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VOLUNTEERING AMONG SURVIVING SPOUSES:
THE IMPACT OF VOLUNTEER ACTIVITY ON THE HEALTH OF
THE RECENTLY WIDOWED

A Dissertation Presented

by

KIMBERLY J. JOHNSON

Submitted to the Office of Graduate Studies,
University of Massachusetts Boston,
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

June 2013

Gerontology Program

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ABSTRACT

VOLUNTEERING AMONG SURVIVING SPOUSES: THE IMPACT OF VOLUNTEER ACTIVITY ON THE HEALTH OF THE RECENTLY WIDOWED

June 2013

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Numerous studies link volunteering to positive mental and physical health for older adults, and recent studies have suggested that volunteering may be particularly beneficial for those who are widowed. This research examines the potential of volunteering to buffer participants from stress-related health declines associated with the death of a spouse.

Using the Health and Retirement Study (HRS), this research investigates the moderating role of volunteering on the self-rated health and depressive symptoms of recently widowed older adults. Consecutive waves of the HRS are used to identify respondents who experience the death of a spouse or who remain married, and those married or widowed respondents who participate in volunteer work over a two-year period. Waves 1998 through 2004 are used to construct three observation periods: 1998–2000, 2000–2002, and 2002–2004. A series of logistic and negative binomial regression

analyses are used to estimate the direct effect and interactive effect of widowed status and volunteer status on self-rated health and depressive symptoms respectively.

Results indicate that while volunteering decreases the odds of being in fair or poor health and decreases the expected number of depressive symptoms for volunteers compared with nonvolunteers, volunteering does not buffer recent widows from declines in self-rated health or reduce the risk of more depressive symptoms. The results do not support the idea that volunteering serves as a source of social support for older adults when dealing with the stress of spousal loss. However, the findings do support the idea that participating in volunteering helps older adults remain socially integrated through a meaningful role in their community.

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CHAPTER 1

INTRODUCTION

Approximately 8.9 million widows and 2.1 million widowers age 65 and older live in the United States, and these surviving spouses represent just over half of the older adult population (Federal Interagency Forum on Aging-Related Statistics, 2010). These widows and widowers have experienced the stress of spousal loss and the related grief and life changes consistent with the death of a partner (Holmes & Ray, 1967; Stroebe & Schut, 1999). The emotions associated with spousal bereavement vary in their incidence and intensity but typically consist of shock, sadness or despair, anxiety, repeated thoughts about the deceased, and feelings of longing for one's deceased spouse (Bonanno, Boerner, & Wortman, 2008; Carr, 2008; Clayton, 1998).

In addition to coping with their emotional reactions of bereavement, widows and widowers often have to adapt to the loss of their partner in instrumental ways by assuming unfamiliar tasks such as paying bills or cooking (Utz, 2006). Further, social adjustments must be made as bereaved spouses navigate within their social network without their partner (Weiss, 2008). Prior research suggests that experiencing a spouse's death places bereaved spouses at risk for declines in health (Bennett, 2006; Prigerson, Maciejewski, & Rosenheck, 2000) and for depression (Choi & Bohman, 2007; Lee & DeMaris, 2007; Zisook & Shuchter, 1991).

The death of a spouse is a profound change in the life of an older adult, given the importance of the marital relationship. Having a spouse is a social resource, helps with the stresses associated with parenting, and enhances financial security (Pearlin & Johnson, 1977). A spouse tends to support positive activity such as health-promoting behaviors (Schone & Weinick, 1998; Umberson, 1992) and volunteering (Butrica, Johnson, & Zedlewski, 2009; U.S. Bureau of Labor Statistics, 2011). Marriage is associated with better health (Dupre & Meadows, 2007), lower health-care expenditures (Prigerson, Maciejewski, & Rosenheck, 2000), and less depression (Brown, Bulanda, & Lee, 2005).

According to the sociological model of stress, a negative or unexpected life event results in a stress-related outcome, but the extent of the impact on well-being is related to the social context and the availability of moderating resources such as social support. A negative life event, such as the death of a spouse, not only constitutes an initial source of stress but is often followed by interrelated sources of strain or secondary stressors (Pearlin, 1989, 1999). To illustrate, husbands and wives experience the stress associated with the loss of their spouse in distinct ways in part because men and women tend to receive different forms of support throughout their married lives (Carr et al., 2000; Fry, 2001; Lee & DeMaris, 2007; Umberson, Wortman, & Kessler, 1992). Women are at greater risk for experiencing financial problems than men following their spouse's death, while men are more likely to experience difficulties associated with household tasks upon losing their wife (Lund, Caserta, & Dimond, 1993; Umberson, Wortman, & Kessler, 1992; Utz, Lund, Caserta, & de Vries, 2011).

There is growing evidence that the loss of a spouse has more adverse effects on the health of men than for women. Prior studies suggest that widowers have a greater risk of health declines and mortality compared to women (Dupre & Meadows, 2007; Lee & Carr, 2007; Martikainen & Valkonen, 1996; Mineau, Smith, & Bean, 2002; Williams & Umberson, 2004). During the transition to widowhood and throughout the process of bereavement, research findings indicate that men experience depression to a greater extent than women (Choi & Bohman, 2007; Lee & DeMaris, 2007; Lee, Willetts, & Seccombe, 1998; Umberson, Wortman, & Kessler, 1992).

While a portion of the adjustments and emotional reactions to the death of a spouse may be temporary and unavoidable components of bereavement, negative stress-related outcomes can be moderated if people have the supportive resources they need (Pearlin, 1989, 1999). Without adequate resources to moderate health-related outcomes, the death of a spouse places both widows and widowers at considerable risk for reductions in health and well-being (Carr et al., 2000; Feld & George, 1994; Ferraro, Mutran, & Barresi, 1984; Umberson, Wortman, & Kessler, 1992). Yet despite the importance of moderating resources in reducing negative stress-related outcomes, much of the existing literature on bereavement and older adults has focused on the types and severity of emotional reactions to this source of stress. Notable exceptions have been studies showing the importance of activity and social support adjustments following the death of a spouse (e.g., Donnelly & Hinterlong, 2009; Ferraro, Mutran, & Barresi, 1984; Ha, 2008; Utz, Carr, Ness, & Wortman, 2002).

Given the stresses associated with the death of a spouse, it is important for researchers and practitioners to understand the ways in which bereaved individuals can be

assisted in dealing with stress and in remaining socially engaged. This study investigates one form of social participation—volunteering—among the recently bereaved. Formal volunteering is an unpaid service structured by a community organization, such as a hospital, school, church, synagogue, or senior center, and is characterized by the function of benefiting others (Wilson, 2000; Wilson & Musick, 1997).

Limited research exists on the influence of volunteering during stressful life transitions; however, some evidence suggests volunteering may assist in moderating the effects of stress among older adults. In one study investigating the role of volunteering after widowhood, Li (2007) found that volunteering during the years following the death of a spouse significantly reduced the occurrence of depressive symptoms among the widowed. However, this study contained a relatively small sample of recently widowed respondents and investigated only one health-related outcome measure of depression. The current study will address these limitations by using data from the Health and Retirement Study (HRS), a large, nationally representative sample containing multiple health indicators. This study will add to the existing literature by exploring whether the benefits of volunteer work for older adults extend to moderating the impact of a stressful life event on self-rated health and depressive symptoms.

The focus of this study is to investigate whether community-based volunteering moderates the negative stress-related outcomes of depression and declines in self-rated health associated with the death of a spouse. Prior studies suggest that older adults who engage in volunteering experience positive effects on their mental and physical health (Li & Ferraro, 2006; Lum & Lightfoot, 2005; Luoh & Herzog, 2002). Research comparing the benefits of volunteering in different age groups finds that in comparison to younger

adults, older adult volunteers experience benefits in physical functioning (Li & Ferraro, 2006), less depression (Musick & Wilson, 2003), and improvements in perceived health and life satisfaction (Van Willigen, 2000). These results suggest that there are properties of volunteering that are uniquely advantageous for older adults, and evidence suggests that the level of formal social participation in activities like volunteering remains relatively stable following the death of a spouse (Donnelly & Hinterlong, 2009; Utz et al., 2002).

The beneficial effects of volunteering have gained the attention of policy makers, who advocate for the community involvement of older adults (Grimm, Spring, & Dietz, 2007), as well as of the practitioners who recruit volunteers (Swinson, 2006). According to the U.S. Bureau of Labor Statistics (2011), about 24% of adults age 65 and older are engaged in volunteering for a community organization, and these volunteers devote about 96 hours on average to volunteering per year. Many scholars and policy makers would like to see an expansion of opportunities and participation in volunteering in order to benefit both society and older adults (Bass & Caro, 2001; Grimm, Spring, & Dietz, 2007; Morrow-Howell, 2006). Moreover, understanding more about the beneficial effects of volunteering and promoting these benefits may be a means for volunteer coordinators to recruit and retain people who are looking for ways to remain engaged in life and active (Swinson, 2006). The findings from this study will assist policy makers and practitioners by building upon existing knowledge about the relationship between volunteering and positive health outcomes for older adults.

Empirical research indicates that formal volunteering is a contributing factor for positive health outcomes. Several studies suggest that older adult volunteers have fewer

declines in ratings of their own health than non-volunteers (Lum & Lightfoot, 2005; Luoh & Herzog, 2002; Morrow-Howell et al., 2003; Thoits & Hewitt, 2001; Van Willigen, 2000). In comparison to non-volunteers, older adult volunteers have fewer functional limitations (Li & Ferraro, 2006; Lum & Lightfoot, 2005; Luoh & Herzog, 2002; Morrow-Howell et al., 2003). One study found that older adults who engaged in volunteering had a reduced risk of fall-related hip fractures (Warburton & Peel, 2008). Further, research findings suggest that volunteers have a lower rate of mortality compared to non-volunteers (Harris & Thoresen, 2005; Lee, Steinman, & Tan, 2011; Lum & Lightfoot, 2005; Luoh & Herzog, 2002; Musick, Herzog, & House, 1999).

Studies consistently find that older adult volunteers have lower levels of depression compared to non-volunteers (Li & Ferraro, 2006; Lum & Lightfoot, 2005; Morrow-Howell et al., 2003; Musick & Wilson, 2003). Prior research suggests that formal volunteering is a significant factor contributing to measures of psychological well-being, including life satisfaction, self-efficacy, and self-esteem (Moen & Fields, 2002; Thoits & Hewitt, 2001; Van Willigen, 2000). Responses to one survey of volunteers suggest that not only do volunteers feel they benefit from volunteering, but their families do as well (Morrow-Howell, Hong, & Tang, 2009).

Yet there remains a need for increased knowledge about the mechanisms of volunteering that result in positive mental and physical health outcomes for older adult volunteers (Morrow-Howell, 2010). This study investigates one possible mechanism. The activity of volunteering can provide older adults with a source of actual or perceived social support, which may serve as a resource in times of stress. According to social-stress theory, social support can reduce a negative stress outcome (Pearlin, 1989, 1999).

Following a stressful event the perception that support is available, or the actual receipt of support, can be beneficial to mental and physical health (Thoits, 2011). The stress used in this investigation is the death of a spouse, with continuously married individuals serving as the comparison group.

The first aim of this research is to investigate whether engaging in community-based volunteer work helps to moderate stress-related declines in self-rated health and increases in depressive symptoms among the recently widowed. Spousal loss can contribute to reductions in perceived health (Bennett, 2006; Prigerson, Maciejewski, & Rosenheck, 2000) and can lead to an increase in depressive symptoms (Choi & Bohman, 2007; Lee & DeMaris, 2007; Zisook & Shuchter, 1991). Volunteering may serve as a social support asset and protect against perceived health declines and depression.

A second aim is to investigate whether gender differences exist in the moderating effect of volunteering on the relationship of spousal loss and declines in health and well-being. According to social stress theory, the reaction to a source of stress such as the death of a spouse is connected to the social context (Pearlin, 1989, 1999). Men and women occupy different roles as husbands and wives, and experience the stress of spousal loss differently (Carr et al., 2000; Fry, 2001; Lee & DeMaris, 2007; Umberson, Wortman, & Kessler, 1992). It is possible that volunteering as a source of social support can have different implications for widows and widowers and serve as a greater asset for bereaved men.

Empirical studies indicate that, in comparison to women, men who experience the death of their spouse are at greater risk for health declines (Dupre & Meadows, 2007; Lee & Carr, 2007) and depression (Lee & DeMaris, 2007; Lee, Willetts, & Seccombe, 1998).

Volunteering may be a more effective moderating resource for recently bereaved men in comparison to women because of the social component to volunteering and the increased risk of health declines among widowers. These research aims are expanded upon in the remaining chapters of this dissertation.

Chapter 2 reviews the empirical research and theoretical framework underlying this research. It examines the available literature on the mental and physical health of widows and widowers, volunteering among older adults, and the sociological theory of stress. Chapter 3 provides the research methodology, and Chapters 4 and 5 contain the results of this research. This dissertation concludes in Chapter 6 with a summary and discussion of the research findings.

CHAPTER 2
THE MENTAL AND PHYSICAL HEALTH OF SURVIVING SPOUSES
AND THE EFFECT OF VOLUNTEER WORK

This chapter reviews the research and theory about spousal bereavement and the way volunteering may moderate the health effects of spousal loss. The chapter begins with an overview of the literature on spousal bereavement and the role of social activities such as volunteering during this life transition. The chapter continues with a review of the empirical evidence of health effects associated with marriage and spousal bereavement with attention to gender differences. Next, additional factors impacting the mental and physical health of widowed and married people are presented with a focus on self-rated health and depression. The chapter concludes with a discussion of the framework and hypotheses guiding this research.

The Stress of Spousal Loss and Its Social Implications

The death of a spouse has long been regarded as an extremely stressful life experience in the adult life course (Holmes & Ray, 1967). Stress represents a condition, event, or exigency perceived by an individual as being negative, threatening, or strenuous (Pearlin, 1989; Pearlin, Lieberman, Menaghan, & Mullan, 1981). Stressful life events are identifiable by a point in time at which an experience occurred, such as the death of a

spouse (Clayton, 1998; Pearlin, 1989). Though a spouse's death may be sudden and without warning, older individuals are increasingly dying after periods of functional decline associated with chronic illness. As a result, surviving spouses may experience stress related to care needs and anticipatory grief along with the finality of the loss of their spouse to death (Carr, Wortman, & Wolff, 2006).

Stroebe and Schut (1999) suggest that the death of a spouse involves contending dually with the loss of an intimate partner and with the day-to-day readjustments that accompany this change in marital status. Throughout the period of spousal bereavement, surviving partners may experience grief in one or more of the following ways: (1) shock or disbelief; (2) despair or feelings of deep loss and emptiness; (3) anxiety or worries about moving forward with life; (4) anger or a sense of the unjust nature of death; (5) repetitive or intrusive thoughts; and (6) yearning or feelings of loneliness and longing for the deceased partner (Carr, 2008). Empirical evidence suggests that experiencing the death of a spouse increases the risk for depression (Choi & Bohman, 2007; Lee & DeMaris, 2007; Zisook & Shuchter, 1991), poor perceived health (Bennett, 2006; Prigerson, Maciejewski, & Rosenheck, 2000), and mortality (Martikainen & Valkonen, 1996; Mineau, Smith, & Bean, 2002).

Along with the grief-related thoughts and emotions, bereaved spouses must adjust or reorder life socially and in practical terms (Berardo, 2003; Utz, 2006; Weiss, 2008). Surviving spouses have to adapt to the loss of instrumental and interpersonal support once received from a partner and begin dealing with tasks such as finances or housework previously performed by him or her (Utz, 2006; Utz et al., 2011). Spousal loss reshapes the relational aspects of life for the surviving partner as the individual transitions from

thinking of the self as part of a couple and interacting with others as a married person to becoming a lone individual (Weiss, 2008). Older adults who become widowed are less likely than the married to possess a close relationship characterized by the sharing of confidences, and widowers are at particular risk of lacking a confidant (Ha, 2008).

Prior research has underscored the importance of one's social network and the support given and received from others following spousal loss. After an acute period of grieving, surviving spouses are likely to continue to want social interaction, to maintain formal social participation, and to increase informal interactions with friends and neighbors (Donnelly & Hinterlong, 2009; Utz, Carr, Ness, & Wortman, 2002). Ha (2008) found that although the widowed were less likely than married people to have a confidant, the bereaved experienced an increase in social support from individuals within their social network. This same study found that in the short term, surviving spouses experienced an increase in support from adult children compared to continuously married respondents, while a significant increase in support received from friends and other relatives was observed 18 months after spousal loss. According to the social theory of stress, social support can reduce negative outcomes from a stressful life event such as the death of a spouse (Pearlin, 1989). Findings from one study suggest that close friendships reduce the risk of hospitalization among the bereaved (Feld & George, 1994). Another study indicates that those surviving spouses who provide assistance to others such as by running errands or providing transportation experience a decline in depressive symptoms (Brown, Brown, House, & Smith 2008).

Some researchers have found no significant changes in the level of volunteering among the recently widowed (Donnelly & Hinterlong, 2009; Utz et al., 2002). However,

one study suggests that for volunteers in late mid-life, a marital dissolution is associated with a reduction in volunteer participation (Butrica, Johnson, & Zedlewski, 2009). While participation in volunteering may change following the death of a spouse, empirical evidence indicates that for volunteers who have lost a spouse, volunteer activity may have a positive impact on their well-being. Greenfield and Marks (2004) find that for older adults who are retired or widowed, volunteering is related to positive feelings or affect, and even helps to maintain a sense of purpose in life.

Utilizing data from the American Changing Lives (ACL) survey, Li (2007) found that volunteer participation partially offset the depressive impact of spousal loss among respondents age 50 and older. However, there are two noteworthy limitations of this study. First, at baseline the average time since the death of a spouse was 16 years, and only 201 respondents become widowed during the course of the study, which resulted in a small sample of respondents widowed fewer than five years. Second, pre-loss characteristics are not controlled because this information is not available for respondents already widowed at baseline. Notwithstanding these limitations, this study does suggest that volunteering may assist older adults by reducing depressive symptoms following the stressful event of spousal loss. Other studies have found that older adult volunteers have lower levels of depression over time compared to non-volunteers (Li & Ferraro, 2006; Lum & Lightfoot, 2005; Morrow-Howell, Hinterlong, Rozario, & Tang, 2003; Musick & Wilson, 2003), and collectively they lend support to the idea that volunteering may moderate the depressive effect of a stressful life event.

Whether widowed or married, older adults likely to engage in volunteer work possess human capital and have occupied roles in social networks that increase their

opportunities to participate in volunteer work (Burr, Choi, Mutchler, & Caro, 2005; Moen & Fields, 2002; Morrow-Howell, 2010; Musick, Wilson, & Bynum, 2000).

In turn, older adults who engage in volunteer work experience positive effects on their mental and physical health (Li & Ferraro, 2006; Lum & Lightfoot, 2005; Luoh & Herzog, 2002). Remaining active, trying new things, and maintaining regular contact with close friends are important resources for mental and physical health during spousal bereavement (Ferraro, Mutran, & Barresi, 1984; Norris & Murrell, 1990; Utz et al., 2002). Participating in volunteering is valued within society (Bass & Caro, 2001; Morrow-Howell, 2010), and a source of mattering to others for volunteers (Morrow-Howell, Hong, & Tang, 2009). Donnelly and Hinterlong (2009) postulate that community-based volunteering may enhance a widowed volunteer's social network and provide the opportunity for older adult volunteers to benefit from helping others. This is a compelling idea in light of recent findings suggesting that informally helping others reduces depression among widows (Brown, Brown, House, & Smith, 2008) and that formal volunteering reduces depressive symptoms among the widowed (Li, 2007). Given the nature of volunteer work, it is plausible that volunteering in one's community helps to provide resources for widowed older adults, although preexisting social networks, social support, and socioeconomic status (SES) significantly affect a bereaved spouse's access to these social and behavioral resources (Ha, 2008; Norris & Murrell, 1990; Utz et al., 2002).

In prior research, the better mental health, higher self-rated health, and lower risk of mortality of volunteers compared to nonvolunteers have been attributed to social integration (Lee, Steinman, & Tan, 2011; Li & Ferraro, 2006; Luoh & Herzog, 2002).

The positive direct effect of volunteering on the health of older adults appears to support the idea that volunteering increases the social integration of older adults. Cohen (2004) distinguishes the direct effect on health of social integration—the variety of activities and roles occupied—from the buffering, or interactive, effect on health of social support following a stressful event. The perceived availability of social support is a buffering resource for the individual confronted with stress (Cohen, 2004; Thoits, 2011), although support may actually be supplied from either close-knit ties or ties with secondary social network members (Thoits, 2011). It is plausible that older adult volunteers perceive a greater availability of social support than do nonvolunteers, or volunteers may actually experience social support from network ties during a period of stress. Through either of these pathways, volunteering may buffer the effect of the stress of spousal loss on the self-rated health and depressive symptoms of older adults. The primary goal of this research is to investigate whether volunteering acts as a moderating resource for those who have recently experienced the death of a spouse.

Marriage and the Mental and Physical Health of Older Adults

Over the course of the twentieth century, marital trends changed in the U.S. population. The age of first marriage rose, and the incidence of divorce increased. These changes have contributed to an increase in the number of unmarried adults, but most individuals do marry and approach retirement age with a spouse (Bianchi & Casper, 2000). Marriage provides protective functions for people as they are confronted with daily stresses associated with parenting and financial resources, while helping to maintain connections with a social network (Pearlin & Johnson, 1977).

Marriage continues to be an important supportive relationship in the lives of adults as they age. Advancements in public health and in health care, which have decreased mortality rates and extended life expectancy, have contributed to an increase in the number of adults 65 and older who reside with a spouse. Due to gender differences in mortality rates and the fact that men tend to partner with younger women, men are more likely to be married at older ages than women (Bianchi & Casper, 2000). Throughout the life course, having a marital partner is associated with more financial security, especially for women (Hirschl, Altobelli, & Rank, 2003; Smeeding & Sandstrom, 2005). In turn, SES is an important determinant of health (House, Lantz, & Herd, 2005).

As married people grow older, spouses supply additional instrumental support, such as health-related assistance and reminders. Individuals who experience the death of their spouse not only lose this support but are also less likely than their married peers to receive health monitoring from other family members or friends, leaving them at greater risk for health declines (Umberson, 1992; Williams, 2004). Among adults 65 and older, marriage is associated with positive health behaviors, although larger differences have been observed in the health practices of married versus widowed men than for comparable groups of women (Schone & Weinick, 1998). Umberson, Chen, House, Hopkins, and Slaten (1996) found that men were more likely to receive health monitoring from their spouse than were women. This form of support partially explains the observed difference in the health behavior of married versus unmarried men found in other studies.

Not only are married men likely to receive health monitoring from their wife (Umberson, 1992; Umberson et al., 1996), but married men most often designate their

spouse as a confidant if they name anyone at all in this role. On the other hand, wives may name their husband but are more likely to name someone else as their confidant (Tower & Kasl, 1996). Not surprising, then, spouses are the most important source of emotional and instrumental support for people 50 and older, followed by friends and, to a lesser extent, adult children (Dean, Kolody, & Wood, 1990).

Empirical evidence suggests that a supportive marital relationship significantly contributes to lower levels of depression and is associated with better perceived health (Kim & McKenry, 2002; Prigerson, Maciejewski, & Rosenheck, 2000; Umberson et al., 1996). Being married is associated with lower levels of depression, especially for midlife and older adult men, in comparison to being formerly married or currently cohabitating (Brown, Bulanda, & Lee, 2005).

In a cross-sectional study, Pienta, Hayward, and Jenkins (2000) found that married people in their 50s were physically healthier than unmarried individuals of the same age. Another study by Dupre and Meadows (2007) followed a cohort of Health and Retirement Study respondents born between 1931 and 1941 for a period of eight years. Using marital histories provided by respondents at baseline in 1992, the authors found that longer, more stable marriages resulted in less risk of chronic disease. Additional empirical evidence suggests that married individuals have a lower rate of mortality than unmarried midlife and older adults (Johnson, Backlund, Sorlie, & Loveless, 2000; Manzoli, Villari, Pirone, & Boccia, 2007).

A marriage effect is also observed when declines in health and functioning occur. For example, depression in one member of a marital couple is associated with the other spouse experiencing depressive symptoms, and the physical health of a husband can

affect the mental well-being of his wife (Ayotte, Yang, & Jones, 2010). If one member of a marital dyad becomes disabled, the nondisabled spouse is most likely to become the informal care provider in the home (Barrett & Lynch, 1999). Overwhelmingly, spousal caregiving is more often available to men (Barrett & Lynch, 1999; Umberson & Williams, 2005). Women in need of care are more likely than men to have in-home paid care providers even if married (Mutchler & Bullers, 1994). Although gender differences in spousal caregiving are consistent with women's traditional role as care provider, the gender difference in availability of spousal caregiving is largely due to the demographic differences in the rates of marriage among older adult men and women (Bianchi & Casper, 2000).

In contrast to the married, widows in need of care are likely to have informal caregiving networks consisting of adult children and friends (Barrett & Lynch, 1999). A disabling condition is more likely to alter the living arrangements of unmarried elders; poor cognitive or physical functioning increase the odds that the unmarried, but not the married, will reside with an adult child (Liang, Brown, Krause, Ofstedal, & Bennett, 2005). Although changes in living arrangements are based on personal factors in addition to health and marital status, such as the number of living children and the availability of economic resources (Mutchler, 1992), spouses are likely to supply vital functions to meet the health and the care needs of their partners.

It is important to note that the quality of the marriage plays an important role in the relationship between marriage and the health and well-being of adults throughout the life course. Research findings indicate that poor-quality marriages or stressful living arrangements are not associated with protective effects on mental and physical health

(Bookwala, 2005; Bookwala & Franks, 2005; Hughes & Waite, 2002; Umberson et al., 1996). To illustrate, midlife and older married persons in conflicted marriages have significantly higher estimates of annual health care costs compared to individuals in harmonious marital relationships (Prigerson, Maciejewski, & Rosenheck, 2000). Because of structural factors and their familial roles, women, more than men, are exposed to greater levels of marital strain over the life course, but overall marital strain is relatively low among current older-adult couples (Umberson & Williams, 2005). In sum, good-quality marriages are associated with better mental and physical health, and with support when stress occurs. However, some evidence suggests that with advancing age men benefit to a greater extent from marriage than women, in part because men are more likely to be married and because of the traditional supportive role of wives.

The Health Consequences of the Stress of Spousal Loss

There is growing evidence that stress, such as the death of a spouse, affects mental and physical health. Perceived stress is significantly related to elevated levels of biochemical health indicators including cortisol (a chemical produced by the adrenal glands to help regulate several body functions); fasting glucose (sugar levels in the bloodstream following a period of not eating, usually associated with tests for diabetes); and triglycerides (a fat used as an indicator of circulatory health) (Goldman, Gleib, Seplaki, Liu, & Weinstein, 2005). The effectiveness of the immune system is decreased by stress, and this can be compounded with age-related reductions in immune system function (Graham, Christian, & Kiecolt-Glaser, 2006). The experience of stress generally associated with subjective feelings of worry, tension, or pressure is related to lower levels

of self-rated health (Farmer & Ferraro, 1997). Stressful life events increase the odds that men and women will experience the onset of mental health problems including alcohol dependence and depression (Slopen, Williams, Fitzmaurice, & Gilman, 2011).

Due in part to the accumulation of negative life events experienced by individuals with advancing age, strains in interpersonal relationships may have particularly deleterious effects on the health and well-being of older adults (Ingersoll-Dayton, Morgan, & Antonucci, 1997; Umberson & Williams, 2005). Likewise, disruptions or stresses occurring in highly valued areas of life, such as marriage, are more detrimental to the health of older adults than are strains associated with less important social roles (Krause, 2004; Shaw & Krause, 2002). For instance, individuals in closer, high-quality marital relationships experience more difficulties adjusting to the death of their spouse than do widowed persons with less optimal marital histories (Carr, House, Kessler, Nesse, Sonnega, & Wortman, 2000; Prigerson, Maciejewski, & Rosenheck, 2000).

There is empirical evidence that the stress of a spouse's death negatively affects the health of the surviving spouse. Prigerson, Maciejewski, and Rosenheck (2000) found that among adults 50 and older, those who were widowed within the preceding three years had significantly lower health than comparable, continuously married respondents as measured by self-rated health, functional limitations, chronic conditions, depressive symptoms, and estimated health-care costs. Additional studies indicate that the widowed report significantly lower self-rated health compared with the non-bereaved (Ferraro, Mutran, & Barresi, 1984; Williams & Umberson, 2004). A spouse's death increases the risk of mortality for the remaining partner, particularly among men (Martikainen & Valkonen, 1996; Mineau, Smith, & Bean, 2002). Existing studies suggest that becoming

widowed affects physical health by raising the incidence of poor health behaviors (Williams, 2004) and by increasing the risk of chronic illness (Dupre & Meadows, 2007; Prigerson, Maciejewski, & Rosenheck, 2000).

Although existing research does not provide definitive conclusions about the timing of perceived health effects related to the death of a spouse, some evidence suggests that negative self-rated health effects may not occur immediately following a spouse's death. For instance, one study that assessed the health of a group of bereaved respondents nine months after the death of a spouse found no health differences between the bereaved and control groups (Norris & Murrell, 1990). In contrast, another study using the British Household Panel Survey found a decline in self-rated health two to three years following the death of a spouse (Bennett, 2006). While it may follow that some duration of time must occur from the death of a spouse until health problems are detected, other factors likely impact the health of widowed persons, such as prior health, gender, SES, and social support (Bennett, 2006; Ferraro, Mutran, & Barresi, 1984; Norris & Murrell, 1990; Williams, 2004).

Research using longitudinal data finds that spousal loss is a risk factor for depression (Choi & Bohman, 2007; Lee & DeMaris, 2007; Norris & Murrell, 1990). Although a clinical diagnosis of a major depressive disorder is generally not attributed to the bereaved within two months of the loss, the recently widowed are at risk for depression, whether assessed through survey measures such as the Center for Epidemiological Studies Scale for Depression (CES-D) or clinical diagnostic criteria (Onrust & Cuijpers, 2006; Turvey, Carney, Arndt, Wallace, & Herzog, 1999; Zisook & Shuchter, 1991). Studies of spousal bereavement generally indicate that through a variety

of trajectories ranging from a few months up to about two years, most older adults adjust psychologically to the loss of their spouse (Boerner, Wortman, & Bonanno, 2005; Bonanno et al., 2002; Lund, Caserta, & Dimond, 1993). Yet an estimated 10% to 15% of bereaved people continue to experience longer-term difficulties with grief and depression (Bonanno, Boerner, & Wortman, 2008; Galatzer-Levy & Bonanno, 2012). Those people in poor health at the time of a spouse's death may be at the greatest risk for more severe grief-related symptoms and depression (Utz, Caserta, & Lund, 2012).

Marriage represents a unique relationship in the life course of men and women, and this relationship contributes to the personal importance of the loss when a spouse dies. To illustrate, one study compared three groups of older adults: a non-bereaved group, a recently widowed group, and an otherwise bereaved group who had recently lost a family member other than a spouse. The findings indicated that the recently widowed were significantly more depressed than the other two groups (Norris & Murrell, 1990). Regardless of whether a spouse's death was anticipated or sudden, studies have shown that the stress of spousal loss places surviving spouses at risk for depression (Carr, House, Wortman, Nesse, & Kessler, 2001; Turvey et al., 1999). Irrespective of their parental status, adults age 50 and over who have been widowed are more vulnerable to depressive symptoms and loneliness (Koropeckyj-Cox, 1998).

In comparisons with those who are married, cohabitating adults are observed to be in significantly worse mental and physical health (Brown, Bulanda, & Lee, 2005; Zhang, 2006). In contrast, several recent studies find no significant differences in the health and well-being of married individuals in comparison to the never married (Hagedoorn et al., 2006; Koropeckyj-Cox, 1998; Zhang, 2006). Moreover, older adults who maintained

their never-married status report fewer stresses associated with being single than their divorced and widowed contemporaries (Pudrovska, Schieman, & Carr, 2006).

Collectively, these results suggest that it is the stress of losing a spouse, and not merely the absence or presence of a partner, that explain the observed health-related differences between recently widowed and married individuals.

Gender Differences in Spousal Bereavement

A negative life event, such as the death of a spouse, not only constitutes an initial source of stress but is often followed by interrelated sources of strain or secondary stressors. These additional sources of stress are often related to the social environment and the places individuals occupy within society (Pearlin, 1989, 1999). To illustrate, for women the experience of a spouse's death is frequently followed by loss of income and wealth, particularly among Hispanic widows (Angel, Jimenez, & Angel, 2007). Since husbands and wives tend to receive different forms of support throughout marriage, men and women experience the stress associated with the loss of their spouse in distinct ways (Carr et al., 2000; Fry, 2001; Lee & DeMaris, 2007; Umberson, Wortman, & Kessler, 1992). Women are at greater risk for experiencing financial problems than men following their spouse's death, while men are more likely to experience difficulties associated with household tasks upon losing their wife (Lund, Caserta, & Dimond, 1993; Umberson, Wortman, & Kessler, 1992; Utz et al., 2011). In one study, widows with financial strains and widowers with household-management strains were more likely to experience depression than widowed individuals not experiencing these additional stressors (Umberson, Wortman, & Kessler, 1992). Similarly, research using prospective data

showed that widows who had depended upon their partner for instrumental support such as financial management and home maintenance were more likely to experience distress, such as symptoms of anxiety (Carr et al., 2000).

The existing research on the physical health effects of bereavement suggests that, in comparison to women, men are at a greater disadvantage upon losing their spouse. In one study, a significant decline in physical functioning was observed for male respondents, who were identified as highly distressed during the process of losing their spouse, but this same effect was not observed among recently widowed women. Widowers reported high distress if their spouse was in poor health prior to death or if they were absent at the time of their spouse's death (Lee & Carr, 2007). In another study, the transition to widowhood did not significantly attenuate self-rated health status for women at any age. In contrast, men reported lower self-rated health one year after the death of their spouse, and although younger widowers were observed to rebound to higher levels of self-rated health approximately three years after the loss, widowed men age 70 and older continued to report lower perceived health (Williams & Umberson, 2004).

Research suggests that men are more at risk than women for depression upon experiencing the death of their spouse. One study showed that, compared to women of the same age, men age 65 and older were likely to experience a greater increase in depressive symptoms following a marital disruption, including the death of a spouse, marital separation, divorce, or the onset of spousal caregiving (Choi & Bohman, 2007). Prior cross-sectional studies have found that widowers are significantly more depressed than widows (e.g., Lee, Willetts, & Seccombe, 1998; Umberson, Wortman, & Kessler,

1992); however, some longitudinal studies either found no gender differences in depression or had too few widowed men to make comparisons (e.g., Norris & Murrell, 1990; Turvey et al., 1999).

In an investigation of gender differences in depression among the recently bereaved, Lee and DeMaris (2007) used two waves of data from the National Survey of Families and Households. The findings indicated that respondents who became widowed after the baseline were more depressed than continuously married respondents at follow-up regardless of gender. Interestingly, this same study found that the male respondents who transitioned to widowhood during the course of the study were significantly more depressed than non-bereaved men at baseline, but this was not true for women. Lee and DeMaris concluded that there appeared to be some degree of anticipatory grief unique to the males in their study that was not observed among females and was not explained by health or caregiving status. In their research on the different courses of bereavement, Bonanno et al. (2002) noted that approximately 10% of the bereaved in their study exhibited higher pre-loss depressive symptoms than at 6 and 18 months after the loss. It remains unknown whether this form of bereavement is more prevalent among men than women; however, Lee and DeMaris (2007) suggest that their findings partially explain the lack of gender differences found in previous longitudinal studies of post-bereavement depression.

A plausible explanation for these gender differences is that men and women have distinctive personal and social resources to draw from during spousal bereavement. One study of recently widowed male and female respondents investigated the life domains associated with a sense of mastery. Included were affective/emotional, dietary/

nutritional, financial, interpersonal, instrumental, health, spiritual, and social-support domains. Findings indicated that ratings in these areas were positively related to two-year follow-up reports of health, quality of life, and self-esteem for widows and widowers. While widows had higher levels of efficacy in the spiritual, interpersonal, and social-support areas compared to widowers, the latter had higher efficacy in the financial, health, and instrumental domains compared to widows. These findings suggest that the personal strengths possessed by widows assist these women in coping with the stress of spousal loss (Fry, 2001).

One caveat noted by scholars is that differences observed in the mental and physical health of widowed men and women may be misleading depending upon the inclusion of factors such as mortality and remarriage in previous studies. These researchers suggest that men are more likely both to die and to remarry if widowed; hence the length of time since an individual lost a spouse can limit the sample of widowers and affect findings pertaining to gender differences (Umberson, Wortman, & Kessler, 1992). An additional note is that it has also been suggested that women fare better in widowhood because of a higher concentration of widows in the population, which provides widows a normative status in society and possible supports not afforded to widowers (Lee & DeMaris, 2007).

Factors Associated with the Health and Depressive Symptoms of Older Adults

Additional factors are associated with the mental and physical health of older adults including: prior health status, functional limitations, health behaviors, and socioeconomic status. These factors are not only related to self-perceptions of health and

depressive symptoms among older adults, but they can also play a role when an individual is confronted with a stressful life event such as the death of a spouse. The following sections discuss factors associated with the mental and physical health of older adults. Specifically these factors are associated with the physical health measure of self-rated health and the mental health measure of depressive symptoms.

Physical Health Status

Physical health, as indicated by self-rated health, is partly explained by prior health status (Bennett, 2006; Idler & Benyamini, 1997; Liang et al., 2010). In a study using four waves of data from the British Household Panel Survey, Bennett (2006) found that prior self-rated health status was a significant predictor of health-service utilization, self-rated health, and the number of health problems at follow-up. Perceptions of poorer health are also associated with higher rates of mortality (Idler & Benyamini, 1997; Idler, Leventhal, McLaughlin, & Leventhal, 2004; Liang et al., 2010), although some research suggests that self-rated health is a stronger predictor of mortality for men than for women (Benyamini, Leventhal, & Leventhal, 2000; Idler, 2003).

Research on the physical health status of men and women suggests important gender differences, and these in turn have implications for self-ratings of health. With advancing age, women, more than men, are diagnosed with chronic but non-life threatening health conditions, such as arthritis (Murtagh & Hubert, 2004; Needham & Hill, 2010; Pienta, Hayward, & Jenkins, 2000; Whitson et al., 2010). Among older adults, the health conditions of women more frequently restrict activity or limit physical functioning relative to men (Arber & Cooper, 1999; Murtagh & Hubert, 2004; Whitson et

al., 2010). Studies suggest that men have a higher incidence of cardiovascular problems such as hypertension, stroke, and congestive heart failure than women of the same age (Gottdiener et al., 2000; Needham & Hill, 2010; Pienta, Hayward, & Jenkins, 2000). These distinctions in health conditions have been attributed in part to differences in the psychosocial experiences and health behaviors of men and women (Verbrugge, 1985, 1989; Williams & Umberson, 2004). The higher rates of potentially life-threatening illness of men relative to women are observed in their higher mortality rates, although gender gaps in self-rated health are not consistently observed (Arber & Cooper, 1999; Idler, 2003). One recent longitudinal study on the change of self-rated health among midlife and older adults found a significant correlation between male gender and poorer self-rated health (Liang et al., 2010). There are several possible reasons for the mixed findings observed between men and women on self-rated health including socioeconomic factors, experiential differences in health and health care, differences in the way men and women assess and report on their global health, and methodological differences between studies of self-rated health (Arber & Cooper, 1999; Benyamini, Leventhal, & Leventhal, 2000; Idler et al., 2004; Leinonen, Heikkinen, & Jylha, 2001a).

Physical health is an important indicator of depression, and frequently the two are interrelated. Depression may be a secondary complication associated with other health conditions that are common among older adults (e.g., dementia, diabetes, and heart disease) (Kayton, 2003; Kessler et al., 2005). Choi and Bohman (2007) found that baseline health status is a significant predictor of a change in the number of depressive symptoms two years later. Research using five waves of HRS data suggests that self-

perceptions of health are a significant indicator of subsequent depression (Kosloski, Stull, Kercher, & Van Dussen, 2005).

Mental Health

The majority of lifetime mood and anxiety disorders, which include depression, typically emerge in young adulthood (Kessler et al., 2005). Yet a significant predictor of depressive symptoms among older adults is a prior history of depression or other mental disorders, and the risk of increased depressive symptoms is higher for those faced with the stress of spousal loss (Choi & Bohman, 2007; Norris & Murrell, 1990). An accumulation of losses, such as of family members and friends, is associated with greater depressive symptoms, particularly among African-American older adults (George & Lynch, 2003).

As with physical health, there are gender differences in mental health conditions. Overall, men have a higher lifetime incidence of substance abuse and disorders related to antisocial or aggressive behaviors, while women have higher rates of most anxiety and mood disorders, such as major depressive and dysthymic disorders (Needham & Hill, 2010; Slopen et al., 2011). Even at older ages, women experience more depression than their male peers (Roberts, Kaplan, Shema, & Strawbridge, 1997; Whitson et al., 2010).

For both men and women, physical health status is often associated with mental health at older ages. Research findings suggest that certain physical conditions (e.g., diabetes or heart disease) co-exist with depression (Kayton, 2003; Kessler et al., 2005). In turn, depression may have an adverse effect on health by reducing compliance with medical advice such as taking medication as prescribed, exercising, and following dietary

recommendations (Kayton, 2003). Depression increases the risk of mortality (Penninx et al., 2001) and is associated with suicide (Conwell & Brent, 1995).

Hana and Jylhab (2006) found that over a two-year period a decline in depressive symptoms is associated with the odds of a positive change in self-rated health. In another longitudinal study of the relationship between depression and self-rated health, the findings suggest that depression does not significantly predict self-rated health among older adults (Kosloski et al., 2005). Yet among older adults the relationship of both physical functioning and health conditions with depression suggests that depression is inversely related to health at a given point in time (Hana & Jylhab, 2006; Kayton, 2003; Roberts et al., 1997).

Functional Limitations

Functional limitations or difficulties performing activities of daily living (ADLs) and instrumental activities of daily living (IADLs) are related to physical health. One study found that functional limitations are related to perceptions of poorer health (Mora, Dibonaventura, Idler, Leventhal, & Leventhal, 2008), and functional limitations are also directly related to depression (Bookwala, 2005; Murtagh & Hubert, 2004; Roberts et al., 1997; Whitson et al., 2010). Due to gender differences in physical health conditions, functional limitations are more common among women than men (Arber & Cooper, 1999; Murtagh & Hubert, 2004; Pienta, Hayward, & Jenkins, 2000; Verbrugge, 1985). However, gender and health conditions do not entirely explain the relationship between functional limitations and depression. Whitson and her colleagues (2010) continued to

find a significant association between depression and ADL limitations even after adjusting for medical conditions and sociodemographic factors.

Health Behaviors

Health behaviors are activities that influence individual health and well-being. Examples include smoking, diet, sleep, and levels of physical activity (McPhee, Johnson, & Dietrich, 2004; Wray, Alwin, & McCammon, 1995). Research suggests that having a spouse and engaging socially with others are two factors related to exercising and other positive health behaviors (Schone & Weinick, 1998; Umberson, 1992).

Smoking increases the risk of poor health, functional limitations, and death (Ostbye, Taylor, & Jung, 2002; Ostbye, Taylor, Krause, & Scoyoc, 2002). Remaining physically active and avoiding a sedentary lifestyle is associated with a lower risk of functional limitations and better physical health (Ostbye, Taylor, & Jung, 2002; Ostbye et al., 2002; Taylor et al., 2004). According to a five-year longitudinal study of a 1914 birth cohort of Finnish adults, changes in the level of physical activity of older adults is directly related to changes in perceptions of health (Leinonen, Heikkinen, & Jylha, 2001b).

Engaging in physical activity also decreases the risk of depression and contributes to overall well-being (Choi & Bohman, 2007; Taylor et al., 2004). In contrast, smoking is related to an increase in depression (Breslau, Peterson, Schultz, Chilcoat, & Andreski, 1998; Choi & Bohman, 2007). Further, depressive symptoms are associated with negative health behaviors such as increased sedentariness, poor eating habits, and smoking (Breslau et al., 1998; Kayton, 2003).

Social Network and Social Roles

The social roles and related formal and informal activities engaged in by older adults represent their social networks, and these social factors are associated with mental and physical health. Findings from one study suggest that engaging in social activities and possessing a social network of friends and family are directly related to ratings of physical health (Cornwell & Waite, 2009). The results from another study indicate that formal kinds of social participation, such as paid and voluntary work, are positively related to the physical health of older adults (Luoh & Herzog, 2002). The availability of supportive friends within an older adult's network is inversely associated with depression (Dean, Colody, & Wood, 1990), whereas the perception of social isolation is directly related to depression and lower self-ratings of health (Cornwell & Waite, 2009).

One reason people within a social network have an effect on an individual's health is the exchange of support that can occur through ties with others (House, Landis, & Umberson, 1988; Thoits, 2011). People within a social network, such as family members, friends, or co-workers, influence social support over time through the process of giving and receiving support to one another or through the influence on the perceived availability of support (Thoits, 2011). Social networks are also related to health through the influence on health-related behaviors (Schone & Weinick, 1998; Umberson, 1992). A study comparing a recently bereaved group and a continuously married sample found that only those widowed respondents who reported lacking close friends at baseline showed an increased likelihood of hospitalization (Feld & George, 1994).

Religious Importance

Religious importance is a subjective measure of the value or importance people place on religion in their lives. The measure of religious importance is correlated with religious activity such as service attendance (Atchley, 1997). While prior research indicates that the number of religious services attended and positive spiritual beliefs are both related to medical outcome measures (Campbell, Yoon, & Johnstone, 2010), longitudinal research indicates that the importance of religion does not have a direct effect on self-rated health (Atchley, 1997). By contrast, recent research suggests that religious importance is associated with lower risk for depression (Miller et al., 2012).

The self-perception of religion as important is associated with beginning to volunteer and continuing volunteer work (Butrica, Johnson, & Zedlewski, 2009; Choi & Bohman, 2007). Multiple studies report a relationship between volunteering and various measures of religious affiliation, participation, and beliefs, particularly among African-American individuals (Li & Ferraro, 2006; Musick, Wilson, & Bynum 2000; Van Willigen, 2000; Wilson & Musick, 1997). Religion is a form of support and personal coping often used in the daily lives of older adults and in times of stress (Pargament, Koenig, Tarakeshwar, & Hahn, 2004; Van Hook & Rivera, 2004). Older adults may receive support from social connections through a place of worship and spiritually through their faith-based practices (Moreira-Almeiga, Neto, & Koenig, 2006).

Age

Older age does not automatically lead to poor health and depression; however, advancing age is associated with reductions in productive activity, physical functioning,

and health (Bennett, 2006; Burr, Mutchler, & Caro, 2007; Li & Ferraro, 2006). In comparison to adults in midlife, older adults are observed to possess lower self-rated health, and over time self-rated health does decline (Liang et al., 2010). Among older adults, age is correlated with depression, but to a large extent this relationship is attributed to health-related conditions and limitations in functioning (Roberts et al., 1997; Kayton, 2003; Whitson et al., 2010).

Age is also related to the association between experiencing the death of a spouse and health declines. One study found that men had lower self-ratings of health a year after a spouse's death, but, unlike younger widowers, older widowers are less likely to have higher ratings of self-rated health over time (Williams & Umberson, 2004). Another study suggests that the death of a spouse may lead to less of a decline in health status if there is an increase in health-related reminders from someone other than a spouse, but this moderating effect of health-related reminders on the change in health status decreases for surviving spouses 70 and older compared to similar individuals ages 50–69 (Williams, 2004).

Race and Ethnicity

The demographic characteristics of race and ethnicity are associated with the mental and physical health of older adults. Those individuals who are African American or Hispanic have a health disadvantage in comparison to White non-Hispanic adults (Jang, Chiriboga, Kim, & Phillips, 2008; Liang et al., 2010). African-American race or Hispanic ethnicity is associated with lower self-rated health (Liang et al., 2010). Empirical results indicate that older adults from racial and ethnic minority groups tend to

report more depressive symptoms compared with White non-Hispanic older adults (Ayotte, Yang, & Jones, 2010; George & Lynch, 2003; Jang et al., 2008; Sachs-Ericsson, Plant, & Blazer, 2005; Skarupski et al., 2005). Related to these disparities is the exposure to higher levels of stress and the possession of fewer instrumental resources (e.g., years of education and income) by Hispanic and African-American individuals (George & Lynch, 2003; Jang et al., 2008; Turner, Wheaton, & Lloyd, 1995). In fact, one study found that education and perceived difficulty in meeting one's needs mediated the relationship between race and depressive symptoms in a sample of community-dwelling older adults (Sachs-Ericsson, Plant, & Blazer, 2005).

Across all racial and ethnic groups, marriage is correlated with better health (Pienta, Hayward, & Jenkins, 2000). Of interest is the finding that African-American widows experience less stress associated with being single than White non-Hispanic widows. The researchers suggest that this finding may be attributable to lower rates of marriage or to alternative forms of social support in the African-American population (Pudrovskaya, Schieman, & Carr, 2006). A study of social engagement among older adults suggests that widowed African-Americans engage in less social participation than their non-widowed peers (Utz et al., 2002). Reduced social involvement could have a negative impact on the mental and physical health of this population to the extent that lower social interaction represents less perceived social support, fewer health reminders, or social isolation.

African-American adults also tend to engage in volunteer work less often than White adults (Musick, Herzog, & House, 1999; Thoits & Hewitt, 2001). One reason is that African-Americans are less likely to be asked to volunteer by someone within their

social network (Musick, Wilson, & Bynum, 2000). This suggests that societal or organizational factors may influence whether older adults volunteer. A recent study suggests that the benefits of volunteering are significantly related to program characteristics such as support received for training and stipends; and when such factors are taken into account, older adults from racial and ethnic minority groups do perceive more benefits from volunteering than do White older adults (Morrow-Howell, Hong, & Tang, 2009).

Socioeconomic Status

Socioeconomic status (SES) is often assessed using one or more of the demographic factors of education, annual income, and wealth. Net worth, which includes assets and savings, represents the accumulation or dissipation of financial resources over time, and because of the normative status of retirement and related changes in annual earnings, measures of wealth provide a better indication of SES at older ages than annual household income (Henretta & Campbell, 1978). Among older adults depressive symptoms and self-rated health are associated with SES. For example, poor self-rated health is associated with fewer years of education (Liang et al., 2010) and lower levels of wealth (Hajat, Kaufman, Rose, Siddiqi, & Thomas, 2010). Depression in older adults is associated with lower education and economic status (George & Lynch, 2003; Sachs-Ericsson, Plant, & Blazer, 2005).

Research findings suggest that SES plays a role in the support received during spousal bereavement and is related to health and well-being following spousal loss (Ha, 2008; Norris & Murrell, 1990; Utz et al. 2002). The importance of SES is underscored by

the relationship of widowhood and declines in income and financial assets, particularly among minority women (Angel, Jimenez, & Angel, 2007). Further, studies have found that SES is directly correlated with community integration and volunteering (Li & Ferraro, 2006; Moen & Fields, 2002; Musick, Herzog, & House, 1999; Thoits & Hewitt, 2001; Van Willigen, 2000; Wilson & Musick, 1997). However, Musick, Wilson, and Bynum (2000) found that SES explained more of the participation in volunteering among White than African-American adults.

Theoretical Framework

According to the social theory of stress, stress is a process consisting of three interconnected domains: stressors, moderating resources, and stress-related outcomes. In this model, the social context is intertwined with the stress process in such a way that each of the three domains of stress is connected to the social environment (Pearlin, 1989, 1999; Pearlin et al., 1981). Figure 1 shows the relationship of the three domains of the stress process. The first domain, the source of stress, represents a condition or event perceived by an individual as being negative, threatening, or strenuous (Pearlin, 1989; Pearlin et al., 1981). The loss of a spouse and the related life transition from being married to widowed has long been considered a stressful life event (Clayton, 1998; Holmes & Ray, 1967), and it is a useful indicator of stress for purposes of this research. Moderating resources are behavioral, cognitive, or social factors that influence the stress process in such a way to reduce negative stress outcomes. These resources influence the stress process by affecting an individual's perception and reaction to a stressor, or by

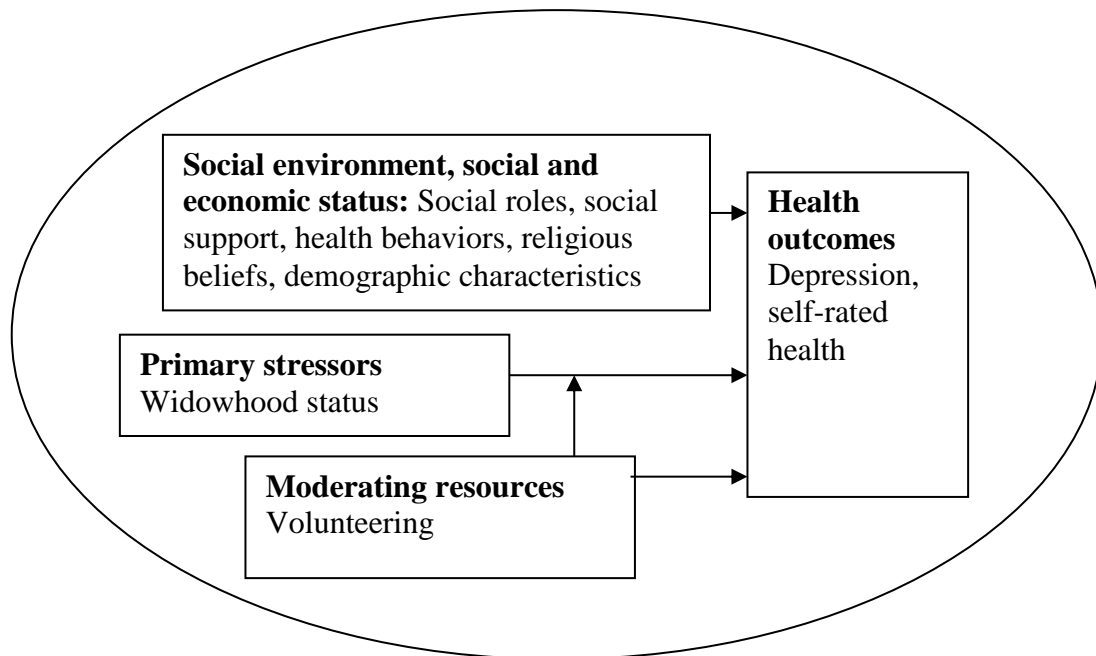


Figure 1. The effect of volunteering on the health of older adults experiencing the stress of spousal loss

reducing the impact of a stress outcome (Pearlin, 1999). A well-documented moderator of stress is positive social support. Social support is the utilization of informal social relationships, such as family members or friends, or formal systems, such as community organizations for assistance in dealing with a problem or stressor. Following a stressful life event, individuals, groups, or organizations provide social support that serve as a moderating resource. According to the stress process, social support occurs in the form of affective or instrumental support in order to minimize negative stress outcomes. The effectiveness of social support depends on the quality of the relationship between the recipient and the provider of the support, and social support will vary over time and according to an individual's social network (Pearlin, 1989; Pearlin et al., 1981). An individual's social network (e.g., family members, friends, or co-workers) influence the perceived availability and actual receipt of social support over time through the process

of giving and receiving support related to the closeness of ties or the commonality of experience (Thoits, 2011). Social support simply defined as “the actual exchange of support” indicates a mutual giving and receiving of support (Antonucci, 2001, p. 428). By providing examples or reinforcement, social networks also influence the coping methods or behaviors that individuals select when experiencing stress (Pearlin, 1989; Thoits, 2011). Health behaviors (e.g., physical exercise and smoking) are a common coping method that are influenced by social networks and can influence well-being (Umberson, 1992).

Formal volunteering involves the direct or indirect giving to another within a social context, and implies that some activity will be performed without pay. Although there is wide variability in the activities a volunteer may perform, the nature of formal volunteering suggests both giving to others and social involvement between the volunteer and members of the community organization, other volunteers, and/or the beneficiaries of the volunteer activity (Wilson, 2000; Wilson & Musick, 1997). Volunteering is included among the activities of productive aging (Butler & Gleason, 1985; Caro, Bass, & Chen, 1993; Herzog, Kahn, Morgan, Jackson, & Antonucci, 1989). As a productive activity, volunteering has value within society and maintains social engagement for people as they age (Bass & Caro, 2001; Morrow-Howell, 2010).

Volunteering may moderate the stress process for older adults because this social activity maintains and fosters perceived social support from within one’s social network or the actual receipt of support following a stressful life event. By definition, formal volunteering is a means of maintaining social interaction and a social network through service for a social institution or community organization (Wilson & Musick, 1997). The

social network related to volunteering may provide formal or informal forms of social support utilized to moderate the stress process.

The outcome of stress is the result of the combination of a stressor and moderating resources, and the ways outcomes are manifested vary and depend on multiple structural factors. Examples of stress outcomes include psychological distress, the onset of additional stressors, substance use, and mental or physical health problems (Pearlin, 1989, 1999). As previously noted, stress-related outcomes found in studies of bereaved spouses are grief, depression, and lower self-rated health (Bonanno et al., 2002; Carr et al., 2000; Ferraro, Mutran, & Barresi, 1984; Umberson, Wortman, & Kessler, 1992; Williams & Umberson, 2004).

The stress process is related to the contextual factors of social life, and this relationship is evident in stress exposure, in the presence or absence of moderating resources, and in the interpretation or perception of stress (Pearlin, 1989, 1999). To illustrate this relationship, consider that structural factors such as SES, age, and gender affect both an individual's exposure to stressors and the resources available to moderate stress outcomes. Further, an individual's status within the social structure affects the possibility of stress proliferation—that is, a stressor leading to additional sources of stress (Pearlin, 1999; Pearlin & Skaff, 1995).

Another way the social context influences the stress process is through the roles individuals occupy in their relationships with others and within social institutions. Social roles such as employee, spouse, and parent affect the stress process by determining in part the stressors people experience and by influencing the moderating resources people possess (Pearlin, 1989, 1999). Finally, the social environment impacts the stress process

indirectly through shaping values. Social values impact an individual's perception of sources of stress and the way stressors are manifested by individuals (Pearlin, 1989).

In sum, this model consists of three components: (1) a stressor (the death of a spouse); (2) moderating resources (volunteering and health behaviors); and (3) stress outcomes (depression and health status). This theoretical perspective emphasizes the influence of the social context (social roles and demographic characteristics) on each of the interconnected components of the stress process. The framework posits that the stress of the death of a spouse contributes to an increase in depressive symptoms and to a decline in self-rated health, but that volunteering moderates this relationship in such a way as to decrease the impact of spousal loss on depression and self-rated health.

Hypotheses

The objectives of this research are to investigate whether volunteering moderates declines in depression and self-rated health among people who have experienced the stress of spousal loss and to determine if gender differences exist within this relationship. In order to achieve these research objectives, the following hypotheses are investigated.

Hypothesis 1: Volunteering will moderate the effect of spousal loss on self-rated health status.

Hypothesis 2: Volunteering will have more of a positive impact on the self-rated health status of recently widowed men than bereaved women, when compared with a group of continuously married men and women.

Hypothesis 3: Volunteering will moderate the effect of the death of a spouse on depression.

Hypothesis 4: Volunteering will be more beneficial in reducing depression for recently widowed men than for bereaved women, when compared with a group of continuously married men and women.

By investigating these hypotheses, this research improves upon previous studies in several ways. First, the HRS data allow for a prospective investigation of the life event of widowhood and for the observation of changes over time between widowed respondents and a comparison group of continuously married respondents, who either do or do not engage in volunteering. Second, this study uses baseline health and social characteristics prior to the death of a spouse to better assess changes over time related to the stress of losing a spouse for men and women. Finally, the study investigates two health-related outcomes, which better represent the diverse ways the life stressor of a spousal death may be manifested. Self-rated health and depression represent distinctive constructs. Self-rated health represents multiple factors of overall health, while depression captures a single mental health issue. By investigating both self-rated health and depression, this study expands upon previous research to include two indicators of health that have been correlated with older adult volunteering.

This research investigates one possible mechanism underlying the positive effect volunteering has on self-ratings of health and depression. Utilizing social stress theory, the current study investigates the idea that volunteering provides older adults with a source of social support, which serves as a moderating resource during spousal bereavement. Further, it is hypothesized that when confronted with the life event of spousal loss, men may benefit more from the moderating effect of volunteering than women.

The methodology used to test the hypotheses is discussed in the following chapter. Two chapters will provide the results of the analysis. Chapter 4 will present the results of the analysis related to self-rated health, and Chapter 5 will present the results for depressive symptoms.

CHAPTER 3

METHODOLOGY

This chapter provides an overview of the methodology employed to investigate whether volunteering moderates the effects of spousal loss on self-rated health and depressive symptoms. Descriptions of the data, data structure, and sample used for analysis are provided. Treatment of missing data and sample attrition are discussed. The measures used in the analysis are detailed, and sample descriptive data are provided.

Data and Sample

Data

This study uses data from the Health and Retirement Study (HRS), a large, nationally representative sample of individuals residing in the continental United States. The HRS is a cohort panel study with data collection every two years. The HRS questionnaire is designed to collect demographic, economic, and health-related information. Starting in 1998, the HRS consists of a multistage probability sample of 21,384 respondents representing non-institutionalized individuals born prior to 1948 and their marital partners, if available. The sampling design of the HRS allows for the oversampling of non-White and Hispanic individuals and residents of Florida. Data from four waves of the HRS are used in this study: the 1998, 2000, 2002, and 2004 waves. The

sample design and response rates for the HRS are discussed at length elsewhere (see Hauser & Willis [2004] and Health and Retirement Study [2007]).

The initial sample for this study ($n = 8,659$) consists of HRS respondents who reported being married and were at least 60 years old as of the 1998 wave of the HRS. Three observation periods, each spanning two years and consisting of two consecutive HRS waves, are used in this study: 1998 to 2000, 2000 to 2002, and 2002 to 2004. Observations of HRS respondents who experienced the death of their spouse in any of the three pairs of successive waves are compared with observations of continuously married respondents. Though it may be useful to include other forms of marital dissolution, cases of respondents who divorced or separated between two consecutive waves are not included in the analysis due to their extremely small numbers.¹

Each two-wave observation period has a baseline and follow-up representing the year the observation period began and ended. The dependent variables, depression and self-rated health, are assessed at follow-up for each observation period: 2000, 2002, and 2004. (See the section below on measures for more detailed information on the questionnaire items used and the coding of variables.) Widowhood status is determined using multiple items relating to marital status and partner status at both baseline and follow-up to determine whether respondents remained married to the same partner or became widowed over each of the two-wave observation periods.

¹ Respondents are excluded from a two-wave observation-period in the case of divorce or separation; exclusion for this reason is extremely rare: 64 observations out of 22,910 (<0.3%). Respondents were not considered divorced or separated merely due to moving into a nursing home, and exclusion from the second or third two-wave observation-period because of divorce/separation did not exclude a respondent from earlier observation-periods when the respondent remained married.

Volunteer status and hours volunteered are assessed at follow-up for each observation period (2000, 2002, and 2004) to determine whether volunteer work occurred and to what extent a respondent engaged in volunteer work within the two-year observation. Additional covariates are obtained at baseline during each of the three observation periods: 1998, 2000 and 2002. The pooling of consecutive waves for the two-wave observation periods results in up to three observations for each HRS respondent. This data structure is employed to maximize the number of HRS respondents who experience the death of a spouse and to provide an ample comparison group of married respondents observed over time.

Sample

The analytic sample is obtained from three two-wave observations of community-dwelling HRS respondents who were married and were at least 60 years old in 1998. Eligibility for observation periods is based on a respondent's eligibility for the baseline interview wave and either remaining married to his or her 1998 spouse or becoming widowed after his or her 1998 interview. This pooled set of respondent-observations results in a potential sample of 22,846 cases.

A total of 1,693 cases (7.4%) are lost to nursing home placement or death, and 930 cases (4.1%) are lost because of other forms of attrition from the HRS. Twenty-one cases of respondent-observations possessed inconsistent marital status information, precluding their classification as either widowed or married.² An additional 166 cases are

² These 21 observations are unique in that marital status information in subsequent waves of the HRS contradicted the 1998 documentation of being married (e.g., reported marital status of never married after the 1998 wave or no living spouse in 1998 per HRS records

excluded due to missing data on volunteer status, baseline depressive symptoms, self-rated health, or the HRS imputation of net worth. Together these 187 cases represent 0.8% of the total respondent-observations.

The analytic sample for this study consists of 20,036 respondent-observations of HRS respondents who were married in 1998 and either remained married to the same spouse for one or more of the two-wave observations or became widowed during one of the three observations. Table 1 shows the demographic characteristics of the analytic sample. As seen there, the analytic sample consists of more observations of males (53.2%) than females. The majority of respondent observations are of those who remain married (90.0%), with 5.2% of respondent observations being of those widowed for less than two years and 4.8% of those widowed between two to six years. The mean age for the respondent-observations is 71.3 years. The sample is predominantly White non-Hispanic with members of other racial and ethnic groups making up 12.3% of the analytic sample. On average respondents have slightly more than a high school education at 12.3 years and have a median household net worth of \$242,600.

A comparison of the 20,036 retained respondent observations and the 2,810 excluded respondent observations on the independent variables is shown in Table 2. As seen on Table 2, those respondent observations excluded from the analysis were to a greater extent male (60.2% versus 53.2%), previously widowed (8.6% versus 4.8%), and in poor or fair health (48.5% versus 24.1%). Those respondent observations excluded from the analysis were older (74.7 versus 71.3 years). On average the respondent

using the National Death Index). These cases are rare, and excluding them is not likely to affect the analysis.

Table 1. Demographic characteristics for married and widowed respondent observations

Characteristic (metric)	Value
Male (%)	53.2
Recently widowed (% < 2 years)	5.2
Previously widowed (% 2–6 years)	4.8
Married (% remained married)	90.0
Age (mean years)	71.3
Race/ethnicity (% not White and Hispanic)	12.3
Education (mean years)	12.3
Net worth (median dollars)	242,600

Note. $N = 20,036$. All calculations are weighted. Source: Health and Retirement Study (1998 to 2004 waves).

observations retained for analysis had fewer functional limitations (0.4 versus 1.7) and depressive symptoms (1.1 versus 1.5). Since the aim of this study is to investigate the interaction of volunteering during the stressful period of spousal loss on self-rated health and depressive symptoms and doing so excludes older and frailer respondent observations, it is important to interpret any results of this study with caution.

The analytic sample for estimating the effects of widowed status and volunteer status on depressive symptoms has 2,079 fewer cases (10.4%) due to missing data on depressive symptoms at follow-up. The majority of these cases, 94.4%, are missing because of proxy interviews (proxy respondents are not asked the eight items pertaining to depressive symptoms in the HRS).

Table 2. Descriptive statistics for those retained and excluded from the analytic sample

Variable	Retained sample (<i>n</i> = 20,036)	Excluded sample (<i>n</i> = 2,810)
Male (%)	53.2	60.2
Recently widowed (% < 2 years)	5.2	2.6
Previously widowed (% 2-6 years)	4.8	8.6
Volunteer status (% yes)	36.2	19.8
Chronic conditions (mean count, 0–7)	1.8	2.2
Self-rated health (% in fair or poor health)	24.1	48.5
Psychiatric diagnosis (% yes)	10.5	15.9
Proxy interview (% yes)	8.4	20.6
Depressive symptoms (mean count, 0–8)	1.1	1.5
Functional limitations (mean count, 0–11)	0.4	1.7
Smoking (% yes)	9.4	12.0
Sedentary (% yes)	52.8	70.6
Religion (% important/very important)	89.5	88.3
Social network (mean, 0–3)	1.6	1.5
Parent (% yes)	96.1	95.1
Paid work (% yes)	26.0	14.1
Age (mean years)	71.3	74.7
Race/ethnicity (% not White and Hispanic)	12.3	13.7
Education (mean years, 0–17)	12.3	11.7
Net worth (mean dollars)	478,613	382,285

Note. All calculations are weighted. All differences are significant at the .05 level except chronic conditions, depressive symptoms, religion, social network, parent, race/ethnicity, and education. Source: Health and Retirement Study (1998 to 2004 waves).

Baseline sample weights provided by the HRS are used in analyses of the data. Respondent-level weights are applied at baseline for each of the two-wave observations (1998, 2000, and 2002). For example, the respondent-level weights from the 2000 wave are used for respondent observations spanning from 2000 to 2002. The use of the baseline weights for each two-wave observation is preferable to the use of the respondent-level weight as of the 1998 wave of the HRS; using the single weight in 1998 for all observations would not correct for attrition between the three observation periods.

The weights are adjusted, or centered, for use in all analyses. In this process, the mean of the sample weight is determined, and a new weight is created that divides the respondent-observation weight at baseline by the mean weight of the sample. This allows the researcher to weight the sample without increasing the sample size, which would overstate the statistical significance of the results. In the multivariate analyses, repeated observations of the same respondents are also taken into account using the “cluster” command in Stata, which adjusts the standard errors for the non-independence of observations.

Missing Data

Missing data on the independent variables are handled in several ways for this analysis. Imputed variables are taken directly from the HRS imputation file where possible, and this is the case for the baseline measure of net worth. A method of imputation suggested by Cohen and Cohen (1983) is used for depressive symptoms at baseline for respondents who were interviewed by proxy. Baseline cases with missing data on the number of depressive symptoms due to proxy interviews are assigned a score

of zero indicating the absence of depressive symptoms, and a binomial variable is included in the model as a missing-item indicator (1 = proxy interview, 0 = all others). Zero (0) is used to represent the number of baseline depressive symptoms for proxy respondents because it is the modal value of depressive symptoms. This method of imputation for the independent variable, depressive symptoms at baseline, is used in the analysis of both dependent variables: self-rated health and depressive symptoms.

As noted in the previous section, respondent observations are excluded from the analysis if they have missing data on the dependent variables of self-rated health or depressive symptoms, or the independent variables of widowed/marital status, volunteer status, self-rated health at baseline, imputed net worth, and depressive symptoms at baseline for reasons other than proxy interview. There are 222 cases (1.1%) with missing data on one or two additional covariates.³ These missing data on the baseline covariates are imputed as the mean for continuous variables and the mode for categorical variables. Preliminary analysis of these cases revealed no significant differences between those with imputed means or modes and those with no imputed values on the independent variables.

Measures

This section provides a summary of all the variables used in the analysis including the HRS questionnaire items and the coding of variables. Table 3 shows the coding of all variables along with descriptive statistics for the analytic sample.

³ There are 222 observations with a total of 234 missing items from nine covariates including: psychiatric diagnosis, chronic conditions, functional impairment, sedentary lifestyle, smoking, paid, social network, race/ethnicity, and religion.

Table 3. Descriptive statistics for male and female respondent observations

Dependent Variables	Males (<i>n</i> = 10,636)	Females (<i>n</i> = 9,400)
Self-rated health at follow-up (% in poor or fair health)	28.0	24.6
Depressive symptoms at follow-up (mean, 0–8) (S.D.)	1.1 (1.6)	1.5 (1.9)
Independent Variables		
Recently widowed (% < 2 years)	3.0	7.8
Previously widowed (% 2–6 years)	2.5	7.3
Married (%)	94.5	84.9
Volunteer status (% yes)	33.5	37.3
Chronic conditions (mean count, 0–7) (S.D.)	1.8 (1.2)	1.8 (1.2)
Self-rated health at baseline (% in fair or poor health)	25.2	22.7
Psychiatric diagnosis (% yes)	7.5	14.1
Proxy interview (% yes)	12.7	3.5
Depressive symptoms at baseline (mean count 0–8) (S.D.)	0.9 (1.4)	1.4 (1.8)
Functional limitations (mean count, 0–11) (S.D.)	0.4 (1.3)	0.4 (1.3)
Smoking (% yes)	10.4	8.3
Sedentary (% yes)	48.8	57.4
Religion (% important/very important)	85.9	93.7
Social network (mean, 0–3) (S.D.)	1.6 (0.9)	1.6 (0.9)
Parent (% yes)	96.3	95.8
Paid work (% yes)	32.6	18.6
Age (mean years) (S.D.)	71.6 (6.8)	71.0 (6.5)
Race/ethnicity (% not White and Hispanic)	12.6	11.9
Education (mean years, 0–17) (S.D.)	12.4 (3.5)	12.3 (2.8)
Net worth (quintiles)		
Q1 (≤\$80,000)	20.0	20.3
Q2 (\$80,001 – \$179,000)	19.6	20.3
Q3 (\$179,001– \$325,800)	19.7	20.2
Q4 (\$325,801 – \$634,600)	20.0	20.0
Q5 (≥\$634,601)	20.7	19.2

Note. All calculations are weighted. All differences are significant at the .05 level except functional limitations, chronic conditions, social network, parent, race/ethnicity, education, and the lowest four quintiles for net worth. Source: Health and Retirement Study (1998 to 2004 waves). Dependent variables were measured using data from the 2000, 2002, and 2004 waves, while baseline measures for self-rated health and depressive symptoms were measured using the 1998, 2000, and 2002 waves.

Dependent Variables

The dependent variables in this study are self-rated health and depressive symptoms. Self-rated health and depressive symptoms are assessed at follow-up for each of the three observations: 2000, 2002, and 2004.

Self-rated health. The HRS contains a global measure of health, which consists of a single item asking for a respondent's rating of his or her own health. Response categories for this item are: excellent, very good, good, fair, or poor. Prior research indicates that self-ratings of health are a reliable measure of physical health status (see Idler and Benyamini, 1997). A binary variable coded one (1 = fair or poor health) and zero (0 = good, very good, or excellent health) is constructed.

Depressive symptoms. Depressive symptoms are measured by the use of an eight-item form of the Center for Epidemiological Studies Scale for Depression (CES-D) (Radloff, 1977). The construction of the eight-item CES-D (8) scale and the internal consistency of the items are discussed elsewhere; see Steffick (2000) for details. The CES-D short form has been demonstrated to be a reliable indicator for depressive symptoms in survey research (Kohout et al., 1993; Steffick, 2000). The scale includes eight questions, which ask, "For much of the time in the past week, you felt" (1) depressed, (2) that everything was an effort, (3) sleep was restless, (4) you were happy, (5) you felt lonely, (6) enjoyed life, (7) felt sad, (8) and could not get going.

Responses to each of these items are coded so that answers affirming the presence of a depressive symptom are each assigned a value of 1, and answers indicating the absence of the symptom are coded as 0. Two items in the CES-D (8) are reverse coded:

enjoyed life and were happy. A sum of these items is used to construct a single variable with a range of zero to eight.

Independent Variables

Widowed status. The measures related to widowed status are determined using multiple items available at each wave of the HRS. Respondents are asked at each interview if they are still with the same spouse/partner from the previous wave. Those respondents answering “no” are then asked if their spouse is still alive.⁴ HRS respondents who report that their spouse of the previous wave is no longer alive are asked to provide the month and year their spouse died. Widowed status is assessed at three HRS waves (2000, 2002, and 2004) in order to determine whether a respondent has become widowed during the two-wave observation period or has remained married to his or her 1998 spouse.

Two categorical binary variables indicate whether a respondent is widowed during the current observation (recently widowed), widowed during a prior observation (previously widowed), or remained married, with the latter serving as the reference group. The recently widowed variable is designed to identify observations of respondents who have been widowed less than two years, or those who transition from being married

⁴ The HRS asks a household respondent at the start of each interview the questions pertaining to spousal/partner status stability or change from the previous interview. This means the identification of partner/marital status is provided for a household by a single respondent representing that household. The HRS also asks these same questions of a portion of individual HRS respondents when collecting demographic information. In order to assess whether an individual became widowed or remained with the same spouse as accurately as possible, both sets of items were used for classifying respondents. A spouse’s death was then confirmed through either the month and year of death provided by the surviving spouse or the month and year of death using the HRS-linked information to the National Death Index.

at baseline to being a widow/widower at follow-up during any single observation period (recently widowed = 1, all others = 0). The previously widowed variable identifies observations of respondents who became widowed in either the 1998–2000 or 2000–2002 observation period (1 = widowed in a previous observation period, 0 = all others). Though all cases are married in 1998, these cases are widowed prior to either the 2000–2002 or 2002–2004 observation period. For these cases the experience of spousal loss occurred between two and four years for the 2002 follow-up or between two and six years at the 2004 follow-up. Those respondent observations indicating continuous marriages over one or more of the two-wave observation periods serve as the reference group. Since a major aim of this study is to observe respondents during the transition from being married to becoming widowed—a time period when a surviving spouse may be experiencing bereavement—eligibility for the study required a respondent to be married as of the 1998 wave of the HRS.

Volunteer status. The measure of volunteer status is determined from responses to a yes/no question: “Have you spent any time in the past 12 months doing volunteer work for religious, educational, health-related or other charitable organizations?” A single binary variable identifies respondents who report doing any volunteer work versus those who do not. Volunteer status is assessed at follow-up for each observation period in 2000, 2002, and 2004.

Volunteer hours. Volunteer hours are determined from responses to several questions to determine the amount of volunteer activity. In the 2000 and 2002 waves, HRS respondents who report doing volunteer work are first asked, “Altogether, how many hours did you spend in the past 12 months doing volunteer work for such

organizations?” If the number of hours is not provided, the respondent is questioned further to determine whether the hours of volunteering were less than or more than the cut points of 100 and 200 hours. In the 2004 wave of the HRS, respondents are not asked the open-ended question regarding the number of hours volunteered; in this wave only the information on hours being more than or less than the cut points is obtained. To help insure consistency of the measure of volunteer hours, variables representing observations of respondents who volunteered less than 100 hours, 100 to 199 hours, and 200 or more hours are constructed, with those who did not volunteer serving as the reference group.⁵ Volunteer hours are assessed at follow-up in 2000, 2002, and 2004. See the Appendix for the analysis using volunteer hours.

Sex. The sex of a respondent is coded in a single binary variable: males = 1 and females = 0. In order to assess gender differences in the effect of spousal loss and volunteering on depressive symptoms and self-rated health, separate models are estimated for men and women. As previously noted, the sampling frame of the HRS includes cohort-eligible adults and their spouses. Due to the inclusion of multiple adults from the same household, separate analyses are necessary to avoid biased results.⁶

It is expected that gender differences exist in terms of the effect of becoming widowed and volunteering on the dependent variables of self-rated health and depressive symptoms. Depressive symptoms are more common among women than men (Roberts et

⁵ There are 23 cases of respondents who affirm doing volunteer work over the preceding 12 months but have missing data on the number of hours of volunteer work. For the analysis using the volunteer hours measure, these cases were dropped from the analysis.

⁶ The inclusion of men and women from common households may lead to an under-estimation of the standard errors and bias the regression coefficients. To avoid this misspecification, gender-separate analysis is used in this study.

al., 1997; Whitson et al., 2010), and while mortality rates indicate that men have a physical health disadvantage relative to women, a male health disadvantage is not consistently observed in self-rated health (Arber & Cooper, 1999; Idler, 2003). These gender differences suggest that there may be separate processes for men and women in determining depressive symptoms and self-rated health. Further discussion of the characteristics of men and women within the analytic sample are highlighted in the Sample Descriptives section of this chapter.

Control Variables

The remaining variables serve as controls in this study and are measured at baseline for each observation period: 1998, 2000, and 2002. Covariates are included from the following categories: mental health, physical health, functional limitations, health behaviors, and social/demographic factors.

All covariates in these categories are measured at the baseline for each observation period except race/ethnicity and education in the social/demographic category; these two variables are measured as of the 1998 wave of the HRS and are not expected to vary over time.

Mental health. Two measures of mental health are included as covariates in this study: psychiatric diagnosis and depressive symptoms. Both psychiatric diagnosis and depressive symptoms are measured at the baseline of each observation period (1998, 2000, and 2002).

Psychiatric diagnosis, or a history of medically diagnosed emotional or psychiatric illness, is determined by using a single item from the HRS: “Has a doctor ever

told you that you have any emotional, nervous, or psychiatric problems?" Affirmative answers are coded as 1 and negative responses are coded as 0. This item has been used in prior research as a control variable for mental health issues other than depression (Turvey et al., 1999). Depression is coded as discussed above, using the eight-item CES-D to create a variable ranging from 0 to 8 with a higher score indicating more depressive symptoms. As previously stated, proxy respondents are not asked the CES-D items in the HRS. In order to retain these respondents for analyses, a value of 0 is imputed for those interviewed at baseline by proxy and a binary variable, proxy, is used as a missing item indicator (1 = proxy interviewed at baseline, 0 = all others).⁷ Zero (0) is used to represent the number of baseline depressive symptoms for proxy respondents, because it is the modal value of depressive symptoms. This method of imputation is used in the analysis of both self-rated health and depressive symptoms.

Physical health. Two measures of baseline physical health are used in the current study: a count of medically diagnosed chronic conditions and self-rated health. Both chronic conditions and self-rated health are measured at the baseline of each observation period (1998, 2000, and 2002).

The first measure of baseline physical health, chronic conditions, consists of a count of common chronic conditions among older adults. These include: (1) arthritis, (2) heart disease, (3) stroke, (4) cancer (excluding skin cancer), (5) lung disease, (6) diabetes, and (7) hypertension. The questions in the HRS are phrased in a similar way for each condition: "Has a doctor ever told you that you have — ?" "Yes" responses are coded as 1, and "no" responses as 0; the sum of affirmative responses for these conditions form

⁷ See Cohen and Cohen (1983) for more information about this form of imputation.

a single index variable with values ranging from 0 to 7. Using the self-rated health item described above, a binary variable is constructed with 1 = fair or poor health, and 0 = good, very good, or excellent health.

Functional limitations. Limitations in activities of daily living (ADLs) and in instrumental activities of daily living (IADLs) are used to measure functional limitations (see Fonda and Herzog, 2004). Six items in the HRS are used for a count of ADL limitations. “Because of a health or memory problem do you have any difficulty”: (1) walking across a room, (2) dressing, (3) bathing, (4) eating, (5) using the toilet, and (6) getting out of bed. A count of ADL limitations is obtained by assigning a value of one (1) for each response of yes or a confirmation of inability to do the task without assistance. The IADL limitations consist of the number of affirmative responses to five items. “Because of a health or memory problem, do you have any difficulty”: (1) preparing a hot meal, (2) shopping for groceries, (3) making phone calls, (4) managing your money, and (5) taking medication. The range for IADL limitations is 0 to 5. A single variable measuring functional limitations is constructed by summing the ADL and IADL limitations to form an index variable ranging from zero to eleven (0–11). This measure of functional limitations is obtained at baseline for each observational period (1998, 2000, and 2002).

Health behaviors. Two measures indicating risky health practices are used in this study: a sedentary lifestyle or a lack of regular physical exercise, and smoking. Prior research identifies these as behaviors with implications for health and well-being (Wray, Alwin, & McCammon, 1995). A sedentary lifestyle and smoking behavior are measured at baseline for each observation period (1998, 2000, and 2002). A single yes/no item is

used for sedentary lifestyle: “On average over the last 12 months have you participated in vigorous physical activity or exercise three times a week or more?” Negative responses to this item are coded as 1 indicating those respondents with a sedentary lifestyle, and affirmative responses are coded as 0.

Two items in the HRS pertain to smoking status: (1) “Have you ever smoked cigarettes?” and (2) “Do you smoke cigarettes now?” Both questions have yes/no response values. In this study, smoking status is constructed in a single dichotomous variable representing respondents who reported they were current smokers, coded as 1, and both those respondents who reported being former smokers and those reporting they had never smoked, coded as 0.

Social roles/network. Three measures are used in this study: paid work, parental status, and a social network index. These social role/network variables are measured at baseline for each observation period (1998, 2000, and 2002). Conceptually, social networks and the roles individuals occupy within those networks influence health indirectly by providing the social pathways for the giving and receiving of support and by influencing behavior (Pearlin, 1989; Pearlin et al., 1981). A HRS question is used to determine paid work: "Are you doing any work for pay at the present time?" Yes responses are coded as 1, and all others are coded as 0. Parental status is determined from a HRS question asking about the number of children a respondent has. A dichotomous variable is given a value of 1 for respondents who report having any children and 0 for all other respondents. A social network index is used to indicate the availability and level of contact with friends, neighbors, or relatives. This measure of social network is an index variable constructed from three questions: “Do you have any relatives in your

neighborhood?” “Do you have any good friends living in your neighborhood?” and “How often do you get together with any of your neighbors just to chat or for a social visit?”⁸

The social network variable is coded as a count variable; answers of Yes for the first two questions are each assigned a value of 1. For the third question, a value of 1 is assigned to any frequency of contact of at least once a week. Each of the first two items is coded as 0 if negative answers were provided, and the third question is assigned a value of 0 if the frequency of contact was less than once a week. The result is a count variable for social network with a range of zero to three (0–3). This social network index measure has been used in a prior study investigating the effects of volunteering on health (Luoh & Herzog, 2002).

Religion. A religious-importance variable is coded according to a single question in the HRS: “How important would you say religion is in your life; is it very important, somewhat important, or not too important?” The three response categories are recoded into a binary variable with very important or somewhat important coded as 1 and those respondents reporting religious beliefs as not important coded as 0.

Demographic characteristics. Several demographic variables (race/ethnicity, socioeconomic status, and age) are included in these analyses. In this study, race/ethnicity is coded in a single dichotomous measure with non-White and Hispanic coded as 1, and White non-Hispanics serving as the reference group. Preliminary analysis showed few

⁸ In the 1998 and 2000 waves of the HRS, the three items for the social network index were asked of a family respondent who represented the household. However, in 2002 each HRS respondent was asked these three items. Preliminary analysis revealed no statistical difference whether the family respondents were used or if each HRS respondent’s response was used in 2002. A decision was made to use the respondent value. Though the universe for the question changed, the wording of the questions remained consistent and this change is not likely to affect the analysis.

respondents falling into the racial/ethnic categories of Black non-Hispanic, Hispanic, and other race, and inclusion of these categories yielded results similar to the use of the single indicator of race/ethnicity.

Socioeconomic status (SES) consists of two measures: education and net worth. The HRS contains an item representing the years of education from zero to seventeen (0–17), and this continuous variable is used in this study. Net worth, which contains imputed values for missing data provided by the HRS, is coded into quintiles with the lowest quintile serving as the reference group. Net worth is measured at baseline for each observation period (1998, 2000, and 2002).

Age is coded as a continuous variable in years as of June of each of the baseline observations.

Sample Descriptives

Table 3 shows the descriptive statistics for male and female respondent observations for the analytic sample. Sample weights are applied in this analysis. The male sample consists of 10,636 observations, and the female sample contains 9,400 observations. Recall that each observation does not represent a unique HRS respondent as respondents are potentially observed over three two-wave periods.

As seen in Table 3, a higher percentage of females is recently widowed than males: 7.8% and 3.0% respectively. Volunteering is observed in a higher percentage of female observations (37.3%) than male observations (33.5%). A slightly larger percentage of males is observed to be in poor or fair health at baseline than females: 25.2% and 22.7% respectively, and at follow-up 28.0% of male observations and 24.6%

of female observations are in fair or poor health. The mean number of depressive symptoms at baseline is slightly higher among female observations than male: 1.4 and 0.9 respectively, and this difference is also observed at follow-up with a mean of 1.5 depressive symptoms for female observations and 1.1 for male observations.

Overall the observations of males and females indicate a generally healthy sample with an average number of chronic conditions of 1.8 and few functional limitations with a mean of 0.4. A higher percentage of female observations report having a history of a psychiatric diagnosis, 14.1%, compared with male observations of 7.5%. Relatively few observations are of males or females who report currently smoking: 10.4% of male observations and 8.3% of female observations. Nearly half of all male observations are of cases of a sedentary lifestyle, while 57.4% of female observations report being sedentary.

A majority of male observations (85.9%) and female observations (93.7%) identify religion as being important or very important. Both male and female observations have a social network index mean of 1.6, indicating a fairly high level of social connectedness. A higher percentage of male observations engaged in paid work than female observations: 32.6% and 18.6% respectively. The overwhelming majority of observations were of men and women who reported having at least one living child.

Demographically, there are very few differences between the observations of males and females, which is likely due to the fact that all participants were married and age 60 or older at the start of the study. Female observations had slightly lower levels of SES (years of education and net worth) than male observations. A slightly higher percentage of male observations (12.6%) than female-observations (11.9%) were of those reporting a race or ethnicity other than White non-Hispanic.

Presentation of Results

The following two chapters will present the results of the investigation of whether volunteering moderates the relationship between the stress of spousal loss and the increase in depressive symptoms and the declines in self-rated health. Chapter 4 will present the results for self-rated health for both the male and female samples. Chapter 5 will present the results for depressive symptoms for the male and female samples.

CHAPTER 4

THE EFFECT OF WIDOWED STATUS AND VOLUNTEER STATUS ON SELF-RATED HEALTH

This chapter presents the results on the effect of widowed status and volunteer status on self-rated health. The chapter begins with a description of the analysis and a review of the hypotheses pertaining to self-rated health. Next, bivariate findings for self-rated health by widowed status and by volunteer status are presented. Finally, multivariate results are presented from the logistic regression models.

Analysis

A dichotomous dependent variable contrasting fair or poor health to good, very good, or excellent health is used in this analysis. As noted in Chapter 3, descriptive findings for self-rated health show that 28.0% of male observations and 24.6% of female observations are in fair or poor health at follow-up. Prior research suggests that experiencing the death of a spouse leads to declines in self-rated health (Prigerson, Maciejewski, & Rosenheck, 2000; Williams & Umberson, 2004). Previous studies have found that participating in volunteering is related to higher assessments of self-rated health among older adults (Thoits & Hewitt, 2001; Van Willigen, 2000). It is plausible that engaging in volunteer work might help reduce or moderate the negative effect of

spousal loss on self-rated health. A series of logistic regressions is used to test the following hypotheses:

Hypothesis 1: Volunteering moderates the effect of spousal loss on self-rated health status.

Hypothesis 2: Volunteering is more beneficial for the self-rated health status of recently widowed men than of bereaved women, when compared with a group of continuously married men and women.

A series of five logistic regression models are estimated for both the male and female samples. All models adjust the standard errors for repeated observations and use weighted data. First, a model using only widowed status and volunteer status is evaluated using the dichotomous self-rated health measure. This model is used to estimate the direct effect of widowed status and volunteer status on self-rated health without taking into account other factors that might influence the variation in self-rated health for men or women, such as physical or mental health status, health behaviors, or sociodemographic factors.

A second logistic regression model is run adding the social and demographic measures (age, education, race/ethnicity, net worth, religion, social network, paid work, and parental status). Model 2 estimates how much variation in self-rated health can be explained by social and demographic factors beyond that of the direct effects of widowed status and volunteering. Next, a third model is evaluated that adds baseline measures of functional limitations, health behaviors (smoking and sedentary lifestyle), mental health (depressive symptoms, proxy, and psychiatric diagnosis) and chronic conditions. This model shows the variation in self-rated health that can be explained by widowed status

and volunteer status, net of social and demographic factors, functional impairment, health behaviors, and mental and physical health.

The fourth model adds the baseline measure of self-rated health to the regression. This model represents the change in self-rated health between baseline and follow-up explained by the direct effect of widowed status and volunteer status net of all covariates. A fifth model adds the interaction terms combining widowed status and volunteer status to estimate the odds of being in fair or poor self-rated health by the moderating effect, or interaction, of widowed status times volunteer status net of other factors. Finally, the findings are compared for males and females to evaluate the gender difference in the moderating effect of volunteering on the self-rated health of widows.

Self-Rated Health and Widowed Status

This section addresses the relationship between self-rated health and widowed status in the analytic sample. Table 4 shows the percentage of observations with poor or fair self-rated health by widowed status. As seen on Table 4, the group with the lowest portion of fair or poor self-rated health observations is married females (24.0%), while poor or fair health is seen in nearly one-third (31.8%) of the observations of recently widowed males. In contrast to the 24.0% of observations of married females in fair or poor health, approximately 28% of both recently widowed ($\chi^2 = 5.93, p < .05$) and previously widowed ($\chi^2 = 11.29, p < .01$) female-observations have ratings of fair or poor health. Among male observations, 31.8% of the observations of recent widowers, 28.9% of observations of the previously widowed men, and 27.9% of observations of married

Table 4. Men and women in fair or poor health by widowed status, percentages

	Men	Women
Recently widowed	31.8	27.9
Previously widowed	28.9	28.2
Married	27.9	24.0

Note. All estimates are based on weighted data. The comparisons of recently widowed males with married males, and of previously widowed males with married males, are not statistically significant. In comparison to married females, a higher percentage of recently widowed women are in fair or poor health ($\chi^2 = 5.93, p < .05$). In comparison to married females, a higher percentage of previously widowed women are in fair or poor health ($\chi^2 = 11.29, p < .01$). Source: Health and Retirement Study (HRS), 2000–2004.

men are in fair or poor health, though these group differences are not statistically significant.

Self-Rated Health and Volunteer Status

This section addresses the relationship between self-rated health and volunteer status for the male and female samples. Table 5 shows the percentage of observations with poor or fair self-rated health for volunteers and non-volunteers. As seen on Table 5, the percentage of observations of non-volunteers in fair or poor health is more than double that observed for volunteers among both males and females. For the male sample, 34.1% of non-volunteering observations are in fair or poor health compared to only 15.9% of volunteer observations ($\chi^2 = 381.98, p < .001$). While only 13.5% of volunteering female observations are in fair or poor health, 31.2% of non-volunteering female observations are in fair or poor health ($\chi^2 = 391.20, p < .001$).

The percentage of non-volunteer observations in fair or poor health remains about twice as high as the percentage of observations in fair or poor health performing any number of hours of volunteering. Appendix Tables 1 and 2 show the percentage of observations in fair or poor health by level of volunteering. Only for the percentages of male observations in fair or poor health among those recently and previously widowed are there notable differences in this pattern. Among observations of males who are recently or previously widowed, those volunteering less than 100 hours over the last year have a modestly lower percentage in fair or poor health compared to those recently and previously widowed who did not volunteer at all: 29.3% versus 35.0% for observations of recently widowed males, and 33.7% versus 24.1% for observations of previously widowed males. For those recently widowed and previously widowed male observations volunteering 100-199 hours, the percentages in fair or poor health are slightly higher than those not volunteering: 37.5% versus 35.0% for those recently widowed observations, and 35.3% versus 33.7% for those previously widowed observations. The number of male observations in these groups of volunteer levels is relatively small, and drawing conclusions is difficult given the insignificant differences between the percentage of those in fair or poor health by widowed status noted in the previous section. However, these percentages are still surprising.

Table 5. Men and women in fair or poor health by volunteer status, percentages

	Men	Women
Volunteers	15.9	13.5
Non-volunteers	34.1	31.2

Note. All estimates are based on weighted data. The comparison of male volunteers and non-volunteers in fair or poor health is significant ($\chi^2 = 381.98, p < .001$). The comparison of female volunteers and non-volunteers in fair or poor health is significant ($\chi^2 = 391.20, p < .001$). Source: Health and Retirement Study (HRS), 2000 – 2004.

Effect of Widowed Status and Volunteer Status on the Self-Rated Health of Men

In order to evaluate the association of widowed status and volunteer status with fair or poor self-rated health, a series of binary logistic regressions is run.⁹ Table 6 details the logistic regression results of the effect of widowed status and volunteer status on the self-rated health among males. To assist in the interpretation of the results, the transformation of coefficients to odds ratios is provided and is used in the discussion of the results. Model 1 estimates the effect of widowed status and volunteering over a two-year period on self-rated health without adding any more covariates to the model.¹⁰ This model shows the odds of being in fair or poor health to be about 64% lower for

⁹ An alternative specification of ordinal logistic regression using the five categories of self-rated health was specified, but post-estimation analysis showed that the proportional odds assumption, or the parallel regression assumption, was violated.

¹⁰ The effect of widowed status on the self-rated health of males with no additional covariates yields no significant differences between the recently and previously widowed relative to married males: recently widowed $OR = 1.206, p \text{ value} = 0.157$; previously widowed $OR = 1.053, p \text{ value} = 0.750$.

Table 6: The effect of widowhood and volunteering on the self-rated health of males

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coef.	(O.R.)	Coef.	(O.R.)	Coef.	(O.R.)	Coef.	(O.R.)	Coef.	(O.R.)
Recently widowed	0.081	1.084	-0.238	0.788	-0.361*	0.697	-0.372*	0.689	-0.584**	0.558
Previously widowed (Married)	-0.040 (0)	0.960 (0)	-0.401* (0)	0.670 (0)	-0.654** (0)	0.520 (0)	-0.404* (0)	0.668 (0)	-0.338 (0)	0.714 (0)
Volunteer status	-1.007***	0.365	-0.692***	0.500	-0.467***	0.627	-0.433***	0.649	-0.454***	0.635
Age			0.032***	1.032	0.026***	1.026	0.027***	1.027	0.027***	1.027
Non-White or Hispanic			0.189*	1.208	0.244*	1.276	0.198*	1.218	0.198*	1.219
Education			-0.091***	0.913	-0.073***	0.929	-0.053***	0.949	-0.052***	0.949
Net worth ≤\$80,000			(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Net worth \$80,001 - 179,000			-0.521***	0.594	-0.276**	0.759	-0.217*	0.805	-0.222*	0.801
Net worth \$179,001 - 325,800			-0.561***	0.571	-0.235*	0.790	-0.119	0.888	-0.120	0.887
Net worth \$325,801 - 634,600			-0.772***	0.462	-0.437***	0.646	-0.363***	0.696	-0.366***	0.693
Net worth ≥\$634,601			-0.710***	0.492	-0.309**	0.734	-0.205*	0.815	-0.209*	0.811
Parent			0.064	1.066	0.040	1.041	0.025	1.025	0.026	1.027
Paid work			-0.645	0.525	-0.363***	0.696	-0.240**	0.787	-0.239**	0.788
Religion			-0.156	0.855	-0.137	0.872	-0.062	0.939	-0.066	0.936
Social network			-0.026	0.975	-0.015	0.985	-0.010	0.990	-0.009	0.991
Functional limitations					0.235***	1.265	0.128***	1.137	0.128***	1.137
Smoking					0.520***	1.682	0.463***	1.589	0.467***	1.595
Sedentary					0.480***	1.616	0.338***	1.403	0.336***	1.400
Psychiatric diagnosis					0.457***	1.580	0.338*	1.402	0.339**	1.403
Proxy					0.707***	2.027	0.490***	1.633	0.490***	1.633
Depressive symptoms					0.226***	1.254	0.136***	1.145	0.136***	1.146
Chronic conditions					0.447***	1.564	0.312***	1.366	0.312***	1.366
Self-rated health							1.853***	6.379	1.859***	6.419
Recently widowed volunteer									1.092*	2.981
Previously widowed volunteer									-0.345	0.708

Note. Reference groups are noted by parentheses. $n = 10,636$

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

volunteers as compared to non-volunteers net of widowed status ($p < .001$). Consistent with the bivariate findings for males, the odds of being in poor or fair health are not significantly different for the recently widowed or previously widowed as compared with the married net of volunteer status.

Model 2 estimates the effect of widowed status and volunteer status on self-rated health, controlling for social and demographic factors. The odds of being in fair or poor health are 50% lower for volunteers as compared to non-volunteers net of other social and demographic factors ($p < .001$). The odds of being in poor or fair health are not significantly different among recent widowers as compared with married males net of social and demographic factors.

The odds of being in fair or poor health are 33% lower for previously widowed males as compared to the married net of social and demographic factors ($p < .05$).

Model 3 estimates the effect of widowed status and volunteer status on self-rated health, controlling for baseline mental health, health behaviors, functional limitations, chronic conditions, and social and demographic factors. Unlike the results from earlier models, Model 3 shows that the odds of being in fair or poor health are about 31% lower for the recently widowed as compared to the married net of mental health, health behaviors, functional limitations, chronic conditions, and social and demographic factors ($p < .05$). Compared with married males, the odds of being in fair or poor health are about 48% less among the previously widowed net of other factors in Model 3 ($p < .01$).

Volunteering continues to be a significant indicator for lower odds of fair or poor health net of other factors in Model 3 ($OR = 0.63, p < .001$).

Model 4 estimates the effect of widowed status and volunteer status on self-rated health, adjusting for baseline physical health, mental health, health behaviors, functional limitations, and social and demographic factors. This model is used for estimating the direct effects of widowed status and volunteer status on the change in self-rated health net of all other covariates. In contrast to expectations, the odds of being in fair or poor health at follow-up are 31% lower ($p < .05$) for the recently widowed as compared to the married net of baseline self-rated health and all other factors, and the odds of being in fair or poor health are about 33% less among the previously widowed as compared with the married net of other factors ($p < .05$). The odds of being in fair or poor health at follow-up are 35% lower for volunteers as compared to non-volunteers net of other covariates in the model ($p < .001$).

Model 4 shows that physical health at baseline is a strong predictor of being in fair or poor health at follow-up. The odds of being in fair or poor health for men increase by about 37% with each additional chronic condition ($p < .001$). Males who are older or have less education are more likely to be in fair or poor health than those who are younger or have higher levels of education. The odds of being in fair or poor health increase by about 15% with each additional depressive symptom net of other factors ($p < .001$), and those males with a history of a psychiatric diagnosis have higher odds of being in fair or poor health at follow-up ($OR = 1.40, p < .05$).

Among men health behaviors significantly contribute to a change in self-rated health status. The odds of being in fair or poor health at follow-up are almost 60% higher among smokers compared to non-smokers and about 40% higher among those who are sedentary compared with those otherwise similar males who exercise regularly ($p < .001$).

Among the social roles and social network variables, being engaged in paid work reduces the odds of being in fair or poor health at follow-up for otherwise similar males (*OR* 0.79, $p < .01$).

Model 5 estimates the interaction or moderating effect of widowed status and volunteer status on the change in self-rated health, net of baseline physical health, mental health, health behaviors, functional limitations, and social and demographic factors. As seen on Table 6, the odds of being in fair or poor health at follow-up are lower for volunteers than non-volunteers, but the significance of the interaction with being recently widowed shows that this is primarily true only among the married and those widowed more than two years. In fact there is no significant difference in the beneficial effect of volunteering in reducing the odds that a male is in fair or poor health between those who remain married and those who have been widowed for two or more years.

In order to aid in the interpretation of the effect of widowed status and volunteer status on the change in self-rated health among males, the predicted probabilities were computed representing the different groups. Table 7 shows the predicted probability of being in fair or poor health for males in the three widowed status groups given their volunteer status net of all covariates. Though the probability of being in fair or poor health is lower for married and previously widowed volunteers compared with their non-volunteering peers, the probability of being in fair or poor health at follow-up is higher among recently widowed volunteers compared with their otherwise similar male peers. In contrast to expectations, volunteering does not have a beneficial effect on the self-rated health of males who experience the death of their spouse. These findings do not support Hypothesis 1.

Table 7. Predicted probability of being in fair or poor health for married and widowed males given volunteer status

Widowed status	Volunteers	Non-Volunteers
Married	0.188	0.266
Recently widowed	0.277	0.168
Previously widowed	0.104	0.206

Note. Predicted probabilities were calculated using means for all covariates.

Effect of Widowed Status and Volunteer Status on the Self-Rated Health of Women

In order to evaluate the association of widowed status and volunteer status with fair or poor self-rated health among females, a series of binary logistic regressions was run. Table 8 details the logistic regression results of the effect of widowed status and volunteer status on the self-rated health among females. Model 1 estimates the effect of widowed status and volunteering on self-rated health without including any additional covariates to the model.¹¹ This model shows that the odds of being in fair or poor health are 65% lower for volunteers as compared to non-volunteers net of widowed status ($p < .001$). In contrast to expectations, the odds of being in poor or fair health are not

¹¹ The effect of widowed status on the self-rated health of females with no additional covariates included in the regression model shows that both recently widowed and previously widowed females have significantly higher odds of being in fair or poor health compared with married females: recently widowed $OR = 1.227, p < .05$; previously widowed $OR = 1.242, p < .05$. As seen in Model 1, the addition of volunteering into the model results in an insignificant relationship between the odds of being in fair or poor health and widowed status. This change does suggest that volunteering has some effect on the relationship of self-rated health and widowed status for women.

Table 8: The effect of widowhood and volunteering on the self-rated health of females

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coef.	(O.R.)	Coef.	(O.R.)	Coef.	(O.R.)	Coef.	(O.R.)	Coef.	(O.R.)
Recently widowed	0.145	1.156	-0.186	0.830	-0.236*	0.790	-0.135	0.873	-0.132	0.877
Previously widowed (Married)	0.188 (0)	1.206 (0)	-0.239* (0)	0.787 (0)	-0.449*** (0)	0.638 (0)	-0.260* (0)	0.771 (0)	-0.118 (0)	0.889 (0)
Volunteer status	-1.063***	0.346	-0.726***	0.484	-0.506***	0.603	-0.413***	0.662	-0.371***	0.690
Age			0.038***	1.038	0.022**	1.022	0.023***	1.023	0.022***	1.023
Non-White or Hispanic			0.384***	1.468	0.512***	1.669	0.371***	1.449	0.369***	1.447
Education			-0.100***	0.905	-0.075***	0.928	-0.052***	0.949	-0.052***	0.949
Net worth ≤\$80,000			(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Net worth \$80,001 - 179,000			-0.510***	0.601	-0.287**	0.751	-0.247*	0.781	-0.243*	0.785
Net worth \$179,001 - 325,800			-0.705***	0.494	-0.295**	0.745	-0.259*	0.772	-0.260*	0.771
Net worth \$325,801 - 634,600			-0.895***	0.409	-0.392**	0.675	-0.321**	0.725	-0.319**	0.727
Net worth ≥\$634,601			-0.979***	0.376	-0.436**	0.647	-0.343**	0.710	-0.341**	0.711
Parent			-0.412	0.959	-0.056	0.945	-0.069	0.933	-0.079	0.924
Paid work			-0.738***	0.478	-0.376**	0.687	-0.279**	0.757	-0.281**	0.755
Religion			-0.033	0.968	-0.050	0.951	-0.008	0.992	-0.006	0.994
Social network			-0.075*	0.927	-0.016	0.984	-0.026	0.975	-0.028	0.973
Functional limitations					0.299***	1.348	0.162***	1.176	0.161***	1.175
Smoking					0.262*	1.300	0.311**	1.365	0.315**	1.370
Sedentary					0.484***	1.623	0.361***	1.434	0.359***	1.432
Psychiatric diagnosis					0.410***	1.506	0.372***	1.450	0.370***	1.448
Proxy					0.539**	1.715	0.370*	1.447	0.370*	1.447
Depressive symptoms					0.203***	1.225	0.117***	1.124	0.118***	1.125
Chronic conditions					0.515***	1.674	0.368***	1.445	0.369***	1.446
Self-rated health							1.977***	7.224	1.980***	7.244
Recently widowed volunteer									-0.004	0.996
Previously widowed volunteer									-0.595	0.551

Note. Reference groups are noted by parentheses. $n = 9,400$

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

significantly different for the recently widowed or previously widowed as compared with the married net of volunteer status.

Model 2 estimates the effect of widowed status and volunteer status on self-rated health, controlling for social and demographic factors. Again, female volunteers are significantly less likely to be in fair or poor health than non-volunteers net of social and demographic factors ($OR = 0.48$; $p < .001$). In contrast to the expectation of widowed status being positively related to fair or poor health, the odds of being in poor or fair health are not significantly different for the recently widowed as compared with the married net of social and demographic factors.

The odds of being in fair or poor health are 21% lower for previously widowed as compared to the married net of social and demographic factors ($p < .05$).

Model 3 estimates the effect of widowed status and volunteer status on self-rated health, controlling for baseline mental health, health behaviors, functional limitations, chronic conditions, and social and demographic factors. Unlike the results from the other models, Model 3 shows that the odds of being in fair or poor health are about 21% lower for the recently widowed as compared to the married net of mental health, health behaviors, functional limitations, chronic conditions, and social and demographic factors ($p < .05$). Compared with married females, the odds of being in fair or poor health are about 36% less among the previously widowed net of other factors in Model 3 ($p < .001$). As expected, volunteering continues to be a significant factor for lower odds of fair or poor health net of other factors ($OR = 0.60$, $p < .001$).

Model 4 estimates the effect of widowed status and volunteer status on the change in self-rated health between baseline and follow-up, net of physical health, mental health,

health behaviors, functional limitations, and social and demographic factors. This model is used for estimating the direct effects of widowed status and volunteer status on the change in self-rated health net of all other covariates. In contrast to expectations, the odds of being in fair or poor health at follow-up are about 23% lower for the previously widowed as compared to the married net of all other factors ($p < .05$). However, there is no significant difference in the change in self-rated health for recent widows as compared to married females.¹² The insignificant effect of widowed status on the change in self-rated health is surprising.

Similar to the findings for males, the odds of being in fair or poor health at follow-up are about 34% lower for female volunteers as compared to female non-volunteers net of other covariates in the model ($p < .001$). As expected, physical health at baseline is a strong predictor of being in fair or poor health at follow-up. The odds of being in fair or poor health increase by about 45% with each additional chronic condition ($p < .001$).

Model 4 shows that females who are older or have less education are more likely to be in fair or poor health than those who are younger or have higher levels of education. For females the odds of being in fair or poor health are higher for those with more depressive symptoms than otherwise similar females with fewer depressive symptoms ($OR = 1.12, p < .001$). The odds of being in fair or poor health are 45% higher for those females with a history of a psychiatric diagnosis net of other factors ($p < .001$). Similar to the findings for men, among women both indicators of health behavior significantly

¹² A Wald test in Stata version 10 confirmed that there was no significant difference between the recently widowed and previously widowed categories for female respondents.

contribute to a change in self-rated health between baseline and follow-up. The odds of being in fair or poor health are about 37% higher among smokers compared to otherwise similar non-smokers ($p < .01$), and the odds of being in fair or poor health are 43% higher among those who are sedentary compared with those otherwise similar females who exercise regularly ($p < .001$). Paid work reduces the odds of being in fair or poor health at follow-up for females ($OR = 0.76, p < .01$).

Model 5 estimates the interaction or moderating effect of widowed status and volunteer status on the change in self-rated health, net of baseline physical health, mental health, health behaviors, functional limitations, and social and demographic factors. As seen on Table 8, volunteering reduces the odds of being in fair or poor health, but the lack of significance among both the widowed status and interaction terms shows there is no significant difference in the effect of volunteering between widows and married women. Table 9 shows the predicted probabilities of fair or poor health at follow-up for volunteers and non-volunteers according to their widowed status. Volunteers have a lower probability of being in fair or poor health than non-volunteers for each of the widowed status categories; however, the differences in the probability of fair or poor health between the widowed and married categories given volunteer status are relatively small. The results do not support the hypothesis that volunteering moderates the effect of spousal loss on self-rated health status. It is interesting to note that the odds of being in fair or poor health are higher among the recently and previously widowed in comparison to the married when no other variables are included in the model; however, the inclusion of volunteer status in the model changes this relationship.

Table 9. Predicted probabilities of being in fair or poor health for widowed and married women given volunteer status

Widowed status	Volunteers	Non-volunteers
Married	0.155	0.217
Recently widowed	0.138	0.195
Previously widowed	0.124	0.176

Conclusion

The lack of association between being in poor or fair health at follow-up and being recently or previously widowed contradicts earlier research that showed the ratings of perceived health declined following the death of a spouse (Prigerson, Maciejewski, & Rosenheck, 2000; Williams & Umberson, 2004). It is possible that the design of this research, which excludes observations of the frailest and sickest HRS respondents, may contribute to the discrepancy. It is also possible that those who lose a spouse and are healthy enough to survive and remain in the community recover prior to follow-up.

For both men and women the odds of being in fair or poor health are lower for volunteers than non-volunteers net of all other factors. Although the unexpected findings related to the direct effect of widowed status on self-rated health complicate the investigation of the moderating effect of volunteering on the self-rated health of widows, these findings relating to the direct effect of volunteering for men and women are consistent with prior studies showing a positive health effect for volunteers. Previous research indicates that older adult volunteers have better self ratings of their health than

non-volunteers (Lum & Lightfoot, 2005; Luoh & Herzog, 2002; Morrow-Howell et al., 2003; Thoits & Hewitt, 2001; Van Willigen, 2000).

Recall that Hypothesis 2 stated that volunteering is more beneficial for the self-rated health status of recently widowed men than for bereaved women, when compared with a group of continuously married men and women. Though there are several sound methodological and theoretical reasons for conducting separate analysis for men and women in this study, the analysis presented here precludes the direct testing of this hypothesis. In the results from the male sample, being a recently widowed volunteer compared to a non-volunteer actually increased the odds of being in fair or poor health at follow-up relative to married non-volunteers. The lack of significant findings between the interaction of widowed status and volunteer status for women suggests that there is no difference in the beneficial effect of volunteering by widowed status among females. In both the analysis of men and women the findings contradict the expectation that volunteering helps reduce the decline in self-rated health associated with the death of a spouse, and this undermines the rationale of Hypothesis 2. Further the findings in the separate analysis for males and females do not suggest Hypothesis 2 would be supported if direct gender comparisons could be made. The question still remains as to whether there are gender differences in the interaction effect of volunteering and widowed status. The results of a *t*-test comparing the coefficient on the interaction term of recent widowhood and volunteer status for men and women indicates a significant difference ($t = 2.03, p < .05$). The significant difference in the interaction effect of volunteer and recent widowed status between men and women does not support or disprove Hypothesis 2, but it does suggest there may be a difference by gender. Although the difference might be

due to some difference in the self-rated health of widows and widowers given their volunteer status, the findings do not support the idea that volunteering is more beneficial for the self-rated health status of recently widowed men than bereaved women.

CHAPTER 5

THE EFFECT OF WIDOWED STATUS AND VOLUNTEER STATUS ON DEPRESSIVE SYMPTOMS

This chapter presents the analysis of the effect of widowed status and volunteer status on numbers of depressive symptoms. The chapter begins with a description of the analysis and a review of the hypotheses pertaining to depressive symptoms. Next, bivariate findings for depressive symptoms by widowed status and by volunteer status are presented. Finally, multivariate results are presented from the negative binomial regressions.

Analysis

A count dependent variable ranging from zero to eight (0–8) is used in this analysis. As noted in Chapter 3, descriptive findings for depressive symptoms show that males have a mean of 1.1 (standard deviation 1.6) depressive symptoms, while females have a mean of 1.5 (standard deviation 1.9) depressive symptoms at follow-up. Prior studies suggest that the experience of the death of a spouse often leads to an increase in depressive symptoms (Choi & Bohman, 2007; Turvey et al., 1999). Participating in volunteering is related to lower rates of depression among older adults (Li & Ferraro, 2006; Morrow-Howell et al., 2003; Musick & Wilson, 2003). It is plausible that engaging

in volunteer work might help reduce or moderate the negative effect of spousal loss on depressive symptoms. A series of negative binomial regressions is used to test the following hypotheses:

Hypothesis 3: Volunteering moderates the effect of spousal loss on depressive symptoms.

Hypothesis 4: Volunteering is more beneficial for the depressive symptoms of recently widowed women than bereaved men, when compared with a group of continuously married women and men.

A series of five negative binomial regression models is estimated for both the male and female samples.¹³ All models adjust the standard errors for repeated observations and use weighted data. First, a model using only widowed status and volunteer status is evaluated using the count of depressive symptoms. This model is used to estimate the direct effect of widowed status and volunteer status on depressive symptoms without taking into account other factors that might influence the variation in symptoms of depression for men or women, such as physical or mental health status, health behaviors, or sociodemographic factors.

A second regression model is run adding the social and demographic measures (age, education, race/ethnicity, net worth, religion, social network, paid work, and parental status). Model 2 estimates the expected number of depressive symptoms that can be explained by widowed status and volunteer status when social and demographic factors are added to the model. Next, a third model is evaluated that adds baseline

¹³ A negative binomial regression is an appropriate model when the dependent variable is a count consisting of non-negative integers and is overdispersed.

measures of functional limitations, health behaviors (smoking and sedentary lifestyle), physical health (self-rated health and chronic conditions) and psychiatric diagnosis. This model estimates the variation in depressive symptoms that can be explained by widowed status and volunteer status net of factors related to social and demographic characteristics, functional impairment, health behaviors, and physical and mental health.

The fourth model adds the baseline measure of depressive symptoms, along with the proxy indicator, to the regression. This model represents the change in the expected number of depressive symptoms that is explained by the direct effect of widowed status and volunteer status net of all covariates. A fifth model adds the interaction terms combining widowed status and volunteer status to estimate the change in depressive symptoms between baseline and follow-up that is explained by the moderating effect of volunteer status on widowed status net of other factors. Finally, the findings are compared for males and females to evaluate the gender difference in the moderating effect of volunteering on a change in depressive symptoms among the widowed.

Depressive Symptoms and Widowed Status

This section addresses the relationship between depressive symptoms and widowed status in the analytic sample. Table 10 shows the mean number of depressive symptoms by widowed status for male and female observations. As seen in Table 10, the group with the lowest observed average depressive symptoms are those who are married, with married male observations possessing a mean of 1.0 depressive symptoms and married female observations a mean of 1.4 depressive symptoms. The highest average depressive symptoms are seen among the recently widowed observations for both

Table 10. Depressive symptoms by gender and widowed status

	Men	Women
	Mean (S.D.)	Mean (S.D.)
Recently widowed	2.6 (2.2)	2.7 (2.2)
Previously widowed	1.6 (1.8)	1.9 (2.0)
Married	1.0 (1.5)	1.4 (1.8)

Note. For male observations, the mean difference between those recently widowed and those married is significant ($t = -15.83, p < .001$), and the mean difference between previously widowed and married males is significant ($t = -6.08, p < .001$). For female observations, the mean difference between those recently widowed and those married is significant ($t = -18.45, p < .001$), and the mean difference between the previously widowed and married females is significant ($t = -6.24, p < .001$). Source: Health and Retirement Study (HRS), 2000 – 2004. All estimates use weighted data.

men and women: 2.6 and 2.7 respectively. For male observations the recently widowed have more depressive symptoms than the married: 2.6 versus 1.0 ($t = -15.83, p < .001$) and the previously widowed have more depressive symptoms than the married: 1.6 versus 1.0 ($t = -6.08, p < .001$). Among the females, the recently widowed have a higher average of depressive symptoms at 2.7 than the married at 1.4 ($t = -18.45, p < .001$), and the previously widowed have more depressive symptoms at 1.9 than the married at 1.4 ($t = -6.24, p < .001$).

Depressive Symptoms and Volunteer Status

This section addresses the relationship between depressive symptoms and volunteer status for the male and female samples. Table 11 shows the mean depressive symptoms for observations of volunteers and non-volunteers. As seen in Table 11, on

Table 11. Depressive symptoms by gender and volunteer status

	Men	Women
	Mean (S.D.)	Mean (S.D.)
Volunteers	0.8 (1.3)	1.0 (1.5)
Non-volunteers	1.2 (1.7)	1.8 (2.1)

Note. For the male sample, the mean difference between volunteers and non-volunteers is significant ($t = 14.26, p < .001$). For the female sample, the mean difference between volunteers and non-volunteers is significant ($t = 19.11, p < .001$). Source: Health and Retirement Study (HRS), 2000 – 2004. All estimates use weighted data.

average observations of depressive symptoms for volunteers are lower than those for non-volunteers. Among the male sample, volunteers have a mean of 0.8 depressive symptoms compared to 1.2 for non-volunteers ($t = 14.26, p < .001$). For the female sample the difference is slightly larger; the mean depressive symptoms for volunteers is 1.0, while for non-volunteers it is 1.8 ($t = 19.11, p < .001$).

Mean depressive symptoms are lower for all male and female observations of volunteers than for non-volunteers at all levels of volunteer participation. In results not shown here but displayed in Appendix Tables 3 and 4, the observations of males and females who volunteered for fewer than 100 hours, 100-199 hours, and 200 or more hours all had fewer average depressive symptoms than did non-volunteers. Among the male sample, the differences in average depressive symptoms between the levels of volunteer participation are quite small: 0.8 for those volunteering fewer than 100 hours, 0.7 for volunteers of 100–199 hours, and 0.7 for those contributing 200 or more hours, as compared with 1.2 symptoms for non-volunteers. The differences are also quite small for

the mean number of depressive symptoms for the observations of all females: 1.1 symptoms for fewer than 100 volunteer hours, 1.0 symptoms for 100–199 hours, and 1.0 symptoms for 200 or more hours, in comparison to 1.8 symptoms for non-volunteers. Interestingly, those females participating in the highest level of volunteering, 200 or more hours, have the lowest mean number of depressive symptoms for observations of recently widowed females. However, although this is true for observations of previously widowed males, recently widowed males who volunteer for 200 or more hours do not have a lower mean on depressive symptoms. The mean number of depressive symptoms among males who are recent widowers are 2.6 for non-volunteers, 2.5 for those volunteering fewer than 100 hours, and 2.1 for both those volunteering 100–199 hours and for volunteers of 200 or more hours.

Also of interest is the slightly higher mean of depressive symptoms among observations of previously widowed males who volunteer less than 100 hours in comparison to those previously widowed males who do not volunteer: 1.6 and 2.0 respectively. Though the numbers in some of these groups is relatively small, the results show an increase in the average number of depressive symptoms among those who have recently lost a spouse, but the average number of depressive symptoms is lower for those who volunteer, particularly among female observations.

Effect of Widowed Status and Volunteer Status on the Depressive Symptoms of Men

In order to evaluate the association of widowed status and volunteer status with the number of depressive symptoms, a series of negative binomial regressions was run.¹⁴ Table 12 details the negative binomial regression results of the effect of widowed status and volunteer status on the expected count of depressive symptoms for men. To assist with the interpretation of the results, coefficients are transformed to incident rate ratios (IRR), which are used in the discussion of the results.¹⁵ Model 1 estimates the effect of widowed status and volunteering on the number of depressive symptoms over a two-year period without including any additional covariates in the model. The results from Model 1 are consistent with the bivariate findings. Compared to the married, the expected count of depressive symptoms is 145% higher among the recently widowed and 54% higher for those previously widowed net of volunteer status ($p < .001$). Engaging in volunteering reduces the expected number of depressive symptoms by 38% net of widowed status ($p < .001$).

Model 2 estimates the effect of widowed status and volunteer status on the expected number of depressive symptoms, net of social and demographic factors. As shown on Table 12, the negative effect of being recently or previously widowed relative

¹⁴ Alternative specifications were considered: A Poisson regression model was rejected because the variance and mean of the count were not equal and violated the Poisson distribution. A zero-inflated negative binomial model was rejected because there was no theoretical reason to assume a separate probability model for zero and non-zero counts of depressive symptoms. OLS was rejected because the count of depressive symptoms was not normally distributed. A binomial logistic regression model was rejected because preliminary analysis showed that a single cut-point for depression underestimated the effect of widowed status on depression.

¹⁵ Incident rate ratios (IRR), also called incident risk ratios, are the exponential transformation of the coefficient b : $\text{Exp}(B)$.

Table 12. The effect of widowed status and volunteer status on the depressive symptoms of men

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coef.	(IRR)	Coef.	(IRR)	Coef.	(IRR)	Coef.	(IRR)	Coef.	(IRR)
Recently widowed	0.897***	2.453	0.798***	2.221	0.843***	2.324	0.778***	2.177	0.692***	1.998
Previously widowed (Married)	0.430*** (0)	1.537 (0)	0.265** (0)	1.303 (0)	0.282** (0)	1.325 (0)	0.007 (0)	1.006 (0)	0.092 (0)	0.913 (0)
Volunteer status	-0.476***	0.621	-0.328***	0.721	-0.211***	0.810	-0.182***	0.834	-0.208***	0.912
Age			0.012***	1.012	0.010**	1.010	0.010***	1.010	0.010***	1.011
Non-White or Hispanic			0.115	1.121	0.148*	1.159	0.062	1.064	0.058	1.059
Education			-0.035***	0.966	-0.022**	0.979	-0.015**	0.986	-0.015**	0.986
Net worth ≤\$80,000			(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Net worth \$80,001 - 179,000			-0.309***	0.734	-0.163**	0.850	-0.098*	0.907	-0.101**	0.904
Net worth \$179,001 - 325,800			-0.450***	0.638	-0.252***	0.778	-0.181***	0.835	-0.183***	0.833
Net worth \$325,801 - 634,600			-0.481***	0.618	-0.278***	0.757	-0.196***	0.822	-0.196***	0.822
Net worth ≥\$634,601			-0.431***	0.650	-0.201**	0.818	-0.137*	0.872	-0.137*	0.872
Parent			-0.053	0.948	-0.083	0.921	-0.108	0.898	-0.105	0.900
Paid work			-0.112*	0.894	0.061	1.063	0.059	1.060	0.060	1.062
Religion			-0.104	0.901	-0.089	0.915	-0.035	0.966	-0.035	0.966
Social network			-0.023	0.977	-0.020	0.980	-0.007	0.993	-0.009	0.991
Functional limitations					0.097***	1.102	0.022	1.022	0.021	1.022
Smoking					0.198**	1.219	0.167**	1.182	0.171**	1.187
Sedentary					0.136***	1.146	0.076*	1.079	0.076*	1.079
Psychiatric diagnosis					0.519***	1.680	0.258***	1.294	0.256***	1.292
Chronic conditions					0.087***	1.091	0.072***	1.075	0.072***	1.075
Self-rated health					0.512***	1.669	0.327***	1.387	0.327***	1.386
Proxy							0.667***	1.949	0.669***	1.952
Depressive symptoms							0.284***	1.329	0.284***	1.328
Recently widowed volunteer									0.362	1.437
Previously widowed volunteer									0.371	1.449

Note. Reference category is noted in parentheses. $n = 9,043$

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

to married on the expected number of depressive symptoms is reduced when the social and demographic factors are added in Model 2. The recent loss of a spouse increases the expected number of depressive symptoms by 122% relative to the depressive symptom count of those who remain married, net of social and demographic factors ($p < .001$). For the previously widowed the expected number of depressive symptoms increases by 30% in comparison to the married, net of social and demographic factors ($p < .01$). With the addition of social and demographic covariates in Model 2, the negative effect of volunteering on the number of depressive symptoms is also reduced. Males who engage in volunteer work decrease the number of expected depressive symptoms by about 28% compared with males who do not volunteer, net of social and demographic factors ($p < .001$).

Model 3 estimates the effect of widowed status and volunteer status on the expected count of depressive symptoms, controlling for baseline physical health, health behaviors, functional limitations, psychiatric diagnosis, and social and demographic factors. As expected, being recently widowed relative to married continues to contribute to a higher count of depressive symptoms net of covariates in the model (IRR = 2.32, $p < .001$). Compared to married men, previously widowed males have a 33% higher number of depressive symptoms net of physical health, health behaviors, functional limitations, psychiatric diagnosis, and social and demographic factors ($p < .01$). Volunteering decreases the number of expected depressive symptoms by about 19% net of physical health, health behaviors, functional limitations, psychiatric diagnosis, and social and demographic factors ($p < .001$).

Model 4 estimates the effect of widowed status and volunteer status on the change in the number of depressive symptoms between baseline and follow-up, net of physical health, mental health, health behaviors, functional limitations, and social and demographic factors. This model is used for estimating the direct effects of widowed status and volunteer status on the change in the number of depressive symptoms net of all other covariates. As expected, the recent loss of a wife relative to remaining married significantly increases the depressive symptoms between baseline and follow-up for otherwise similar males (IRR = 2.177, $p < .001$). However, there is no significant change in the number of depressive symptoms for the previously widowed males relative to married males. Volunteering reduces the number of depressive symptoms at follow-up by about 17% ($p < .001$) net of all covariates.

As expected, mental and physical health at baseline are strong indicators of a change in the number of depressive symptoms at follow-up. Net of other factors, the number of depressive symptoms increases by about 33% with each additional baseline depressive symptom and by 29% for those males with a history of a psychiatric diagnosis ($p < .001$). For those males in fair or poor health at baseline the expected number of depressive symptoms at follow-up increases by 39% in comparison to those otherwise similar males with good, very good, or excellent health ($p < .001$). Each additional chronic condition at baseline is expected to increase the number of depressive symptoms at follow-up by about 8%, net of other covariates ($p < .001$).

Model 4 shows that males who are older or who have less education are more likely to experience an increase in depressive symptoms than those who are younger or have higher levels of education. Both indicators of health behavior significantly

contribute to a change in the number of depressive symptoms between baseline and follow-up. Male smokers experience an increase of about 18% in the number of depressive symptoms compared to otherwise similar non-smokers ($p < .01$). Men who are sedentary at baseline experience an increase of about 8% in the number of depressive symptoms at follow-up compared to otherwise similar men who exercise ($p < .05$).

Model 5 estimates the interaction or moderating effect of widowed status and volunteer status on the change in the number of depressive symptoms, net of baseline physical health, mental health, health behaviors, functional limitations, and social and demographic factors. As shown on Table 12, volunteering reduces the expected number of depressive symptoms, but the lack of significance of either interaction term indicates there is no significant difference in the effect of volunteering between widowers and married men. The significance of being recently widowed in increasing the expected number of depressive symptoms relative to the married, and the lack of significance on the interaction term, suggests that the effect of volunteering is equally beneficial for widowers and married men. This result should be interpreted with some caution due to the lack of significant findings among the previously widowed group relative to married men. The depressive effect of spousal loss is likely to be temporary net of other factors. These results do not support the hypothesis that volunteering moderates the effect of spousal loss on depressive symptoms.

Effect of Widowed Status and Volunteer Status on the Depressive Symptoms of Women

In order to evaluate the association of widowed status and volunteer status on the number of depressive symptoms, a series of negative binomial regressions was run. Table 13 details the negative binomial regression results of the effect of widowed status and volunteer status on the expected count of depressive symptoms for women. Once again, the coefficients are transformed to incident rate ratios (IRR) to assist with the interpretation and discussion of results. Model 1 estimates the effect of widowed status and volunteering on the number of depressive symptoms over a two-year period without including additional covariates in the model. Compared to married women, the expected count of depressive symptoms is 95% higher among the recently widowed and 35% higher for those previously widowed net of volunteer status ($p < .001$). Volunteering reduces the expected number of depressive symptoms by 42% among women net of widowed status ($p < .001$).

Model 2 estimates the effect of widowed status and volunteer status on the expected number of depressive symptoms, net of social and demographic factors. Similar to the findings for men, the inclusion of social and demographic factors in the model reduces the effect of widowed status and volunteer status on the expected number of depressive symptoms. As shown on Table 13, the recent loss of a husband increases the expected number of depressive symptoms by 83% relative to those who remain married net of social and demographic factors ($p < .001$). For previously widowed women, the expected number of depressive symptoms increases by 21% in comparison to married

Table 13. The effect of widowed status and volunteer status on the depressive symptoms of women

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coef.	(IRR)	Coef.	(IRR)	Coef.	(IRR)	Coef.	(IRR)	Coef.	(IRR)
Recently widowed	0.678***	1.970	0.604***	1.830	0.663***	1.940	0.600***	1.822	0.527***	1.695
Previously widowed (Married)	0.302*** (0)	1.352 (0)	0.192*** (0)	1.212 (0)	0.232*** (0)	1.261 (0)	0.010 (0)	1.020 (0)	0.007 (0)	1.007 (0)
Volunteer status	-0.549***	0.577	-0.387***	0.679	-0.264***	0.768	-0.209***	0.812	-0.235***	0.791
Age			0.007*	1.007	0.003	1.003	0.006*	1.006	0.006**	1.006
Non-White or Hispanic			0.063	1.065	0.061	1.063	0.020	1.020	0.020	1.020
Education			-0.048***	0.953	-0.029***	0.972	-0.014**	0.986	-0.014**	0.986
Net worth ≤\$80,000			(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Net worth \$80,001 - 179,000			-0.228***	0.796	-0.102*	0.903	-0.073*	0.923	-0.073*	0.930
Net worth \$179,001 - 325,800			-0.288***	0.750	-0.095*	0.910	-0.077*	0.926	-0.076	0.927
Net worth \$325,801 - 634,600			-0.385***	0.680	-0.161**	0.851	-0.131**	0.877	-0.128**	0.880
Net worth ≥\$634,601			-0.453***	0.636	-0.218***	0.804	-0.157**	0.855	-0.155**	0.857
Parent			0.040	1.041	0.045	1.046	0.027	1.027	0.026	1.027
Paid work			-0.345***	0.708	-0.195***	0.823	-0.145***	0.865	-0.143***	0.867
Religion			0.042	1.043	0.052	1.053	0.057	1.058	0.058	1.060
Social network			-0.080***	0.923	-0.061***	0.941	-0.048**	0.953	-0.049**	0.953
Functional limitations					0.060***	1.062	0.008	1.008	0.008	1.008
Smoking					0.173**	1.189	0.137**	1.147	0.135**	1.145
Sedentary					0.115***	1.122	0.077**	1.080	0.076**	1.079
Psychiatric diagnosis					0.464***	1.590	0.237***	1.268	0.237***	1.268
Chronic conditions					0.056***	1.058	0.045***	1.046	0.045***	1.046
Self-rated health					0.478***	1.613	0.291***	1.337	0.291***	1.338
Proxy							0.531***	1.701	0.535***	1.708
Depressive symptoms							0.213***	1.238	0.214***	1.238
Recently widowed volunteer									0.241**	1.272
Previously widowed volunteer									0.008	1.008

Note. Reference category is noted in parentheses. $n = 8,914$

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

women net of social and demographic factors ($p < .001$). Women who engage in volunteer work decrease the number of expected depressive symptoms by 32% compared with women who do not volunteer net of social and demographic factors ($p < .001$).

Model 3 estimates the effect of widowed status and volunteer status on the expected count of depressive symptoms, controlling for baseline physical health, health behaviors, functional limitations, psychiatric diagnosis, and social and demographic factors. As expected, being recently widowed relative to married continues to contribute to a higher expected count of depressive symptoms net of covariates in the model (IRR = 1.94, $p < .001$). Compared to married women, previously widowed women have a 26% higher count of depressive symptoms net of physical health, health behaviors, functional limitations, psychiatric diagnosis, and social and demographic factors ($p < .001$). Volunteering decreases the number of expected depressive symptoms by about 23% net of physical health, health behaviors, functional limitations, psychiatric diagnosis, and social and demographic factors ($p < .001$).

Model 4 estimates the effect of widowed status and volunteer status on the change in the number of depressive symptoms between baseline and follow-up, net of physical health, mental health, health behaviors, functional limitations, and social and demographic factors. This model is used for estimating the direct effects of widowed status and volunteer status on the change in the number of depressive symptoms net of all other covariates. As expected, being recently widowed relative to remaining married significantly increases the depressive symptoms between baseline and follow-up for otherwise similar females (IRR = 1.82, $p < .001$). Similar to the findings for men, there is no significant change in the number of depressive symptoms for the previously widowed

relative to married females. Among women, volunteering reduces the number of depressive symptoms at follow-up by about 19% ($p < .001$) net of all covariates.

As expected, mental and physical health at baseline are strong indicators of a change in the number of depressive symptoms for women at follow-up. Net of other factors, the number of depressive symptoms increases by about 24% with each additional baseline depressive symptom and by 27% for those females with a history of a psychiatric diagnosis ($p < .001$). For those females in fair or poor health at baseline, the expected number of depressive symptoms at follow-up increases by 34% in comparison to otherwise similar females with good, very good, or excellent health ($p < .001$). Each additional chronic condition at baseline is expected to increase the number of depressive symptoms at follow-up by about 5%, net of other covariates ($p < .001$).

Similar to the findings for men, Model 4 shows that females who are older or have less education are more likely to experience an increase in depressive symptoms than those who are younger or have higher levels of education. Unlike the findings for men, two social factors, paid work and social network, contribute to the change in the number of depressive symptoms among women. Women with a larger social network at baseline can expect a decline in the number of depressive symptoms at follow-up with all other factors held constant ($IRR = 0.95, p < .01$). Those women who work for pay have a 14% decline in the number of depressive symptoms at follow-up compared with otherwise similar women who are not working ($p < .001$).

Similar to the findings for men, health behaviors significantly contribute to a change in the number of depressive symptoms between baseline and follow-up among women. Female smokers experience an increase of roughly 15% in the number of

depressive symptoms compared to otherwise similar non-smokers ($p < .01$), and women who are sedentary at baseline experience an increase of about 8% in the number of depressive symptoms at follow-up compared to otherwise similar women who exercise ($p < .01$).

Model 5 estimates the interaction effect of widowed status and volunteer status on the change in the number of depressive symptoms, net of baseline physical health, mental health, health behaviors, functional limitations, and social and demographic factors. As shown on Table 13, the interaction of being recently widowed and volunteering is significant ($p < .01$). For the recently widowed relative to married women, the number of depressive symptoms is expected to increase by 70% for those women who do not volunteer, and this effect of being recently widowed relative to remaining married increases by 27% for those women who volunteer. In other words, female volunteers who recently lost a spouse have a greater expected increase in the number of depressive symptoms than non-volunteers who recently lost a spouse relative to those who remain married net of other factors. Volunteering decreases the expected number of depressive symptoms by 21% for married women, but this beneficial effect is reduced by 27% for the recently widowed. These results indicate that there is a significant interaction-effect between being recently widowed and volunteering, though this effect is not beneficial in terms of reducing the number of depressive symptoms or in minimizing the increase in depressive symptoms associated with spousal loss. Although volunteering is equally beneficial for married and previously widowed women, the results showing that volunteering does not benefit women who recently lost a spouse are not as expected.

Conclusion

Consistent with previous research, the recent loss of a spouse significantly increases the number of depressive symptoms for both men and women. Among the married, volunteer work significantly decreases the number of depressive symptoms for both males and females. Married women who volunteer experience a decline in the number of depressive symptoms by 21% in comparison to women who are non-volunteers; and married men who volunteer decrease the number of expected depressive symptoms by 9% in comparison to males who do not volunteer. The lack of significance on the interaction terms in the analysis on the male sample indicates that volunteering is equally beneficial for men across the three widowed-status groups: recently widowed, previously widowed, and married. Although the interaction between recently widowed and volunteering is significant for the female sample, the results indicate that women who have recently experienced the death of their spouse and volunteer have a greater expected increase in depressive symptoms compared to the expected increase in depressive symptoms experienced by those recent widows who do not volunteer. As previously noted these results do not support Hypothesis 3.

The results for both the male and female models contradict the expectation that volunteering helps reduce the number of depressive symptoms associated with the death of a spouse, and this undermines the rationale supporting Hypothesis 4. The fourth hypothesis states that volunteering is more beneficial for the depressive symptoms of recently widowed women than bereaved men, when compared with a group of continuously married women and men. Though gender-separate analysis was performed, due to several methodological issues the analysis presented here does not allow for the

optimal testing of Hypothesis 4. A *t*-test comparing the interaction effect of being recently widowed and volunteering for men and women showed no significant difference ($t = -0.82, p = 0.41$). The lack of significance in the comparison of the coefficient on the interaction term and the findings in the separate analysis for males and females do not suggest Hypothesis 4 would be supported if direct gender comparisons could be made. Overall, the results do not support the idea that volunteering is more beneficial for reducing the depressive symptoms of recently widowed women than of bereaved men.

CHAPTER 6

DISCUSSION

Growing numbers of studies have shown an association between the social activity of volunteering and better mental and physical health outcomes for older adults. The mechanism by which volunteering contributes to these positive health outcomes is less understood. This study examines the idea that volunteering provides older adults with a source of social support to be used as a resource during stressful life events. It is possible that by utilizing the social support obtained through volunteering, older adults reduce the risk of negative stress-related outcomes.

Using the stressful life event of the death of a spouse, this study focuses on whether volunteering helps to reduce the negative effects of spousal loss observed in prior studies. Specifically, the primary objective of this research is to investigate whether volunteering moderates changes in self-rated health and depressive symptoms among respondents who have recently experienced the death of a spouse. A second objective is to determine if gender differences exist in the interaction effect of widowhood and volunteering.

This study adds to prior studies on the effect of volunteering and widowed status in several ways. First, the current study uses two health-related outcomes, self-rated health and depressive symptoms, rather than focusing only on psychological or mental

health effects. Self-rated health represents multiple factors of overall health, while depression captures a single mental-health issue.

Second, the panel data available in the Health and Retirement Study allow for a longitudinal study on the effects of widowhood and volunteering. Specifically, data available through the HRS allow for the observation of volunteer participation and changes in self-rated health and depressive symptoms over time between widowed and continuously married respondents. Finally, instead of using retrospective reports provided by widowed respondents or post-loss characteristics of widowed respondents, this investigation uses baseline health and social characteristics obtained prior to the death of a spouse to better assess changes over time related to this stressful life event.

The Impact of Widowed Status and Volunteering on Self-Rated Health

The first hypothesis this research investigates is whether volunteering moderates the effect of spousal loss on self-rated health status. This hypothesis is based on prior studies indicating that the death of a spouse is a risk factor for reductions in perceived health (e.g., Bennett, 2006; Prigerson, Maciejewski, & Rosenheck, 2000), and volunteering has a positive impact on the self-rated health of older adults (e.g., Luoh & Herzog, 2002; Van Willigen, 2000). The discussion will begin with an overview of the direct effects of volunteering on self-rated health and the direct effect of widowed status on self-rated health.

Bivariate results suggest that volunteering is associated with fewer observations of fair or poor self-ratings of health for both men and women. Even when additional factors are adjusted, volunteering is associated with better self-ratings of health. Findings

shown in the Appendix indicate that, for both women and men, better self-rated health is related to volunteering at all levels: fewer than 100 hours, 100–199 hours, and 200 or more hours. These findings are consistent with prior research suggesting that volunteering has a positive impact on perceived health status for older adults (Lum & Lightfoot, 2005; Luoh & Herzog, 2002; Morrow-Howell et al., 2003; Thoits & Hewitt, 2001; Van Willigen, 2000).

The results for the direct effect of the death of a spouse on the self-rated health of men are surprising. Bivariate findings for males show no significant differences in self-rated health between the recently widowed, previously widowed, and married males. When additional factors are adjusted, the findings indicate an association between widowhood and better ratings of self-rated health, although this should be interpreted with some caution as these findings represent the self-perceptions of surviving widowers. The models adjusting for volunteer hours and additional covariates shown in the Appendix indicate that only the previously widowed males have a significant association with better self-rated health compared with otherwise similar married males. These findings contradict prior research showing an association between poor perceived health and spousal loss (Ferraro, Mutran, & Barresi, 1984; Prigerson, Maciejewski, & Rosenheck, 2000; Williams & Umberson, 2004).

Even though volunteering has an overall positive impact on the self-rated health of older adult men, this effect is not maintained during the first two years following the death of a spouse. In fact, older adult male volunteers who experience the death of their spouse have a higher probability of a negative change in their self-rated health than their fellow widows who do not volunteer. Once an older adult male has been widowed for

more than two years, the positive effects of volunteering on self-rated health are similar to that of married males. These findings suggest that volunteering is not beneficial during the stressful period of spousal bereavement; the benefits of volunteering do not protect these bereaved males from health declines.

The timing between the death of a spouse and self-ratings of health may be a factor contributing to the unexpected findings related to the direct effects of widowed status on self-rated health. One study found no effect of spousal loss on self-rated health for those widowed less than a year (Norris & Murrell, 1990). Another study suggests that the observed impact of widowhood on self-rated health is limited to one to three years post-loss (Bennett, 2006). The measures of widowed status, less than two years for recent widows and two to six years for previous widows, may not be capturing possible time-sensitive reductions in self-rated health.

The bivariate findings for females show significant differences in self-rated health between the recently widowed, previously widowed, and married female observations. If no other factors are considered, widowhood for women is associated with lower levels of self-rated health, but this significant relationship disappears once volunteer status is included in the analysis. When all additional factors are considered, widowed status continues to be unrelated to self-rated health among women in the study. These findings are consistent with those of Williams and Umberson (2004), suggesting fewer perceived-health-effects of widowhood among women.

Regardless of the widowed status among women, volunteering is associated with more positive levels of self-rated health. The lack of significance in the interaction between widowed status and volunteering indicates that there are no differences in the

impact of volunteering on the self-rated health of older adult women by widowed status. Though the interaction between volunteering and recent widowhood is significant for men, volunteering does not indicate a protective impact from self-perceived declines in health status. Overall, the results for men and women do not support the hypothesis that volunteering moderates the effect of spousal loss on self-rated health.

The second hypothesis is that volunteering is more beneficial for the self-rated health status of recently widowed men than for bereaved women when compared with a group of continuously married men and women. Although the separate analyses for men and women do not allow for the direct comparison of the interaction of widowed and volunteer status by gender, the findings do not suggest that this hypothesis would be supported if such a three-way interaction were tested. Among the female sample, the benefits of volunteering on self-rated health did not differ by widowed status, and although the benefits of volunteering did differ significantly between recently widowed and married men, these differences did not indicate a benefit for the bereaved widower. There may be a gender difference in the association of self-rated health and the interaction of widowed and volunteer status, but there is no evidence to support the idea that volunteering would be more beneficial for the self-rated health of widowers than widows.

Overall the findings related to the effect of spousal loss on self-rated health are surprising and may be related to the nature of the measure of self-rated health and the common but intermittent symptoms of grief. It is possible that prior studies showing a temporary reduction in self-rated health (e.g., Bennett, 2006) represent a short-term increase in grief-related somatic symptoms and not actual physical health declines

associated with illness. Recent research using a sample of 328 surviving spouses from the Living After Loss study suggests that somatic symptoms increase after the loss of a spouse. However, findings from this same study indicate no declines in physical health 18 months post-loss (Utz, Caserta, & Lund, 2012). Though self-rated health is a common indicator of physical health status, it is a measure of the perception one has of overall health. It is possible that self-rated health measures may reflect feeling unwell due to aches or pains and are not directly indicative of the onset or worsening of disease. Self-rated health in this study may be measured at a point in time where the majority of surviving spouses have adjusted to the loss and moved beyond the period of increased somatic symptoms.

The Impact of Widowed Status and Volunteering on Depressive Symptoms

The third hypothesis this study investigates is whether volunteering moderates the effect of spousal loss on depressive symptoms. This hypothesis is based on previous research findings indicating that the death of a spouse increases depressive symptoms (e.g., Choi & Bohman, 2007; Turvey et al., 1999), and volunteering reduces depression among older adults (e.g., Li & Ferraro, 2006; Musick & Wilson, 2003). The discussion starts with an overview of the direct effects of volunteering on depressive symptoms and the direct effect of widowed status on depressive symptoms.

Bivariate results suggest that volunteering is associated with fewer observed depressive symptoms for both men and women. Even when additional factors are adjusted, volunteering is associated with fewer depressive symptoms at follow-up, and this is true across all levels of volunteer hours. These findings are consistent with prior

research indicating that volunteering reduces depression for older adults (Li, 2007; Li & Ferraro, 2006; Lum & Lightfoot, 2005; Morrow-Howell et al., 2003; Musick & Wilson, 2003).

The bivariate findings for both males and females indicate that those who have recently experienced the death of their spouse have significantly more depressive symptoms than those who remain married. These differences remain even when additional factors are adjusted. There is a significant increase in the number of depressive symptoms in the two-year period following the death of a spouse for both men and women.

Bivariate results for men and women indicate that those who have been widowed between two and six years have more depressive symptoms than those who are married; however, when additional factors are adjusted, this association becomes insignificant for both males and females. The change in the number of depressive symptoms over a two year period is not significantly different between those who remain married and those who had previously lost a spouse. These findings are consistent with prior findings showing that the recent loss of a spouse increases depression (Onrust & Cuijpers, 2006; Turvey et al., 1999; Zisook & Shuchter, 1991), but that usually within two years the majority of people adjust to their loss (Boerner, Wortman, & Bonanno, 2005; Bonanno et al., 2002; Lund, Caserta, & Dimond, 1993).

Hypothesis 3 investigates the moderating effect of volunteering on the association between widowed status and depressive symptoms. Among men, volunteering is associated with fewer depressive symptoms, and this effect does not differ significantly by widowed status. Although the interaction between volunteering and recent widowhood

is significant for women, volunteering does not indicate a protective impact on the change in depressive symptoms. The findings indicate that female volunteers who have recently experienced the death of their spouse have a greater increase in depressive symptoms than those recently widowed women who do not volunteer. The benefits of volunteering in reducing depressive symptoms are similar for women who have been widowed for more than two years and married women. Overall, the results for men and women do not support the hypothesis that volunteering moderates the effect of spousal loss on depressive symptoms.

The final hypothesis is that volunteering is more beneficial for the depressive symptoms of recently widowed women than for bereaved men when compared with a group of continuously married women and men. The separate analyses for men and women on depressive symptoms do not allow for the direct comparison of the interaction of widowed and volunteer status by gender, and the findings do not suggest that this hypothesis would be supported if this three-way interaction were tested. Although there are no differences in the impact volunteering has on decreasing depressive symptoms for married or previously widowed women, recent widows who volunteer gain more depressive symptoms than their non-volunteering widowed peers. While volunteering reduces depressive symptoms among married women and women widowed for more than two years, volunteering is not enough to reduce the increase in depressive symptoms accompanying the profound stress of a spouse's death among the female sample.

For men the benefits of volunteering on the number of depressive symptoms at follow-up did not differ by widowed status, even though recent widowers have significantly more depressive symptoms than married men. Although there are modest

differences for men and women relating to the interaction of widowed and volunteer status, there is no evidence to support the idea that volunteering would be more beneficial in reducing the depressive symptoms of widows than widowers.

The lack of support for the moderating effect of volunteering on depressive symptoms is surprising. It is possible that the stressful event of spousal loss may need to be matched with the provision of emotional support to act as a stress buffer. Given the emotional nature of bereavement, emotional support is likely the type of social support needed by the surviving spouse, and emotional support can be provided by similar others or by those closest to the bereaved (Thoits, 2011). Volunteer participation may not enhance the availability of either kind of social ties for volunteers, or perhaps the type of volunteer work plays an important role in the opportunity for such support. A volunteer who engages in a solitary task for an organization may have different opportunities to form ties with others than someone actively engaged with others to complete a common task. Hence, while volunteering may help older adults remain engaged in their community, volunteering may not facilitate the actual delivery of emotional support or the perception of such support being available.

There is also the possibility that volunteering, particularly if accompanied by a sense of obligation, may actually be counterproductive during the stressful life transition of spousal loss. In facing the numerous adjustments accompanied by losing a partner, a volunteer may feel obligated to fulfill a commitment to an organization, and such a sense of obligation may reduce the sense of purpose or meaning previously obtained from volunteering. Over time, as adjustments are made by the surviving partner, it is possible that volunteering regains its sense of purpose or meaning for the individual.

A final explanation for the lack of findings supporting the moderating effect of volunteering on depressive symptoms is that volunteers may have more room for decline. Prior research suggests that older adults who decide to volunteer have several psychic advantages—higher self-esteem, more self-efficacy, greater life satisfaction, and lower rates of depression—than those who do not volunteer (Li & Ferraro, 2006; Moen & Fields, 2002; Thoits & Hewitt, 2001; Van Willigen, 2000). It may be that married volunteers have fewer depressive symptoms than non-volunteers, but upon the death of a spouse, the number of depressive symptoms increases more for the volunteer compared with the nonvolunteer. In short, a volunteer may have more depressive symptoms to gain as a result of a spouse's death than a nonvolunteer.

Study Limitations

The HRS provides a unique opportunity for examining the moderating effect of volunteering on the self-rated health and depressive symptoms of those experiencing the stress of spousal loss. Utilizing records from the National Death Index, the HRS confirms the month and year of a respondent's death. In this way, the HRS allows for the accurate identification of the timing of a spouse's death and the clear distinction between those respondents who lost a spouse recently, those who have been widowed for several years, and those who remain married.

With data collection every two years on multiple social and health indicators, the HRS provides the opportunity to use pre-loss characteristics for baseline measures and investigate changes over time in self-rated health and depressive symptoms between these groups.

Although the HRS provides several advantages for this study, there are some limitations. First, as previously mentioned, the length of time between the death of a spouse and the observation of the dependent variable may not be adequate for detecting changes in self-rated health. Previous studies suggest that changes in self-rated health may not occur within the first year of a spouse's death, and for many widows self-rated health may rebound around the third year following the loss of a spouse (Bennett, 2006; Norris & Murrell, 1990). The categories of recently widowed (less than two years) and previously widowed (widowed two to six years) may not be capturing possible time-sensitive reductions in self-rated health experienced by widows.

Second, the exact time of volunteer activity cannot be determined. The HRS asks respondents if they have done any volunteer work over the past 12 month period, but more specific information about the timing of volunteering is not available. For respondents that have experienced the death of a spouse within the last year, there is no way of knowing when the volunteer activity took place in relation to the loss. Findings by Li (2007) suggest that engaging in volunteer work following the death of a spouse can be beneficial, but it is possible that some of the recently widowed respondents volunteered prior to their spouse's death.

A third limitation is the unavailability of specific information about the type of organization for which the volunteer work is performed. It is possible that organizational characteristics and the type of volunteer work performed for the organization might influence actual or perceived support for volunteers. The type of attachment a person has with an organization and the social context in which the organization and the person are embedded influence the type and quality of social ties and support (Berkman, Glass,

Brissette, & Seeman, 2000). For example, a volunteer in a religious organization where she has been an active member for 50 years may have a different attachment level and opportunity for support than a volunteer fairly new to an organization and with less contact with others affiliated with the organization.

Finally, there is no measurement of the quality of the marital relationship. Prior studies have suggested that the degree of cohesion within a marital relationship influences the adjustments when a spouse dies (Carr et al., 2000; Prigerson, Maciejewski, & Rosenheck, 2000). However, such a measure of marital quality is not available in the HRS. Despite these limitations, the HRS provides a rich source of data for investigating the interaction of spousal loss and volunteering on the self-rated health and depressive symptoms of older adults.

Future Research

The findings of this study suggest that volunteering does not protect or prevent older adults from experiencing the health-related effects of the stress of spousal loss. However, volunteering may be a valuable source of social support for older adults, even if these findings do not directly support this idea. Social support associated with volunteer work may contribute to the relationship between volunteering and positive mental and physical health outcomes found in other studies.

The findings of this study suggest several areas for future research. Subsequent studies are needed to examine the impact of volunteering during other life transitions such as moving or retirement. It is possible that volunteering may supply more instrumental or integrative forms of social support, rather than the emotional support

needed by many after the death of a spouse. By investigating the way volunteering may influence the adjustment of older adults to other transitions, researchers could gain a better understanding of whether volunteering has a moderating effect on the well-being of older adults in potentially stressful situations.

Future research is needed to investigate the social-network characteristics and perceived social support of volunteers and non-volunteers to identify whether there are differences by volunteer status. There may be differences between volunteers and non-volunteers in the number and quality of relations with other people in their social network. Furthermore, differences need to be investigated between different types of volunteer work. Some types of volunteer work, such as volunteering for a local religious institution, may be associated with higher perceived or actual support than volunteering for a national organization. Research in this area could help identify the relationship between volunteering and social support. It is possible that specific types of volunteer work, or volunteering more generally in comparison to not volunteering, increases perceived social support for older adults and this may have a buffering effect on mental and physical health declines. In fact, it may be that volunteering buffers older adults from declines in perceived social support that can occur with the loss of network members with advancing age.

A final area for subsequent research is in the area of the effect of volunteering on the physical health of widows. Given the unexpected findings of better ratings of self-rated health among the widowed relative to the married, it would be advantageous to investigate other health effects of spousal loss and whether volunteering made a difference in the outcome. Additional studies could focus on functional limitations, the

onset of chronic conditions, or mortality. These studies should use pre-loss characteristics related to health and the quality of the marital relationship at baseline, if such indicators are available. Conducting such research would add to the existing literature by increasing our understanding of the physical health impacts of spousal loss and the role of volunteering in promoting physical health.

Policy and Practice Implications

Leaders in the field of gerontology have long advocated for an increase in opportunities and participation in volunteer work for older adults (Bass & Caro, 2001; Caro, Bass, & Chen, 1993). The beneficial effects of volunteering on the mental and physical health of older adults have gained the attention of the practitioners who recruit volunteers (Swinson, 2006) and policy makers (Grimm, Spring, & Dietz, 2007). This growing awareness contributed to national recognition of the importance of volunteering at the 2005 White House Conference on Aging. One resolution passed at this conference acknowledged the need to expand the opportunities for older adults to volunteer in meaningful ways in their community (Morrow-Howell, 2006).

The following year the reauthorization of the Older Americans Act (OAA) provided guidelines for the expanded use of volunteers in OAA programs. The 2006 reauthorization also established a collaborative relationship with the Corporation for National and Community Service (CNCS), which was founded in 1993 to coordinate national service opportunities. The goal of the partnership with CNCS was to update the ways community-based organizations utilized older adult volunteers (Administration on Aging, 2011). In 2009 the Serve America Act was passed, which reauthorized the CNCS

through the year 2014 and expanded service opportunities. Among the provisions in this law was the expansion of opportunities for people 55 and older to participate in National Senior Service Corps programs (Edward M. Kennedy Serve America Act, 2009).

These policy efforts to expand meaningful volunteer options for older adults are worthwhile; however, there remain unanswered questions about the universality of positive health effects from volunteering and ways volunteer coordinators could assist in maximizing such benefits. For example, the findings of this study suggest that while overall volunteering has a positive effect on the perceived health and depression of older adult men and women, volunteers who experience the death of a spouse are likely going to need additional support to avoid negative effects on their health, particularly their mental health. Volunteer coordinators may be in a unique position to reach out to others within the bereaved individual's network of friends and to make referrals to community bereavement support groups. Once surviving spouses have gone through a period of bereavement, the full positive impact of volunteering appears to return. This finding suggests that efforts by volunteer coordinators to retain volunteers through periods of bereavement could be advantageous in the long run. These points underscore the need to have appropriately trained individuals in positions to oversee volunteer programs on a local level, and programs supporting volunteer opportunities for older adults will need to include appropriations for obtaining professionals as volunteer coordinators or managers.

Conclusion

The results of this research support the findings of numerous prior studies that point to the positive direct effect of volunteering on the mental and physical health of older adults. Even with multiple factors adjusted, volunteering reduces the odds that older

adults will rate their health as fair or poor and reduces the risk of the onset of additional depressive symptoms. These findings support the idea that volunteering helps to maintain adequate levels of social integration for older adults noted in other studies (Lee, Steinman, & Tan, 2011; Li & Ferraro, 2006; Luoh & Herzog, 2002).

Theoretical work on the relationship between social factors and health supports the idea that social factors influence mental and physical health through similar pathways (Cohen, 2004; Thoits, 2011). However, Cohen (2004) points out that social integration has a direct effect on health, while social support has an interactive effect on health. Cohen asserts that social support, whether perceived or actually provided, only has an influence on health in combination with a stressful event. Social stress theory maintains that a stress outcome is influenced by the combination of the type and severity of a stressor and the availability and benefits perceived from resources to minimize or cope with the stress (Pearlin, 1989, 1999). Underlying this dissertation research is the idea that older adult volunteers perceive or receive social support from volunteering during the stressful period of spousal bereavement. However, the findings do not support this idea, at least not using the stress of the death of a spouse and the outcomes of self-rated health and depressive symptoms. Volunteering does not appear to be a moderating resource for those who have recently experienced the death of a spouse. Rather, the findings related to the direct effects of volunteering on reducing the odds of fair or poor health and the number of depressive symptoms lend support to the importance of volunteering as a means of social integration in the lives of older adults. Further, the findings highlight the positive direct effect such social integration can have on health.

This research has shown that volunteering is beneficial for perceived health and reducing depressive symptoms of older adults, but that such benefits are not enough to offset the increase in depressive symptoms associated with spousal bereavement, particularly among women. Among older adult men volunteering is similarly beneficial for reducing depressive symptoms regardless of whether a spouse has died, even though a recent widower is likely to experience an increase in depressive symptoms in the period of bereavement. While poor health is not a clear result of spousal loss, the findings indicate volunteering does not help protect recent widowers from declines in self-rated health. In contrast, these findings show that for widowed and married women volunteering has a similar benefit on their perceived health status. For many older adult men and women the health effects from spousal loss are temporary, and these findings show that for those widowed more than two years, volunteering is beneficial for perceived health and reducing depressive symptoms. Looking ahead, it will be important to focus on effective ways of maintaining volunteer engagement during such stressful life transitions.

APPENDIX TABLES

Appendix Table 1. Incidence of males in fair or poor health by level of volunteering

Volunteer level	In fair or poor health	
	Number	Percentage
All male observations ($n = 10,624$)		
No volunteering	2,518	35.2
Less than 100 hours	329	18.0
100 to 199 hours	135	17.8
200 hours and up	121	13.6
Recently widowed ($n = 325$)		
No volunteering	89	35.0
Less than 100 hours	12	29.3
100 to 199 hours	3	37.5
200 or more hours	4	18.2
Previously widowed ($n = 272$)		
No volunteering	68	33.7
Less than 100 hours	7	24.1
100 to 199 hours	6	35.3
200 or more	3	12.5

Note. Percentages are based on weighted data. Source: Health and Retirement Study (HRS), 1998–2004.

Appendix Table 2. Incidence of females in fair or poor health by level of volunteering

Volunteer level	In fair or poor health	
	Number	Percentage
All female observations ($n = 9,389$)		
No volunteering	1,941	32.6
Less than 100 hours	277	15.9
100 to 199 hours	104	13.0
200 hours and up	102	11.5
Recently widowed ($n = 737$)		
No volunteering	179	34.9
Less than 100 hours	22	19.5
100 to 199 hours	5	11.1
200 hours and up	9	13.6
Previously widowed ($n = 682$)		
No volunteering	181	39.4
Less than 100 hours	11	11.3
100 to 199 hours	8	12.9
200 or more hours	11	17.2

Note. Percentages are based on weighted data. Source: Health and Retirement Study (HRS), 1998–2004.

Appendix Table 3. Mean depressive symptoms by volunteer levels for men

Volunteer hours	<i>N</i>	Mean	<i>SD</i>
All male observations (<i>n</i> = 9,035)			
No volunteering	5,835	1.24	1.68
Less than 100 hours	1,672	0.79	1.36
100 to 199 hours	706	0.72	1.30
200 hours and up	822	0.71	1.23
Recently widowed males (<i>n</i> = 289)			
No volunteering	220	2.63	2.28
Less than 100 hours	39	2.50	2.03
100 to 199 hours	8	2.05	2.24
200 hours and up	22	2.12	2.28
Previously widowed males (<i>n</i> = 247)			
No volunteering	179	1.57	1.80
Less than 100 hours	28	2.01	2.30
100 to 199 hours	17	1.50	1.82
200 hours and up	23	1.07	1.11

Note. All calculations are based on weighted data. Source: Health and Retirement Study (HRS), 1998–2004.

Appendix Table 4. Mean depressive symptoms by volunteer levels for women

Volunteer hours	<i>N</i>	Mean	<i>SD</i>
All female observations (<i>n</i> = 8,903)			
No volunteering	5,540	1.80	2.05
Less than 100 hours	1,711	1.10	1.56
100 to 199 hours	782	1.00	1.45
200 hours and up	870	0.98	1.45
Recently widowed females (<i>n</i> = 683)			
No volunteering	464	3.03	2.31
Less than 100 hours	110	2.13	1.82
100 to 199 hours	45	2.41	2.20
200 hours and up	64	1.79	1.69
Previously widowed females (<i>n</i> = 643)			
No volunteering	422	2.16	2.08
Less than 100 hours	96	1.60	1.86
100 to 199 hours	62	1.09	1.33
200 hours and up	63	1.16	1.42

Note. All calculations are based on weighted data. Source: Health and Retirement Study (HRS), 1998–2004.

Appendix Table 5. The effect of level of volunteering on the self-rated health of men and women

Independent variables	Model 1: Males	Model 2: Females
	Coefficient	Coefficient
Less than 100 hours of volunteering	−0.429***	−0.385***
100–199 hours of volunteering	−0.305*	−0.364**
200 or more hours of volunteering	−0.576***	−0.540***
(No volunteering)	0	0
Recently widowed	−0.366	−0.132
Previously widowed	−0.401*	−0.255*
(Married)	0	0
Age	0.027***	0.022***
Non-White or Hispanic	0.201*	0.372***
Education	−0.052***	−0.051***
Net worth less than \$80,000	0	0
Net worth \$80,001 – \$179,000	−0.223*	−0.250**
Net Worth \$179,001 – \$325,800	−0.121	−0.261*
Net worth \$325,801 – \$634,600	−0.365***	−0.320**
Net worth \$634,601 or greater	−0.208*	−0.344**
Parent	0.017	−0.070
Paid work	−0.247**	−0.281**
Social network	−0.010	−0.025
Religion	−0.063	−0.011
Smoking	0.463***	0.312**
Sedentary	0.339***	0.360***
Functional limitations	0.129***	0.162***
Psychiatric diagnosis	0.339**	0.368***
Proxy	0.495***	0.371*
Depressive symptoms	0.136***	0.117***
Chronic conditions	0.314***	0.367***
Self-rated health	1.852***	1.976***

Note. Source: Health and Retirement Study (HRS), 1998–2004.

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

Appendix Table 6. The effect of level of volunteering on the depressive symptoms of men and women

Independent variables	Model 1: Males	Model 2: Females
	Coefficient	Coefficient
Less than 100 hours of volunteering	-0.170***	-0.188***
100–199 hours of volunteering	-0.182***	-0.188***
200 or more hours of volunteering	-0.242***	-0.272***
(No volunteering)	0	0
Recently widowed	0.694***	0.597***
Previously widowed	0.039	0.011
(Married)	0	0
Age	0.006***	0.006*
Non-White or Hispanic	0.034	0.021
Education	-0.015***	-0.014**
Net worth less than \$80,000	0	0
Net worth \$80,001 – \$179,000	-0.081**	-0.073*
Net worth \$179,001 – \$325,800	-0.119***	-0.078*
Net worth \$325,801 – \$634,600	-0.158***	-0.131**
Net worth \$634,601 or greater	-0.140***	-0.156**
Parent	-0.033	0.028
Paid work	-0.075**	-0.148***
Social network	-0.030**	-0.048**
Religion	0.030	0.054
Smoking	0.144***	0.138**
Sedentary	0.093***	0.077**
Functional limitations	0.013	0.008
Psychiatric diagnosis	0.256***	0.238***
Proxy	0.575***	0.529***
Depressive symptoms	0.245***	0.213***
Chronic conditions	0.053***	0.045***
Self-rated health	0.297***	0.288***

Note. Source: The Health and Retirement Study (HRS), 1998–2004.

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

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