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Gender, Race, and Ethnic Differences in the Effects of Education on Depression in Later Life: The Mediating Roles of Mastery and Stress

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GENDER, RACE, AND ETHNIC DIFFERENCES IN THE EFFECTS OF EDUCATION ON DEPRESSION IN LATER LIFE: THE MEDIATING ROLES OF MASTERY AND STRESS

A Dissertation Presented

by

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ABSTRACT

GENDER, RACE, AND ETHNIC DIFFERENCES IN THE EFFECTS OF EDUCATION ON DEPRESSION IN LATER LIFE: THE MEDIATING ROLES OF MASTERY AND STRESS

June 2014

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The central objective of this study was to examine gender, race, and ethnic differences in the effects of education on late-life depression. This study differentiated education from other measures of SES due to the psychosocial resources developed through schooling. Education provides intrinsic resources, such as perceived mastery, that are beyond monetary value. Higher levels of education is hypothesized to increase perceived mastery throughout the life course and result in lower levels of stress, influencing psychological well-being in later life. The Stress Process Paradigm was the conceptual framework used for this study. The Stress Process Paradigm includes elements of Ross and Mirowsky's (2006) Resource Substitution and Resource Multiplication hypotheses. Ross and Mirowsky's hypotheses were used to examine whether education improves psychological well-being more for disadvantaged or advantaged groups. The Health and Retirement Study (HRS) was the data source used for this study. The analyses included

an evaluation of both the prevalence of depression (cross-sectional models with the 2006 wave of the HRS) and the incidence of depression onset and recovery (longitudinal models with the 2006 and 2008 waves of the HRS). The analyses included examining the moderating effects of gender, race, and ethnic group status on the relationship between SES and late-life depression. Also, this study examined the mediating effects of perceived mastery and stress in the SES-depression relationship. The results suggested the benefits of education may have a more significant effect on psychological well-being than other indicators of SES. There was no evidence of gender moderating the relationship between education and depression. The results showed there appears to be a protective effect of education on depression for Whites. The results did not show mediating effects of perceived mastery and stress in the relationship between education and depression. Rather, the results implied a suppressor effect. Last, this study examined depression among specific gender-race-ethnic groups. It was found that White men have significantly lower odds of having depression than all other groups. This study concludes that it is important to understand that socioeconomic inequalities throughout the life course have an effect on mental health disparities in later life.

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LIST OF ABBREVIATIONS

HRS	Health and Retirement Study
LBQ	Leave-Behind Questionnaire
SES	Socioeconomic Status

CHAPTER 1

INTRODUCTION

Approximately seven million older Americans are affected by depression (Centers for Disease Control and Prevention, 2010), and depression is the most prevalent mental health condition among older adults (Centers for Disease Control and Prevention and National Association of Chronic Disease Directors, 2008). Depression is defined as clinical depression (e.g., meeting the Diagnostic and Statistical Manual of Mental Disorders' [DSM-IV] criteria for major depressive disorder). According to the DSM-IV (American Psychiatric Association, 2000), symptoms of depression include sadness, fatigue, loss of motivation, irritability, insomnia or hypersomnia, and lack of concentration. Depression decreases quality of life by causing emotional suffering and impairment in everyday functioning (Blazer, 2009; Pratt & Brody, 2008).

The need to investigate issues concerning late-life depression is relevant for the improvement in the provision of quality mental health care for older adults. Among older Americans affected by depression, only 10% receive treatment (Twedell, 2007). Depression is the most prevalent yet under diagnosed mental health condition among older adults (Blazer, 2009; Milne & Williams, 2000).

There are various reasons why older adults, compared to their younger counterparts, encounter barriers in accessing appropriate treatment for depression. One reason is the

mistaken idea that depression is a normal part of aging, which contributes to older adults not seeking help or treatment (Blazer, 2003; Katon et al., 2003; Twedell, 2007). Many older adults assume depression is a natural reaction to major life events that commonly occur in later life (e.g., decline in physical or cognitive functioning, bereavement, adjustment to retirement). As a result, they do not seek treatment. Therefore, depression is often unrecognized, undiagnosed, and untreated.

Another barrier in accessing treatment for depression is that older adults have more stigmatized attitudes toward having a mental health condition than younger adults (Godfrey & Denby, 2004; Katon et al., 2003). Also, older adults may have more stigmatized attitudes about seeing a mental health care provider and participating in counseling or therapy than younger adults (Godfrey & Denby, 2004).

Research also shows that another reason why older adults encounter barriers in accessing mental health treatment is depressed mood often coexists with other medical conditions, making depression difficult to detect (Alexopoulos, 2005; Blazer, 2009; Twedell, 2007). That is, an older adult may have depression combined with other medical conditions and physical disabilities (co-morbidities), such as stroke, heart disease, Alzheimer's disease, or arthritis (Twedell, 2007). These other illnesses may contribute to depression and/or may be reasons why depression is not diagnosed. Physical disability often induces emotional distress and feelings of sadness (Blazer, 2009). Sadness is a temporary reaction when encountering disability, however prolonged depression needs to be professionally treated (Twedell, 2007). Furthermore, some practitioners, such as primary care providers, also assume depression is normal among older patients, which contributes to low treatment rates. According to the American Psychological Association

(2003), appropriate training for primary care providers is needed to improve recognition, diagnosis, and treatment of late-life depression.

Depression is associated with increased healthcare costs, resulting from higher utilization of medical services (e.g., primary care visits, emergency room visits, laboratory examinations, pharmacy costs) (Katon et al., 2003). Many older patients do not report depressed mood to their healthcare providers, rather older adults often attribute their mental health concerns as physical complaints (e.g., fatigue, pain, aches) (Katon et al., 2003; Twedell, 2007). As a result, depressed older patients have more unexplained physical symptoms, which lead to more medical examinations aimed at reducing these symptoms (Katon et al., 2003). In addition, another contributing factor for increased healthcare costs is depressed older patients have higher rates of nonadherence to self-care regimens (e.g., diet, exercise, medication), which may worsen the course of medical conditions and lead to higher medical costs (Katon et al., 2003). Katon et al. (2003) found that older patients with depressive symptoms have approximately 50% higher medical costs than non-depressed patients. Depression among older adults is costly. However, depression is treatable (Katon et al., 2003).

The prevalence of depression among older adults varies across demographic groups. Utilizing a sample of older adults aged 50 years and older, the Centers for Disease Control and Prevention and the National Association of Chronic Disease Directors (2008) reported that depression rates are higher among older women than older men (8.9% and 6.2%, respectively). Among race and ethnic groups, older Blacks and older Hispanics have higher rates of depression than older Whites. Specifically, 6.8% of Whites, 9.0% of Blacks, and 11.4% of Hispanics have depression. Rates of depression

among older adults increased over the past decade and it is projected that the number of older adults with depression will continue to increase (Chapman & Perry, 2008). As the U.S. population is aging, it is important to gain a better understanding of late-life depression because this may allow us to improve the provision of mental health treatment for older adults, especially for women and minorities who are at greater risk for depression.

Previous studies have identified risk factors for depression in later life (e.g., Alexopoulos, 2005; Blazer, 2009; Godfrey & Denby, 2004). Many studies identify lower socioeconomic status (SES) as one of the risk factors for depression (Alexopoulos, 2005; Blazer, 2009; Lorant et al., 2003). SES refers to persons' economic position relative to others in the hierarchy of the social stratification system (Mirowsky & Ross, 2003; O'Rand, 2001). Commonly used measurements of SES are educational attainment, occupation, income, wealth, and poverty status (Lorant et al., 2003; Mirowsky & Ross, 2003; Singleton & Straits, 2005; Williams & Wilson, 2001).

Persons lower in SES are exposed to more stressors that negatively affect mental health (Pearlin et al., 2005). Stressors are the experiential conditions of hardships, demands, frustrations, and adversities that challenge persons' adaptive capacities (Pearlin et al., 2005). Some of the stressful conditions experienced among persons lower in SES include everyday hassles, residing in poor neighborhoods, and discrimination (Pearlin et al., 2005; Mirowsky & Ross, 2003). These stressors experienced in childhood and young adulthood have deleterious effects on mental health into later life (Pearlin et al., 2005). It is widely documented that women and minorities are overrepresented as groups lower with SES and members of these groups occupy disadvantaged positions in the social

structure relative to men and Whites (e.g., Arber & Khlat, 2002; Kahn & Fazio, 2005; Ross & Mirowsky, 2002; Williams, 1999). These findings indicate that women and minorities may be at increased risk for depression due to lower SES.

There continues to be a need to examine how individuals' position in the social structure (e.g., class, gender, race, ethnicity) exposes them to stressors that affect mental health outcomes in later life (Avison & Cairney, 2003). The conceptual framework used for this current study is the Stress Process Paradigm. The Stress Process Paradigm provides an understanding on how SES and exposure to stressors are associated with depression. This study examines the moderating effects of gender, race, and ethnicity on the relationship between SES and depression. As well, stress is considered as a mediator between SES and depression.

Furthermore, the Stress Process Paradigm includes attention to the concept of perceived mastery, which is also a mediator between the SES and depression relationship (Avison & Cairney, 2003). Perceived mastery refers to the extent in which individuals believe they have control over their lives (Jang et al., 2002; Skinner, 1996). It is recognized that higher levels of perceived mastery are associated with psychological well-being (Pearlin & Pioli, 2003; Ross & Mirowsky, 2006; Skinner, 1996). Persons with higher levels of perceived mastery are more likely to initiate action, exert effort, be optimistic, and persist in solving problems, which are fundamental to good mental health.

For this reason, I examine the mediating effects of perceived mastery on the SES-depression relationship, especially as related to education. For the analysis of these research objectives, I use two hypotheses proposed by Ross and Mirowsky (2006): Resource Substitution and Resource Multiplication. Resource Substitution hypothesizes

that education improves psychological well-being more for disadvantage groups (e.g., women, minority race and ethnic groups) who have fewer alternative economic resources (Ross & Mirowsky, 2006). In contrast, Resource Multiplication hypothesizes that the beneficial effects of education on psychological well-being are greater for advantaged groups (e.g., men, non-Hispanic Whites) who have more economic resources (Ross & Mirowsky, 2006).

Ross and Mirowsky's (2006) hypotheses distinguish education as different from other measures of SES that is relevant for psychological well-being. Although educational attainment is a valid indicator for SES, the economic resources from obtaining higher levels of education do not completely explain the psychological benefits (Mirowsky & Ross, 2003). The psychological benefits from obtaining an education exceed its economic and monetary value (Ross & Mirowsky, 2006; Mirowsky & Ross, 2003). Education develops internal psychosocial resources, including perceived mastery or the motivation to control one's life (Ross & Mirowsky, 2006; Mirowsky & Ross, 2003). Through schooling, individuals learn to effectively solve problems, are encouraged to use good judgment, and be competent in achieving desired goals (Ross & Mirowsky, 2006). Education instills intrinsic resources that are relevant to psychological well-being, such as perceived mastery over events in life, meaningful skills, and knowledge. Income and wealth are considered monetary resources that are external to a person (Ross & Mirowsky, 2006).

Education may render more meaningful for psychological well-being among persons from disadvantaged backgrounds with fewer economic resources than advantaged groups (Ross & Mirowsky, 2006; Mirowsky & Ross, 2003). This current study also examines if

education is related to depression for a set of specific demographic groups (White males, White females, Blacks males, Black females, Hispanic males, and Hispanic females).

Research Objectives

In sum, the purpose of this study is to examine the relationship between education and depression among older adults utilizing the Health and Retirement Study (HRS), a large nationally representative dataset. This study is framed broadly within the Stress Process Paradigm of Health Model, focusing on differences by gender, race, and Hispanic ethnicity. The Resource Substitution and Resource Multiplication hypotheses, the central hypotheses of this study, are drawn from the work of Ross and Mirowsky (2006). The research objectives for this study are to:

1) Examine the main effects of SES, gender, race, and ethnicity on late-life depression;

2) Examine if the relationship between SES and late-life depression is moderated by gender, race, and ethnic group status;

3) Examine whether perceived mastery and stress mediate the relationship between SES and late-life depression among the total sample;

4) Evaluate the mediating effects of perceived mastery and stress in the relationship between SES and late-life depression for each specific gender, race, and ethnic group.

CHAPTER 2

LITERATURE REVIEW

Socioeconomic Status and Depression

This section describes what is currently known about the relationship between SES and depression. Studies use various indicators to measure SES, such as educational attainment (e.g., Miech & Shanahan, 2000), occupation (e.g., McLaughlin & Jensen, 2000), income (e.g., Kubzansky et al., 2000), accumulated wealth or net worth (e.g., Kahn & Fazio, 2005), and poverty status (e.g., Lynch et al., 1997). Numerous studies have concluded that persons lower in SES are at risk for higher levels of depression (e.g., Lorant et al., 2003; Lynch et al., 1997; Miech & Shanahan, 2000; Mirowsky, 1996; Mirowsky & Ross, 2001).

Lorant et al. (2003) conducted a meta-analysis of research on the association between SES and depression. The inclusion criteria for the meta-analysis were studies that used a community-dwelling sample of adults at least 16 years-old and published after 1979. A total of 56 studies were reviewed for the meta-analysis. The results indicated that persons lower in SES are 1.81 times more likely to be depressed than persons higher in SES (Lorant et al., 2003). Lorant et al. (2003) concluded that there are socioeconomic inequalities in depression. From the empirical findings of the meta-analysis, stress exposure, ongoing negative life events, and poorer coping styles were identified as some

of the risk factors for depression that are more prevalent among lower SES groups (Lorant et al., 2003).

Among the studies reviewed for the meta-analysis conducted by Lorant et al. (2003), educational attainment was the most frequently used indicator for SES, and is the primary but not only indicator of SES to be employed in this current study. Educational attainment is recognized as a fundamental predictor of economic well-being throughout the life course (Day & Newburger, 2009; Delors et al., 1996). Obtaining a formal education is usually completed early in life and is associated with occupational status and income in adulthood. The extent to which education is considered to be fundamental to the development and well-being among individuals is demonstrated in part by compulsory school attendance laws for all children and young adults in the U.S. and other developed societies. There is variation among states with respect to the age range for compulsory school attendance, but age ranges are typically from five to eighteen years-old (National Center for Education Statistics, 2008).

Furthermore, most young adults are encouraged to continue their education beyond high school by attending college. It is expected that obtaining higher levels of education will have beneficial effects on economic status throughout the life course, including in later life (Ross & Van Willigen, 1997). Obtaining higher levels of education increases employment and career opportunities for working adults. During these working years, higher educated persons earn larger incomes that facilitate a higher quality of life, including the generation of savings and investments needed for retirement (Ross & Van Willigen, 1997).

A study by Miech and Shanahan (2000) examined the relationship between SES and

depression over the life course, using educational attainment as the indicator for SES. The data for this study come from the Work, Family, and Well-Being Study, which is a nationally representative sample of adults aged 18 to 90. The results of the study showed that persons with lower levels of education reported more depressive symptoms. Further, the results indicated that this relationship diverges with increasing age. The differences in depressive symptoms across education levels were smaller among the younger age groups and gradually increased with advancing age (Miech & Shanahan, 2000). The results of this study suggest the consequences from lower levels of education have a cumulative effect on disadvantages over the life course.

In another study, Lynch et al. (1997) examined the cumulative effect of sustained poverty over the life course on depression in later life. The data source used for the study was the Alameda County Study. The results demonstrated that older adults who experienced poverty early in life are more likely to be depressed than older adults with no history of economic hardship (Lynch et al., 1997). The conditions of poverty and economic hardship lead to distress, worry, and feelings of hopelessness, which subsequently have negative consequences on mental health.

Gender, Education, and Depression

Research indicates that gender may moderate the relationship between SES and depression. Research supports this contention by showing that social and economic inequalities between men and women account for some of the gender gap in depression (Mirowsky, 1996). In a cross-sectional design study utilizing three surveys, Mirowsky (1996) demonstrated that the inequalities in employment, earnings, and economic strain in middle adulthood account for the higher levels of depression among older women than

men. Women experience more tensions between family and work and disproportionate demands of household duties than men (Mirowsky, 1996). Mirowsky (1996) concluded that the unequal status in adulthood between men and women have consequences on psychological well-being into later life for women (Mirowsky, 1996).

Among older cohorts, females have less access to educational opportunities than males due in part to the influence of gender roles (Jacobs, 1996; Milne & Williams, 2000). According to more traditional gender roles, the primary role for women was to be the care provider for the family, while roles outside the home were considered secondary (Gottlieb 1989; Griffin et al., 2002; Moen, Robison, & Dempster-McClain, 1995). The social expectations for women as they reached adulthood were to get married, provide care for both children and adults (e.g., husband, aging parents), and be responsible for housekeeping inside the home (Gottlieb, 1989). Although women found benefits and gratification from fulfilling the roles of wife and mother, they were given less encouragement than males to obtain higher levels of education. Meanwhile, it was normative for many men to attend educational institutions beyond the compulsory levels embedded in law in preparation for providing financial support for the family.

Older cohorts of women experienced limited opportunities not only in education but also in labor force participation. Many women depended on their husbands to provide economic resources for themselves and the household (Gottlieb 1989). As men assumed the role of the "breadwinner," women fulfilled the role of "homemaker." For women, family roles took precedence over working outside the home, which limited opportunities for participating in the labor force and pursuing careers (Gottlieb, 1989).

Patterns of inequality persist for women who have higher levels of education, as demonstrated by earning differentials; women do not receive the same returns on their education as men do. Using the Current Population Survey for the 1997 to 1999 time period, a study examined the relationships between educational attainment and average annual earnings among workers aged 25 to 64 years-old (Day & Newburger, 2002). It was found that men have higher average annual earnings than women within the same level of education (Day & Newburger, 2002). Women's average annual earnings were 67% of men's earnings, and this earnings gap was found with slight variation at every level of education (Day & Newburger, 2002). Day and Newburger (2002) identify potential reasons for the earnings gap. Over the course of women's working lives, women experience competing events due to family obligations in the home, discontinuity in labor force participation, less commitment to career goals, and gender discrimination (Day & Newburger, 2002).

A study by Luo and Waite (2005) found that the limited opportunities in education for upward mobility in the social hierarchy have negative consequences on mental health for older women. Luo and Waite (2005) examined gender variations in the effects of adult SES on depression in later life using a nationally representative sample of adults aged 50 years and older. Adult SES was measured as years of education and household income. Results from the study demonstrated that older persons who reported obtaining higher levels of education had fewer depressive symptoms. While decreased levels of depression were found in both higher educated men and women, the study concluded that the effects were larger for women. The female participants in the study benefited more from a greater number of years of education than did males. Specifically, college

education appeared to be more significant for women's psychological health than college education is for men's health. For men, household income was more significant (Luo & Waite, 2005), which is one reason other measures of SES are included in this study.

Luo and Waite (2005) found that education has greater importance to psychological health for women than for men. This current study further examines the SES-depression relationship by distinguishing education from other measures of SES (specifically, income and wealth) that may be relevant for psychological well-being. In addition, this current study purposely examines if education has greater importance to psychological well-being for disadvantaged groups than for advantaged groups, by examining gender and race-ethnic differences. Education may render more meaning for the current cohort of older women than men due to less access in educational opportunities (Reynolds & Ross, 1998; Ross & Mirowsky, 2006). For older men, they were encouraged to attend school in preparation of providing financial support for the household. Therefore, income and wealth may be more important determinants of psychological well-being among the current cohort of older men.

Using Ross and Mirowksy's (2006) Resource Substitution and Resource Multiplication hypotheses, this current study examines if the beneficial effect of education on depression is greater for older women than older men. Furthermore, this study examines if income and wealth have greater importance to men's psychological health.

Race, Ethnicity, Education, and Depression

Research also indicates that race and Hispanic ethnicity moderate the SES-depression relationship. There is a considerable amount of evidence demonstrating the

disadvantaged positions of non-White race and ethnic groups in the U.S. Minority race and ethnic groups experience social and economic inequalities throughout the life course, which in turn influence health status in later life. Previous studies that investigated health status across minority groups often emphasize the need to consider the role of socioeconomic factors (e.g., Crimmins & Saito, 2001; HHS, 2001; Kahn & Fazio, 2005; Mutchler & Burr, 1991; Sachs-Ericsson et al., 2005; Williams, 1999). What may appear to be race and ethnic effects on health may actually be economic effects. Previous studies conclude that minority group membership itself is not necessarily a predictor of poorer health status, rather economic inequalities and lower SES throughout the life course account for much of the difference in health during later life (Crimmins & Saito, 2001; Kahn & Fazio, 2005; Sachs-Ericsson et al., 2005).

Previous studies that examined race-ethnicity and depression in later life concluded that lower SES accounts for much of the difference in depression (Kahn & Fazio, 2005; Sachs-Ericsson et al., 2005). Lower SES among minority race and ethnic groups has been shown to be an important risk factor for higher rates of depression compared to Whites. A study by Kahn and Fazio (2005) examined SES over the life course on depression in later life. Results from this study found that Whites and Blacks reported similar levels of depressive symptoms (Kahn & Fazio, 2005). However, when adding socioeconomic status measures (education, income, wealth, and financial strain) into regression models, it was found that Blacks have significantly lower levels of depression when they were not economically disadvantaged (Kahn & Fazio, 2005). In another study that examined race differences in depressive symptoms among older adults, Blacks endorsed more items of depressive symptoms than Whites (Sachs-Ericsson et al., 2005).

However, when including socioeconomic measures (education and difficulty meeting basic needs), the study concluded that Blacks had significantly fewer depressive symptoms than Whites.

In addition, studies have shown that economic stressors have consequences on mental health among Hispanic ethnic elders (e.g., Angel et al., 2009; Chiriboga et al., 2002). A study by Chiriboga et al. (2002) examined stress and depressive symptoms among Mexican American elders. Among the sample, about half of Mexican American elders did not complete elementary school. The results of the study found that financial strain was the most common stressor reported among the sample members. From the empirical findings, the study concluded that limited educational resources available to Mexican American elders and chronic financial strain have a critical role in depression among this minority group.

Along with socioeconomic inequalities, the added effects of racism and discrimination throughout the life course have deleterious consequences on health, including depression, among older members of minority groups (HHS, 2001; Williams, 1999). It has been repeatedly demonstrated that racism and discrimination are positively related to psychological distress and depression (HHS, 2001; Williams, 1999). Discriminatory acts range from daily demeaning insults (acute stressors) to societal institutional practices that occur throughout the life course (chronic stressors) (HHS, 2001). Williams (1999) identified persistent acts of institutional discrimination that have contributed to lower SES among minority groups: lower quality of education, residential segregation, restricted employment opportunities, and racial inequalities in income. Thus, both discrimination and inequalities in achieving socioeconomic success throughout the life

course have negative consequences for mental health and SES in later life for minority groups.

Blacks and Hispanics have experienced improvements in access to educational opportunities over the last half of the twentieth century due in no small part to the Civil Rights Movement (Yang & Lee, 2009). The federal government used civil rights laws to aid students from disadvantaged backgrounds to attend college for the goals of ending racial discrimination and poverty. Despite advancements across subsequent cohorts in access to educational opportunities for minorities, Blacks and Hispanics consistently have lower levels of education than Whites.

Patterns of socioeconomic inequality in earnings persist throughout the working years for Blacks and Hispanics even when they have the same educational attainment level of Whites. At every education level, Blacks and Hispanics have lower work-life earnings compared to Whites (Day & Newburger, 2002). Socioeconomic inequalities continue into later life as demonstrated by the proportion of older adults, aged 65 years and older, who are living in poverty. In 2008, 5% of older White men were living in poverty. The proportions for older Black and Hispanic men were approximately triple that of older White men (14% and 16%, respectively) (AARP Public Policy Institute, 2010). For older women, 10% of White women were living in poverty. The proportions for older Black and Hispanic women were more than double that of older White women (24% and 22%, respectively) (AARP Public Policy Institute, 2010).

Given the strong relationship between race-ethnic status and inequalities in SES, this study examines if education provides more psychological benefits for older Blacks and Hispanics than for Whites. Few studies have examined the psychological benefits of

education among different race and ethnic groups. Using Ross and Mirowsky's (2006) Resource Substitution and Resource Multiplication hypotheses, this study examines whether education's beneficial effect on psychological well-being is greater for older Blacks and Hispanics compared to Whites. Education may have greater importance for disadvantaged groups (Blacks and Hispanics) who have fewer alternative economic resources compared to advantaged groups (Whites).

Mediating Effects of Mastery for the SES-Depression Relationship

Perceived mastery is a term employed to represent the psychological construct of control (Skinner, 1996). Control refers to the extent to which individuals believe they are able to produce desired outcomes in their lives (Jang et al., 2002; Skaff & Gardiner, 2003; Skinner, 1996). A variety of terms are used in the literature for the construct of control, yet they are interrelated and partially overlapping (Krause 2003; Skinner, 1996). The construct of control has also been referred to as perceived mastery (Pearlin & Schooler, 1978), sense of control (Abeles, 1991), locus of control (Rotter, 1966), and personal control (Gurin, Gurin & Morrison, 1978). Some studies have even used the terms interchangeably (e.g., Angel et al., 2009; Jang et al., 2002; Turner et al., 1999). These terms share the core meaning of the construct of control in that individuals with higher levels of control believe outcomes in their lives are contingent upon their own choices, efforts, and actions (Krause, 2003).

Research demonstrates that perceived mastery has direct effects on depression risk and that perceived mastery also mediates the relationship between SES and depression (e.g., Avison & Cairney, 2003; George, 2003; Skinner, 1996). Having higher levels of perceived mastery requires individuals or groups to live in environmental conditions that

encourage control over their lives, which is reflective of socially structured opportunities and constraints (George, 2003; Pearlin & Pioli, 2003). Research has shown group variation in control and location in the social structure, especially in stratification systems (George, 2003). Groups with more social and economic resources have higher levels of perceived mastery, whereas social and economic impoverishment limits the ability to have control over one's life (George, 2003). Perceived mastery is least likely to be experienced by members of groups with the fewest socioeconomic resources (George, 2003). Groups lower in SES who occupy disadvantaged positions in the social structure have limited resources or means available for exerting control (George, 2003). In contrast, groups higher in SES have more socioeconomic resources that encourage exerting control over their lives.

Previous studies have examined mean variation in average group levels of control (e.g., Angel, Angel, & Hill, 2009; Shaw & Krause, 2001; Ross & Mirowsky, 2002). A study by Shaw and Krause (2001) examined race differences in the association between aging and personal control. The data were from the Americans' Changing Lives, which is a national longitudinal panel survey of non-institutionalized persons aged 25 years and older. Persons aged 60 years and older were oversampled. The study identified a set of intervening factors that influence aging and personal control: education, income, physical health, cognitive impairments, social support, and religiosity. Then, the study compared the effect of each factor on personal control among Whites and Blacks.

First, results showed that personal control progressively decreases in the older age groups, and this inverse relationship was found for both Whites and Blacks (Shaw & Krause, 2001). Although this inverse relationship was found in both Whites and Blacks,

Blacks reported lower levels of personal control than Whites across all age groups (Shaw & Krause, 2001).

Next, this study tested for the degree to which the set of intervening factors account for the relationship between age and personal control (Shaw & Krause, 2001). When examining the set of factors, results demonstrate that more income, fewer cognitive impairments, and lower levels of religiosity were significantly associated with higher levels of personal control for the entire sample, regardless of age (Shaw & Krause, 2001). This study showed there were no race differences in any of the factors with the exception of education. The results indicated that the effect of higher levels of education on greater feelings of personal control was significant for Whites but not significant for Blacks (Shaw & Krause, 2001). Shaw and Krause (2001) suspected that Blacks receive less return from education than Whites, weakening the relationship between education and personal control for Blacks compared to Whites.

Research has also examined perceived control among Hispanic ethnic elders (Angel et al., 2009). A study by Angel et al. (2009) examined levels of perceived control among Hispanic elders from two different national contexts: Mexico and U.S. The Mexican sample was from the Mexican Health and Aging Study, and the Mexican American sample was from the Hispanic Established Populations for Epidemiologic Study of the Elderly. Both surveys provided detailed data on demographics, socioeconomic characteristics, financial strain, health insurance status, psychological distress, and perceived control. Results indicated that the Mexican sample had lower levels of perceived control over their own health and were three times more likely to have depression than the Mexican American sample (Angel et al., 2009). From the results of

the empirical tests, Angel et al. (2009) concluded that the experience of poverty, lack of adequate material resources, and limited access to health care services in Mexico limits the ability to exert control over health in the Mexican sample.

Gender also appears related to control among older adults. A study by Ross and Mirowsky (2002) compared levels of sense of control among older men and older women. Results demonstrated that older women reported significantly lower levels of sense of control than older men. Ross and Mirowsky (2002) also examined factors that account for the lower levels of sense of control among older women. Levels of education were significantly lower among older women than men (Ross & Mirowsky, 2002). Household income also was significantly lower among older women than men. Last, there were significant gender differences in work history, with 92% of older men reporting they were employed for most of their adult life while the proportion was significantly lower among older women (45%). Using both cross-sectional and overtime analyses, the study found that education, personal history of full-time employment, and household income explain much of the gender differences on personal control in later life. From the empirical analyses, Ross and Mirowsky (2002) concluded that the results underscore the socioeconomic disadvantages that the current cohorts of older women experienced over their life course, which are associated with variation in the levels of sense of control between older men and women (Ross & Mirowsky, 2002).

In sum, for the current cohort of older women and minority race-ethnic groups, the inequalities in limited opportunities for education, labor force participation, and accumulation of independent financial resources that cumulate over the life course have negative consequences in later life. Lower SES reflects constraints and is related to

lower levels of perceived mastery. Consequently, having lower levels of perceived mastery increases the likelihood of psychological distress in the form of depressed mood (Ross & Mirowsky, 2002).

CHAPTER 3

CONCEPTUAL FRAMEWORK

Stress Process Paradigm

The Stress Process Paradigm is used as the overarching theoretical framework for the current study. The Stress Process Paradigm provides a framework for understanding how socially patterned exposure to stressors are related to psychological distress (Avison & Cairney, 2003; Turner & Lloyd, 1999). Figure 1 depicts the process of how SES and exposure to stressors are expected to influence depression. The arrows in the figure demonstrate the causal paths that link the components of the framework. There are three different types of arrows to represent the relationships that will be examined for this current study: direct, indirect (mediating), and moderating relationships. The solid arrows in the figure refer either to direct or indirect (mediating) effects. The thicker solid arrow represents direct relationships. The thinner solid arrow represents indirect (mediating) relationships. The dotted arrow refers to moderating effects. The figure shows relationships that address the first three research objectives of this current study and is a simplification of the complex reality associated with factors related to depression.

The Stress Process Paradigm depicts how demographic characteristics (gender, race, and Hispanic ethnicity) moderate the relationship between SES and depression. As applied here, the Stress Process Paradigm begins with the proposition that SES has

important implications for exposure to stressors. Groups lower in socioeconomic positions (sometimes referred to as the SES ladder) are exposed to more stressors than groups from advantaged social positions, such as stressful life events and discriminatory experiences (Pearlin et al., 2005; Turner & Lloyd, 1999). These socially induced stressors negatively affect psychological well-being (Avison & Cairney, 2003). From the Stress Process Paradigm, stress can be measured as either chronic or acute stress. The preliminary analyses of this current study included estimating models with chronic stress or acute stress. It was found both measurements of stress yielded similar results. I chose to use chronic stress for this current study. The mediating effect of chronic stress between SES and depression is evaluated.

Another component of the Stress Process Paradigm is represented by the psychosocial resources hypothesized to mediate the relationship between SES and depression. According to the Stress Process Paradigm, psychosocial resources include perceived mastery, social support, self-esteem, and coping (Avison & Cairney, 2003). Although social support, self-esteem, and coping are relevant psychosocial resources in the Stress Process Paradigm, this current study focuses on perceived mastery. Perceived mastery is recognized as being a critical analytic indicator in mediating the relationship between SES and psychological distress, and it has been recommended that further research is needed to examine more extensively the relationships among perceived mastery, membership in disadvantaged groups, stress, and patterned changes of health across the life course (Avison & Cairney, 2003; Krause, 2003; Pearlin & Pioli, 2003; Turner & Lloyd, 1999).

Resource Substitution and Resource Multiplication Hypotheses

This current study tests the moderating effects of gender, race, and ethnicity on the SES-depression relationship, with a focus on education. As well, another research objective is to examine the mediating effects of perceived mastery in the SES-depression relationship. This study examines education as the variable of interest for SES. This study tests two hypotheses proposed by Ross and Mirowsky (2006): Resource Substitution and Resource Multiplication. Resource Substitution and Resource Multiplication are used to examine whether education improves psychological well-being more for advantaged or disadvantaged groups. Ross and Mirowsky (2006) examined gender differences in the effect of education on depression. Their analyses did not include examining race and ethnic groups. However, Resource Substitution and Resource Multiplication hypotheses can be applied to groups of advantaged and disadvantaged status, including race and ethnic groups. In addition to examining gender differences, I also examine whether the benefits of education improve psychological well-being more for Whites (advantaged group) or Blacks and Hispanics (disadvantaged groups).

Resource Substitution refers to resources substituting for one another in the presence of fewer alternative resources (Ross & Mirowsky, 2006). According to the Resource Substitution hypothesis, "One resource can substitute for another, so that the less a group has of one resource, the more important another will be to psychological well-being" (Ross & Mirowsky, 2006, p. 1402). According to this view, education's beneficial effect on psychological well-being is greater for women than men because women have fewer economic resources than men, as described in the previous chapter (such as restricted

opportunities for paid work, limited authority at work, and lower earnings, and less wealth) (Ross & Mirowsky, 2006). Therefore, women depend more on the benefits of education for psychological well-being because women have fewer economic resources than men (Ross & Mirowsky, 2006). Thus, Resource Substitution would predict that education reduces the likelihood of depression more for women than men because women have fewer economic resources than men. Regarding race and ethnic groups, Resource Substitution would predict that education's beneficial effect has greater importance for Blacks and Hispanics compared to Whites.

In contrast, Resource Multiplication refers to resources multiplying each other's impact (Ross & Mirowsky, 2006). This hypothesis suggests that education's beneficial effect on psychological well-being is greater for advantaged groups who have more economic resources (Ross & Mirowsky, 2006). Ross and Mirowsky (2006, p. 1402) state, "In this view, advantaged groups gain the most from the resources they have, so that their resources multiply to perpetuate and augment their advantage." According to this hypothesis, education improves psychological well-being more for men than women due to larger labor market payoffs: work, earnings, income, authority, and wealth (Ross & Mirowsky, 2006). Resource Multiplication hypothesis predicts that women receive fewer benefits from education due to lower economic payoffs, and thus have a higher likelihood of depression than men. For race and ethnic groups, it predicts that Blacks and Hispanics (disadvantaged groups) would get fewer psychological benefits despite educational achievements due to lower economic payoffs compared to Whites (advantaged group).

Ross and Mirowsky (2006) tested their hypotheses using the survey of Aging, Status, and the Sense of Control, which is a national telephone probability sample of households

in the U.S. Respondents of this survey were age 18 years and older, however the survey oversampled older adults age 60 years and older. Their results provide support for the Resource Substitution hypothesis and no support for the Resource Multiplication hypothesis (Ross & Mirowsky, 2006). The negative association between education and depression was larger for women than men. Additionally, it was found that education reduces depression more for women than men at all ages throughout the life course.

After testing Resource Substitution and Resource Multiplication hypotheses based on the interaction between gender and education, Ross and Mirowsky (2006) examined possible mediators likely to explain education's beneficial effects on depression. The results indicated that education's beneficial effect on depression for women is attributable to increased levels of sense of control. Although their results indicated that education increases sense of control for both men and women, there was a larger effect of sense of control on depression for women. These results support the Resource Substitution hypothesis.

Ross and Mirowsky (2006) did not examine their hypotheses for different race and ethnic groups and did not examine these for specific gender-race-ethnic groups as proposed herein, and they did not focus on older persons. This current study examines moderating effects for membership in broad groups (e.g., men and women, Whites and minority groups) and for specific gender-race-ethnic groups (White men, White women, Black men, Black women, Hispanic men, and Hispanic women), where sample size permits. "Other race" is excluded from the intersectionality analyses due to small sample sizes. Components of the conceptual framework of this current study, the Stress Process

Paradigm, include elements of the Resource Substitution and Resource Multiplication hypotheses.

Hypotheses for Research Objectives

In this section, I present hypotheses for the research objectives of this current study regarding gender, race, and ethnic differences for the SES-depression relationship. These hypotheses are based on the research literature with reference to the Stress Process Paradigm (e.g., Avison & Cairney, 2003; Krause, 2003; Pearlin & Pioli, 2003; Turner & Lloyd, 1999) and the Resource Substitution/Multiplication hypotheses (Ross & Mirowsky, 2006).

H1. Among older persons, lower in SES, females, and minority race and ethnic groups will report more depressive symptoms than greater in SES, males, and non-Hispanic Whites, respectively.

H2. Among older persons, the relationship between SES and the number of depressive symptoms will be moderated by gender, race, and ethnicity. There will be a negative relationship between SES and depression, and the relationship between SES and depression will be stronger for females and minority race-ethnic groups as compared to males and non-Hispanic Whites, respectively.

H3. Among older persons, the relationship between SES and the number of depressive symptoms will be mediated by perceived mastery and stress. Persons greater in SES will have higher levels of perceived mastery than persons lower in SES, and in turn, perceived mastery will be negatively related to the number of depressive symptoms. Further, persons greater in SES will have lower levels of stress than persons lower in SES, and in turn, stress will be positively related to the number of depressive symptoms. These

hypotheses address mediators (perceived mastery and stress) of the SES-depression relationship.

H4. Among older persons, the mediating effects of perceived mastery and stress for the relationship between SES and the number of depressive symptoms will be stronger for females and minority race-ethnic groups than for males and non-Hispanic Whites.

If these specific hypotheses are supported in the analyses, then support for the more general Resource Substitution hypothesis will be provided. If the opposite occurs (e.g., if the relationship between SES and the number of depressive symptoms is stronger for males than females), then support will be provided for the Resource Multiplication hypothesis.

CHAPTER 4

RESEARCH DESIGN

Data Source

The Health and Retirement Study (HRS) was the data source used for the analyses of this study's research questions. The HRS was administered by the Institute for Social Research at the University of Michigan, with funding and support from the National Institute on Aging and the Social Security Administration (visit http://hrsonline.isr.umich.edu/). The HRS is a longitudinal panel study that surveys a nationally representative sample of older Americans aged 51 years and older, with supplemental oversampling of three groups: Blacks, Hispanics, and residents from Florida. The HRS is a valuable source for studying America's aging population and collects detailed data from respondents on a variety of areas, such as demographics, physical health, mental health, economics, retirement, and other topic areas (National Institute on Aging & U.S. Department of Health and Human Services, 2007).

The HRS sample was selected using a multi-stage area probability sample design. The first cohort was interviewed in 1992 (wave 1). The overall response rate was 81.6%, which met the sample design specifications of the HRS (Heeringa & Connor, 1995). The HRS surveyed respondents every two years. New cohorts have been added throughout subsequent waves of the HRS. Since 1992, the HRS has interviewed more than 27,000

older Americans (National Institute on Aging & U.S. Department of Health and Human Services, 2007). This current study used the 2006 and 2008 waves of the HRS.

In 2004, the HRS started collecting additional data on psychosocial measures, as well as physical performance measures and biomarkers, through enhanced face-to-face interviews. In the earlier waves of the HRS, the assessment of psychosocial measures was limited (Clarke et al., 2008; Ryff, 2004). Given a lack of psychosocial measures provided in earlier waves of the HRS and the need for more understanding on the roles of psychosocial factors in later life (Ryff, 2004), HRS added a new feature for collecting psychosocial measures in the form of a self-administered questionnaire, as part of an experimental module with a relatively small sample size in 2004 (Clarke et al., 2008). The self-administered questionnaire was given to a small sub-sample among the full core sample. The self-administered questionnaire was left with respondents after completion of the face-to-face interview. Hence, the self-administered questionnaire on psychosocial topics was referred as the Leave-Behind Questionnaire (LBQ) (Clarke et al, 2008; HRS, 2010). Respondents were asked to complete and mail back the LBQ (Clarke et al., 2008).

After review of the 2004 pilot study, a revised LBQ was administered to an expanded random selection to one-half of the core sample in 2006 (Clarke et al., 2008; HRS, 2010). This 2006 sample did not include respondents who completed the 2004 pilot LBQ. For the 2006 wave, the sample response rate of the LBQ was 74%, yielding a total of 7,732 respondents who completed the questionnaire (Clarke et al., 2008). The 2006 LBQ asked questions on perceived mastery and stress, and these two psychosocial measures were used to address the research objectives of this current study.

I also used some variables from data files provided by RAND. RAND is a nonprofit institution and conducts research and analysis on a variety of areas, including aging (visit http://www.rand.org/). Due to the rich and complex design of the HRS, the RAND Center for the Study of Aging created RAND HRS data files with the goal of having HRS data more accessible to researchers (St.Clair et al., 2011). The RAND data files are easy-to-use and cleaned versions of the HRS (St.Claire et al., 2011). The RAND data files provided a wide range of HRS variables that have been constructed to make the data more user-friendly.

For each wave of the HRS, there are numerous data files (an estimated 40 data files) that are organized by topic area (e.g., demographics, health status, cognition, family structure). In addition, although RAND constructed user-friendly versions of the HRS, there are several RAND data files that are available. Table 1 lists all the data files from HRS and RAND used for this study and the variables selected from each file. I identified and selected variables from the research literature that would be included in preliminary analyses and eventually in the final models to examine the relationships among my central theoretical variables. The data files were available to the public and were downloaded (October 2011) from the HRS and the RAND web sites. Each respondent of the HRS was given a unique person number (PN) and household identifier (HHID) that identifies each respondent. I merged the data files into a single respondent level file, sorted by PN and HHID.

Study Sample

The study sample was drawn from the HRS 2006 core wave and a second wave of interviews conducted in 2008. The core wave refers to respondents from the full HRS

sample. Whereas, the analyses for this current study that included psychosocial measures (perceived mastery and chronic stress) were restricted to the LBQ sample. Psychosocial measures were only available from the LBQ sample. The LBQ sample is a sub-sample of the full HRS sample. Below, I describe the sample development of the two samples: the core or full sample and the LBQ or restricted sample.

HRS 2006 Core Sample

Table 2 demonstrates the study sample development and analytic sample criteria for inclusion in this study. The HRS 2006 core wave consisted of a total of 18,469 respondents. Respondents aged 50 years and older were selected from the sample. This study sample was representative of community-dwelling older adults, therefore, nursing home residents were excluded from this study. Proxy respondents were also excluded from this study because they did not answer questions on the dependent variable (depression). The HRS did not ask proxy respondents to answer questions for depression on behalf of the original self-respondent, as there could be error in proxy reporting on the symptomatic experiences of depression. After selecting community-dwelling adults aged 50 years and older and non-proxy respondents, the sample size was 16,553 respondents.

This current study excludes respondents less than age 50 years-old. Persons not in the target birth cohorts, equal or greater to 50 years-old in 2006, who were partners of sample respondents were interviewed for the HRS. Those partners or spouses may be born in any year and be of any age. HRS developed sample weights that adjust appropriately for the probabilities of entering the sample of a given cohort as an age-ineligible spouse of an age-eligible respondent. No sample weights were given for partners or spouses who were age-ineligible. Thus, they were excluded from this study. Respondents with a sample

weight greater than zero were selected from this sample, which yields 16,038 respondents.

Respondents with missing data on any of the variables used for this study were excluded from the sample. Table 3 shows the number of non-missing cases and missing cases for each variable used in this current study. There was not a substantial amount of missing cases due to item non-response, therefore, a listwise deletion of missing cases was employed for this study (Allison, 2001). The final HRS 2006 core sample for this current study was 15,633 respondents. Among this HRS core sample, the sample sizes by gender were 6,442 males and 9,191 females. The sample sizes by race and ethnicity were 11,818 Whites, 2,126 Blacks, 1,362 Hispanics, and 327 respondents in the 'other race' group.

The longitudinal modeling strategy of this current study examined change in depression among the HRS 2006 core sample across a 2-year observation period (2008). This study examined respondents' change in depression overtime from 2006 to 2008: new onset of depression and recovery from depression. I estimated models separately for depression onset (not depressed at baseline) and depression recovery (depressed at baseline). Additionally, respondents who died between the 2006 and 2008 waves were retained in these analyses (n=780), but coded accordingly (see below). Table 4 demonstrates the sample development for the longitudinal analyses in 2008. The sample criterion for the change analysis was no missing data on the 2008 depression variable. Among the HRS 2006 core sample (*n*=15,633), the number of respondents with no missing data on the depression variable in 2008 was 13,854 respondents. Regarding attritors due to death between the 2006 and 2008 waves, there were 780 deceased respondents. With the addition of non-attritors and deceased respondents, the total

sample size for the 2-year change in depression status analyses in 2008 was 14,634 respondents. Specifically, there were 6,005 males and 8,629 females. The sample sizes for the race-ethnic groups were 11,119 Whites, 1,957 Blacks, 1,265 Hispanics, and 293 respondents in 'other race' group.

2006 LBQ Sample

Measures for perceived mastery and stress were taken from the HRS 2006 LBQ. The statistical analyses for this current study that included perceived mastery and stress were restricted to those respondents who were part of the 2006 LBQ sample. Table 5 demonstrates the sample development of the 2006 LBQ sample. The LBQ was randomly given to about one-half of the respondents from the HRS 2006 core wave. Among the HRS 2006 core wave, there were a total of 7,732 respondents who completed the LBQ.

Respondents who did not meet the sample criteria for this study were excluded from the LBQ sample, which yielded 7,166 respondents. Respondents with missing data on any of the variables, including perceived mastery and stress, were excluded from the sample. Table 6 demonstrates the total number of non-missing cases and missing cases for each variable. After a listwise deletion of missing cases, the 2006 LBQ sample contained 6,232 respondents. Among this LBQ sample, the sample sizes by gender were 2,667 males and 3,565 females. For race-ethnic groups, there were 4,972 Whites, 727 Blacks, 419 Hispanics, and 114 respondents in the 'other race' group.

As noted above, this study also examined recovery and onset from depression between the 2006 and 2008 waves among the 2006 LBQ sample. Table 7 shows the development of the LBQ sample for the longitudinal analyses. Among the 2006 LBQ sample (n=6,232), 5,682 respondents had no missing data on the 2008 depression variable.

There were 260 LBQ respondents who died between the 2006 and 2008 waves. With the addition of non-attritors and attritors due to death, the total sample size was 5,942 respondents. Among this LBQ sample, there were 2,533 males and 3,409 females. For race-ethnic groups, there were 4,755 Whites, 683 Blacks, 396 Hispanics, and 108 respondents in the 'other race' group.

Measures

The variables and coding schemes for this study are discussed below. Along with the description of the variables, I briefly discuss the expected direction of the relationship between each of the variables with depression. The following discussion also includes variables that were examined in the preliminary analyses but were not used in the final models of this current study. Specifically, the preliminary analyses included exploring alternative variables specifications, continuous or categorical, for the main variables of interest for this current study (education, household income, and net worth). Table 8 provides the details of the measures.

Dependent variables. The HRS used eight items from the Center for Epidemiologic Studies-Depression Scale (CES-D) to measure depressive symptoms (Radloff, 1977). HRS used a shorter scale of the full CES-D. This subset of items has been validated to the full CES-D with other samples (Radloff, 1977). In addition, the subset of items was strongly correlated to the full CES-D (Radloff, 1977). Respondents were asked if they experienced any of these symptoms much of the time in the past week: (1) "felt everything you did was an effort," (2) "felt your sleep was restless," (3) "were happy" (reverse coded), (4) "felt lonely," (5) "enjoyed life" (reverse coded), (6) "felt sad," (7) "couldn't get going," and (8) "had a lot of energy" (reverse coded) (Chronbach's

alpha=0.79 and 0.80 for 2006 and 2008 waves, respectively). From the HRS, the response option for depressive symptoms was dichotomous (yes or no). The items were combined to produce an 8-count measure of depressive symptoms. A binary variable was created based on the standard cut-off point or threshold for the likely presence of depression based on the self-report of three or more depressive symptoms (Radloff, 1977).

Sociodemographic variables. The sociodemographic variables were age, gender, race, ethnicity, and martial status. Age was a continuous variable in years, 50 years and older. Gender was coded into a dichotomous variable (1=female, 0=male). Controlling for all other variables, it is expected that depression will be higher among older females than older males. Previous studies have shown gender differences in depression with females having more depressive symptoms than males (e.g., Godfrey & Denby, 2004; Mirowsky, 1996; Pratt & Brody, 2008).

The HRS employed the U.S. Census Bureau's definitions of race and Hispanic origin. Race and Hispanic ethnicity are usually considered two distinct concepts (Humes, Jones, & Ramirez, 2011). The HRS included three race groups: White, Black, and 'other race.' The 'other race' category was used by the HRS staff to protect the confidentiality of members from these smaller race groups. Each race group was coded into a dichotomous variable (1=yes, 0=no). Except for the intersectionality analysis due to small sample size, respondents in the 'other race' group were included in the analyses of this current study.

Hispanic ethnicity was coded as a dichotomous variable (1=Hispanic, 0=non-Hispanic). Persons who identify being Hispanic may be of any race (Humes, Jones, & Ramirez, 2011). Hispanic ethnic group status was combined with self-reported race group status yielding the following categories: non-Hispanic White, non-Hispanic Black,

Hispanic, and non-Hispanic 'other race'. Each category was turned into a dichotomous variable. Non-Hispanic White served as the reference group for the regression analyses in this current study. Controlling for all other variables, it is expected that non-Hispanic Whites will have lower levels of depression compared to minority race and ethnic groups. The effects of socioeconomic inequalities, stress, and racism (unobserved in this study) are some of the factors identified in the research literature that contribute to higher depression among minority older adults (e.g., Sachs-Ericsson et al., 2005; Williams, 2004).

HRS had four categories of marital status: married, divorced/separated, widowed, and never married. Each category was coded into a dichotomous variable (1=yes, 0=no). Next, the martial status variable was recoded to contrast married persons and their non-married counterparts (1= married, 0=non-married). Controlling for all other variables, it is expected that older adults who are married will have fewer depressive symptoms than older adults who are not married. Having a spouse may be important for social and emotional support as well as companionship among older adults (Godfrey & Denby, 2004).

Socioeconomic status variables. The SES variables examined in this study were education, annual household income, and net worth (wealth). The main variable of interest and the primary measure of SES for this study was education. I also used household income and net worth to examine gender, race, and ethnic differences for the SES-depression relationship. This study used household income and net worth to examine whether the benefits of education exceed its relationship with financial well-being.

Education was a continuous measure of completed school years, ranging from 0 to 17 years. In addition, the preliminary analyses for this study consisted of estimating regression models using a categorical measure of education. The set of education dichotomous variables were coded as the highest degree completed (1=yes, 0=no): less than high school, high school graduate but no college, some college, and college graduate. College graduate served as the reference group in the regression models. It was found that the relationship between education and depression was very similar regardless of whether a continuous or categorical measure of education was employed. The results were similar when I ran the regressions with each version of the education variables. I decided to leave the education variable in its original metric. This current study used the continuous measure of school years. It is hypothesized that middle-aged and older persons who completed more school years will have fewer depressive symptoms and this relationship will be stronger for disadvantaged groups: females, non-Hispanic Blacks, Hispanics, and 'other race' respondents.

The household income variable was taken from the RAND HRS 2006 Core Income and Wealth Imputations file. Household income was the total income of both the respondent and spouse, when married, for the last calendar year (RAND Center for the Study of Aging, 2007). RAND constructed total household income by summing both the respondent's and spouse's earnings, pension or annuity, supplemental security income and Social Security disability, Social Security retirement, unemployment and workers compensation, other government transfers, household capital income, and other income (RAND Center for the Study of Aging, 2007).

This study used a logged continuous measure of household income. Income measures tend to have highly skewed distributions and there were respondents who reported zero values for household income ($0). I transformed zero values by assigning the zero values to equal one.[1] Then, I performed a logarithmic transformation of the household income variable. That is, to allow for the log transformation, a small value ($1) was added for respondents reporting an income of $0. Among the HRS 2006 core sample of this current study (*n*=15,633), there were 97 cases with zero values for household income, which is 0.6% of the sample. Among the 2006 LBQ sample (*n*=6,323), there were 27 cases with zero values (0.4% of the sample).

For the preliminary analyses, I also examined household income recoded as quartile dichotomous variables based on these percentages: 0-25%, 26-50%, 51-75%, and 76-100%. The values of household income quartiles variables were: first quartile (<$18,652), second quartile ($18,652.01-$36,960), third quartile ($36,960.01-$70,240), and fourth quartile (≥$70,240.01). Zero value cases were in category of the lowest 25th percentile. I examined the regressions with each the continuous and categorical version of the household income variable. The results indicated that the continuous and categorical household income measures yielded similar results. I decided to use to household income variable in its original continuous metric.

The net worth variable was also taken from the RAND HRS 2006 Core Income and Wealth Imputations file. RAND calculated net worth as the net value of total wealth. It was calculated as the sum of all assets, except a second home, less the sum of all debt, except mortgage on a second home (RAND Center for the Study of Aging, 2007).

[1] Results may be robust to alternative specifications of income.

Similar to the income variable, net worth is characterized by skewness and thus adjustments needed to be made because there were respondents who reported negative and zero values for net worth. To allow for the log transformation, I also assigned one ($1) to respondents who reported having negative or zero net worth.[2] Then, I performed a logarithmic transformation of the net worth variable. Net worth was a logged continuous measure. The lowest negative value for net worth was $-2,463,500. Among the HRS 2006 core sample of this current study, there were 1,117 cases with negative or zero values (7.1% of the sample). Among the 2006 LBQ sample, there were 389 cases with negative or zero values (6.2% of the sample).

Due to net worth having more cases with negative or zero values compared to household income, it appears that any bias may be more likely for wealth than income. There are other ways to account for negative and zero values, including adding a positive value to each case that includes the largest negative value or using broad categories. But this current study assigned 1 to cases with negative or zero values to perform a logarithmic transformation for both the income and wealth variables.

For the preliminary analyses, quartile dichotomous variables were also created for net worth. The values of the net worth quartile dichotomous variables were: first quartile (<$39,292), second quartile ($39,292.01-$162,600), third quartile ($162,600.01-$412,000), and fourth quartile (≥ $412,000.01). Negative and zero value cases were in the first quartile. The wealthiest fourth quartile also served as the reference group in the regression analyses. When examining logged or quartile measures of net worth in the preliminary analyses, the results indicated that the continuous and categorical net worth

[2] Results may be robust to alternative specifications of net worth.

variables yielded similar results.

For household income and net worth, it is expected that respondents with lower income and wealth will be at greater risk for experiencing depression, controlling for all other variables. It is repeatedly demonstrated that persons lower in SES who have financial hardships experience more psychological distress than persons higher in SES (e.g., Luo & Waite, 2005; Smith, 1997).

Social engagement variables. Respondents were asked if they were doing any work for pay at the time of the interview. According to the HRS, respondents who reported working for pay were wage and salaried workers or self-employed workers. Also, respondents working for pay included those who were temporarily laid off but expected to go back to work. Working for pay was coded as a dichotomous variable (1=yes, 0=no).

HRS asked respondents if they had spent any time in the past 12 months doing volunteer work for religious, educational, health-related, or other charitable organizations. Volunteering was also coded as a dichotomous variable (1=yes, 0=no). It is expected that respondents who engage in these activities, working for pay or volunteering, will have lower levels of depression. Previous studies have shown that there are benefits from engaging in productive and social activities in the later years of life (Caro et al., 2009).

Respondents were asked how often they attended religious services during the past year. The full range of possible responses from the HRS were: more than once a week, once a week, two or three times a month, one or more times a year, or not at all. Each response was coded into a dichotomous variable (1= yes, 0=no). Next, the religion variable was recoded to identify respondents who regularly attended religious services and those who did not regularly attend religious services (1=at least once a week, 0=no).

Controlling for all other variables, it was expected that respondents who regularly attend religious services will report lower levels of depression. Older adults who are religious may derive a sense of well-being from involvement in religious and social activities as well as community services (Wink & Dillon, 2003). Furthermore, religion may help older adults confront mortality in the later years of life, which could result in lower levels of depression when encountering bereavement or the prospect of their own death (Koenig, George, & Siegler, 1988).

Health and functional status variables. As a measure for health status, this study used a count of chronic health conditions. This variable was taken from the RAND HRS Data File. RAND constructed and provided a summary measure for a count of chronic health conditions. The 8-count of health conditions included: (1) high blood pressure, (2) diabetes, (3) cancer, (4) lung disease, (5) heart problem, (6) stroke, (7) psychiatric disorders, and (8) arthritis.

A common measure for disability and functional status is limitations in activities of daily living (ADLs). This variable was also taken from the RAND HRS Data File. HRS asked respondents if they have difficulty performing the following activities: (1) bathing, (2) dressing, (3) eating, (4) transferring (getting in or out of bed), (5) walking, and (6) toileting (Chronbach's alpha=0.76). Each was recoded into dichotomous variables (1=difficulty performing the activity, 0=no difficulty performing the activity). The variables were then combined to produce a 6-count measure of ADLs limitations. It is expected that a higher number of ADLs limitations is related to more depressive symptoms. It has been repeatedly demonstrated that physical disability in later life is a major risk factor for depression among older adults (Wilhelmson et al., 2005).

Respondents were asked to rate their own health. It has been shown that the subjective quality of self-reported health is a valid measure for health status (Idler, Hudson, & Leventhal, 1999). HRS provided five categories for self-rated health: excellent, very good, good, fair, or poor health. Each indicator was coded into a dichotomous variable (1=yes, 0=no). Then, the variable was coded to identify respondents who reported poorer health (fair or poor) and those who reported better health (excellent, very good, or good). Controlling for all other variables, it is expected that older adults who rated their own health as fair or poor will also have more depressive symptoms than older adults who reported excellent, very good, or good health. Previous studies have found that older adults with depression rate their health as poor, independent of physical and functional disability (Han, 2002).

Physical activity was measured as moderate or vigorous exercise. Respondents were asked how often they take part in sports or activities that are moderately energetic. In addition, respondents were also asked how often they take part in vigorous activities. The full range of possible responses for both moderate and vigorous exercise was: everyday, more than once a week, once a week, one to three times a month, and hardly ever or never. The moderate and vigorous exercise variables were combined and recoded to contrast respondents who participate regularly in exercise versus respondents who reported hardly ever or never exercising: 1=at least one to three times a month and 0=hardly ever or never. Controlling for all other variables, it is expected that respondents who exercise will have lower levels of depression than respondents who reported never exercising. Numerous studies have shown that exercise is not only beneficial to physical health but also beneficial to mental health among older adults (Strawbridge et al., 2002).

LBQ psychosocial variables. The two psychosocial variables used for this study were perceived mastery and chronic stress. There were five items for perceived mastery. Respondents were asked how much they disagree or agree with the following statements: (1) "do anything I set my mind to," (2) "usually find a way to succeed," (3) "get what I want is in my own hands," (4) "the future depends on me," and (5) "do things that I want to do" (Chronbach's alpha=0.89). Respondents were asked to rate each of the five items on a scale from 1 to 6 (1=strongly disagree, 2=somewhat disagree, 3=slightly disagree, 4=slightly agree, 5=somewhat agree, and 6=strongly agree). To create an index of perceived mastery, the scores across all five items were averaged. According to HRS, the final score was set to missing if there were more than three items with missing values (Clarke et al., 2008). Controlling for all other variables, it is expected that older adults with higher levels of perceived mastery will have lower levels of depression (Lachman & Weaver, 1998) and that perceived mastery will mediate the relationship between SES and depression.

For stress, respondents were asked whether these eight items were ongoing or current problems they have experienced: (1) health problems (in yourself), (2) physical or emotional problems (in spouse or child), (3) problems with alcohol or drug use in family member, (4) difficulties at work, (5) financial strain, (6) housing problems, (7) problems in a close relationship, and (8) helping at least one sick frail family member or friend on a regular basis (Chronbach's alpha=0.59). Respondents rated each of the eight items by indicating how upsetting the chronic stressors were to them: 1=no, didn't happen, 2=yes, but not upsetting, 3=yes, somewhat upsetting, and 4=yes, very upsetting. Then, a dichotomous variable was recoded for each of the eight items (1=somewhat/very

upsetting, 0=didn't happen/not upsetting). The items were summed to produce an 8-count variable of chronic stressors. It is expected that respondents with more stressors will have higher levels of depression.

Analytic Strategy

All analyses were weighted with a mean centered weight constructed from the person weight provided in the HRS. Further, regression models were estimated using the "svy" options in Stata to account for the geographic clustering of sample respondents in the HRS survey design. Preliminary analyses consisted of examining the data for leveraging effects of outliers to observe if they have an influential impact on the results. The analyses also included checking for problems of multicollinearity by inspecting variance inflation factors (VIFs) and tolerance levels. The tolerance levels and VIFs meet the normative thresholds indicating that multicollinearity was not a problem.

Part of the analytic strategy for this study included cross-sectional analyses using the HRS 2006 core sample to help better understand the factors related to the prevalence of depression in later life. This part of the study specifically examined the prevalence of depression. Binomial logistic regression models were estimated with the standard cut-off point of 3 or more depressive symptoms as the dependent variable. The coefficients for the cross-sectional analyses were reported as odds ratios (OR).

The longitudinal part of the analytic strategy included examining the incidence of depression by examining separately the onset and recovery of depression between the 2006 (baseline) and 2008 waves. This part of the study is similar to models that address the incidence of depression between two time points. Here, the new cases in the observation window included not only onset of depression but also recovery from

depression.

The HRS 2006 core sample (baseline) was divided into respondents who had depression and who had no depression in 2006. Thus, the first sample allowed me to analyze factors related to recovery from depression and the second sample allowed me to analyze the factors related to onset of depression in 2008. This strategy separates recovery from depression from onset of depression in order to acknowledge that some people do recover from this illness (for a similar modeling strategy applied to disability recovery and onset, see Freedman et al., 2008). Also, in the longitudinal portion of the analysis, the dependent variables also included a category for whether the respondent died between the 2006 and 2008 waves. Respondents who were loss-to-sample for other reasons (e.g., non-response, dropped from the sample) were excluded from these analyses. Regarding proxy respondents in 2008, there were 1,705 respondents who were lost from the sample because they were self-respondents in 2006 but had proxy respondents in 2008. For the LBQ sample, there were 529 respondents who were excluded from the longitudinal analyses because they were self-respondents in 2006 and had proxy respondents in 2008.

I created two different dependent variables for the longitudinal analysis: one captures recovery from depression and one captures onset of depression. For respondents who were depressed in 2006, the categories are: 1=depression at both waves in 2006 and 2008 (reference group), 2=recovery from depression in 2008, and 3=death. For respondents who were not depressed in 2006, the categories are: 1=no depression at both waves in 2006 and 2008 (reference group), 2=onset of depression in 2008, and 3=death. Table 9 displays the proportions of respondents for depression recovery and depression onset as

well as death for both the HRS core sample and LBQ sample in 2008.

Here, multinomial logistic regression models were employed. As stated earlier, this part of the study included retaining attrition due to death between 2006 and 2008 as a competing outcome for change in depression status. I ran duplicate models using the two different dependent variables, depressed and not depressed at baseline (2006) compared to depression status in 2008. The coefficients for the longitudinal analyses are reported as relative risk ratios (RRR). Relative risk ratios are similar to odds ratios.

Other strategies were considered for examining the incidence (onset and recovery) of depression because there is more than one way to estimate change in a dependent variable in a regression format, and there does not appear to be consensus on which approach is most appropriate. One approach is to generate a change score model where a continuous outcome variable at time 1 is subtracted from the same variable reported at time 2. Because the depression variable employed in this study is an ordinal measure, I decided not to estimate this type of model. As noted above, I chose to use a two-category threshold measure for depression.

When estimating change in a dependent variable, one issue that surfaces is whether to adjust for baseline status (Glymour et al., 2005). Adjusting for baseline status has a long history in epidemiological research and is used to eliminate some forms of bias. However, it is possible under some circumstances that adjusting for baseline status may introduce new forms of bias. In Glymour et al.'s study (2005), they argue that variables such as education are often strongly related to baseline health status, such as cognition. Under these circumstances, the real causal effects (if any) may be related to baseline status rather than the change that is being measured. Glymour et al. (2005) found that

adjusting for baseline values of the dependent variable (cognition) inflates their education regression coefficient estimates compared to models without baseline adjustments. They recommend against baseline adjustment under these circumstances.

The research design for this study includes dividing the sample into two parts according to baseline status (depression at time 1 versus no depression at time 1). Thus, this may be considered a form of baseline adjustment. Following the cautionary statements of Glymour et al. (2005), I decided to estimate two multinomial logistic regression models that include three outcome categories at time 2 (depressed, not depressed [reference group], and died). The first model does not include an adjustment for baseline depression status (the one preferred by Glymour et al., 2005) and the second model introduces the baseline adjustment for depression status. For the model without baseline adjustment, the results show that older persons with higher education are at lower risk of depression (compared to being depressed) at time 2 (2008) (a table showing these results is presented in Appendix A). The results for education are not significant for the contrast between being not depressed in 2008 and attrition due to death between waves. For the model with baseline adjustment, the results for the relationship between education and the two comparisons (depressed versus not depressed and depressed versus died) are similar in direction and significance level to those for the model that did not include a baseline adjustment. At least in this study with this sample and the specific measures included in the model, the inclusion or exclusion of baseline adjustment appears not to impact the direction of the relationships of education and the outcome variable or whether the relationships are statistically significant at the $p \leq .05$ level. Nevertheless, researchers need to be aware of the issues raised by Glymour et al. (2005)

as they design their research and interpret results from incidence models like the ones employed in this study. Finally, it is not straightforward to compare the results from these supplementary analyses to those based on the research design employed in this study. However, in general the negative relationship between education and depression appears to be robust under both modeling strategies.

Below is a discussion of the statistical analyses and regression models that were estimated to address the four research objectives of this current study. Each set of analyses is conducted to understand the factors associated with the prevalence and incidence of depression in later life – focusing on SES, gender, race, and ethnicity.

1) Examine the main effects of SES, gender, race, and ethnicity on late-life depression.

The first research objective was to examine the relationships among SES, gender, race, ethnicity, and late-life depression in terms of prevalence and incidence. A series of logistic regression models were estimated to analyze the main effects of SES, gender, race, and ethnicity on measures of depression. I entered sets of variables into models using a hierarchical approach. Model 1 included only SES variables: education, household income, and net worth. Model 2 added gender and race-ethnicity. Model 3 added adjustments for sociodemographic characteristics: age and marital status. Model 4 added adjustments for social engagement variables: work for pay, volunteer, and attend religious services. Last, Model 5 added adjustments for health status: health conditions, ADLs limitations, self-rated health, and exercise. Model 5 is the full model and contains all variables specified for the analyses of this current study.

2) Examine if the relationship between SES and late-life depression is moderated by gender, race, and ethnic group status.

The second research objective was to examine whether the relationship between SES and late-life depression was moderated by gender, race, and ethnic groups status. The analyses consisted of estimating logistic regression models that contain interaction terms: SES by gender and SES by race-ethnicity. To examine differences among SES measures on late-life depression, models were estimated separately for each SES measure: education (education-gender, education-race and ethnicity), household income (household income-gender, household income-race and ethnicity), and net worth (net worth-gender, net worth-race and ethnicity).

The analyses entailed estimating a set of logistic regression models for each of the SES measures. The first model adjusts for all control variables specified for this current study, without the other alternative SES variables. Then, I re-estimated the same model, with the inclusion the other SES variables. The difference between the two models was whether the alternative SES variables were controlled. This was done to examine if the effect of the interaction term was diminished when the alternative SES indicators were controlled.

Of particular interest, the main effects of SES, gender, race, and ethnicity and the cross-product terms were reported in the tables. To conserve space, the results for all other covariates included in the analyses were not reported in the tables or discussed in detail.

3) Examine whether mastery and stress mediate the relationship between SES and late-life depression for the total sample.

A series of regression models were estimated to examine the mediating effects of perceived mastery and stress on the relationship between SES and late-life depression among the total LBQ sample. The perceived mastery and stress variables were from the 2006 HRS psychosocial LBQ, therefore these analyses were restricted to the smaller LBQ sample. The analyses of this current study include examining whether the psychosocial variables mediate the relationship for each of the SES measures (education, household income, and net worth) and depression.

The statistical analyses involved a three step process. To test whether perceived mastery and stress functioned as a mediator between SES and depression, the following conditions must have been met: (1) the independent variable (SES) was related to the mediator variable (perceived mastery or stress), (2) the independent variable was related to the dependent variable (depression) without the mediator variable in the model, and (3) the mediator variable was related to the dependent variable (Baron & Kenny, 1986). These models were adjusted for control variables. Only the variables of interest have to meet the conditions for mediation (the set of control variables do not have to meet rules for mediation). To suggest full mediation, the previous significant relationship between the independent (SES) and dependent variable (depression) should no longer be significant when the mediator variable (perceived mastery or stress) was included in the model. To suggest partial mediation, the significant relationship between the independent and dependent variable was reduced in size when the mediator variable was included in the model.

The first step was to regress SES on perceived mastery and stress, adjusted for the basic set of controls. Ordinary linear regression models were estimated with the

continuous measure of perceived mastery and stress as the dependent variables (to conserve space, the results for SES, gender, and race-ethnicity were only reported in the tables or discussed). The second step required regressing SES on measures of depression without the perceived mastery and stress variables, adjusted for the same set of controls, which is part of the procedure consistent with the Baron and Kenny approach (1986). The final step included regressing the same model with the inclusion of stress and perceived mastery in the model. If the effect of SES was reduced or eliminated in the final model, this provided evidence that perceived mastery or stress mediated the relationship between SES and measures of depression.

4) Evaluate the mediating effects of mastery and stress in the relationship between SES and late-life depression for each specific gender, race, and ethnic group.

The modeling strategy to address this research objective was similar to the third analytic approach described above. However, this research objective examines the intersecting effects of specific gender-race-ethnic group status on measures of depression. The gender-race-ethnic groups were White males, White females, Black males, Black females, Hispanic males, and Hispanic females. Respondents from the 'other race' group were excluded from this part of the study due to small sample size.

Both the HRS core sample and LBQ sample were used for the intersectionality analyses. The first step was to estimate basic intersectionality regression models with the HRS core sample. I estimated an unadjusted and a fully adjusted model. The basic unadjusted model only included gender-race-ethnic group variables and did not adjust for any control variables. White males served as the reference group. This model allowed examination of differences in depression across groups with White males serving as the

reference group. Then, I estimated an adjusted model which included all control variables.

The second step used the smaller LBQ sample and these analyses included the perceived mastery and stress variables in the models. Similar to the statistical approach with the HRS core sample, unadjusted and adjusted models were estimated for the LBQ sample. However, the first set of models did not include the perceived mastery and stress variables in the analyses, and the second set included the psychosocial variables.

The final step was to estimate a series of logistic regression models for each gender-race-ethnic group. The samples for these analyses were stratified by specific gender-race-ethnic groups. Similar to the analytic approach of the third research objective, the first model included all covariates, without the inclusion of stress and perceived mastery. The second model added the stress variable. The third model included both the stress and perceived mastery variables.

CHAPTER 5

RESULTS: CROSS-SECTIONAL

Descriptive Statistics among Total HRS 2006 Core Sample

First, in this section, it provides descriptive statistics among the full HRS 2006 core sample. Then, I provide descriptive statistics for the smaller 2006 LBQ sample. Table 10 displays descriptive characteristics among the total HRS 2006 core sample. The analysis indicated 21% of the sample reported having three or more depressive symptoms (depression). Looking at the sociodemographic characteristics, the mean age was 65.3 years-old. The majority of the HRS core sample was women, 56%. For race and ethnic groups, the sample was comprised of 82% Whites, 9% Blacks, 7% Hispanics, and 2% respondents in the 'other race' group. The majority of respondents in the sample was married (62%).

Among the HRS core sample, the mean number of school years completed was 12.9 years. For both household income and net worth, the median was reported to account for skewed distributions common in income and wealth measures. The median household income was $43,548 and median net worth was $182,000.

For the social engagement variables, 45% of the HRS core sample was working for pay. For volunteering, 36% of the sample was engaged in volunteering activities. Approximately 39% of respondents in the total sample attended religious services at least

once a week.

Respondents in the HRS core sample had an average of 1.94 health conditions and 0.31 ADLs limitations. For self-reported health, more than a quarter, 26%, of the total sample rated their own health as fair or poor. Last, 40% of the total sample moderately or vigorously exercised one to three times per month or more.

Additionally, Table 11 reports descriptive characteristics among respondents excluded from this current study. As stated earlier, respondents from the HRS core wave were excluded if they were younger than 50 years-old, nursing home residents, proxy respondents, had a mean weight less than or equal to zero, or had missing data on any of the variables. The descriptive characteristics are presented to observe differences between excluded and included respondents.

For depression, there was a higher proportion of respondents who had depression among the excluded sample (28%) than included sample (21%). Concerning sociodemographic characteristics, the mean age was similar between excluded and included respondents (65.0 and 65.3 years-old, respectively). There was a higher proportion of women among excluded respondents than included respondents in the study sample (59% and 56%, respectively). For marital status, there was a lower proportion of respondents who were married among excluded (60%) than included respondents (62%).

Excluded respondents were lower in all three measures of SES. Excluded respondents (11.8 school years) had fewer years of education than included respondents (12.9 school years). Excluded respondents had lower median household income ($34,971) than included respondents ($43,548). Last, median net worth was lower among excluded ($100,300) than included respondents ($182,000).

Descriptive Statistics by Gender among HRS 2006 Core Sample

Table 12 contains descriptive characteristics and bivariate analysis by gender among the HRS 2006 core sample (t-tests and chi-square statistics were used to determine differences that are statistically significant). There were significant gender differences in depression, indicating a larger percentage of women (24%) had depression than men (17%) ($p<.000$). On average, women were older than men, 65.9 and 64.6 years-old, respectively ($p<.000$). Men were more likely to be married compared to women, specifically, 72% of men and 54% of women were married ($p<.000$).

Consistent with previous studies, the results demonstrated women were lower in all three measures of SES (education, household income, and net worth) compared to men. Women had significantly fewer years of education than men, 12.7 and 13.1 school years, respectively ($p<.000$). Median household income was lower for women ($36,987) than men ($52,364) ($p<.000$). Women ($165,948) also had lower median net worth than men ($202,000) ($p<.000$).[3] A larger percentage of men (52%) were working for pay than women (40%) ($p<.000$). The results indicated that a significantly larger percentage of women (36%) were volunteering than men (35%) ($p<.018$).

There also were significant gender differences in health status, with the results indicating women had a higher average number of health conditions ($p<.000$) and ADLs limitations ($p<.000$) than men. A larger percentage of women (27%) rated their own health as fair or poor compared to men (24%) ($p<.001$).

[3] To test for gender differences in household income and net worth, the mean of the logged household income and logged net worth measures were used.

Descriptive Statistics by Race and Ethnicity among HRS 2006 Core Sample

Next, Table 13 provides descriptive characteristics and difference in means tests for each race and ethnic group among the HRS 2006 core sample (t-tests and chi-square statistics were used to determine differences that are statistically significant). Among race and ethnic groups, the proportion of respondents with depression was lowest for Whites and highest for Hispanics: 19% Whites, 27% Blacks, 34% Hispanics, and 28% 'other race' respondents ($p<.000$). Respondents in the 'other race' group (62.6 years-old) were the youngest, followed by Hispanics (63.2 years-old), Blacks (63.4 years-old), and Whites (65.8 years-old) ($p<.000$). Whites (65%) were most likely to be married and Blacks (39%) were least likely to married. About 59% of Hispanics and 61% of 'other race' respondents were married ($p<.000$).

For all SES measures, Whites were significantly higher in SES compared to minority race and ethnic groups. Whites had the highest average number of school years completed and Hispanics had the fewest: Whites, 13.3 school years; Blacks, 11.9 school years; Hispanics, 9.4 school years; and 'other race', 12.7 school years ($p<.000$). The results also indicated the median household income was highest for Whites and lowest for Hispanics: White, $47,965; Black, $23,234; Hispanic, $21,454; and 'other race', $43,012 ($p<.000$). Whites ($219,000) and 'other race' respondents ($117,142) had significantly higher median net worth, more than twice the net worth of Blacks ($42,375) and Hispanics ($54,000) ($p<.000$).[4]

From the index of health conditions (range 0-8), Blacks (2.18) had the highest average

[4] To test for race and ethnic differences in household income and net worth, the mean of the logged household income and logged net worth measures were used.

number of health conditions and Hispanics had the lowest (1.83). Both Whites and respondents from the 'other race' category reported having an average of 1.93 health conditions (p<.000). Not only did Blacks have more health conditions compared to other race and ethnic groups, Blacks also had the highest number of ADLs limitations (p<.000). Hispanics had the largest percentage of respondents who rated their own health as fair or poor (50%). Approximately 22% of Whites, 39% of Blacks, and 35% of 'other race' respondents rated their health as fair or poor (p<.000).

Descriptive Statistics among Total 2006 LBQ Sample

The analyses for this current study that included psychosocial measures (perceived mastery and chronic stress) were restricted to the LBQ sample. Psychosocial measures were only available from the LBQ sample. The LBQ sample is a sub-sample of the full HRS sample. This section provides descriptive statistics among the LBQ sample and there appeared to be similarities between the LBQ and HRS core samples. Table 14 contains the descriptive characteristics among the total 2006 LBQ sample, including the perceived mastery and stress variables. Approximately 18% of the LBQ sample reported three or more depressive symptoms. On average, respondents in the LBQ sample were 64.9 years-old. Similar to the HRS core sample, there was a larger proportion of women than men in the LBQ sample, 54% and 46%, respectively. For race and ethnic groups, the sample consisted of 86% Whites, 7% Blacks, 5% Hispanics, and 2% respondents in the 'other race' group. Similar to the HRS core sample, the majority of the respondents in the LBQ sample were married (66%).

Respondents in the LBQ sample had a mean of 13.1 school years completed. The median household income was $47,600 and median net worth was $200,200. Almost

half, 48%, of the sample reported working for pay.

The sample had a mean of 1.86 health conditions and 0.27 ADLs limitations. For self-reported health, 22% of the LBQ sample rated their health as fair or poor. About 40% of the sample reported moderately or vigorously exercising one to three times per month or more.

Concerning the psychosocial variables, the results indicated, for a scale ranging from 1 to 6, respondents in the LBQ sample had a mean score of 4.80 for perceived mastery. From the index of chronic stress (range 0-8), the sample had an average of 1.33 stressors.

Table 15 provides descriptive characteristics among excluded respondents from the LBQ sample. Again, respondents who did not meet the sample criteria for this study were excluded from the LBQ sample. Also, respondents with missing data on the perceived mastery and stress variables were excluded from the sample. The descriptive characteristics are reported to observe differences between excluded and included respondents among the LBQ sample.

For depression, there was a higher proportion of respondents who had depression among the excluded sample (26%) than included sample (18%). Concerning sociodemographic characteristics, excluded respondents (65.2 years-old) were older than included respondents (64.9 years-old). There was a higher proportion of women among excluded respondents than included respondents in the study sample (65% and 54%, respectively). For marital status, there was a lower proportion of respondents who were married among excluded (58%) than included respondents (66%).

Similar to the HRS core sample, excluded were lower in all three measures of SES. Excluded respondents (11.9 school years) had fewer years of education than included

respondents (13.1 school years). Excluded respondents had lower median household income ($32,786) than included respondents ($47,600). Last, median net worth was lower among excluded ($120,000) than included respondents ($200,200).

Descriptive Statistics by Gender among 2006 LBQ Sample

Table 16 contains the descriptive characteristics and bivariate analyses by gender among the 2006 LBQ sample. Consistent with the results from the HRS core sample, a significantly larger percentage of women (21%) had depression than men (15%) ($p<.000$). Among the LBQ sample, women were older than men, 65.5 and 64.3 years-old, respectively ($p<.000$). There were a significantly larger percentage of men (75%) who were married than women (59%) ($p<.000$).

Consistent with the HRS core sample, the results again demonstrated women were lower on all three measures of SES. Women completed fewer years of education than men, 12.9 and 13.3 school years, respectively ($p<.000$). The median household income was lower for women ($40,426) than men ($55,624) ($p<.000$). Further, the results also showed that women ($190,664) had lower median net worth than men ($220,000) ($p<.002$).[5] Among the LBQ sample, more than half, 54%, of men were working for pay. A lower percentage of women were working for pay (42%) ($p<.000$). The results again showed that a larger percentage of women (40%) were engaged in volunteering activities compared to men (36%) ($p<.003$).

Female respondents also had more health conditions ($p<.000$) and ADLs limitations ($p<.000$) than males. There were no significant gender differences for self-rated health:

[5] To test for gender differences in household income and net worth, the mean of the logged household income and logged net worth measures were used.

23% of men and 22% of women rated their health as fair or poor (p=.607). The results also indicated women (4.77) had lower perceived mastery than men (4.88) (p<.006). In addition, women (1.46) had a higher number of stressors than men (1.17) (p<.000).

Descriptive Statistics by Race and Ethnicity among 2006 LBQ Sample

Next, Table 17 contains the descriptive characteristics and difference in means tests by race and ethnic group status. Consistent with the results from the HRS core sample, depression was lowest for Whites and highest for Hispanics: 17% Whites, 23% Blacks, 32% Hispanics, and 27% 'other race' respondents (p<.000).

The results repeatedly demonstrated that Whites were significantly higher in SES compared to minority race and ethnic groups. Similar to the HRS core sample, Hispanics had the fewest number of school years completed: Whites, 13.4 school years; Blacks, 11.9 school years; Hispanics, 10.0 school years; and 'other race', 12.8 school years (p<.000). The results from the HRS core sample indicated that Hispanics had the lowest median household income compared to the other race and ethnic groups. For the LBQ sample, the results indicated that Blacks had the lowest median household income: White, $50,655; Black, $25,000; Hispanic, $27,410; and 'other race', $50,000 ($p$<.000). For net worth, the results again showed that Whites and 'other race' respondents had substantially higher median net worth compared to Blacks and Hispanics: Whites, $232,112; Blacks, $45,460; Hispanics, $66,815; and 'other race', $189,556 ($p$<.000).[6]

From the 8-count measure of health conditions, the results again showed Blacks (2.14) had the highest number of health conditions and Hispanics had the fewest number of

[6] To test for race and ethnic differences in household income and net worth, the mean of the logged household income and logged net worth measures were used.

health conditions (1.80) (p<.000). Blacks also had the highest mean for ADL limitations: Whites, 0.24 ADL limitations; Blacks, 0.49 ADL limitations; Hispanics, 0.39 ADL limitations; and 'other race', 0.23 ADL limitations (p<.000). The results again indicated that Hispanics had the largest percentage of respondents who rated their own health as fair or poor (42%). About 20% of White, 39% of Black, and 31% of 'other race' respondents rated their health as fair or poor (p<.000).

Concerning perceived mastery, there were no statistically significant race and ethnic group differences in the mean levels of perceived mastery (p=.310). Although there were no statistically significant differences in perceived mastery, Whites had the highest mean level for perceived mastery: Whites, 4.81; Blacks, 4.77; Hispanics, 4.75; and 'other race,' 4.67. For stress, it was found that Whites had the fewest number of stressors and 'other race' respondents had the highest number of stressors: Whites, 1.31; Blacks, 1.37; Hispanics, 1.42; and 'other race,' 1.77 (p<.001).

Overall, for both the HRS core and LBQ sample, a larger proportion was women than men. Women were consistently lower in all three measures of SES compared to men. Additionally, the results continued to show that minority race and ethnic groups were significantly lower in all three measures of SES. In both samples, Whites had the greatest number of school years completed while Hispanics had the least years of education. In the HRS core sample, Hispanics had the lowest median household income compared to the other race and ethnic groups. However, in the LBQ sample, Blacks had the lowest median household income. In both samples, median net worth was significantly lower among Blacks and Hispanics compared to Whites and 'other race' respondents. Depression was significantly higher among women than men. Regarding

race and ethnic groups, minority race and ethnic groups were significantly more depressed than Whites. Among race and ethnic groups, the proportion of respondents with depression was consistently highest for Hispanics.

Regression Results: Main Effects of SES, Gender, Race, and Ethnicity

The first research objective was to examine the main effects of SES, gender, race, and ethnicity on the prevalence of late-life depression. A series of binomial logistic regression models were estimated using a cross-sectional research design with data from the HRS 2006 core sample (results for the longitudinal analyses of the incidence of depression for each research question are reported in the next chapter).

Table 18 shows the results of the binomial logistic regression models and the coefficients are reported as odds ratios (OR). In Model 1, the results showed all three indicators of SES were significantly related to depression. The estimated odds ratio of 0.92 suggests that for each additional year of education, the odds of having depression are about 8 percent lower, holding other SES factors constant ($p<.001$). The estimated odds ratio of 0.85 suggests that increases in household income (logged) are related to lower odds of having depression ($p<.001$). Concerning wealth, increases in net worth (logged) are also related to decreased likelihood of having depression, holding other SES factors constant ($OR=0.91$, $p<.001$).

Model 2 included the addition of the gender and race-ethnic variables. Education ($OR=0.93$, $p<.001$), household income ($OR=0.86$, $p<.001$), and net worth ($OR=0.91$, $p<.001$) remained related to depression. Women were significantly more likely to be depressed than men. The estimated odds ratio of 1.42 suggests that the odds of having depression are about 42 percent higher for women than for men ($p<.001$). Among race

and ethnic groups, only respondents in the 'other race' group were different from Whites (reference group). The estimated odds ratio of 1.41 suggests that the odds of having depression are about 41 percent higher for respondents in the 'other race' group compared to Whites, holding other factors in the model constant ($p<.050$).

Model 3 added adjustments for sociodemographic variables: age and marital status. The results continued to show that higher SES was related to lower odds of having depression (education, $OR=0.92$, $p<.001$; household income, $OR=0.89$, $p<.001$; net worth, $OR=0.93$, $p<.001$). In addition, gender differences remained related to depression, with women having higher odds of depression compared to men ($OR=1.34$, $p<.001$). Age was statistically significantly related to depression. The results suggested the odds of having depression were lower with increasing age. The estimated odds ratio of 0.98 suggests that for each additional year of age, the odds of having depression are 2 percent lower ($p<.001$). For marital status, the estimated odds ratio of 0.62 suggested that the odds of having depression are about 38 percent lower for married older adults than for their non-married counterparts, holding other factors in the model constant ($p<.001$).

Model 4 added adjustments for social engagement variables. Higher SES remained related to decreased odds of having depression (education, $OR=0.94$, $p<.001$; household income, $OR=0.95$, $p<.050$; and net worth, $OR=0.93$, $p<.001$). 'Other race' became insignificantly related to depression compared to Whites. The results showed that working for pay is related to mental health in later life. The estimated odds ratio of 0.47 suggests that the odds of having depression are about 53 percent lower for older adults who work for pay compared to those who do not work for pay ($p<.001$). For volunteering, the estimated odds ratio of 0.63 suggests that the odds of having depression

are about 37 percent lower for older adults who are engaged in volunteering activities compared to those who are not engaged in volunteering activities ($p<.001$). The results indicated that respondents who frequently attended religious services are about 20 percent less likely to have depression compared to respondents who did not frequently attend religious services (*OR*=0.80, $p<.010$).

Model 5 added adjustments for health status variables. In this full model, education and net worth remained statistically significant while household income became insignificant. The estimated odds ratio of 0.97 suggests that for each additional year of schooling completed, the odds of having depression are about 3 percent lower, holding other factors in the model constant ($p<.010$). Increases in net worth was related to lower odds of having depression (*OR*=0.97, $p<.010$). The results indicated that Blacks are about 24 percent less likely to have depression compared to Whites in the fully adjusted model (*OR*=0.76, $p<.010$).

Concerning the health status variables in Model 5, all measures (number of health conditions, ADLs limitations, self-rated health, and exercise) were related to depression in the expected direction. For each increase in the count of health conditions, the odds of depression increased by about 21 percent, holding other factors in the model constant (*OR*=1.21, $p<.001$). The results also demonstrated that a higher number of ADLs limitations was related to increased odds of having depression (*OR*=1.45, $p<.001$). For self-rated health, it had the largest odds ratio among all variables in the full model. Respondents reporting fair or poor health had increased odds of having depression compared to respondents reporting excellent, very good, or good health (*OR*=2.68, $p<.001$). For exercise, the estimated odds ratio of 0.73 suggests that the odds of having

depression are about 27 percent lower for respondents who exercise than for respondents who never exercise (p<.001).

In sum, the pattern for the five models suggested that higher SES was related to decreased odds of having depression, however, education and net worth may have a more robust relationship than household income. The results indicated that education and net worth remained statistically significant in all five models, whereas household income was significant in all models except Model 5, where health conditions were included. Possibly because many of the respondents were not in the labor force, which likely contributes to lower income, education and net worth are better indictors of where respondents are on the SES ladder than is income. Gender was consistently related to depression in all models, with results showing the odds of having depression were higher among women than men. Among race and ethnic groups, the unexpected results indicated that Blacks were less likely to have depression compared to Whites in the full model. Health status variables were significantly related to depression, especially self-rated health.

Moderating Effects of Gender, Race, and Ethnicity

The second research objective was to examine whether the relationship between SES and late-life depression is moderated by gender, race, and ethnic groups status. The analyses consisted of estimating binomial logistic regression models that contain interaction terms for SES by gender and SES by race and ethnicity.

Table 19 shows the results from binomial logistic regression models that contained the education by gender and education by race and ethnicity interactions terms. The models were estimated without and with household income and net worth in order to determine if

the effect of the education interaction terms was diminished when these alternative SES indicators (household income and net worth) were controlled. There were no statistically significant relationships for the education by gender interaction terms in either model, without or with the inclusion of household income and net worth. Concerning race and ethnic groups, education-Hispanic was the only interaction term that was statistically significant in both models (OR=1.04, p<.050).[7] The results indicated that Whites benefited more from higher levels of education than Hispanics. The results showed there appears to be a protective effect of education with respect to depression for Whites only. The results did not support the idea that Hispanics benefit from higher levels of education when it comes to depression. The results did not show a significant protective effect of education for Hispanics.[8]

Table 20 shows the results of the analyses for the household income by gender and household income by race and ethnicity interactions terms. The difference between the two models is whether education and net worth were controlled. The results showed no statistical significance in gender moderating the relationship between household income and depression in either model. For the household income and race and ethnicity interaction terms, there also were no statistically significant relationships in either form of the model.

Table 21 shows the results for the net worth by gender and net worth by race and ethnicity interaction terms. There were no statistically significant relationships between

[7] Wald test did not indicate a statistically significant improvement in the fit of the model with the inclusion of interaction terms.

[8] The conclusion about the insignificance of education for Hispanics was drawn from an alternative model using Hispanic as the reference group. The additional test examined whether the sum of the two raw coefficients (education and the interaction term for Hispanics) was different from 0.

the interaction terms and the depression measure in both models, without and with the inclusion of education and household income.

For these cross-sectional analyses, results did not show evidence of moderating effects of gender or race-ethnicity for the relationship between SES and depression prevalence, except for the moderating effects of Hispanic ethnicity on the relationship between education and depression. The results indicated that education's beneficial effect only appears to be protective for Whites.

Mediation of Stress and Mastery among the Total LBQ Sample

Tables 22 and 25 display the results of regression models that were estimated to examine the mediating effects of stress and perceived mastery on the relationship between SES and late-life depression prevalence among the LBQ sample. Further, these analyses also included examining mediating effects of stress and perceived mastery between gender and race-ethnicity on depression. As stated earlier, these analyses were restricted to the LBQ sample due to the use of the psychosocial variables (stress and perceived mastery), not the full HRS core sample.

Table 22 shows the results of linear regression models with stress and perceived mastery as the dependent variables. The table reports the unstandardized coefficients, standard errors, and p-values for SES, gender, and race-ethnicity. To conserve space, the results for all other covariates included in the analyses were not reported in the table or discussed in detail. For stress, the results indicated that education was related to stress and the relationship was positive (b=0.30, p<.001). The unexpected results indicated respondents with more years of schooling reported more chronic stress compared to those with fewer years of schooling. There was no statistically significant relationship between

household income and stress. Concerning wealth, the results indicated that there was a significant relationship between net worth and stress and the relationship was negative (b=-0.05, p<.001): respondents with more wealth reported lower levels of stress compared to respondents with less wealth.

To further examine the unexpected results between education and stress, the analyses of this current study included estimating supplementary models with acute stress. This current study used a chronic stress variable, not acute stress. I examined if chronic and acute stressors yielded similar results. To examine acute stressors, changes in marital status (Table 23) and self-rated health (Table 24) between the 2006 and 2008 waves were used as alternative indicators of stress. The categories for changes in marital status were: 1=married in 2006 and not married in 2008, 2=not married in 2006 and married in 2008, and 3=marital status stayed the same in 2006 and 2008 (reference group). For changes in self-rated health, the categories were: 1=self-rated health became worse between 2006 and 2008, 2=self-rated health became better between 2006 and 2008, and 3=self-rated health stayed the same in 2006 and 2008 (reference group). The results of these supplementary models continued to suggest no indication that respondents with more years of education have less stress compared to respondents with fewer years of education.

For gender (Table 22), the results showed that women reported more stress than men (b=0.28, p<.001). For race and ethnic groups, Black was the only group that was statistically different from the White group and the relationship was negative (b=-0.34, p<.001). Counter-intuitively, the results indicated that Blacks had lower levels of stress compared to Whites. These results are expanded on briefly in the discussion chapter, as

well.

Next, examining the results for perceived mastery as the dependent variable, education was not related to perceived mastery, while household income and net worth were significantly related to perceived mastery. Respondents with more household income (b=0.04, p<.050) and more net worth (b=0.02, p<.001) had significantly higher levels of perceived mastery compared to respondents with lower household income and lower net worth. Concerning gender differences, there was no statistically significant relationship with perceived mastery. For the race and ethnic groups, Blacks were statistically different from Whites and the relationship was positive (b=0.16, p<.001). The results indicated that Blacks had higher levels of perceived mastery compared to Whites, net of the control variables, which also was counter-intuitive.

Next, Table 25 shows the results of three binomial logistic regression models with depression as the dependent variable. Again, these analyses used the smaller LBQ sample. In the first model without the inclusion of stress and perceived mastery, there were no statistically significant relationships between the SES variables (education, household income, and net worth) and the prevalence of depression. Concerning gender differences, the results indicated that the odds of having depression are about 27 percent higher for women than for men (OR=1.27, p<.010). The results suggested that the odds of depression are lower for Blacks than for Whites (OR=0.66, p<.010), consistent with the results with the full HRS core sample (Table 18). Hispanics had higher odds of depression than Whites: the estimated odds ratio of 1.42 suggests that the odds of having depression are about 42 percent higher for Hispanics than for Whites, holding other factors constant (p<.050).

In the second model with the addition of stress (mediating variable), education was the only SES variable that became significantly related to depression: the estimated odds ratio of 0.96 suggests that for each increase in the number of school years, the odds of having depression are about 4 percent lower ($p<.050$). Gender became insignificantly related to depression. Black and Hispanic race remained related to depression, with lower odds of depression among Blacks ($OR=0.75$, $p<.050$) and higher odds of depression among Hispanics ($OR=1.54$, $p<.010$) compared to Whites. Concerning stress, more stress was related to increased odds of having depression: the estimated odds ratio of 1.42 suggests that for each increase in the number of stressors, the odds of having depression are increased by about 42 percent, holding other factors in the model constant ($p<.001$).

With the addition of perceived mastery (mediating variable) in the third model, stress remained related to increased odds of having depression ($OR=1.38$, $p<.001$). In addition, there was a statistically significant relationship between perceived mastery and depression: the estimated odds ratio of 0.79 suggests that for each increase in perceived mastery, the odds of having depression are about 21 percent lower, holding other factors in the model constant ($p<.001$). More years of education remained related to decreased odds of having depression ($OR=0.96$, $p<.050$), while household income and net worth remained insignificantly related to depression prevalence.

Evaluation of the results from Tables 22 and 25 were used to examine mediating effects of the psychosocial variables on the relationship between SES and depression. In Table 22, education was significantly related to stress but was not related to perceived mastery. The unexpected results indicated more years of education were related to more

stress. In Table 25, education not was statistically significant with depression when stress and perceived mastery were not included in the model. However, the relationship between education and depression became significant when stress and perceived mastery were added to the models, with results indicating more years of schooling was related to decreased odds of having depression. According to the conditions for testing mediation, the results indicated no evidence of stress or perceived mastery mediating the relationship between education and depression.

Next for household income, there was no significant relationship between income and stress (Table 22). Concerning perceived mastery, there was a significant relationship between household income and perceived mastery, with results showing that more income was related to higher perceived mastery. In Table 25, household income was not significantly related to depression in all three models. The results suggested that both stress and perceived mastery did not mediate the relationship between household income and depression.

Concerning wealth, more net worth was significantly related to less stress and higher perceived mastery (Table 22). However, there were no significant relationships between net worth and depression in all three models in Table 25. These results also suggested that mediation was not occurring in the relationship between net worth and depression.

With regard to gender, there were no significant gender differences in perceived mastery. However the results indicated a statistically significant relationship between gender and stress: results showed females had higher stress compared to males (Table 22). Females were significantly more depressed than males without the inclusion of the stress and perceived mastery variable in Table 25. When stress was added to the models, the

coefficient for the female variable was no longer significantly related to depression. This may suggest that stress mediates the relationship between gender and depression (this was not a central research question but does help illuminate why women may be more depressed than men – through the stress process).

Among race and ethnic groups, the results suggested that Blacks had significantly lower stress and higher perceived mastery than Whites (Table 22). Table 25 showed that in the first model when the mediator variables are excluded from the regression, Blacks had significantly lower odds of having depression compared to Whites. When stress and perceived mastery were added into the model, the coefficient for Blacks became not significantly related to depression. The results also suggested that stress and perceived mastery may mediate the relationship between Blacks and depression (again, not a focus of this dissertation but illuminating).

Mediation of Stress and Mastery for Gender, Race, and Ethnic Groups

Binomial logistic regression models were estimated to examine the intersecting effects of gender, race, and ethnic group status on depression prevalence. Table 26 shows the results of the intersectionality analyses for gender-race-ethnic group status on depression prevalence among the HRS core sample. White males served as the reference group.

In the unadjusted model (does not include any covariates specified in this current study), the results indicated that all gender-race-ethnic groups had significantly higher odds of having depression compared to White males: White females (*OR*=1.56, $p<.001$), Black males (*OR*=1.68, $p<.001$), Black females (*OR*=2.26, $p<.001$), Hispanic males (*OR*=1.95, $p<.001$) and Hispanic females (*OR*=3.68, $p<.001$). Among all groups, Hispanic females had the highest odds of having depression compared to White males.

The estimated odds ratio of 3.68 suggests that the odds of having depression are more than 3.5 times higher for Hispanic females than for White males. In the fully adjusted model (includes covariates), the coefficients for White females (*OR*=1.37, *p*<.001) and Hispanic females (*OR*=1.67, *p*<.001) were the only demographic groups that remained statistically significant, with the results continuing to show White females and Hispanic females had significantly higher odds of having depression compared to White males, holding all other factors in the model constant.

Table 27 displays the results of the intersectionality analyses for the smaller LBQ sample; these analyses included the stress and perceived mastery variables. Similar to the statistical approach with the HRS core sample, unadjusted and adjusted models were estimated. However, the first set of models did not include the stress and perceived mastery variables, and the second set included the psychosocial variables.

For the first set of models (without stress and perceived mastery), all groups except Black males were statistically different from White males: Whites females (*OR*=1.50, *p*<.001), Black females (*OR*=2.06, *p*<.001), Hispanic males (*OR*=2.27, *p*<.010) and Hispanic females (*OR*=3.46, *p*<.001). These groups had significantly higher odds of having depression compared to White males. Again, Hispanic females had the highest odds of depression. Consistent with the results from Table 26 with the HRS core sample, the coefficients for White females (*OR*=1.33, *p*<.010) and Hispanic females (*OR*=1.94, *p*<.001) were the only ones that remained statistically significant in the adjusted model. White females and Hispanic females had significantly higher odds of having depression compared to White males.

In the second set of models (including stress and perceived mastery), the results again

demonstrated that all groups except Black males were statistically significant in having higher odds of depression compared to White males. Stress and perceived mastery were also significantly related to depression, indicating more stress and lower levels of perceived mastery were related to increased odds of having depression. The estimated odds ratio of 1.50 suggests that for each increase in the number of stressors, the odds of having depression are about 50 percent higher ($p<.001$). For perceived mastery, the odds of having depression are about 31 percent lower for each increase in perceived mastery, holding other factors in the model constant ($OR=0.69$, $p<.001$).

In the adjusted model (including all covariates), only the coefficient for Hispanic females remained statistically significant with higher odds of having depression compared to White males ($OR=2.06$, $p<.001$). The results also repeatedly show that stress and perceived mastery remained statistically significant, showing higher stress ($OR=1.37$, $p<.001$) and lower levels of perceived mastery ($OR=0.78$, $p<.001$) were related to higher odds of having depression. From the overall intersectionality analyses, the results indicated that Hispanic females consistently had significantly higher odds of depression compared to White males.

Mediation models similar to those in the previous section among the total LBQ sample were also investigated for each gender-race-ethnic group. Tables 28a to 28f examines whether stress and perceived mastery mediate the relationship between SES and depression for each specific gender-race-ethnic group. These analyses were also restricted to the LBQ sample. Respondents in the 'other race' group are excluded from the intersectionality analyses due to small sample sizes. As seen in the tables, a series of binomial logistic regression models were estimated for each group. Model 1 included the

control variables specified in this study, without the inclusion of stress and perceived mastery (mediating variables). Model 2 is an expansion of Model 1 by adding stress. Model 3 includes both stress and perceived mastery. By adding stress and perceived mastery to the models, it examines the possibility that these psychosocial variables mediate the relationship between SES and depression. These analyses were estimated without the SVY option in Stata due to a large number of small sized PSUs (1 or 0 respondents in these areas). However, the analyses were estimated with weighted data.

Table 28a shows the results for White males (n=2,176). In all three models, none of the SES measures were significantly related to depression for White males. In Model 2, stress was related to depression: the estimated odds ratio of 1.61 suggests that for each increase in the number of stressors by one the odds of having depression are increased by about 61 percent, holding other factors in the model constant (p<.001). In Model 3, the results continued to show that increases in stress remained related to higher odds of having depression for White males (OR=1.58, p<.001). Perceived mastery was also significant, with results indicating that for each increase in perceived mastery, the odds of having depression are decreased by about 30 percent, holding other factors in the model constant (OR=0.70, p<.001). According to the conditions for testing mediation, the results indicated no evidence of stress or perceived mastery mediating the relationship between SES and depression for White males. The results did not meet the criteria for mediation since SES was not related to depression.

In Table 28b, the results for White females are shown (n=2,796). In Model 1, none of the SES measures were significantly related to depression. In Model 2 with the addition of stress, education was the only SES measure that became related to depression: the

results indicated that for each additional year of education, the odds of having depression decreased by 6 percent for White females, holding other factors in the model constant (*OR*=0.94, *p*<.050). The results also indicated that more stress was also related to higher odds of having depression for White females (*OR*=1.37, *p*<.001).

In Model 3 when perceived mastery was added to the regression models, education became insignificantly related to depression. Perceived mastery was related to depression and the results indicated that for each additional increase in perceived mastery, the odds of having depression are expected to decrease by about 21 percent (*OR*=0.79, *p*<.001). From the evaluation of these regression models, the results showed no evidence of stress or perceived mastery mediating the relationship between any of the SES measures and depression for White females.

Table 28c shows the results for Black males (*n*=256). In all three models, net worth was the only SES measure that was significantly related to depression for Black males. In Model 1, the results indicated that increases in net worth were related to decreased likelihood of having depression for Black males (*OR*=0.85, *p*<.001). In Model 2, stress was significantly related to depression. For each additional increase in the number of stressors, the odds of having depression increased by about 31 percent at levels of *p*<.050 (*OR*=1.31). Higher net worth remained related to decreased depression but the significant relationship was reduced at levels of *p*<.010 (*OR*=0.87). In Model 3, higher stress remained related to increased odds of having depression (*OR*=1.33, *p*<.050), and there was no statistically significant relationship between perceived mastery and depression for Black males. Increases in net worth remained related to decreased odds of having depression, however, the significant relationship was reduced at levels of *p*<.010

with stress in the model (*OR*=0.86, *p*<.010). The results suggested that stress partially mediates the relationship between net worth and depression for Black males.

Table 28d shows the results for Black females (*n*=471). None of the SES measures were significantly related to depression in any of the three models. In Model 2, the results indicated that more stress was related to increased odds of having depression: the estimated odds ratio of 1.28 suggests that for each increase in the number of stressors, the odds of having depression are expected to increase by about 28 percent, holding other factors in the model constant (*p*<.010). In Model 3, the results again indicated that there was a significant relationship between more stress and increased odds of having depression (*OR*=1.28, *p*<.050). Higher levels of perceived mastery were also significantly related to decreased odds of having depression for Black females (*OR*=0.76, *p*<.050). These results did not show evidence of mediation for Black females given that SES was not related to depression.

Table 28e shows the results for Hispanic males (*n*=183). None of the SES measures were significantly related to depression in any of the three models. In addition, the results did not indicate statistical significance in the relationship between stress or perceived mastery and depression for Hispanic males. The results did not meet the criteria for mediation since SES measures as well as the psychosocial variables were not related to depression.

Table 28f shows the results for Hispanic females (*n*=236). Similar to Hispanic males, none of the SES measures were significantly related to depression for Hispanic females, thus the results did not meet the criteria for mediation. Furthermore, there also were no statistically significant relationships for either stress or perceived mastery and depression

in Models 2 and 3. For both Hispanic males and females, small sample sizes may have impacted the ability to find statistically significant results.

In sum, the results of the intersectionality analyses for each specific gender-race-ethnic group indicated no evidence of stress or perceived mastery mediating the relationship between SES and depression, except for Black males. Among Black males, stress partially mediates the relationship between net worth and depression.

CHAPTER 6

RESULTS: LONGITUDINAL

Descriptive Statistics among Full HRS Core Sample in 2008

Table 29 displays the descriptive characteristics among the HRS core sample for the 2-year follow-up in 2008. The descriptive statistics for the independent variables are from the 2006 wave, and depression is measured in 2008. The table also provides descriptive statistics of respondents who died between the 2006 and 2008 waves (deceased respondents). Rather than excluding respondents who died, the longitudinal analysis retained deaths in the sample, as death is a competing outcome with depression (Freedman et al., 2008). Descriptive statistics and bivariate analyses that compare non-attritors and deceased respondents are included in the table to examine the differences between these two groups.

Among non-attritors, the results indicated that 20% of the sample experienced depression in 2008. For the sociodemographic characteristics, the mean age of the total HRS core sample was 65.2 years-old. Not surprisingly, non-attritors were significantly younger than respondents who died between the waves (deceased respondents), 64.8 and 74.7 years-old, respectively ($p<.000$). A larger proportion of the total HRS core sample was women than men, 56% and 44%, respectively. There were no significant differences in gender between non-attritors and deceased respondents: 56% of non-attritors and 53%

of deceased respondents were women (p=.198). For race and ethnic groups, the total HRS core sample comprised of 83% Whites, 9% Blacks, 7% Hispanics, and 2% 'other race' respondents. The majority of respondents in the total HRS core sample were married (62%). Non-attritors (63%) were more likely to be married than respondents who died between the waves (43%) (p<.000).

Among the total HRS core sample, the mean number of school years completed was 12.9 years. The results indicated non-attritors were significantly higher in SES compared to deceased respondents. Non-attritors completed more years of schooling than deceased respondents, 12.9 and 11.9 school years, respectively (p<.000). Among the total HRS core sample, the median household income was $43,752. The median household income for non-attritors ($45,010) was nearly twice the median household income of deceased respondents ($23,335) ($p$<.000). Among the total sample, the median net worth was $183,193. Non-attritors had a median net worth of $188,000 and deceased respondents had a median net worth of $97,221 ($p$<.000).[9]

For the social engagement variables, 45% of the total HRS 2008 core sample was working for pay and 36% of the total sample was engaged in volunteering activities. Probably due to functional decline, respondents who died were less likely to be working for pay (p<.000) and volunteering (p<.000) compared to non-attritors. Approximately 39% of the total sample regularly attended religious services at least once a week. Respondents who died (34%) were also less likely to attend religious services than non-attritors (39%) (p<.006).

[9] To test for differences between non-attritors and deceased respondents in household income and net worth, the mean of the logged household income and logged net worth measures were used.

As expected, respondents who died (3.07) had significantly more health conditions than non-attritors (1.88) (p<.000). Deceased respondents (1.04) had a higher mean of ADL limitations than non-attritors (0.27) (p<.000). For self-reported health, more than half of deceased respondents, 59%, rated their health as fair or poor, and 24% of non-attritors rated their health as fair or poor (p<.000).

Descriptive Statistics by Gender among HRS Core Sample in 2008

Table 30 contains descriptive characteristics and bivariate analyses by gender for the full HRS core sample. Among non-attritors of the HRS core sample, the results consistently demonstrated that a larger percentage of women (22%) had depression than men (17%) (p<.000). Similar to the analyses measured in 2006, women were older than men, 65.8 and 64.6 years-old, respectively (p<.000). Men were more likely to be married compared to women, specifically, 72% of men and 54% of women were married (p<.000).

Among the HRS core sample, the results continued to show socioeconomic disparities between males and females. Women had significantly fewer years of education than men, 12.7 and 13.2 school years, respectively (p<.000). Median household income was lower for women ($37,208) than men ($52,600) (p<.000). Women ($167,304) had lower median net worth than men ($203,800) ($p$<.000).[10]

More than half of men (52%) were working for pay whereas less than half of women were working for pay (40%) (p<.000). Approximately 37% of women and 35% of men were volunteering (p<.002). A larger percentage of women (44%) were attending religious services at least once a week than men (33%) (p<.000).

[10] To test for gender differences in household income and net worth, the mean of the logged household income and logged net worth measures were used.

The results continued to show that women had more health conditions (p<.000) and ADLs limitations (p<.000) than men. A larger percentage of women (26%) rated their own health as fair or poor compared to men (24%) (p<.004).

Descriptive Statistics by Race and Ethnicity among HRS Core Sample in 2008

Table 31 contains descriptive characteristics and difference in means tests by race and ethnicity. Similar to the findings from the 2006 sample, depression was lowest for Whites and highest for Hispanics: 18% Whites, 24% Blacks, 31% Hispanics, and 26% 'other race' respondents (p<.000). Respondents in the 'other race' group (62.7 years-old) were the youngest race and ethnic group, followed by Hispanics (63.0 years-old), Blacks (63.4 years-old), and Whites (65.7 years-old) (p<.000). Whites (65%) were most likely to be married and Blacks (38%) were least likely to be married (p<.000).

Whites had the highest number of school years completed and Hispanics had the fewest number of school years completed: Whites, 13.3 school years; Blacks, 12.0 school years; Hispanics, 9.4 school years, and 'other race', 12.7 school years (p<.000). The results also showed that median household income was highest for Whites and lowest for Hispanics: White, $48,003; Black, $23,365; Hispanic, $22,000; and 'other race', $42,755 ($p$<.000). Whites ($220,000) and 'other race' respondents ($109,000) had significantly higher net worth compared to Blacks ($42,595) and Hispanics ($53,217) (p<.000).[11]

From the index of health conditions (range 0-8), Blacks (2.16) had the highest average number of health conditions and Hispanics (1.81) had the least. Whites had an average of 1.92 health conditions and respondent in the 'other race' group had an average of 1.95

[11] To test for race and ethnic differences in household income and net worth, the mean of the logged household income and logged net worth measures were used.

health conditions (p<.000). Blacks also had the highest average of ADLs limitations and Whites had the fewest: Whites, 0.27; Blacks, 0.52; Hispanics, 0.45; and 'other race,' 0.32. Although Whites were the oldest race and ethnic group, a lower proportion of Whites rated their health as fair or poor: 22% White, 39% Black, 49% Hispanic, and 35% 'other race' (p<.000).

Descriptive Statistics among LBQ Sample in 2008

Table 32 displays descriptive characteristics of the LBQ sample, including the perceived mastery and stress variables. In addition, descriptive statistics are reported separately for non-attritors and deceased respondents that allow for comparisons between the two groups. Among non-attritors, 18% of the 2008 LBQ sample had depression. On average, the total LBQ sample was 64.9 years-old. The results again showed that deceased respondents (72.7 years-old) were significantly older than non-attritors (64.6 years-old) (p<.000). There were a larger proportion of women than men in the total LBQ sample, 54% and 46%, respectively. However, there were a larger proportion of men in who died compared to women. That is, among LBQ respondents who died between the 2006 and 2008 waves, there was larger proportion of male (52%) than female (48%) (p<.037). For the race and ethnic groups, the total LBQ sample consisted of 86% Whites, 7% Blacks, 5% Hispanics, and 2% respondents in the 'other race' group. The results continued to show that the non-attritors (67%) were more likely to be married than deceased respondents (54%) (p<.000).

Respondents in the total LBQ sample had a mean of 13.1 school years completed. Respondents who died had fewer school years completed than non-attritors, 12.2 and 13.1 school years, respectively. Among the total LBQ sample, the median household

income was $47,800. The median household income was lower among deceased respondents ($27,896) than non-attritors ($48,632) ($p$<.000). Among the total 2008 LBQ sample, the median net worth was $201,137. Deceased respondents ($129,937) also had lower median net worth than non-attritors ($204,906) ($p$<.000).[12]

Almost half, 48%, of the total sample reported working for pay. Deceased respondents (14%) were significantly less likely to be working for pay than non-attritors (49%) (p<.000). Deceased respondents (19%) were also less likely to be engaged in volunteering activities than non-attritors (39%) (p<.000).

The total LBQ sample had a mean of 1.86 health conditions and 0.26 ADLs limitations. The results continued to show, as expected, respondents who died had more health conditions (p<.000) and ADLs limitations (p<.000) than non-attritors. About 57% of deceased respondents and 21% of non-attritors rated their health as fair or poor (p<.000).

Concerning perceived mastery, respondents in the total LBQ sample had a mean score of 4.81. The results indicated that deceased respondents had lower levels of perceived mastery than non-attritors. For perceived mastery, respondents who died had a mean of 4.37 and non-attritors had a mean of 4.83 (p<.000). Deceased respondents also had more stress than non-attritors. The results indicated deceased respondents had 1.72 stressors and non-attritors had 1.31 stressors (p<.000).

Descriptive Statistics by Gender among LBQ Sample in 2008

Table 33 contains the descriptive characteristics and bivariate analyses by gender

[12] To test differences between non-attritors and deceased respondents in household income and net worth, the mean of the logged household income and logged net worth measures were used.

among the LBQ sample. The results continued to show that a significantly larger percentage of women (21%) had depression than men (16%) ($p<.000$). There were a significantly larger percentage of men (75%) who were married than women (59%) ($p<.000$).

The results again demonstrated women were lower on all three measures of SES than men. Women completed fewer years of education than men, 12.9 and 13.3 school years, respectively ($p<.000$). The median household income was lower for women ($40,557) than men ($56,000) ($p<.000$). Further, the results also showed that women ($191,452) had lower median net worth than men ($223,800) ($p<.002$).[13]

More than half, 55%, of men were working for pay. A lower percentage of women were working for pay (42%) ($p<.000$). The results again showed that a larger percentage of women (40%) were engaged in volunteering activities compared to men (36%) ($p<.003$).

Women consistently had more health conditions ($p<.000$) and ADLs limitations ($p<.000$) than men. There were no significant gender differences for self-rated health: 22% of men and 22% of women rated their health as fair or poor ($p=.486$). Among the LBQ sample, the results indicated women (4.79) had lower perceived mastery than men (4.85) ($p<.026$). In addition, women (1.45) had a higher number of stressors than men (1.17) ($p<.000$).

Descriptive Statistics by Race and Ethnicity among LBQ Sample in 2008

Next, Table 34 contains the descriptive characteristics and difference in means tests by

[13] To test for gender differences in household income and net worth, the mean of the logged household income and logged net worth measures were used.

race and ethnic group status among the LBQ sample. Consistent with previous results, depression was lowest for Whites and highest for Hispanics: 17% Whites, 23% Blacks, 31% Hispanics, and 23% respondents in the 'other race' group ($p<.000$).

The results repeatedly demonstrated that Whites were significantly higher in SES compared to minority race and ethnic groups. Hispanics had the fewest number of school years completed: Whites, 13.4 school years; Blacks, 12.0 school years; Hispanics, 10.1 school years; and 'other race', 12.9 school years ($p<.000$). Among members of the LBQ sample, Blacks had the lowest median household income: White, $50,741; Black, $25,094; Hispanic, $27,725; and 'other race', $50,000 ($p<.000$). For net worth, the results again showed that Whites and 'other race' respondents had substantially higher median net worth compared to Blacks and Hispanics: Whites, $235,000; Blacks, $48,000; Hispanics, $66,275; and 'other race', $191,708 ($p<.000$).[14]

For health conditions ($p<.000$), the results again showed Blacks (2.13) had the highest number of health conditions and Hispanics (1.77) had the fewest number of health conditions. Blacks (0.47) also had the highest mean for ADLs limitations ($p<.000$). The results again indicated that Hispanics had the largest percentage of respondents who rated their own health as fair or poor (41%). About 19% of Whites, 38% of Blacks, and 30% of 'other race' respondents rated their health as fair or poor ($p<.000$).

Concerning perceived mastery, there were no significant race and ethnic group differences in the mean levels of perceived mastery ($p=.238$). However, Whites had a higher mean for perceived mastery compared to minority race and ethnic groups: Whites,

[14] To test for race and ethnic differences in household income and net worth, the mean of the logged household income and logged net worth measures were used.

4.82; Blacks, 4.76; Hispanics, 4.75; and 'other race' 4.70. Similar to the 2006 LBQ sample, it was found that Whites had the fewest number of stressors and 'other race' respondents had the highest number of stressors: Whites, 1.31; Blacks, 1.34; Hispanics, 1.45; and 'other race' 1.70 ($p<.001$).

Regression Results: Main Effects of SES, Gender, Race, and Ethnicity

Depressed at Baseline Group

Table 35 shows the results of models that examined the main effects of SES, gender, race, and ethnicity on *depression recovery*. The coefficients for the longitudinal analyses are reported as relative risk ratios (RRR). The total sample size for this group was 3,506 respondents. Among respondents who were depressed at 2006 (baseline), there were 1,275 respondents who had no depression in 2008 (depression recovery) and 1,451 respondents who continued to have depression in 2008. As well, there were 780 respondents who died between waves.

In Model 1, education and wealth were related to depression recovery, with results showing the relative risk of recovering from depression over having depression increased with more school years and more net worth. The relative risk of recovering from depression relative to having depression increased by 7 percent for each additional school year completed, holding other SES factors constant (*RRR*=1.07, $p<.001$). Increases in net worth were related to increased likelihood of recovering from depression over continued depression (*RRR*=1.04, $p<.010$). The results indicated that more education and more net worth were related to an increased likelihood of recovering from depression. However, for death, the results also indicated that increased risk of death over continued depression was related to more education (*RRR*=1.03, $p<.050$) and more net worth (*RRR*=1.03,

p<.050), which was unexpected results considering that death is a worse outcome than continued depression.

In Model 2 with the addition of the gender and race-ethnicity variables, the results continued to show that respondents with more years of education (*RRR*=1.07, p<.001) and more net worth (*RRR*=1.04, p<.001) were more likely to recover from depression versus remaining depressed. The results suggested that females were more likely to recover from depression compared to males. The relative risk of recovering from depression relative to having depression increased by 26 percent for females than for males (*RRR*=1.26, p<.050). Concerning death, males had a higher relative risk of dying compared to females. The relative risk of dying relative to having depression decreased by 34 percent for females than for males (*RRR*=0.66, p<.001). Among race and ethnic groups, respondents in the 'other race' group and Hispanics were statistically different from Whites: the relative risk of dying over having depression was significantly lower for respondents in the 'other race' group (*RRR*=0.27, p<.010) and Hispanics (*RRR*=0.33, p<.001) compared to Whites, holding all factors in the model constant.

Model 3 added adjustments for sociodemographic variables: age and martial status. More education (*RRR*=1.08, p<.001) and more net worth (*RRR*=1.04, p<.010) continued to be related to increased depression recovery. The results also continued to show increased risk of death over continued depression was related to more years of education (*RRR*=1.08, p<.001). Regarding gender, the results continued to show there was an increased relative risk of recovering from depression for females (*RRR*=1.26, p<.050), while males had a significantly increased relative risk of death over continued depression (*RRR*=0.55, p<.001). For age, the relative risk of death over continued depression

increased by 9 percent for each additional year in age, holding other factors in the model constant (*RRR*=1.09, *p*<.001). For marital status, the results indicated that the risk of death over continued depression increased by 39% for married respondents compared to non-married respondents (*RRR*=1.39, *p*<.050).

In Model 4 with the addition of the social engagement variables, education (*RRR*=1.07, *p*<.001) and net worth (*RRR*=1.04, *p*<.010) remained significantly related to depression recovery. More years of education continued to be significantly related to increased risk of death over continued depression, which was an unexpected relationship (*RRR*=1.09, *p*<.01). The results continued to show the relative risk of recovering from depression over having depression increased for females than for males (*RRR*=1.26, *p*<.050), and males had increased relative risk of dying over having depression compared to females (*RRR*=0.54, *p*<.001).

Last, Model 5 added adjustments for health variables and is the full model for this current study. More years of education remained related to increased relative risk of depression recovery (*RRR*=1.05, *p*<.010) and net worth became insignificantly related to depression recovery. In this full model, the results continued to show the unexpected relationship of more years of education and increased relative risk of death over continued depression (*RRR*=1.08, *p*<.001). Concerning the health variables, recovering from depression relative to having depression decreased for each additional health condition (*RRR*=0.84, *p*<.001) and ADL limitation (*RRR*=0.88, *p*<.050). For self-rated health, recovering from depression relative to having depression decreased by 29 percent for respondents who reported fair or poor health than for respondents who reported

excellent, very good, or good health (*RRR*=0.71, *p*<.010). Concerning death, none of the health status variables were significantly related to death, which was unexpected.

In sum, education was the only SES indicator that remained significantly related to increased depression recovery in all five models. However, the results also indicated more years of education were related to increased relative risk of death over continued depression. Education, age, and male were associated with increased risk of death over continued depression. For the health status variables, none of the health variables were related to death, unexpectedly. Among the depressed group, the results did not show that more health conditions and poorer health status were related to increased relative risk of death, unexpectedly. The unexpected results for the education and health measures may be due to the unique sample of the depressed group- these respondents are depressed at baseline. So, one cannot necessarily expect the results to be the same compared to the general population.

Non-Depressed at Baseline Group

Table 36 shows the results of similar models for depression recovery, except the analyses were estimated among the non-depressed group – capturing the *onset of depression* since baseline (incidence models). The total sample size for this group was 11,908 respondents. Among respondents who were not depressed in 2006, there were 1,276 respondents who became depressed in 2008 (depression onset) and 9,852 respondents who were not depressed in both waves, 2006 and 2008. As well, there were 780 respondents who died between waves.

In Model 1, all three indicators of SES were related to depression onset, indicating the relative risk of depression onset over not having depression decreased for higher SES

(education, *RRR*=0.94, *p*<.001; household income, *RRR*=0.83, *p*<.001; net worth, *RRR*=0.95, *p*<.001). The death risk results for the non-depressed group at baseline compared to the depressed group at baseline are in line with expectations. The result indicated the risk of death decreases with more education (*RRR*=0.91, *p*<.001), more household income (*RRR*=0.79, *p*<.001), and more net worth (*RRR*=0.92, *p*<.001).

In Model 2, the results continued to show higher SES was related to decreased relative risk of depression onset over not having depression (education, *RRR*=0.93, *p*<.001; household income, *RRR*=0.84, *p*<.001; net worth, *RRR*=0.95, *p*<.001). The results continued to show that the risk of death over not having depression decreases with higher SES (education, *RRR*=0.88, *p*<.001; household income, *RRR*=0.77, *p*<.001; net worth, *RRR*=0.91, *p*<.001). The relative risk of depression onset relative to not having depression increased by 34 percent for females compared to males, holding other factors in the model constant (*RRR*=1.34, *p*<.001). There was no statistically significant relationship between race and ethnic group status and depression onset. However, the relative risk for death for Hispanics and Blacks were significantly different from Whites. The relative risk of dying relative to not having depression is decreased by 34 percent for Blacks (*RRR*=0.66, *p*<.010) and 70 percent for Hispanics (*RRR*=0.30, *p*<.001) compared to Whites.

In Model 3, the results continued to show that the relative risk of depression onset over not having depression decreased for all three SES indicators (education, *RRR*=0.93, *p*<.001; household income, *RRR*=0.87, *p*<.001; net worth, *RRR*=0.95, *p*<.001). In addition, the results continued to show the relative risk of depression onset was higher for females than for males, holding other factors in the model constant (*RRR*=1.31, *p*<.001).

Similar to the findings from Table 30, the relative risk of dying was higher among males than females (*RRR*=0.69, *p*<.001).

In Model 4 with the addition of social engagement variables, all three SES indicators (education, *RRR*=0.94, *p*<.001; household income, *RRR*=0.89, *p*<.001; net worth, *RRR*=0.96, *p*<.001) remained related to depression onset. Females were more likely to have higher relative risk of depression onset compared to males (*RRR*=1.32, *p*<.001), while males had a higher relative risk of dying compared to females (*RRR*=0.73, *p*<.001). The results continued to show that Hispanics were significantly different in the relative risk of death compared to Whites: the relative risk of dying relative to not having depression decreased by 44 percent for Hispanics than for Whites, holding other factors in the model constant (*RRR*=0.56, *p*<.010).

In Model 5, more years of education (*RRR*=0.96, *p*<.050) and more household income (*RRR*=0.91, *p*<.010) remained related to decreased relative risk of depression onset, while net worth became not significantly related to depression onset. Among the SES measures, only net worth remained related to death: the risk of death decreased with more net worth (*RRR*=0.94, *p*<.010). In the full model, the results continued to show that females have a higher relative risk of depression onset (*RRR*=1.31, *p*<.001), and males have a higher relative risk of death (*RRR*=0.65, *p*<.001). The results showed that an increasing number of health conditions (*RRR*=1.21, *p*<.001), more ADL limitations (*RRR*=1.25, *p*<.001), and poorer self-rated health (*RRR*=2.01, *p*<.001) were related to increased relative risk of depression onset over not having depression. In addition, all health status measures were significantly related to death, in the expected direction. More health conditions (*RRR*=1.32, *p*<.001) and more ADL limitations (*RRR*=1.58, *p*<.001) were related to

increased relative risk of death over not having depression. As well, respondents who rated their health as fair/poor had increased relative risk of death compared to respondents who rated their health as excellent/very good/good (*RRR*=3.13, $p<.001$).

In sum, more years of education and more household income were related to decreased risk of depression onset over not having depression at baseline in all five models. Contrary to the depressed group, the results did not indicate increased risk of death with more education among the non-depressed group. The results showed that females have a higher relative risk of depression onset over not having depression compared to males. Males have a higher relative risk of death compared to females. Concerning health status, all health variables were related to death in the expected direction in the full model. Among the non-depressed group, the results indicated that more health conditions and poorer health status were related to increased relative risk of death over not having depression at baseline, which were in the expected direction.

Among the non-depressed group, fewer years of education and more health conditions were related to increased risk of death. These results were in the expected directions while the results among the depressed group were in the unexpected directions. In the general population, most researchers consistently find that lower levels of education and more health conditions are related to increased risk of death. The results for risk of death among the non-depressed group may be more consistent with the general population compared to the depressed group.

Moderating Effects of Gender, Race, and Ethnicity

Depressed at Baseline Group

Table 37 displays the results of the estimated models that examine the moderating effects of gender and race-ethnic group status on the relationship between education and depression recovery among the depressed group (depression recovery). For the education by gender interactions terms, there were no statistically significant relationships in either model, without and with the inclusion of the household income and net worth variables. Concerning the education by race and ethnicity interaction terms, the results also suggested that there were no moderating effects of race and ethnic group status on the relationship between education and depression recovery.

Next, Table 38 shows the results for the household income by gender and household income by race and ethnicity interaction terms. The results suggested no statistical significance in gender moderating the relationship between household income and depression recovery in either model, without and with the inclusion of education and net worth. Regarding race and ethnic group status, the results also suggested that the household income by race and ethnicity interaction terms were not significantly related to depression recovery.

In Table 39, there was no statistical significance for the net worth by gender interaction terms. Concerning race and ethnic groups, net worth-Hispanic was statistically significant in both models, without (*RRR*=1.10, $p<.010$) and with (*RRR*=1.09, $p<.010$) the inclusion of education and household income.[15] With increasing net worth,

[15] Wald test did not indicate a statistically significant improvement in the fit of the model with the inclusion of interaction terms.

the differences in depression recovery between Hispanics and Whites were reduced.

Non-Depressed at Baseline Group

The same longitudinal models that examined the moderating effects of gender and race-ethnicity on the relationship between SES and depression were re-estimated among the non-depressed group (depression onset). As seen in Table 40, the results also showed no statistical significance in gender moderating the relationship between education and depression onset in either model, without and with the inclusion of household and net worth measures. In addition, the results also suggested there was no statistical significance in the education by race and ethnicity interaction terms.

In Table 41, the results indicated there was statistical significance in gender moderating the relationship between household income and depression onset in both models, without (*RRR*=1.11, $p<.050$) and with (*RRR*=1.11, $p<.050$) the inclusion of education and net worth.[16] These results indicated that with increasing household income for females, the difference in depression onset was reduced between females and males. There was no statistical significance in the household income by race and ethnicity interaction terms.

Table 42 demonstrates the results for the net worth by gender and net worth by race and ethnicity interactions. Net worth-female interaction was related to depression onset, without the inclusion of education and household income (*RRR*=1.05, $p<.010$). Gender differences in the risk of depression onset were significantly reduced with increasing net worth among females. The effect of net worth appears to depend on gender.[17] For race

[16] Wald test did not indicate a statistically significant improvement in the fit of the model with the inclusion of interaction terms.
[17] The results showed gender is not significant when net worth variable equals 0.

and ethnic groups, the results indicated there was statistical significance in Hispanic ethnicity moderating the relationship between net worth and depression onset, with the inclusion of education and net worth (*RRR*=1.09, *p*<.010).[18] The results suggested that more wealth was associated with increased risk of depression onset among Hispanics.

Mediation of Stress and Mastery among Total LBQ Sample

Depressed at Baseline Group

The statistical approach of the longitudinal analyses that examines the mediating effects of stress and perceived mastery on the relationship between SES and late-life depression recovery are similar to the cross-sectional analyses. The analyses also included examining mediating effects of stress and perceived mastery for gender and race-ethnic groups. First, linear regression models were estimated with stress and perceived mastery as the dependent variables. Next, three multinomial logistic regression models were estimated with depression recovery as the dependent variable.

Table 43 shows the results of the linear regression models with stress and perceived mastery as the dependent variable among the depressed group. Again, these analyses were restricted to respondents who completed the LBQ. The total sample size was 1,249. Among LBQ respondents who were depressed in 2006, there were 478 respondents who recovered from depression in 2008 (depression recovery) and 511 respondents who continued to have depression in 2008. As well, there were 260 LBQ respondents who died between waves.

Similar to the findings from the cross-sectional analyses (Table 22), the results

[18] Wald test did not indicate a statistically significant improvement in the fit of the model with the inclusion of interaction terms.

suggested that more years of education was related to higher stress: respondents with more years of education reported a higher number of stressors compared to respondents with fewer years of education (b=0.05, p<.010). These results were unexpected as previous studies have found that more years of education was related to lower stress. Education was also significantly related to perceived mastery and the relationship was negative: respondents with more years of education reported lower levels of perceived mastery than respondents with fewer years of education (b=-0.03, p<.050).

Among those who were depressed at baseline, the results for household income and net worth were consistent with previous studies showing higher SES was related to lower levels of stress. Respondents with more household income (b=-0.11, p<.050) and more net worth (b=-0.05, p<.001) had significantly fewer stressors compared to respondents with lower household income and lower net worth. Household income and net worth also were significantly related to perceived mastery. Consistent with previous studies, more household income (b=0.08, p<.050) and net worth (b=0.03, p<.001) were related to higher levels of perceived mastery.

There were significant gender differences with females having higher stress than males (b=0.29, p<.010). For race and ethnic groups, Hispanic was the only group significantly different in stress from Whites, with results indicating Hispanics had lower stress compared to Whites (b=-0.44, p<.050). Regarding perceived mastery, Blacks and Hispanics were significantly different from Whites and the relationship was positive, indicating Blacks (b=0.33, p<.05) and Hispanics (b=0.41, p<.010) had higher levels of perceived mastery compared to Whites.

Next, Table 44 shows the results of three multinomial logistic regression models with

depression recovery as the dependent variable. The three models are part of the analyses that examine whether stress and perceived mastery mediate the relationship between SES and depression recovery. In the first model without the inclusion of stress and perceived mastery, the results indicated that none of the SES variables were related to depression recovery. There also were no gender differences in depression recovery. Concerning death, the relative risk of dying over having depression was lower for females than for males (*RRR*=0.51, *p*<.001). Blacks were the only race and ethnic group that was statistically different in depression recovery from Whites. The results indicated that the relative risk of recovering from depression over having depression was higher for Blacks than Whites (*RRR*=1.71, *p*<.050), holding constant the other variables. Respondents from the 'other race' group (*RRR*=0.17, *p*<.050) and Hispanics (*RRR*=0.45, *p*<.050) had decreased relative risk of dying over having depression compared to Whites.

With the addition of stress in the model, all three SES variables remained insignificantly related to depression recovery. Results continued to show that males were more likely to have higher relative risk of dying over having depression compared to females (*RRR*=0.54, *p*<.010). Blacks became not significantly different in depression recovery compared to Whites. Stress was statistically significant: the relative risk of recovering from depression relative to having depression decreased by 17 percent for each additional number of stressor, holding other factors in the model constant (*RRR*=0.83, *p*<.001).

The third model included the perceived mastery variable. Education was the only SES measure that became significantly related to depression recovery, indicating more years of education was related to increased relative risk of depression recovery. The relative

risk of recovering from depression relative to having depression increased by 7 percent for each additional school year completed, holding other factors in the model constant (*RRR*=1.07, *p*<.050). Additionally, similar to the results from the HRS core sample (Table 35), the results among the LBQ sample also show that more years of education was associated with increased risk of death over continued depression, which is an unexpected relationship (*RRR*=1.07, *p*<.050). More stress remained related to decreased relative risk of recovering from depression (*RRR*=0.85, *p*<.010). Perceived mastery also was significantly related to depression recovery: the relative risk ratio of 1.18 suggests that for each unit increase in perceived mastery, the relative risk of recovering from depression relative to having depression increased by 18 percent, holding other factors in the model constant (*p*<.050). Consistent with the HRS core sample (Table 35), health and functional status variables were not associated with increased risk of death over continued depression. Again, it may be that the unexpected results were due to the unique sample of the depressed group –who are not representative of the general population.

The results from Table 43 and Table 44 were used to examine whether stress and perceived mastery mediate the relationship between SES and depression recovery. Similar to the analyses performed with the cross-sectional sample, the analyses consisted of examining whether SES variables and other variables of interest (specifically, gender and race-ethnicity) were significantly related to stress or perceived mastery (mediating variables) in Table 43. Then, the analyses consisted of examining whether the SES variables were related to depression recovery in Table 44.

In Table 42, education was significantly related to both stress and perceived mastery.

The unexpected results indicated that more years of education was related to more stress and lower levels of perceived mastery. In Table 44, more years of education was significantly related to increased relative risk of recovering from depression with the addition of stress and perceived mastery variables in the model. From the evaluation of these regression models, the results showed no evidence of stress or perceived mastery mediating the relationship between education and depression recovery.

For household income, there were significant relationships with both stress and perceived mastery (Table 43). In Table 44, household income was not significantly related to depression recovery in all three models, which suggested no mediating effects. That is, the psychosocial variables did not mediate the relationship between household income and depression recovery. Concerning wealth, net worth was significantly related to both stress and perceived mastery (Table 43). However, there were no significant relationships between net worth and depression recovery in all three models in Table 44. These results also suggested that mediation was not occurring in the relationship between net worth and depression recovery, since wealth was not related to depression recovery in all three models.

With regard to gender, there were significant gender differences, with females having higher stress compared to males (Table 43). In Table 44, there were no significant gender differences in depression recovery. These results also did not show evidence of mediation. Among race and ethnicity groups, the results suggested that Blacks have significantly lower stress and higher perceived mastery compared to Whites (Table 43). In Table 44 when stress and perceived mastery were excluded from the regression, Blacks had significantly higher odds of recovering from depression than Whites. In the

expanded regression with the inclusion the psychosocial variables, the coefficient for Blacks were not significant. This indicates that stress and perceived mastery mediate the relationship between Black groups status and depression recovery.

Non-Depressed at Baseline Group

Table 45 shows the results of the linear regression models including stress and perceived mastery as the dependent variables for respondents who were not depressed at baseline (2006). The total sample size was 4,953. Among LBQ respondents who were not depressed in 2006, there were 516 respondents who had depression in 2008 (onset of depression) and 4,177 respondents who continued to not have depression in 2008. As well, there were 260 LBQ respondents who died between waves. The results again suggested that respondents with more years of education reported a higher number of stressors compared to respondents with fewer years of education (b=0.02, p<.010). Education was not significantly related to perceived mastery. Household income was not significantly related to stress or perceived mastery. There was statistical significance for net worth, with the results showing more net worth was related to fewer stressors (b=-0.04, p<.001). Net worth was also significantly related to perceived mastery, indicating more net worth was related to higher levels of perceived mastery (b=0.01, p<.050).

Females had more stressors compared to males (b=0.26, p<.001). There were no gender differences for perceived mastery. For race and ethnic groups, Blacks was the only group significantly different from Whites, with results indicating lower stress among Blacks compared to Whites (b=-0.32, p<.001). There were no statistically significant relationships among race and ethnic group status and perceived mastery.

Next, Table 46 displays the results of the three multinomial logistic regression models

with depression onset as the dependent variable. Among respondents who were not depressed at baseline, household income was the only SES measure that was significantly related to depression onset in the first model. The results indicated that increases in household income were related to decreased likelihood of depression onset (*RRR*=0.87; *p*<.010). Consistent with the results reported earlier, females had higher relative risk of depression onset compared to males (*RRR*=1.34, *p*<.050) and males had higher relative risk of dying over not having depression compared to females (*RRR*=0.59, *p*<.010). There was no statistically significant relationship between race and ethnicity group status and depression onset.

With the addition of the stress variable, more household income continued to be significantly related to decreased relative risk of depression onset (*RRR*=0.88, *p*<.010). The higher relative risk of depression onset for females became not significant. However, the results continued to show that males had an increased relative risk of dying over not having depression (*RRR*=0.53, *p*<.001). Stress was related to depression onset: the relative risk ratio of 1.34 suggests that for each increase in the number of stressors, the relative risk of depression onset relative to not having depression increased by 34 percent, holding other factors in the model constant (*p*<.001). The results also showed that the relative risk of dying over not having depression increased 39 percent for each additional stressor (*RRR*=1.39, *p*<.001).

With the addition of the perceived mastery variable in the model, more household income remained related to lower relative risk of depression onset (*RRR*=0.88, *p*<.010). Gender and race-ethnic group status were not significantly related to depression onset. More stress continued to be related to higher relative risk of depression onset (*RRR*=1.32,

p<.001) and death (*RRR*=1.36, *p*<.001). Higher levels of perceived mastery were significantly related to lower relative risk of depression onset: the relative risk of depression onset relative to not having depression decreased by 17 percent for each additional increase in perceived mastery, holding other factors in the model constant (*RRR*=0.82, *p*<.001). For death, the relative risk of dying over not having depression decreased by 20 percent for each additional increase in perceived mastery (*RRR*=0.80, *p*<.010). Concerning health measures, the relationship among the health status variables and death were in the expected directions. More health conditions (*RRR*=1.31, *p*<.001), more ADLs limitations (*RRR*=1.57, *p*<.001), and poorer self-rated health (*RRR*=2.96, *p*<.001) were related to increased risk of death.

The results from Table 45 and Table 46 were used to examine whether stress and perceived mastery mediate the relationship between SES and depression onset. There was no evidence that either stress or perceived mastery mediated the relationship in all three SES variables (education, income, and wealth) and depression onset.

With regard to gender, there were significant gender differences with females having higher stress compared to males (Table 45). In Table 46, females had significantly higher relative risk of depression onset than males in the first model without the inclusion of the psychosocial variables. In the expanded regression models that included the psychosocial variables, the coefficient for the relationship between gender and depression onset was no longer significant. This suggested that stress mediated the relationship between females and depression onset.

Among race and ethnic groups, the results suggested that Blacks had significantly lower stress compared to Whites (Table 45). In the first model without the psychosocial

variables of Table 46, Blacks had significantly lower relative risk of dying compared to Whites. This may be evidence of mortality selectivity, whereby only the most robust Blacks live to old age- sometimes called the Black-White mortality cross-over. When stress was added to the models, the relationship between Black and death was no longer significant. The results were suggestive that stress mediated the relationship between race and the risk of death.

Mediation of Stress and Mastery for Gender, Race, and Ethnic Groups

Depressed at Baseline Group

Multinomial regression models were estimated to examine the effects of gender-race-ethnic group status on depression recovery. Similar to the cross-sectional analyses, intersectionality analyses were estimated for the six gender-race-ethnic subgroups (White males, White females, Black males, Black females, Hispanic males, and Hispanic females), with White males serving as the reference group. Respondents in the 'other race' group were excluded for these intersectionality analyses due to small sample sizes.

Table 47 displays the intersectionality results for respondents who were depressed at baseline (2006). In the unadjusted model (does not include any covariates specified in this current study), Hispanic females were the only group that was significantly different in depression recovery from White males. The results indicated that Hispanic females had a lower relative risk of recovering from depression compared to White males: the relative risk ratio of 0.63 suggests that the relative risk of recovering from depression relative to having depression at baseline decreased by 37 percent for Hispanic females compared to White males ($p<.001$). Regarding death, all groups were significantly different from White males, with results suggesting that there was lower relative risk of

dying over having depression compared to White males: White females (*RRR*=0.66, *p*<.001), Black males (*RRR*=0.53, *p*<.050), Black females (*RRR*=0.62, *p*<.010), Hispanic males (*RRR*=0.42, *p*<.050), and Hispanic females (*RRR*=0.19, *p*<.001).

In the adjusted model (including all covariates), the coefficients for Hispanic females became insignificant. White females and Black females became significantly related to depression recovery compared to White males, with results indicating that White females and Black females had increased likelihood of recovering from depression relative to having depression compared to White males. The relative risk ratio of 1.34 suggests that the relative risk of recovering from depression relative to having depression increased by 34 percent for White females than for White males (*p*<.050). The relative risk ratio of 2.14 suggests that the relative risk of recovering from depression relative to having depression increased by 114 percent for Black females than for White males, holding other factors in the model constant (*p*<.001).

Concerning death, White females and Hispanic females were the only gender and race-ethnic groups that remained related to death in the adjusted model. The results continued to show that White females (*RRR*=0.53, *p*<.001) and Hispanic females (*RRR*=0.31, *p*<.001) had lower relative risk of dying over having depression compared to White males.

Next, Table 48 displays the results of the intersectionality analyses with the smaller LBQ sample with the addition of stress and perceived mastery in the models. Similar to the cross-sectional analyses, the first models excluded the stress and perceived mastery variables and the second set of models included the addition of the psychosocial variables. In the unadjusted model (does not include any covariates) without the inclusion of stress

and perceived mastery, Hispanic female was the only group that was less likely to recover from depression compared to White males (*RRR*=0.46, *p*<.050). Consistent with the results from the HRS core wave reported above, White females (*RRR*=0.59, *p*<.050) and Hispanic females (*RRR*=0.15, *p*<.001) had lower relative risks of dying over having depression compared to White males.

In the adjusted model (including all covariates), Hispanic females were not significantly different in depression recovery from White males, while Black females became significant. The results indicated that Black females had higher relative risk of recovering from depression compared to White males (*RRR*=2.81, *p*<.001). Again, the results continued to show White females (*RRR*=0.48, *p*<.010) and Hispanic females (*RRR*=0.22, *p*<.010) had lower relative risk of dying over having depression compared to White males.

In the second set of models with the inclusion of the stress and perceived mastery variables, the results indicated that Hispanic female was the only group who had lower relative risk of recovering from depression compared to White males in the unadjusted model (*RRR*=0.41, *p*<.050). There was a lower relative risk of death for White females (*RRR*=0.63, *p*<.050), Hispanic males (*RRR*=0.39, *p*<.050), and Hispanic females (*RRR*=0.13, *p*<.001) compared to White males. Both psychosocial variables, stress and perceived mastery, were significantly related to depression recovery. The results indicated that the relative risk of recovering from depression relative to having depression decreased by about 21 percent for each additional stressor (*RRR*=0.79, *p*<.001). The relative risk ratio of 1.31 suggests that for each increase in perceived mastery, the relative risk of recovering from depression over having depression increases by 31 percent

(p<.001).

In the adjusted model (includes all covariates), the coefficient for Hispanic females became insignificantly related to depression recovery. White females and Black females became significant, with results suggesting White females (*RRR*=1.54, p<.050) and Black females (*RRR*=2.53, p<.010) had higher relative risk of recovering from depression compared to White males. For death, White females (*RRR*=0.51, p<.010) and Hispanic females (*RRR*=0.19, p<.010) continued to have lower relative risk of death compared to White males. Stress and perceived mastery remained statistically significant, with results demonstrating lower stress (*RRR*=0.83, p<.010) and higher perceived mastery (*RRR*=1.22, p<.010) were related to increased relative risk of recovering from depression over having depression, holding other factors in the model constant.

Similar to the cross-sectional analyses, a series of regression models were estimated to examine the mediating effects of stress and perceived mastery between SES and depression recovery for each specific gender and race-ethnic group among the longitudinal sample. Model 1 included the control variables specified in this study, without the inclusion of stress and perceived mastery. Model 2 added stress. Model 3 includes both stress and perceived mastery. By adding stress and perceived mastery to the model, I examined whether these psychosocial variables mediate the relationship between SES and depression recovery. The sample sizes are small among respondents who were depressed at baseline. These analyses were estimated without the SVY option in Stata due to a large number of small sized PSUs (1 or 0 respondents in these areas). However, the analyses were estimated with weighted data. The results should be interpreted in light of these small sample sizes.

Table 49a shows results for White males (*n*=352). In the first model without the inclusion of the stress and perceived mastery variables, net worth was the only SES measure that was related to depression recovery. Increases in net worth were associated with increased likelihood of recovering from depression (*RRR*=1.41, *p*<.050). With the addition of stress and perceived mastery in the models, net worth became insignificantly related to depression recovery. The results indicated that stress and perceived mastery were not significantly related to depression recovery for White males. From the evaluation of these regression models, the results showed no evidence of stress or perceived mastery mediating the relationship between any of the SES measures and depression recovery for White males.

Table 49b displays the results for White females (*n*=576). In the first model, education was the only SES measure that was related to depression recovery. The results showed that more years of education was related to increased relative risk of recovering from depression (*RRR*=1.14, *p*<.010). With the addition of the stress variable in the model, the relationship between education and depression recovery remained statistically significant (*RRR*=1.18, *p*<.010). Stress was also statistically significantly related to depression recovery, with results showing the relative risk of recovering from depression decreased by 22 percent for each additional number of stressors (*RRR*=0.78, *p*<.010). With the inclusion of perceived mastery in the model, the relationship between more years of education and increased relative risk of depression recovery remained statistically significant (*RRR*=1.19, *p*<.001). The results are suggestive that the psychosocial variables are not mediating the relationship between SES and depression recovery for White females.

For Black males (n=50), the results showed no statistical significance in the relationship between education and depression recovery (Table 49c). The results showed that household income was related to depression recovery for Black males: increases in income were related to increased likelihood of recovering from depression (*RRR*=2.17, p<.050). Net worth was statistically significant however the results were unexpected, suggesting that more net worth was related to decreased relative risk of recovering from depression (*RRR*=0.62, p<.050). Results should be interpreted with caution given the small sample size.

With the inclusion of stress and perceived mastery, household income became insignificantly related to depression recovery. The results continued to suggest that more net worth was related to lower relative risk of recovering from depression for Black males (*RRR*=0.60, p<.050). The coefficient for stress became statistically significant when perceived mastery was added into the model. Unexpectedly, the relative risk ratio of 0.25 suggests that for each additional stressor, the relative risk of recovering from depression relative to having depression is expected to decrease by 75 percent, holding other factors constant (p<.050). The results are suggestive that the psychosocial variables are not mediating the relationship between SES and depression recovery for Black males.

For Black females (n= 116), none of the SES measures were significantly related to depression recovery in the first model (Table 49d). Concerning death, the results indicated that more years of education were related to higher relative risk of dying over having depression for Black females (*RRR*=1.36, p<.010). The unexpected relationship between more years of education and increased relative risk of death was consistent in all three models, with the addition of the stress and perceived mastery variables. Again,

results should be interpreted with caution given the small sample size. Stress was significantly related to depression recovery for Black females while there was no significant relationship between perceived mastery and depression recovery. From the evaluation of these regression models, the results showed no evidence of stress or perceived mastery mediating the relationship between the SES measures and depression recovery.

Table 49e shows the results for Hispanic males (n=48). None of the three SES measures were significantly related to depression recovery in all models, thus there were no mediating effects. Further, the coefficient for stress and perceived mastery were not related to depression recovery.

Last, the results for Hispanic females (n=79) are reported in Table 49f. In the first model, all three SES measures were significantly related to depression recovery. For school years, the unexpected results suggested that more years of education were related to lower relative risk of recovering from depression, holding other factors in the model constant (*RRR*=0.74, p<.001). The results for household income and net worth were consistent to previous literature, with results indicating more household income (*RRR*=1.40, p<.050) and more net worth (*RRR*=1.27, p<.050) were related to higher relative risk of recovering from depression over having depression. Small sample size limits confidence in these results, as well.

In Model 3 with the addition of both stress and perceived mastery in the models, the three SES variables remained statistically significant indicating fewer years of education (*RRR*=0.74, p<.010), more household income (*RRR*=1.36, p<.050), and more net worth (*RRR*=1.28, p<.050) were related to higher relative risk of depression recovery. For

Hispanics females, the results also did not show evidence of mediation.

Non-Depressed at Baseline Group

Table 50 displays the results for the intersectional analyses among respondents who were not depressed at baseline (2006) among the HRS core wave. In the unadjusted model (does not include covariates), all gender and race-ethnic groups except Hispanic males had a higher relative risk of depression onset over not having depression compared to White males: White females (*RRR*=1.47, $p<.001$), Black males (*RRR*=1.47, $p<.050$), Black females (*RRR*=2.02, $p<.001$), and Hispanic females (*RRR*=2.17, $p<.001$). Hispanic females had the highest relative risk of depression onset compared to White males: the relative risk of depression onset over not having depression increased by 117 percent for Hispanic females than for White males. There were no statistical significant relationships among the gender-race-ethnic groups and death in the unadjusted model.

In the adjusted model (includes all covariates), White female was the only group that remained significantly different in depression onset from White males, with results indicating White females had increased relative risk of depression onset compared to White males (*RRR*=1.36, $p<.001$). Gender-race-ethnic group status became significantly related to death in the adjusted model. That is, compared to White males, the relative risk of dying over not having depression was significantly lower for all groups except Hispanic males: White females (*RRR*=0.65, $p<.001$), Black males (*RRR*=0.62, $p<.050$), Black females (*RRR*=0.49, $p<.001$), and Hispanic females (*RRR*=0.42, $p<.010$), holding other factors in the model constant.

Next, Table 51 displays the results of intersectionality analyses for the smaller LBQ sample with the addition of stress and perceived mastery. In the first set of models

without the stress and perceived mastery variables, White females (*RRR*=1.60, *p*<.001), Black females (*RRR*=2.19, *p*<.001), and Hispanic females (*RRR*=2.27, *p*<.010) had significantly higher relative risk of depression onset compared to White males. There were no statistically significant relationships among gender-race-ethnic group status and death.

In the adjusted model (includes all covariates), White female was the only group that continued to have higher relative risk of depression onset compared to White males (*RRR*=1.47, *p*<.010). For death, White females (*RRR*=0.59, *p*<.010) and Black females (*RRR*=0.34, *p*<.010) became statistically significantly in having lower relative risk of death compared to White males.

The second set of models included the stress and perceived mastery variables. In the unadjusted model, White females (*RRR*=1.44, *p*<.010), Black females (*RRR*=2.04, *p*<.010), and Hispanic females (*RRR*=2.06, *p*<.050) remained significant in having higher relative risk of depression onset compared to White males. The coefficients for stress and perceived mastery were significantly related to depression onset. The relative risk of depression onset over not having depression increased for more stress (*RRR*=1.39, *p*<.001) and lower perceived mastery (*RRR*=0.77, *p*<.001). The results also indicated the relative risk of death significantly increased for more stress (*RRR*=1.37, *p*<.001) and lower perceived mastery (*RRR*=0.65, *p*<.001).

In the adjusted model (includes all covariates), White females was the only group that remained statistically significant in having higher relative risk of depression onset compared to White males (*RRR*=1.32, *p*<.050). Further, the relative risk of dying over not having depression decreased by about 47 percent for White females (*RRR*=0.53,

p<.001) and 66 percent for Black females (*RRR*=0.34, *p*<.050) compared to White males. Last, the results continued to show more stress (*RRR*=1.32, *p*<.001) and lower perceived mastery (*RRR*=0.82, *p*<.001) were related to higher relative risk of depression onset. The results also continued to show that stress (*RRR*=1.36, *p*<.001) and perceived mastery (*RRR*=0.80, *p*<.010) was significantly related to death.

Tables 52a to 52f show the results of the analyses on stress and perceived mastery mediating the relationship between SES and depression onset for the six gender and race-ethnic groups among the non-depressed group. Table 52a displays the results for White males (*n*=1,837). None of the SES measures were significantly related to depression onset in any of the models. Stress was related to depression onset: the relative risk ratio of 1.34 suggests that for each additional number of stressors, the relative risk of depression onset relative to not having depression is increased by 34 percent, holding other factors in the model constant (*p*<.001). Perceived mastery also was statistically significant, with results indicating that higher levels of perceived mastery was related to lower relative risk of depression onset (*RRR*=0.77, *p*<.050). From the evaluation of these regression models, none of the SES measures were statistically significant to depression onset. Thus, the results showed no evidence of stress or perceived mastery mediating the relationship between the SES measures and depression onset for White males.

For White females (*n*=2,205), the coefficients for the three SES measures were also not significantly related to depression onset in any of the models (Table 52b). More stress was significantly related to increased relative risk of depression onset (*RRR*=1.32, *p*<.001). In addition, the results showed that higher levels of perceived mastery was significantly related to lower relative risk of depression onset over not having depression

(*RRR*=0.82, *p*<.010). The results also did not meet the criteria for mediation since SES was not related to depression onset among White females.

Table 52c shows the results for Black males (*n*=195). In the first model without the inclusion of the psychosocial variables, there was no statistically significant relationship between education and depression onset for Black males. More household income (*RRR*=0.58, *p*<.050) and more net worth (*RRR*=0.83, *p*<.010) were related to decreased relative risk of depression onset over not having depression. In addition, the results indicated that increases in household income were related to decreased relative risk of death over not having depression (*RRR*=0.52, *p*<.050). Also, increases in net worth were related to decreased risk of death (*RRR*=0.79, *p*<.010).

In Model 2 with the addition of the stress variable, more household income remained related to lower relative risk of depression onset (*RRR*=0.55, *p*<.010) while net worth became insignificant. Concerning death, the results continued to show that more household income (*RRR*=0.51, *p*<.050) and more net worth (*RRR*=0.82, *p*<.050) was significantly related to decreased relative risk of dying over not having depression for Black males. Stress was related to depression onset: the relative risk of depression onset relative to not having depression increased by 66 percent for each additional number of stressors, holding other factors in the model constant (*RRR*=1.66, *p*<.050). Further, the results showed that higher stress was significantly related to increased relative risk of death among Black males (*RRR*=2.08, *p*<.010).

In Model 3 with the addition of the perceived mastery variable, household income remained related to depression onset (*RRR*=0.55, *p*<.010). Also, more stress remained related to increased relative risk of depression onset (*RRR*=1.68, *p*<.050) and death

(*RRR*=2.15, *p*<.001). The results showed no statistically significant relationship between perceived mastery and depression onset for Black males. From the regression models, the results suggested that stress mediates the relationship between net worth and depression onset for Black males. Net worth was statistically significant in Model 1 without the inclusion of the stress variable. In the expanded model with the stress variable (Models 2 and 3), net worth was no longer significant.

For Black females (*n*=348), all three SES measures were not significantly related to depression onset in any of the models (Table 52d). Similar to Black males, more stress was related to higher increased relative risk of both depression onset and death for Black females. The relative risk of depression onset relative to not having depression increased by 33 percent for each additional number of stress, holding other factors in the model constant (*RRR*=1.33, *p*<.050). For death, the relative risk of dying over not having depression increased by about 65 percent (*RRR*=1.65, *p*<.001). The results did not meet the criteria for mediation since SES was not related to depression onset.

Among Hispanic males (*n*=136), household income was the only SES measure that was related to depression onset (Table 52e). In all three models, increases in household income were related to decreased likelihood of depression onset (*RRR*=0.53, *p*<.001). In addition, in all three models, the results also showed that increases in net worth were related to decreased relative risk of death over not having depression (*RRR*=0.68, *p*<.001). More stress was significantly related to increased relative risk of depression onset for Hispanic males (*RRR*=1.72, *p*<.050). According to the conditions for testing mediation, the results indicated no evidence of stress or perceived mastery mediating the relationship between SES and depression onset for Hispanic males.

Table 52f displays results for Hispanic females (n=150). All three SES measures were not significantly related to depression onset in any of the models. Stress and perceived mastery also were not significantly related to depression onset for Hispanic females. The results did not meet the criteria for mediation since SES as well as the psychosocial measures were not related to depression onset.

CHAPTER 7

DISCUSSION

The central objective of this study was to examine gender and race-ethnic differences in the effects of education on late-life depression. This study differentiated education from other measures of SES, specifically household income and net worth, due to the intrinsic resources developed through schooling. Education aims to develop skills, knowledge, and behaviors that encourage persons to have stronger perceived mastery in their lives (Reynolds & Ross, 1998; Ross & Mirowsky, 2006).

With regard to older adults, obtaining higher levels of an early formal education is hypothesized to increase perceived mastery throughout the life course and result in lower levels of stress, influencing psychological well-being in later life. Thus, this study examined the mediating effects of perceived mastery as well as stress in the relationship between SES and late-life depression with attention to education. Partly due to historical inequalities, the current cohort of older women and minority race and ethnic groups were disadvantaged due to limited opportunities in accessing higher levels of education. They may have lower levels of perceived mastery and not be well-equipped when confronting adverse circumstances and the demands of life that increase depression.

To address the central objective of this study, the larger HRS core sample was used to examine the moderating effects of gender and race-ethnic group status on the relationship

between SES and late-life depression. Models using the smaller LBQ sample were estimated to address the mediating effects of perceived mastery and stress in the SES-depression relationship.

The Stress Process Paradigm was the conceptual framework used for this study. The Stress Process Paradigm identifies perceived mastery as an important psychosocial resource for psychological well-being. The Stress Process Paradigm includes elements of Ross and Mirowsky's (2006) Resource Substitution and Resource Multiplication hypotheses. Ross and Mirowsky's hypotheses were used to examine whether education improves psychological well-being more for disadvantaged or advantaged groups. Using Ross and Mirowsky's hypotheses, this current study examined if education's beneficial effect on depression has greater importance for disadvantaged groups, supporting the Resource Substitution hypothesis not the Resource Multiplication hypothesis. Obtaining higher levels of education may be felt more dramatically by disadvantaged groups who more likely encountered some form of gender or race and ethnic inequalities. To reiterate, the research objectives of this study were to:

1) Examine the main effects of SES, gender, race, and ethnicity on late-life depression;

2) Examine if the relationship between SES and late-life depression is moderated by gender, race, and ethnic group status;

3) Examine whether perceived mastery and stress mediate the relationship between SES and late-life depression for the total sample;

4) Evaluate the mediating effects of perceived mastery and stress in the relationship between SES and late-life depression for each specific gender, race, and ethnic group.

Main Effects of SES, Gender, Race, and Ethnicity

The cross-sectional analyses reported above allowed me to address the guiding research questions for the prevalence of depression. The longitudinal analyses address the same questions for the incidence of depression (including the incidence of onset of depression and recovery from depression). To accomplish this, I first examined respondents who were depressed at baseline.

For the cross-sectional analyses, the results supported that higher SES is related to decreased odds of late-life depression. However, education and net worth had a more robust relationship with depression than household income. The results indicated that respondents' education and net worth remained statistically significant in all five models, while household income was significant in all models except in the full model, where health conditions were included. These results showed there is an association between lower SES and higher prevalence of depression (e.g., Kahn & Pearlin, 2006; Lorant et al., 2003; Lynch et al., 1997; Miech & Shanahan, 2000). Depression is higher among older adults in lower SES positions where there are more financial hardships and psychological distress. In contrast, persons higher in SES are less likely to experience the challenges and difficulties of financial hardships that increase depression.

The longitudinal analyses showed that education was the only SES indicator that remained significantly related to depression recovery in all five models (depression recovery model). Among depressed respondents, more years of education was related to increased likelihood of recovering from depression. However, the results also indicated that increases in education were associated with increased risk of death, which was an unexpected relationship. Additional analyses were done to examine the unexpected

relationships for education and health measures on increased risk of death among the depressed group. The additional analysis consisted of estimating unadjusted bivariate regression models for the education and health measures with death as the dependent variable (1=died, 0=alive). Among the depressed group, 22% were attritors. The additional analyses were done to examine if the direction and significance levels of the education and health measures were the same as for the full model. For education, the results of the unadjusted bivariate model suggested there was no statistical significant relationship between school years and death (p=.864). Concerning health measures, the results indicated that all health measures were significantly related to increased likelihood of death in the expected direction. More health conditions (p<.001), more ADLs limitations (p<.001), poorer self-rated health (p<.050), and rarely engaging in exercise (p<.001) were related to increased likelihood of death.

Next, I examined models among respondents who were not depressed at baseline (onset of depression model). That is, I wanted to examine whether non-depressed respondents higher in SES were less likely to report depression two years later. The results indicated that more years of education and more household income were significantly related to decreased risk of depression onset in all five models. More net worth was related to decreased likelihood of depression onset, except in the full model. Regarding death, the results were more reasonable among the non-depressed group: there was no indication that more years of education was related to increased risk of death.

Overall, the results indicated that education was the only SES measure consistently related to depression both cross-sectionally and longitudinally. The pattern suggested that the benefits of education may have a more significant effect on psychological well-

being than household income and net worth. In all estimated models, the results of this current study repeatedly indicated that more years of schooling was related to decreased depression, while household income and net worth were statistically significant in only some models.

Education remained significant after controlling for income and wealth. This suggests that education is more than just a proxy for SES but rather may also be indicative of skills that allow people to recover from or avoid depression (depression recovery or onset of depression). Though it is well established that education is a valid indicator for SES, education also provides intrinsic resources that are not of monetary value. Unlike the monetary resources of income and wealth, education encourages persons to analyze and solve problems that are relevant to psychological well-being (Ross & Mirowsky, 2006). Obtaining more years of education represents accumulated knowledge, competence, skills, and behaviors developed through schooling (Ross & Mirowsky, 2006). More education may help develop a greater sense of perceived mastery. The results of this current study supported the hypothesis that obtaining higher levels of an early formal education has a negative relationship with depression in later life, and problem-solving and coping strategies may be improved for those with more education. Persons who obtained higher levels of education may possess more intrinsic problem-solving resources when confronted with adverse circumstances throughout the life course, thus recovering from depression or avoiding the onset of depression in later life.

For gender, the cross-sectional results of this study repeatedly showed there are gender differences in depression, with older women having significantly higher odds of depression than older men. Gender was also consistently significant in all longitudinal

models. Among depressed older females, the results indicated that women were more likely to recover from depression than men. This relationship was counter-intuitive, as it was hypothesized that women are more likely to experience depression. However, for depression onset, the results showed that females had an increased risk of depression onset compared to males. Men had significantly higher risk of death compared to women, in both the depression recovery and onset analyses. Death may contribute for the female advantage of higher depression recovery—men have higher relative risk of death than women. Among the U.S. population as a whole, demographic characteristics indicate that men have a shorter life expectancy than women (U.S. Census Bureau, 2012). Therefore, the results may indicate that depressed older women are more likely to recover from depression than men, while men are more at risk of death. Further, previous studies have also shown that older men suffering from depression have a higher mortality risk than older women experiencing depression (Schoevers et al, 2000). Schoevers et al. (2000) found that depression increases mortality for both older men and women, however older men were more at risk of death than older women.

In sum, the results of this current study demonstrated that older women are more likely to experience depression than older men. From the descriptive statistics, older women also were consistently lower in all measures of SES compared to men (education, income, and wealth). Of note, gender was still significant after controlling for SES and had a stronger effect. There appears to be other factors (not reported in this study) that may also contribute to gender differences in depression. Women have a longer life expectancy then men. One can speculate that women who outlive their spouses are more susceptible to depression because their social network size shrinks. This current study

does not measure social support (e.g., living alone) or social network size (e.g., friends in the neighborhood, children living nearby). Future research can include measures of social support and social network characteristics.

The unequal status in SES between men and women has implications for psychological well-being in later life. The current cohort of older women experienced limited access to educational opportunities, tensions between family and work, and restricted participation in the labor force (Mirowsky, 1996). The cumulative effects of lifelong inequalities place the current cohort of older women at higher risk of experiencing financial hardship and depression.

The first members of the Baby Boomer cohort turned 65 years-old in 2011. Currently, the large cohort of Baby Boomers is entering its later years and there will be an increasing number of older adults with health concerns, including depression. Women have a longer life expectancy than men, thus a larger proportion of older adults will be women. It is projected that there will be an increasing number of older women suffering from depression (Milne & Williams, 2000). With an aging population, there needs to be more training on mental health issues among older adults, especially older women. Most health care providers do not have specialized training of the older adults. To improve mental health treatment for older women, health care providers need to understand that older women are a vulnerable population for experiencing depression. With appropriate training, it can improve recognition of depression among older women and the provision of appropriate mental health treatment for older women. When providing mental health services to the current cohort of older women, it is important to understand the consequences of a lifetime of restricted opportunities outside the home due to traditional

gender roles (Gottlieb, 1989). These of older women may not been prepared to live an independent life, financially and psychologically (Gottlieb, 1989).

For race and ethnicity, the results indicated no specific pattern of statistical significance among race and ethnic groups, in either the cross-sectional and longitudinal analyses. Using a hierarchical regression procedure, I examined whether minority race and ethnic group comparisons were statistically significant with the adjustments of control variables and under what modeling circumstances these relationships disappeared. Minority groups were compared to Whites. Somewhat unexpectedly, Blacks were less likely to have depression than Whites in the full model only for the cross-sectional analysis. It may be that older Blacks are more resilient than older Whites in part of a lifetime of coping with stress and discrimination. Similar to the cross-sectional analyses, the longitudinal results again showed no pattern of statistical significance between race-ethnic group status and depression recovery as well as depression onset. Overall, the results of this current study, both cross-sectional and longitudinal, found no relationship between the main effects of race-ethnicity and depression.

Moderating Effects of Gender, Race, and Ethnicity

The cross-sectional results for the prevalence of depression did not show evidence for the moderating effects of gender on the relationship between SES and late-life depression. None of the SES by gender interactions terms, including education-gender, was statistically related to late-life depression. For the longitudinal analyses, among respondents who were depressed at baseline (depression recovery analyses), the results also did not show that gender moderated the relationship between education and depression recovery. Further, gender did not moderate the relationship between

education and depression onset (onset of depression analyses). Thus, these cross-sectional and longitudinal results do not support Ross and Mirowsky's (2006) Resource Substitution or Resource Multiplication hypotheses.

Ross and Mirowsky's (2006) study tested their hypotheses and found support for Resource Substitution: education improved psychological well-being more for women than men. The inconsistencies in results between their study and this one may be due to the use of different data sources. Ross and Mirowsky (2006) used a national probability sample of adults aged 18 years and older. Whereas, the age group of this current study was focused on middle-aged and older adults (50 years and older). The difference in age groups may have contributed to the inconsistencies in the results. There are cohort differences in normative expectations regarding gender roles. More recent cohorts of women have made substantial progress in education and are obtaining higher levels of education. Ross and Mirowsky's sample comprised of females, aged 18 and older, who experienced more equity in accessing educational opportunities. Whereas, the sample of this current study consisted of older women who experienced relatively limited access to higher levels of education. Therefore, the role of education on depression may translate differently among age groups (birth cohorts), which contribute to the inconsistencies in the results.

Additionally, it should be noted that this current study controlled for more potential confounders, including health variables. The inclusion of health measures may have also contributed to the inconsistencies in the results between Ross and Mirowsky's (2006) study and this current study. Ross and Mirowsky (2006) did not include health variables in their analyses. This current study focuses on older adults, and health status and

physical impairments are very important factors to consider when studying depression among the aging population. Late-life depression often affects older adults with physical impairments and disabilities. This current study takes into account the significance of health status when examining depression among older adults.

Ross and Mirowsky's study (2006) examined gender differences in the effect of education on depression but did not apply their hypotheses to specific race and ethnic groups. Nonetheless, the Resource Substitution hypothesis proposes that the benefits of education improve psychological well-being more for disadvantaged groups (e.g., minority race-ethnic groups) than advantaged groups (e.g., Whites). In contrast, the Resource Multiplication hypothesis suggests that advantaged groups gain more from higher levels of education, as resources multiply and increase their advantaged position (Ross & Mirowsky, 2006).

The cross-sectional results of this study generally did not show statistically significant relationships for the moderating effects of race and ethnicity on SES and late-life depression, except for the moderating effect of Hispanic ethnicity on the relationship between education and late-life depression. Education only appeared to be protective for Whites. The results did not show a significant relationship between depression and education for Hispanics. From the descriptive statistics, Hispanics were seriously disadvantaged in SES: Hispanics completed the fewest years of education, had the lowest household income, and significantly lower net worth among all race and ethnic groups. Further, Hispanics had the largest proportion of depressed respondents among race and ethnic groups. Thus, social and economic inequalities may continue to persist among Hispanics who did achieve higher levels of education. Despite obtaining higher levels of

an early formal education, higher educated Hispanics may still encounter inequalities, constrained opportunities, and discrimination throughout the life course.

The results supported the Resource Multiplication hypothesis and contradicted the Resource Substitution hypothesis. According to Resource Multiplication, Whites gain more from education because their resources (e.g., income, wealth) multiply to increase their advantaged status compared to Hispanics. In contrast, Hispanics may get fewer psychological benefits from education because of lower economic returns.

Similar to Gavin et al. (2010), this study found no significance in the relationship between higher SES and lower risk of depression among minority race and ethnic groups. Gavin et al. (2010) found significant associations between higher levels of education and lower risk of depression among Whites. However, higher levels of education and lower depression were not observed among minority race and ethnic groups, including Hispanics. Gavin et al. (2010) concluded that education may not translate to economic opportunity for minority race and ethnic groups. This is an example of the unequal return to investments in education by minority groups that I mentioned above.

For the longitudinal analyses, the results indicated that Hispanic ethnicity moderated the relationships between net worth and depression recovery and onset of depression, however the findings were inconsistent. For the depression recovery analyses, depressed Hispanics with more net worth had a lower likelihood of recovering from depression than Whites, which is an unexpected relationship.[19] For the depression onset analyses, the results showed that non-depressed Hispanics with more net worth had higher risk of

[19] This is a consequence of the interaction term. The Hispanic RRR is 0.41—this is the RRR relative to Whites when net worth=0. The interaction term is positive so that at higher net worth the reverse will be true.

depression onset than Whites, which is also a counter-intuitive relationship. With this measure of SES, net worth, the Resource Multiplication hypothesis is supported. The results indicated that Whites benefited more from increasing levels of net worth than Hispanics.

Mediation of Stress and Mastery among the Total LBQ Sample

After examining the moderating effects of gender and race-ethnicity on the relationship between SES and late-life depression, this study explored whether perceived mastery and stress act as mediators in the relationship between SES and late-life depression among respondents in the LBQ sample. According to Ross and Mirowsky's study (2006), the larger beneficial effect of education on depression for women than men was attributable to the mediating effect of sense of control (or, perceived mastery). Although Ross and Mirowsky (2006) did not have a hypothesis about the mediating effect of stress, this was also examined here as stress is a major part of the Stress Process Model and stress has been shown to vary by gender and race-ethnicity (e.g., Avison & Cairney, 2003; Turner & Lloyd, 1999).

From the linear regression models, the cross-sectional results indicated that older adults with more household income or more net worth have higher levels of perceived mastery. For education, there was no statistically significant relationship between education and perceived mastery. To further examine the insignificant relationship between education and perceived mastery, additional analyses were done using a three category education variable (low= 0-11 school years, medium= 12 school years, high= more than 12 school years). The results still indicated no statistical significance between the relationship of education and perceived mastery.

The results suggested that more income and more wealth were related to higher levels of perceived mastery, but not education. It was hypothesized that higher levels of education would be associated with higher levels of perceived mastery. The results of this current study did not show support for Ross and Mirowksy's (2006) study. According to Ross and Mirowsky (2006), persons with more years of education have higher levels of control (or, perceived mastery) than those with fewer years of education. The results of this current study were inconsistent to Ross and Mirowksy's study. Rather than education, the results indicated that income and wealth were related to perceived mastery. Older adults with more income and wealth have greater feelings of exercising control over their own lives than older adults with lower income and wealth.

Further, for education, there was an unexpected positive relationship between education and stress. The results indicated that more years of education was related to a higher number of stressors. Contrary to the results of this current study, it is widely documented that persons with higher levels of education are less likely to be exposed to stressors and financial hardships compared to persons with lower levels of education (e.g., Kahn et al., 2005; Pearlin et al.,2005; Turner et al., 1999). However, some studies have identified less favorable health outcomes, including depression, among higher educated persons compared to lower educated persons (e.g., Allen et al., 2000; Qiu, Bures, & Shehan., 2012). A study by Qiu et al. (2012) found that higher educated employees in higher status occupations are more likely to experience job overload, have work-family conflicts, and work overtime compared to lower educated employees. The study by Qiu et al. (2012) concluded that the consequences of work demands and pressure were related to increased stress and depression among higher educated persons. However, I did not

control for work status or other indicators of stress (e.g., job stressors) in the models of this current study. Thus, the literature is somewhat equivocal regarding the direction of the relationship between education level and stress.

To further examine the unexpected results between education and stress, the analyses of this current study included estimating supplementary models with stress recoded differently. I estimated binomial logistic regression models with stress recoded as 0=0 stressors and 1=1 or more stressors. In addition, multinomial logistic regression models were estimated with stress recoded as 1=0 stressors (reference group), 2=1 or 2 stressors, and 3=3 or more stressors. The results continued to show higher levels of education was related to more stress compared to lower levels of education.

Next, for the prevalence of depression models, I regressed the SES measures on depression without the perceived mastery and stress variables for the first model. The results showed that there were no direct effects between any of the SES variables and depression. None of the SES measures were related to depression in the first model. Thus, according to the Baron and Kenny (1986) strategy for determining whether mediation is present, there were no mediating effects of perceived mastery or stress because no direct effect exists with this model. That is, there was no evidence that either perceived mastery or stress mediated the relationship between all three SES measures (education, income, and wealth) and depression prevalence.

However, the results indicated a suppressor effect for stress in the relationship between education and depression. In the second model when stress was introduced into the models, education became significantly related to depression (in the expected direction): more years of education was related to decreased odds of depression. This

implied a suppressor effect for stress in the relationship between education and depression. In other words, education's "true" relationship with depression may only be evident when stress was included the model. Given that the effect of education stayed the same after perceived mastery is entered into the model, this suggests the suppressor effect was based on the stress variable and not the perceived mastery variable. The models also showed that stress and perceived mastery were related to depression in the expected directions. The suppressor effect implies that the impact of education on depression is only evident among those with more stress. That is, the relationship between education and depression is likely only present among those who are under the most stress.

Concerning health, all health status measures were statistically significant in all three models. More health conditions, more ADLs limitations, poorer self-rated health, and not engaging in exercise were significantly related to higher odds of depression. The results showed the significance of health status on depression. The inclusion of health controls may account for why most of the results did not support the Ross and Mirowsky's (2006) hypotheses.

For the longitudinal analyses, there also was no indication that either perceived mastery or stress mediated the relationship in all three SES measures and incidence of depression (both onset of depression and depression recovery). However, there again appeared to be a suppressor effect for stress and perceived mastery in the relationship between education and depression recovery. With the inclusion of perceived mastery and stress in the model, education became statistically related to depression recovery (in the expected direction): more years of education was related to increased likelihood of recovering from depression. In addition, the relationship between more years of

education and increased risk of death emerged as statistically significant with the inclusion of the psychosocial variables. Similar to the cross-sectional analyses, this indicates a suppressor effect based on perceived mastery or stress. Overall, there appears to be a suppression effect in the relationship between education and depression. It is not until stress and perceived mastery are added to the models that education becomes significantly related to depression.

Mediation of Stress and Mastery for Gender, Race, and Ethnic Groups

Using an intersectionality strategy, this study examined the intersecting effect of gender and race-ethnicity to better understand late-life depression among White men, White women, Black men, Black women, Hispanic men, and Hispanic women. As stated earlier, 'other race' respondents were excluded from the intersectionality analyses due to small sample size. The cross-sectional results indicated that White men had significantly lower odds of having depression than all other specific gender-race-ethnic groups in the unadjusted model. Hispanic women had the highest odds of depression prevalence compared to White men. Compared to White men, the hierarchy from highest to lowest odds of depression was: Hispanic women, Black women, White women, Hispanic men, and Black men. These results generally demonstrated higher depression rates among older women than older men. That is, there were gender disparities in depression with women having higher odds of having depression than men within each race-ethnic group. In the adjusted model that included covariates, White women and Hispanic women were the only gender-race-ethnic groups that remained statistically significant in having higher odds of depression compared to White men. Although there was no statistical significance for Black women, these results again demonstrated higher depression rates

among older women than older men.

For the longitudinal analyses, the results also showed that older women had decreased likelihood of recovering from depression compared to older men. The coefficients for White women, Black women, and Hispanic women were statistically significant in most models, with the results indicating that depressed older females had decreased likelihood of recovering from depression. For the onset of depression, the results indicated higher risk of depression onset among older women than older men. The general pattern in the models indicated that White women, Black women, and Hispanic women had higher risk of depression onset. Similar to the cross-sectional analyses, Hispanic women had the highest risk for depression onset compared to other gender-race-ethnic groups.

The results suggested that there are mental health disparities in later life defined at the intersection of gender and race-ethnicity, with White men having an advantage in lower odds of depression compared to men and women from other race and ethnic groups. Further, the results indicated that older women repeatedly had higher depression than older men within each race-ethnic group, both cross-sectionally and longitudinally. Older women, especially minority older women, have 'multiple' jeopardies and a combination of social disadvantages compared to older men that increase risk of psychological distress and depression (e.g., Cooper, 2002).

Next, this study examined the mediating effect of perceived mastery and stress for the relationship between SES and depression among the specific gender-race-ethnic groups. For the cross-sectional analyses, there was no indication of perceived mastery or stress mediating the relationship between SES and depression for all groups, expect Black males. The results suggested that stress partially mediates the relationship between net

worth and depression for Black males. For the longitudinal analyses, there was no indication of the psychosocial variables mediating the relationship between SES and depression for any of the gender-race-ethnic groups. For the onset of depression, there again appeared to be mediating effects for Black men. The results indicated that stress mediated the relationship between net worth and depression onset for Black males.

From the results, it appears that net worth has significant implications for older Black men. Previous studies have also identified economic disadvantaged status throughout the life course as a significant risk factor for depression among older Black men (Mizell, 1999; Weaver & Gary, 1993). Black men lower in SES experienced financial hardships, unemployment, and difficulty in fulfilling their role as providers for their families, all of which are stressful (Weaver & Gary, 1993; Neighbors et al., 1983). In addition to financial hardships, racial discrimination is stressful and has deleterious effects on the psychological well-being among older Black men. According to the Black Mental Health Alliance (2003), older Black men experienced racism, inequality, and economic oppression on a daily basis, which increase the risk of depression.

According to the American Psychiatric Association (2010), older Blacks who are experiencing depression are unlikely to receive appropriate mental health treatment compared to older Whites, especially older Black men. There are various reasons older Black men are not properly diagnosed and treated for depression. One reason is the strong stigma associated with having a mental health illness among older Black men (Black Mental Health Alliance, 2003). For Black men, issues related to culture and masculinity prevents seeking mental health treatment. According to the Black Mental Health Alliance (2003), health education and outreach at community organizations, faith-

based institutions (e.g., church), and primary care settings can decrease the stigma of having a mental health illness. For older Black men who are experiencing depression, there is a need to increase awareness and understanding about depression in order to develop the skills and knowledge necessary to treat depressive symptoms.

Policy Implications

Research demonstrates that the benefits from obtaining an early formal education extend into adulthood, including later adulthood. Numerous studies have found that greater levels of formal education are associated with decreased risk of poor health outcomes, including psychological health (e.g., Cutler, 2007; Willis & Margrett, 2001). Although the current cohort of older women and minority groups had fewer educational opportunities, successive cohorts have obtained increasingly higher levels of education (Arber & Khlat, 2002; Goldin et al., 2006; Milne & Williams, 2000; Strobino et al., 2002). There have been advancements in the equity of educational opportunities and more recent cohorts of women and race-ethnic groups experienced improvement (but not equal) access to education, occupations, fair wages, and salaries. These are the result of anti-discrimination laws and policies that support increased opportunities for these groups. These policies need to continue to help equalize these groups with White men in the future.

The gender gap in completion of a college education historically favored men, however there has been substantial progress in educational achievements among women (Moss, 2002; Strobino et al., 2002; Willis & Margrett, 2001). According to the National Center for Education Statistics (2011), the gender gap in completion of a college education narrowed in the later half of the twentieth century and closed recently. For

men aged 25 years and older, 10% in 1960, 21% in 1980, 28% in 2000, 29% in 2005, and 30% in 2010 had a bachelor's degree or a higher degree (master's or doctorate's degree) (National Center for Education Statistics, 2011). The proportion of women who had a bachelor's or higher degree was lower than men until 2010, closing the gender gap: 6% in 1960, 14% in 1980, 24% in 2000, 27% in 2005, and 30% in 2010 (National Center for Education Statistics, 2011).

Currently, the gender gap in education has reversed with women more likely to complete a college education than men (Goldin et al., 2006; Ross & Mirowsky, 2006; Strobino et al., 2002). Further, the National Center for Education Statistics (2011) projects the continuation of this trend and women will increasingly become the majority of undergraduate students and earn a bachelor's degree.

Minority race and ethnic groups also obtained higher levels of education throughout the later half of the twentieth century. For Blacks aged 25 years and older, 8% in 1980, 17% in 2000, 18% in 2005, and 20% in 2010 had a bachelor's or higher degree (National Center for Education Statistics, 2011). For Hispanics, 8% in 1980, 11% in 2000, 12% in 2005, and 14% in 2010 had a bachelor's or higher degree (National Center for Education Statistics, 2011). Despite advancements in education among Blacks and Hispanics, there currently continues to be race and ethnic disparities in educational attainment with a higher proportion of Whites completing a bachelor's or higher degree: 18% in 1980, 28% in 2000, 31% in 2005, and 33% in 2010.

Unlike the narrowing and even reversal of the gender gap in college completion, race and ethnic differences in educational attainment still persist among Blacks and Hispanics compared to Whites. According to Kao and Thompson (2003), educational aspirations

are high among adolescents from all race and ethnic groups, and most young adults desire and expect to complete a college education. However, there remain racial and ethnic inequalities in education, especially among Blacks and Hispanics.

Obtaining an education, especially college education, is becoming increasingly important to persons' position in the stratification system and has the ability to produce both physical and mental health differentials between those with lower and higher levels of education (Liu & Hummer 2008; Ross & Van Willigen, 1997). Further, educational differences in health are widening among more recent birth cohorts due, in part, to more sophisticated educational content in school than ever before, especially for persons who received a college education (Liu & Hummer, 2008). Thus, it is imperative to continue to expand educational opportunities for historically disadvantaged groups, women and minority groups.

Study Limitations

One of the limitations of this study is the relative small sample sizes for some of the gender-race-ethnic groups, especially for the analyses that were restricted to the LBQ sample. When using the LBQ sample, there were relatively small sample sizes considering the goal of this current study was to estimate separate models for each specific gender-race-ethnic group. There may be too few cases to find statistically significant effects when using the LBQ sample for this part of the study. The results should be interpreted in light of these small sample sizes.

Next, this study was not able to identify the race and ethnicity among respondents in the 'other race' group. Based on the standard categories of race and ethnicity, respondents in the 'other race' group most likely included Asians and Native Americans.

A limitation of this study is the exclusion of these race and ethnic groups.

As noted in the Chapter 4 (research design), there is more than one way to estimate change in a dependent variable in a regression format and researchers often do not agree on which approach is most appropriate (Glymour et al., 2005). Specifically, the question of whether to include baseline adjustment for models of change is questionable under some circumstances. It is likely, for example, that the relationship between education and change in health status (e.g., depression) is biased due to the relationship between education and the baseline measure of health (a form of endogeneity). A potential limitation of this current study is that baseline depression was employed for estimating the incidence (onset or recovery) of depression between 2006 and 2008. Thus, readers should be aware there may be bias in my results.

The longitudinal analyses retained attritors due to death between the 2006 and 2008 waves (deceased respondents). However, attritors who were loss-to-sample for other reasons were excluded from the analyses. These include persons who refused to participate, could not be found possibly because they migrated, entered a nursing home or hospital, or were too ill to participate. Another limitation of this study is the differences by attrition in the sample. That is, one could speculate some possible selectivity for attritors who were lost to follow-up that may have impacted the findings of this current study. On the one hand, it is difficult to know if persons who refused to participate or migrated out of the area were more or less likely to be depressed than respondents who participated in both waves or who died between waves. On the other hand, persons who entered a nursing home or were too ill to participate may have been more depressed than those who did participate in both waves. Thus, there may be differences by attrition— a

limitation of this current study is the uncertainty of what the effect of selection bias may be and this needs further research.

Respondents who were lost-to-sample other than because of dying between waves were excluded from these longitudinal analyses (e.g., non-response, had proxy respondents). Regarding proxy respondents in 2008, there were 1,705 respondents from the HRS core sample who were not included in this study because they were not asked the questions about depressive symptoms. A possible limitation of this current study is that these respondents were not included as a competing outcome, as was death. In other words, I could have assigned these respondents as another outcome group as I did with deaths for the longitudinal analyses. One can speculate that respondents who required a proxy two years later in 2008 are different from respondents who were self-respondents in both time periods (2006 and 2008) and including these respondents in the longitudinal analyses may have uncovered some useful additional information.

To understand better the differences between the excluded respondents due to having a proxy in 2008 and those who remained in the study sample, I describe the characteristics of three groups— those who were in the sample both waves as self-respondents, respondents who were in the sample in 2006 but required a proxy in 2008, and respondents who were in the sample in 2006 but died between 2006 and 2008 (see Appendix B; t-tests and chi-square statistics were used to determine differences that are statistically significant). The analysis indicated that respondents who were excluded due to having a proxy in 2008 were lower in all three measures of SES (education, income, and wealth) compared to self-respondents in both waves ($p<.000$). As would be expected, respondents excluded due to having a proxy in 2008 had poorer functional status

compared to self-respondents in both waves (p<.000).

Next, the table also shows bivariate analyses comparing respondents excluded due to having a proxy in 2008 with respondents who died between waves. The results showed that respondents excluded due to having a proxy in 2008 were higher in all three measures of SES compared to respondents who died between waves (p<.000). Further, the results showed that there were significant differences in all health measures. As would be expected, respondents who died between waves had poorer health compared to respondents who had a proxy in 2008 (p<.000). In sum, future studies could assign proxy respondents as another outcome group for longitudinal analyses.

Another limitation is that I was unable to identify how frequently depression status changed between the two waves of observation — which is likely for many persons. This current study only looked at two time points. A person could have several episodes of depression recovery and onset between the 2006 and 2008 waves, however I was only able to observe depression at two specific points in time. This may be especially relevant considering the economic recession was beginning in 2006. The data for my study were collected as the great recession was occurring (2006) and with a follow-up at its worst point (2008). One can speculate whether that had any impact on rates of depression as well as on the relationships among the key variables of this current study.

Wealth measures tend to have highly skewed distributions. In addition, wealth variables often have negative and zero values. To account for these issues, I assigned one ($1) to respondents who reported having negative or zero values for wealth and then transformed the variable by the natural log. I made the assumption that persons with negative or zero wealth values would be the similar when it came to depression risk.

There are several other strategies for accounting for the skewness and negative values in measures of wealth. For example, it is possible to create a wealth variable that relies on quartiles or quintiles. Another option is offered by Bradley et al. (2008). This approach does not make the assumption that negative wealth and zero wealth values are similar when it comes to depression risk.

To compare the results of this current study with the alternative approach for a logged wealth measure, I estimated additional models using the approach taken by Bradley et al. (2008). In following Bradley et al.'s (2008) approach, I multiplied negative values by -1, making these values positive. The next step is to take the natural log of the values. Once I had the logged values, I again multiplied the results by -1, which made the values negative. For values that are in the positive range, I transformed these by the natural log. For values that are zero, I assigned the logged values as zero. This preserves the original negative to positive distribution of the values and allows a log transformation to account for skewness. Appendix C displays the results of binomial logistic regression models for the main effect of wealth with this alternative logged measure for the 2006 HRS core sample. When comparing the results of this model containing the alternative wealth measure with the results of this current study (Table 18, Model 5), I find the results are remarkably similar. Persons with higher wealth have a lower risk of depression. To further compare Bradley et al.'s approach with my original analysis, I estimated logistic regression models that contain interaction terms: wealth by gender and wealth by race-ethnicity using the alternative logged net worth variable (see Appendix D). The results with the alternative logged net worth variable were again similar to the results of this current study (Table 21).

Study Contributions

This study used a high quality, nationally representative data set of older Americans. The HRS collects data among older adults on numerous topic areas enabling researchers to examine age-related concerns and issues in the aging population, including the complex relationships between SES and depression (National Institute on Aging & U.S. Department of Health and Human Services, 2007). Further, the recent addition of the HRS LBQ provides psychosocial measures, which are infrequently available in data sets.

From the wide-range of variables available from the HRS, I used a robust set of control variables in the regression models for the statistical analyses, adding confidence to the findings of this study. In fact, the inclusion of health controls may account for why most of the results did not support the Ross and Mirowsky's (2006) hypotheses. In addition, because the HRS is a longitudinal panel study, I was able to examine both prevalence of depression as well as the incidence of onset and recovery of depression across a two-year observation period.

The majority of previous studies on late-life depression examine Whites with far fewer studies giving specific consideration to Blacks or Hispanic ethnicity. As the older population is becoming more racially and ethnically diverse, there is a need to better understand reasons that contribute to the higher prevalence of depression among minority elders. This study contributes to more understanding on the effects of socioeconomic inequalities developed over the life course that are related to higher depression among minority elders. In addition, this study investigates late-life depression in a comparative, intersectionality framework for gender- race-ethnic groups. Few studies have simultaneously examined gender, race, and ethnicity to better understand depression

among older adults. In gerontological research, a limited number of studies have applied the intersectionality perspective (Mair, 2010). It is known that gender inequalities place males at a higher position in the social structure compared to females, however it is important to acknowledge that Black and Hispanic men are seriously disadvantaged in SES compared to White men. Also, it is likely that older Black and Hispanic women experienced discriminatory inequalities due to their minority race and ethnic status compared to White women. The analyses of this current study included examining the intersecting effects of gender, race, and ethnicity on depression.

Last, this study examined intrinsic psychosocial resources in the relationship between education and late-life depression. Many studies repeatedly identify the tangible economic resources from obtaining a formal education (e.g., work, employment, earnings, income, wealth). According to the sequencing of life events, an early formal education increases the likelihood of employment opportunities with leads to higher income and the capacity to accumulate wealth throughout the life course. Although education is a valid indicator for SES, few studies recognize the intrinsic psychosocial benefits from obtaining an education that are not related to economic resources. However, this current study found that only in limited circumstances was education related to perceived mastery (psychosocial resource) which in turn was related to depression.

Future Studies

The reversal of the gender gap in college completion is a recent phenomenon, with more females enrolled in college than males. It would be insightful for future studies to examine inter-cohort effects among older women on the relationship between education and late-life depression. The experiences throughout the life course among the current

cohort of older women are very different compared to younger cohorts of women due changes in social norms on the expectations of women's roles (Arber & Khlat, 2002). Although more recent cohorts of women are obtaining higher levels of education, gender inequalities still persist, as there is still a gap in pay and, presumably, the accumulation of net worth in later life. Because gender roles vary across time, future studies could examine inter-cohort variation in education on psychological well-being in later life among older women.

Also, future studies could examine the relationships between education and late-life depression for Asians and Native Americans. This current study was not able to identify the specific race and ethnicity among respondents from the 'other race' group. Previous studies have identified Asians as a more advantaged group in SES (Hirschman & Lee, 2005; Kao & Thompson, 2003). On the other hand, Native Americans are a disadvantaged group. Future studies should examine the beneficial effects of education among these race and ethnic groups.

This study examined perceived mastery and stress as mediators (or pathways) between the relationship of education and depression. Future studies could also examine other psychosocial variables as mediators. The HRS LBQ provides numerous psychosocial variables such as life satisfaction, quality of life, job satisfaction, and hopelessness.

Future studies could also use three or more waves of data to examine trajectories of depression in later life for a variety of race and ethnic groups. This current study used two waves of data. By using of three or more waves (e.g., growth curve models), it can provide further insight longitudinally on depression among disadvantaged groups.

Last, cross-national studies can be conducted to examine the effects of education on

depression for other countries. This study could be replicated to other countries and it would be interesting to see the results of other populations.

Figure 1

Stress Process Paradigm

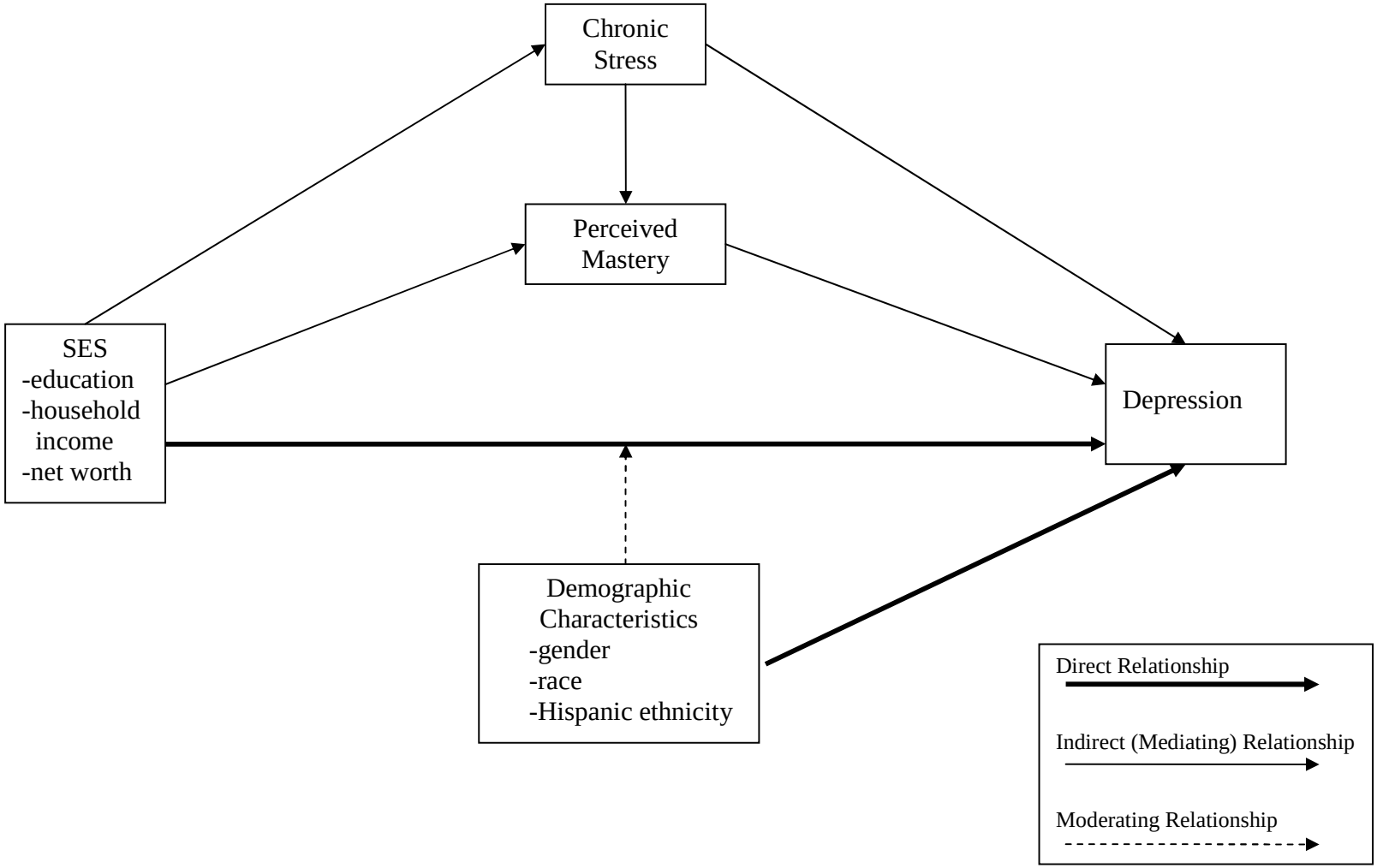

Table 1

HRS and RAND Data Files and Variables Selected from Each File

File Name	Variables
HRS 2006 Core File	mastery chronic stress attend religious services moderate exercise vigorous exercise
HRS 2010 Cross-Wave Tracker File	marital status (2006) marital status (2008)[a]
RAND HRS Data File (Version K)	ADL limitations health conditions
RAND HRS 2006 Core Fat File	age gender race Hispanic ethnicity school years work for pay volunteer self-reported health (2006) depression (2006) highest degree of education[b]
RAND HRS 2008 Core Fat File	depression (2008) self-reported health (2008)[a]
RAND HRS 2006 Core Income & Wealth Imputations File	household income net worth

[a]Changes in marital and health status (2006 to 2008) was explored in preliminary models as a measurement for stress but not included in the final models.
[b]Highest degree of education variable was explored in preliminary models but not included in the final models.

Table 2

Sample Development, HRS 2006 Core Sample

Sample Development	Respondents
Total HRS 2006 core wave	18,469
Analytic sample criteria	
≥50 years-old[a]	
community-dwelling[b]	
non-proxy status[c]	16,553
Mean weight[d]	
mean weight>0	16,038
Complete data on all variables	15,633

[a]≥50 years-old (*n*=17,930).
[b]Community-dwelling (*n*=18,031).
[c]Non-proxy status (*n*=17,209).
[d]HRS developed weights that adjust appropriately for the probabilities of entering the sample of a given cohort.

Table 3

Non-Missing and Missing Cases for Each Variable, HRS 2006 Core Sample

	Non-Missing		Missing	
Variable	*n*	percent	*n*	percent
Dependent Variable				
depression	15902	99.15	136	0.85
Sociodemographics				
age	16038	100.00	0	0.00
gender	16038	100.00	0	0.00
race	16037	99.99	1	0.01
Hispanic ethnicity	16038	100.00	0	0.00
marital status	16036	99.99	2	0.01
Socioeconomic Status				
school years	15977	99.62	61	0.38
highest degree of education	15960	99.51	78	0.49
household income	16038	100.00	0	0.00
net worth	16038	100.00	0	0.00
Social Engagement				
work for pay	16027	99.93	11	0.07
volunteer	16031	99.96	7	0.04
attend religious services	16023	99.91	15	0.09
Health/Functional Status				
health conditions	16037	99.99	1	0.01
ADLs	15999	99.76	39	0.24
self-reported health	16015	99.86	23	0.14
moderate/vigorous exercise	16009	99.82	29	0.18

Note: n=16,038.

Table 4

Sample Development for 2-Year Follow-Up in 2008, HRS Core Sample

Sample Development	Respondents
Non-Attritors	
Complete data on 2008 depression variable[a]	13,854
Deceased Respondents[b]	780
Total	14,643

Note: Drawn from the HRS 2006 core sample (*n*=15,633).
[a]1,779 missing cases for 2008 depression.
[b]Attrition due to death.

Table 5

Sample Development, 2006 LBQ Sample

Sample Development	Respondents
Total HRS 2006 LBQ sample	7,732
Analytic sample criteria	
≥50 years-old[a]	
community-dwelling[b]	
non-proxy status[c]	
mean weight>0[d]	7,166
Complete data on all variables	6,232

[a]≥50 years-old (*n*=7,511).
[b]Community-dwelling (*n*=7,726).
[c]Non-proxy status (*n*=7,611).
[d]Mean weight>0 (*n*=7,166).

Table 6

Non-Missing and Missing Cases for Each Variable, 2006 LBQ Sample

	Non-Missing		Missing	
Variable	*n*	percent	*n*	percent
Dependent Variable				
depression	7117	99.32	49	0.68
Sociodemographics				
age	7166	100.00	0	0.00
gender	7166	100.00	0	0.00
race				
Hispanic ethnicity	7166	100.00	0	0.00
marital status	7165	99.99	1	0.01
Socioeconomic Status				
school years	7145	99.71	21	0.29
highest degree of education	7141	99.65	25	0.35
household income	7166	100.00	0	0.00
net worth	7166	100.00	0	0.00
Social Engagement				
work for pay	7165	99.99	1	0.01
volunteer	7165	99.99	1	0.01
attend religious services	7163	99.96	3	0.04
Health/Functional Status				
health conditions	7166	100.00	0	0.00
ADL	7157	99.87	9	0.13
self-reported health	7158	99.89	8	0.11
moderate/vigorous exercise	7157	99.87	9	0.13
Psychosocial				
mastery	7030	98.10	136	1.90
chronic stress	6408	89.42	758	10.58

Note: n=7,166.

Table 7

Sample Development for 2-Year Follow-Up in 2008, LBQ Sample

Sample Development	Respondents
Non-Attritors	
Complete data on 2008 depression[a]	5,682
Deceased Respondents[b]	260
Total	5,942

Note: Drawn from the 2006 LBQ sample (*n*=6,232).
[a]550 missing cases for 2008 depression.
[b]Attrition due to death.

Table 8

Variables, Coding Schemes, and Expected Signs

Variable	Definition	Expected Sign[a]
Dependent Variables		
depression	1=3+ CES-D depressive symptoms=1; 0=less than 3 depressive symptoms	
change in depression (2008)		
recovery from depression	1=depression at both waves (reference group); 2=recovery from depression in 2008; 3=death	
onset of depression	1=no depression at both waves (reference group); 2=onset of depression in 2008; 3=death	
Sociodemographics		
age	age in years, 50 years and older	+
gender	1=female; 0=male	+
race and ethnicity	1=non-Hispanic White; 0=other (reference group)	−
	1=non-Hispanic Black, 0=other	+
	1=Hispanic; 0=other	+
	1=non-Hispanic other race; 0=other	+
marital status	1=married; 0=non-married	−
Socioeconomic Status		
education		
school years	number of school years completed, ranging from 0 to 17 years	−
highest degree of education	1=less than high school; 0=other	+
	1=high school graduate; 0=other	+
	1=some college; 0=other	+
	1=college graduate; 0=other (reference group)	−
household income		
logged	logged measure of household income	−
quartiles	1=first quartile (<$18,652); 0=other	+

continuation of Table 8

	1=second quartile ($18,652.01-$36,960); 0=other	+
	1=third quartile ($36,960.01-$70,240); 0=other	+
	1=fourth quartile (≥$70,240.01); 0=other (reference group)	−
net worth		
logged	logged measure of net worth	−
quartiles	1=first quartile (< $39,292); 0=other	+
	1=second quartile ($39,292.01 - $162,600); 0=other	+
	1=third quartile ($162,600.01 - $412,000); 0=other	+
	1=fourth quartile (≥ $412,000.01); 0=other (reference group)	−
Social Engagement		
work for pay	1=work for pay; 0=no	−
volunteer	1=volunteer; 0=no	−
attend religious services	1=at least once a week; 0=no	−
Health/Functional Status		
health conditions	8-count of health conditions (high blood pressure, diabetes, cancer, lung disease, heart problem, stroke, psychiatric, or arthritis)	+
ADL limitations	6-count of ADL limitations (dress, walk, bath, eat, bed, or toilet)	+
self-reported health	1=fair/poor health; 0=excellent/very good/good	+
moderate/vigorous exercise	1=at least one to three times a month; 0=no	−
Psychosocial		
mastery	mean average, ranging from scale of 1 to 6	−
chronic stress	8-count of chronic stressors (health problems in yourself, physical or emotional problems in spouse or child, problems w/ alcohol or drug use in family member, difficulties at work, financial strain, housing problems, problems in a close relationship, or helping sick frail family member or friend on a regular basis)	+

[a]Expected sign refers to the hypothesized direction of the relationship with depression.

Table 9

Proportions for Depression Recovery and Depression Onset

	HRS Core Sample (*n*=14,634)	LBQ Sample (*n*=5,942)
Depressed in 2006		
not depression in 2008 (depression recovery)	1,275	478
depressed in both waves, 2006 and 2008	1,451	511
died	780	260
total	3,506	1,249
Not Depressed in 2006		
depressed in 2008 (depression onset)	1,276	516
not depressed in both waves, 2006 and 2008	9,852	4,177
died	780	260
total	11,908	4,953

Table 10

Descriptive Statistics among Total Study Sample, HRS 2006 Core Sample

	Total (*n*=15,633)	
Variable	*M*[a]	*SD*
Dependent Variable		
depression	0.21	0.40
Sociodemographics		
age	65.37	10.09
female	0.56	0.49
White	0.82	0.38
Black	0.09	0.28
Hispanic	0.07	0.24
other race	0.02	0.15
married	0.62	0.48
Socioeconomic Status		
education	12.91	3.00
household income[b]	$43,548	395,788
net worth[b]	$182,000	2,667,050
Social Engagement		
work for pay	0.45	0.49
volunteer	0.36	0.47
religious services	0.39	0.48
Health/Functional Status		
health conditions	1.94	1.44
ADLs limitations	0.31	0.89
self-rated health	0.26	0.43
exercise	0.40	0.48

Note: Means were weighted using HRS 2006 person level weight.
[a]For binary or categorical variables, the percent distributions are provided. For continuous variables, the means are provided.
[b]Median reported.

Table 11

Descriptive Statistics among Excluded Respondents from Study, HRS 2006 Core Sample

Variable	*M*[a]	*SD*	*statistic*[b]	*p-value*
Dependent Variable				
depression (*n*=1,429)	0.28	0.45	6.86	.009
Sociodemographics				
age (*n*=2,836)	65.00	16.00	306.84	.084
female (*n*=2,836)	0.59	0.49	8.69	.003
White (*n*=2,835)	0.68	0.46	7.13	.008
Black (*n*=2,835)	0.16	0.36	5.60	.018
Hispanic (*n*=2,835)	0.12	0.32	1.12	.289
other race (*n*=2,835)	0.04	0.19	15.59	.000
married (*n*=2,832)	0.60	0.48	19.51	.000
Socioeconomic Status				
education (*n*=2,728)	11.84	3.69	4.55	.478
household income[c] (*n*=2,836)	$34,971	$369,621	27.70	.000[d]
net worth[c] (*n*=2,836)	$100,300	$1,289,590	183.67	.000[d]
Social Engagement				
work for pay (*n*=2,823)	0.41	0.49	0.18	.671
volunteer (*n*=2,823)	0.24	0.43	5.03	.025
religious services (*n*=2,807)	0.32	0.46	19.12	.000
Health/Functional Status				
health conditions (*n*=2,835)	2.11	1.67	0.53	.613
ADLs limitations (*n*=2,749)	1.09	1.95	22.57	.000
self-rated health (*n*=2,811)	0.38	0.48	21.24	.000
exercise (*n*=2,802)	0.30	0.46	4.84	.028

Note: n's vary due to missing data.
Note: Bivariate analysis compared excluded and included respondents.
Note: Means were weighted using HRS 2006 person level weight.
[a]For binary or categorical variables, the percent distributions are provided. For continuous variables, the means are provided.
[b]For categorical variables, Pearson chi-square test was performed. For continuous variables, ANOVA means test was performed.
[c]Median reported.
[d]To test for differences, the mean of the logged household income and logged net worth measures were used.

Table 12

Descriptive Statistics by Gender, HRS 2006 Core Sample

	Male (*n*=6,442)		Female (*n*=9,191)			
Variable	*M*[a]	*SD*	*M*[a]	*SD*	*statistic*[b]	*p-value*
Dependent Variable						
depression	0.17	0.37	0.24	0.42	127.49	.000
Sociodemographics						
age	64.67	9.71	65.93	10.35	6303.84	.000
White	0.83	0.37	0.81	0.39	13.45	.000
Black	0.08	0.27	0.10	0.29	10.74	.001
Hispanic	0.06	0.24	0.07	0.25	3.08	.079
other race	0.02	0.15	0.02	0.15	0.08	.768
married	0.72	0.44	0.54	0.49	599.74	.000
Socioeconomic Status						
education	13.17	3.13	12.70	2.87	859.83	.000
household income[c]	$52,364	422,128	$36,987	373,168	446.58	.000[d]
net worth[c]	$202,000	2,729,330	$165,948	2,615,800	645.35	.000[d]
Social Engagement						
work for pay	0.52	0.49	0.40	0.48	243.64	.000
volunteer	0.35	0.47	0.36	0.48	5.60	.018
religious services	0.33	0.46	0.43	0.49	190.97	.000
Health/Functional Status						
health conditions	1.85	1.44	2.02	1.43	118.53	.000
ADLs limitations	0.24	0.77	0.36	0.96	58.00	.000
self-rated health	0.24	0.42	0.27	0.44	11.57	.001
exercise	0.48	0.49	0.33	0.46	403.19	.000

Note: n=15,633.

Note: Means were weighted using HRS 2006 person level weight.

[a]For binary or categorical variables, the percent distributions are provided. For continuous variables, the means are provided.

[b]For categorical variables, Pearson chi-square test was performed. For continuous variables, ANOVA means test was performed.

[c]Median reported.

[d]To test for gender differences, the mean of the logged household income and logged net worth measures were used.

Table 13

Descriptive Statistics by Race and Ethnicity, HRS 2006 Core Sample

	White (*n*=11,818)		Black (*n*=2,126)		Hispanic (*n*=1,362)		Other Race (*n*=327)			
Variable	*M*[a]	*SD*	*M*[a]	*SD*	*M*[a]	*SD*	*M*[a]	*SD*	*statistic*[b]	*p-value*
Dependent Variable										
depression	0.19	0.39	0.27	0.44	0.34	0.47	0.28	0.45	183.45	.000
Sociodemographics										
age	65.83	10.20	63.49	9.41	63.23	9.18	62.63	8.87	15596.81	.000
female	0.55	0.49	0.60	0.49	0.58	0.49	0.56	0.49	15.20	.002
married	0.65	0.47	0.39	0.48	0.59	0.49	0.61	0.48	380.23	.000
Socioeconomic Status										
education	13.30	2.57	11.93	3.17	9.41	4.51	12.76	3.56	16550.15	.000
household income[c]	$47,965	322,084	$23,234	59,589	$21,454	51,285	$43,012	1,710,760	1590.73	.000[d]
net worth[c]	$219,000	2,692,470	$42,375	354,949	$54,000	384,625	$117,142	6,805,110	17307.10	.000[d]
Social Engagement										
work for pay	0.46	0.49	0.42	0.49	0.40	0.49	0.50	0.50	20.34	.000
volunteer	0.37	0.48	0.35	0.47	0.19	0.38	0.29	0.45	157.43	.000
religious services	0.37	0.48	0.53	0.49	0.43	0.49	0.30	0.45	168.72	.000
Health/Functional Status										
health conditions	1.93	1.43	2.18	1.50	1.83	1.43	1.93	1.48	96.55	.000
ADLs limitations	0.27	0.83	0.54	1.14	0.45	1.08	0.34	0.87	114.39	.000
self-rated health	0.22	0.41	0.39	0.48	0.50	0.50	0.35	0.47	563.37	.000
exercise	0.41	0.49	0.32	0.46	0.31	0.46	0.42	0.49	78.34	.000

Note: n=15,633.

Note: Means were weighted using HRS 2006 person level weight.

[a]For binary or categorical variables, the percent distributions are provided. For continuous variables, the means are provided.

continuation of Table 13

[b]For categorical variables, Pearson chi-square test was performed. For continuous variables, ANOVA means test was performed.
[c]Median reported.
[d]To test for race and ethnic differences, the mean of the logged household income and logged net worth measures were used.

Table 14

Descriptive Statistics among Total Study Sample, 2006 LBQ Sample

	Total (*n*=6,232)	
Variable	*M*[a]	*SD*
Dependent Variable		
depression	0.18	0.38
Sociodemographics		
age	64.99	9.79
female	0.54	0.49
White	0.86	0.35
Black	0.07	0.26
Hispanic	0.05	0.21
other race	0.02	0.14
married	0.66	0.47
Socioeconomic Status		
education	13.12	2.79
household income[b]	$47,600	122,956
net worth[b]	$200,200	2,444,070
Social Engagement		
work for pay	0.48	0.49
volunteer	0.38	0.48
religious services	0.39	0.48
Health/Functional Status		
health conditions	1.86	1.41
ADLs limitations	0.27	0.81
self-rated health	0.22	0.41
exercise	0.40	0.49
Psychosocial		
mastery	4.80	1.07
stress	1.33	1.47

Note: Means were weighted using HRS 2006 person level weight.
[a]For binary or categorical variables, the percent distributions are provided. For continuous variables, the means are provided.
[b]Median reported.

Table 15

Descriptive Statistics among Excluded Respondents from Study, 2006 LBQ Sample

Variable	*M*[a]	*SD*	*statistic*[b]	*p-value*
Dependent Variable				
depression (*n*=1,327)	0.26	0.44	83.69	.000
Sociodemographics				
age (*n*=1,500)	65.28	13.88	9301.11	.000
female (*n*=1,500)	0.65	0.47	8.84	.003
White (*n*=1,500)	0.67	0.46	65.89	.000
Black (*n*=1,500)	0.18	0.38	41.98	.000
Hispanic (*n*=1,500)	0.12	0.32	20.21	.000
other race (*n*=1,500)	0.03	0.17	1.27	.260
married (*n*=1,499)	0.58	0.49	120.36	.000
Socioeconomic Status				
education (*n*=1,471)	11.92	3.52	775.54	.000
household income[c] (*n*=1,500)	$32,786	$499,374	249.65	.000[d]
net worth[c] (*n*=1,500)	$120,000	$1,247,440	926.38	.000[d]
Social Engagement				
work for pay (*n*=1,499)	0.35	0.47	129.26	.000
volunteer (*n*=1,499)	0.30	0.46	28.81	.000
religious services (*n*=1,497)	0.40	0.49	1.86	.172
Health/Functional Status				
health conditions (*n*=1,500)	2.08	1.52	107.03	.000
ADLs limitations (*n*=1,489)	0.46	1.14	45.00	.000
self-rated health (*n*=1,492)	0.36	0.48	111.08	.000
exercise (*n*=1,491)	0.31	0.46	33.34	.000
Psychosocial				
mastery (*n*=1,352)	4.59	1.24	69.77	.000
stress (*n*=701)	1.58	1.68	47.01	.000

Note: n's vary due to missing data.
Note: Bivariate analysis compared excluded and included respondents.
Note: Means were weighted using HRS 2006 person level weight.
[a]For binary or categorical variables, the percent distributions are provided. For continuous variables, the means are provided.
[b]For categorical variables, Pearson chi-square test was performed. For continuous variables, ANOVA means test was performed.
[c]Median reported.
[d]To test for differences, the mean of the logged household income and logged net worth measures were used.

Table 16

Descriptive Statistics by Gender, 2006 LBQ Sample

	Male (*n*=2,667)		Female (*n*=3,565)			
Variable	*M*[a]	*SD*	*M*[a]	*SD*	*statistic*[b]	*p-value*
Dependent Variable						
depression	0.15	0.35	0.21	0.40	35.91	.000
Sociodemographics						
age	64.30	9.35	65.59	10.12	2704.14	.000
White	0.87	0.33	0.85	0.36	7.11	.008
Black	0.06	0.24	0.08	0.27	8.70	.003
Hispanic	0.05	0.21	0.05	0.21	0.01	.903
other race	0.02	0.13	0.02	0.14	0.97	.324
married	0.75	0.43	0.59	0.49	184.35	.000
Socioeconomic Status						
education	13.35	2.94	12.91	2.63	313.59	.000
household income[c]	$55,624	133,785	$40,426	112,395	137.59	.000[d]
net worth[c]	$220,000	2,321,360	$190,664	2,544,280	100.71	.002[d]
Social Engagement						
work for pay	0.54	0.49	0.42	0.49	99.79	.000
volunteer	0.36	0.48	0.40	0.48	8.59	.003
religious services	0.33	0.46	0.44	0.49	84.21	.000
Health/Functional Status						
health conditions	1.77	1.40	1.94	1.40	47.72	.000
ADLs limitations	0.21	0.70	0.31	0.90	17.06	.000
self-rated health	0.23	0.41	0.22	0.41	0.26	.607
exercise	0.48	0.49	0.33	0.47	143.57	.000

continuation of Table 16

Psychosocial						
mastery	4.84	1.04	4.77	1.10	8.86	.006
stress	1.17	1.36	1.46	1.55	134.67	.000

Note: n=6,232.

Note: Means were weighted using HRS 2006 person level weight.

[a]For binary or categorical variables, the percent distributions are provided. For continuous variables, the means are provided.

[b]For categorical variables, Pearson chi-square test was performed. For continuous variables, ANOVA means test was performed.

[c]Median reported.

[d]To test for gender differences, the mean of the logged household income and logged net worth measure was used.

Table 17

Descriptive Statistics by Race and Ethnicity, 2006 LBQ Sample

	White (*n*=4,972)		Black (*n*=727)		Hispanic (*n*=419)		Other Race (*n*=114)			
Variable	*M*[a]	*SD*	*M*[a]	*SD*	*M*[a]	*SD*	*M*[a]	*SD*	*statistic*[b]	*p-value*
Dependent Variable										
depression	0.17	0.37	0.23	0.41	0.32	0.46	0.27	0.44	59.90	.000
Sociodemographics										
age	65.30	9.90	63.50	9.07	62.87	8.87	62.63	8.58	3868.11	.000
female	0.53	0.49	0.60	0.48	0.54	0.49	0.58	0.49	10.07	.018
married	0.68	0.46	0.42	0.49	0.65	0.47	0.68	0.46	145.18	.000
Socioeconomic Status										
education	13.40	2.48	11.96	3.05	10.06	4.30	12.89	3.50	4175.49	.000
household income[c]	$50,622	130,244	$25,000	60,698	$27,410	45,539	$50,000	63,865	479.60	.000[d]
net worth[c]	$232,112	2,632,610	$45,460	312,905	$66,815	444,494	$189,556	537,727	6103.55	.000[d]
Social Engagement										
work for pay	0.48	0.49	0.42	0.49	0.46	0.49	0.57	0.49	10.89	.012
volunteer	0.39	0.48	0.38	0.48	0.20	0.40	0.29	0.45	54.20	.000
religious services	0.37	0.48	0.53	0.49	0.46	0.49	0.32	0.46	54.09	.000
Health/Functional Status										
health conditions	1.84	1.38	2.14	1.54	1.80	1.49	1.92	1.51	41.64	.000
ADLs limitations	0.24	0.76	0.49	1.08	0.39	1.08	0.23	0.79	33.05	.000
self-rated health	0.20	0.39	0.39	0.48	0.42	0.49	0.31	0.46	177.11	.000
exercise	0.41	0.49	0.33	0.46	0.35	0.47	0.37	0.48	18.24	.000
Psychosocial										
mastery	4.81	1.06	4.77	1.15	4.75	1.20	4.67	0.93	4.15	.310
stress	1.31	1.44	1.37	1.57	1.42	1.61	1.77	1.88	33.74	.001

Note: n=6,232.

Note: Means were weighted using HRS 2006 person level weight.

continuation of Table 17

[a] For binary or categorical variables, the percent distributions are provided. For continuous variables, the means are provided.
[b]For categorical variables, Pearson chi-square test was performed. For continuous variables, ANOVA means test was performed.
[c]Median reported.
[d]To test for race and ethnic differences, the mean of the logged household income and logged net worth measure was used.

Table 18

Binomial Logistic Regression Models for Depression, HRS 2006 Core Sample

	Model 1	Model 2	Model 3	Model 4	Model 5
Socioeconomic Status					
education	0.92***	0.93***	0.92***	0.94***	0.97**
household income	0.85***	0.86***	0.89***	0.95*	0.98
net worth	0.91***	0.91***	0.93***	0.93***	0.97**
Sociodemographics					
female	—	1.42***	1.34***	1.36***	1.32***
Black[a]	—	0.94	0.86	0.90	0.76**
Hispanic[a]	—	1.14	1.11	1.17	1.18
other race[a]	—	1.41*	1.36*	1.33	1.20
age	—	—	0.98***	0.97***	0.96***
married	—	—	0.62***	0.60***	0.60***
Social Engagement					
work for pay	—	—	—	0.47***	0.79***
volunteer	—	—	—	0.63***	0.74***
religious services	—	—	—	0.80**	0.90
Health/Functional Status					
health conditions	—	—	—	—	1.21***
ADLs limitations	—	—	—	—	1.45***
self-rated health	—	—	—	—	2.68***
exercise	—	—	—	—	0.73***
Pseudo R-square	0.054	0.060	0.068	0.089	0.178

Note: n=15,633.

Note: Odds ratios were from weighted binomial logistic regression models adjusted for complex survey design using Stata's svy procedure.

[a]Non-Hispanic White was reference group.

*$p < .050$; **$p < .010$; ***$p < .001$.

Table 19

Education Interactions on Depression, HRS 2006 Core Sample

	Unadjusted for Income & Net Worth[a]	Adjusted for Income & Net Worth[b]
Gender		
education	0.97*	0.97
female	1.45*	1.41*
education x female	0.99	0.99
Pseudo R-square	0.177	0.178
Race and Ethnicity[c]		
education	0.95***	0.96**
Black	0.67	0.61
Hispanic	0.79	0.76
other race	1.31	1.28
education x Black	1.01	1.01
education x Hispanic	1.04*	1.04*
education x other race	0.99	0.99
Pseudo R-square	0.178	0.179

Note: n=15,633.

Note: Odds ratios were from weighted binomial logistic regression models adjusted for complex survey design using Stata's svy procedure.

[a]Models were adjusted for control variables except household income and net worth.

[b]Models were adjusted for control variables including household income and net worth.

[c]Non-Hispanic White was reference group.

*$p < .050$; **$p < .010$; ***$p < .001$.

Table 20

Household Income Interactions on Depression, HRS 2006 Core Sample

	Unadjusted for Education & Net Worth[a]	Adjusted for Education & Net Worth[b]
Gender		
household income	0.95	0.97
female	1.13	1.15
household income x female	1.01	1.01
Pseudo R-square	0.177	0.179
Race and Ethnicity[c]		
household income	0.94*	0.97
Black	0.81	0.73
Hispanic	0.81	0.72
other race	1.23	1.28
household income x Black	1.00	1.00
household income x Hispanic	1.05	1.05
household income x other race	0.99	0.99
Pseudo R-square	0.176	0.178

Note: n=15,633.

Note: Odds ratios were from weighted binomial logistic regression models adjusted for complex survey design using Stata's svy procedure.

[a]Models were adjusted for control variables except education and net worth.

[b]Models were adjusted for control variables including education and net worth.

[c]Non-Hispanic White was reference group.

*$p < .050$; **$p < .010$; ***$p < .001$.

Table 21

Net Worth Interactions on Depression, HRS 2006 Core Sample

	Unadjusted for Education & Income[a]	Adjusted for Education & Income[b]
Gender		
net worth	0.95***	0.95**
female	0.99	0.99
net worth x female	1.02	1.02
Pseudo R-square	0.178	0.179
Race and Ethnicity[c]		
net worth	0.96**	0.97*
Black	0.77	0.76
Hispanic	1.15	1.04
other race	1.73	1.68
net worth x Black	1.00	0.99
net worth x Hispanic	1.01	1.01
net worth x other race	0.96	0.96
Pseudo R-square	0.177	0.179

Note: n=15,633.

Note: Odds ratios were from weighted binomial logistic regression models adjusted for complex survey design using Stata's svy procedure.

[a]Models were adjusted for control variables except education and household income.

[b]Models were adjusted for control variables including education and household income.

[c]Non-Hispanic White was reference group.

*$p < .050$; **$p < .010$; ***$p < .001$.

Table 22

Ordinary Linear Regression Models for Stress and Mastery, 2006 LBQ Sample

	Chronic Stress		Mastery	
	b[a]	*SE*[b]	*b*[a]	*SE*[b]
Socioeconomic Status				
education	0.30***	0.00	-0.00	0.00
household income	-0.05	0.02	0.04*	0.02
net worth	-0.05***	0.00	0.02***	0.00
Gender				
female	0.28***	0.04	-0.01	0.03
Race and Ethnicity[c]				
Black	-0.34***	0.06	0.16*	0.06
Hispanic	-0.15	0.09	0.14	0.07
other race	0.25	0.23	-0.07	0.11
Adjusted R-squared	0.152		0.069	

Note: n=6,228.
Note: 4 observations deleted from analyses due to stratum with single sampling unit.
Note: Unstandarized coefficients and standard errors were weighted for complex survey design using Stata's svy procedure.
[a]Unstandardized coefficient.
[b]Standard error.
[c]Non-Hispanic White was reference group.
*$p < .050$; **$p < .010$; ***$p < .001$.

Table 23

Multinomial Logistic Regression Models for Acute Stress, Change in Marital Status, LBQ Sample

	Change in Marital Status	
	became not married in 2008	became married in 2008
Socioeconomic Status		
education	0.99	1.01
household income	1.34	1.33
net worth	1.02	0.88**
Gender		
female	1.53*	0.79
Race and Ethnicity[c]		
Black	1.20	1.80
Hispanic	1.58	1.05
other race	1.53	1.74e-06***
Pseudo R-square	0.047	

Note: *n*=5,821.
Note: Marital status stayed the same in 2006 and 2008 was base outcome group.
Note: Coefficients are relative risk ratios (RRR).
*p < .050; **p <.010; ***p < .001.

Table 24

Multinomial Logistic Regression Models for Acute Stress, Change in Self-Rated Health, LBQ Sample

	Change in Self-Rated Health	
	health became worse in 2008	health became better in 2008
Socioeconomic Status		
education	0.93***	0.90***
household income	0.92	0.96
net worth	0.97	1.00
Gender		
female	0.87	0.79
Race and Ethnicity[c]		
Black	0.86	1.92***
Hispanic	1.30	1.59
other race	1.43	1.54
Pseudo R-square	0.048	

Note: *n*=5,821.
Note: Self–rated health stayed the same in 2006 and 2008 was base outcome group.
Note: Coefficients are relative risk ratios (RRR).
*p < .050; **p <.010; ***p < .001.

Table 25

Binomial Logistic Regression Models on Stress and Mastery Mediating between SES and Depression, 2006 LBQ Sample

	Without Stress & Mastery	Plus Stress	Plus Stress & Mastery
Socioeconomic Status			
education	0.97	0.96*	0.96*
household income	0.97	1.00	1.01
net worth	0.97	0.99	0.99
Sociodemographics			
female	1.27**	1.14	1.14
Black[a]	0.66**	0.75*	0.78
Hispanic[a]	1.42*	1.54**	1.61**
other race[a]	1.47	1.30	1.30
age	0.97***	0.98***	0.98***
married	0.57***	0.54***	0.53***
Social Engagement			
work for pay	0.91	0.87	0.89
volunteer	0.70**	0.68***	0.70**
religious services	0.94	0.99	0.97
Health/Functional Status			
health conditions	1.25***	1.17***	1.18***
ADLs limitations	1.47***	1.41***	1.38***
self-rated health	2.49***	2.27***	2.19***
exercise	0.65***	0.68***	0.71***
Psychosocial			
chronic stress	—	1.42***	1.38***
mastery	—	—	0.79***
Pseudo R-square	0.169	0.196	0.203

Note: *n*=6,228.
Note: 4 observations deleted from analyses due to stratum with single sampling unit.
Note: Odds ratios were from weighted binomial logistic regression models adjusted for complex survey design using Stata's svy procedure.
[a]Non-Hispanic White was reference group.
*$p < .050$; **$p < .010$; ***$p < .001$.

Table 26

Intersectionality Analyses for Gender-Race-Ethnic Groups, HRS 2006 Core Sample

	Unadjusted Model[a]	Adjusted Model[b]
White females	1.56***	1.37***
Black males	1.68***	0.89
Black females	2.26***	0.96
Hispanic males	1.95***	1.17
Hispanic females	3.68***	1.67***
Pseudo R-square	0.020	0.178

Note: n=15,306.
Note: Excluded non-Hispanic 'other race' from these analyses due to small sample size (*n*=327).
Note: Odds ratios were from weighted binomial logistic regression models adjusted for complex survey design using Stata's svy procedure.
Note: Non-Hispanic White males was reference group.
[a]Unadjusted model did not include any control variables (without SES, sociodemographics, social engagement, and health status variables).
[b]Adjusted model included control variables (with SES, sociodemographics, social engagement, and health status variables).
*$p < .050$; **$p < .010$; ***$p < .001$.

Table 27

Intersectionality Analyses with Stress and Mastery, 2006 LBQ Sample

	Without Stress & Mastery		With Stress & Mastery	
	Unadjusted Model[a]	Adjusted Model[b]	Unadjusted Model[a]	Adjusted Model[b]
White females	1.50***	1.33**	1.28**	1.17
Black males	1.46	0.81	1.32	0.86
Black females	2.06***	0.82	1.85***	0.89
Hispanic males	2.27**	1.44	2.16*	1.50
Hispanic females	3.46***	1.94***	3.28***	2.06***
Chronic stress	—	—	1.50***	1.37***
Mastery	—	—	0.69***	0.78***
Pseudo R-square	0.016	0.170	0.102	0.203

Note: n=6,114.
Note: 4 observations deleted from analyses due to stratum with single sampling unit.
Note: Excluded non-Hispanic 'other race' from these analyses due to small sample size (*n*=114).
Note: Odds ratios were from weighted binomial logistic regression models adjusted for complex survey design using Stata's svy procedure.
Note: Non-Hispanic White males was reference group.
[a]Unadjusted model did not include any control variables (without SES, sociodemographics, social engagement, and health status variables).
[b]Adjusted model included control variables (with SES, sociodemographics, social engagement, and health status variables).
*$p < .050$; **$p < .010$; ***$p < .001$.

Table 28a

Binomial Logistic Regression Models for Depression among White Males, 2006 LBQ Sample

	Without Stress & Mastery	Plus Stress	Plus Stress & Mastery
Socioeconomic Status			
education	0.97	0.96	0.95
household income	1.08	1.14	1.19
net worth	0.98	1.01	1.03
Sociodemographics			
age	0.96***	0.97*	0.97*
married	0.47***	0.40***	0.37***
Social Engagement			
work for pay	0.91	0.89	0.87
volunteer	0.74	0.70	0.73
religious services	0.86	0.91	0.88
Health/Functional Status			
health conditions	1.31***	1.25***	1.25***
ADLs	1.67***	1.58***	1.52***
self-rated health	2.37***	2.10***	2.00***
exercise	0.63*	0.64*	0.66*
Psychosocial			
chronic stress	—	1.61***	1.58***
mastery	—	—	0.70***
Pseudo R-square	0.162	0.218	0.235

Note: *n*=2,176.
Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are odds ratios (OR).
*$p < .050$; **$p < .010$; ***$p < .001$.

Table 28b

Binomial Logistic Regression Models for Depression among White Females, 2006 LBQ Sample

	Without Stress & Mastery	Plus Stress	Plus Stress & Mastery
Socioeconomic Status			
education	0.96	0.94*	0.94
household income	0.92	0.95	0.95
net worth	0.98	1.00	1.01
Sociodemographics			
age	0.98*	0.99	0.99
married	0.67**	0.66**	0.64**
Social Engagement			
work for pay	0.95	0.89	0.94
volunteer	0.66**	0.65**	0.66**
religious services	0.85	0.87	0.86
Health/Functional Status			
health conditions	1.22***	1.14**	1.14**
ADLs	1.45***	1.41***	1.38***
self-rated health	2.30***	2.12***	2.02***
exercise	0.76	0.80	0.86
Psychosocial			
chronic stress	—	1.37***	1.34***
mastery	—	—	0.79***
Pseudo R-square	0.146	0.178	0.186

Note: *n*=2,796.
Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are odds ratios (OR).
*$p < .050$; **$p < .010$; ***$p < .001$.

Table 28c

Binomial Logistic Regression Models for Depression among Black Males, 2006 LBQ Sample

	Without Stress & Mastery	Plus Stress	Plus Stress & Mastery
Socioeconomic Status			
education	1.05	1.01	1.01
household income	0.83	0.84	0.83
net worth	0.85***	0.87**	0.86**
Sociodemographics			
age	1.02	1.02	1.02
married	1.02	1.05	1.02
Social Engagement			
work for pay	0.98	1.18	1.18
volunteer	0.76	0.65	0.65
religious services	1.14	1.08	1.13
Health/Functional Status			
health conditions	1.35	1.42	1.41
ADLs	1.93*	1.70	1.73
self-rated health	2.77	2.20	2.31
exercise	0.75	0.73	0.74
Psychosocial			
chronic stress	—	1.31*	1.33*
mastery	—	—	1.11
Pseudo R-square	0.304	0.322	0.323

Note: *n*=256.
Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are odds ratios (OR).
*$p < .050$; **$p < .010$; ***$p < .001$.

Table 28d

Binomial Logistic Regression Models for Depression among Black Females, 2006 LBQ Sample

	Without Stress & Mastery	Plus Stress	Plus Stress & Mastery
Socioeconomic Status			
education	0.94	0.95	0.96
household income	1.00	0.99	0.99
net worth	0.98	0.98	0.98
Sociodemographics			
age	0.95*	0.96*	0.95*
married	0.66	0.66	0.66
Social Engagement			
work for pay	1.21	1.21	1.29
volunteer	0.78	0.74	0.73
religious services	0.82	0.86	0.86
Health/Functional Status			
health conditions	1.42***	1.33**	1.30*
ADLs	1.46***	1.40***	1.38**
self-rated health	1.74	1.70	1.71
exercise	0.77	0.83	0.87
Psychosocial			
chronic stress	—	1.28**	1.28*
mastery	—	—	0.76*
Pseudo R-square	0.183	0.201	0.214

Note: *n*=471.
Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are odds ratios (OR).
*$p < .050$; **$p < .010$; ***$p < .001$.

Table 28e

Binomial Logistic Regression Models for Depression among Hispanic Males, 2006 LBQ Sample

	Without Stress & Mastery	Plus Stress	Plus Stress & Mastery
Socioeconomic Status			
education	0.92	0.91	0.91
household income	0.92	0.93	0.91
net worth	0.96	0.98	0.99
Sociodemographics			
age	0.90**	0.91*	0.91*
married	0.43	0.40	0.41
Social Engagement			
work for pay	0.41	0.43	0.39
volunteer	0.63	0.70	0.69
religious services	1.30	1.38	1.39
Health/Functional Status			
health conditions	1.55*	1.46*	1.50*
ADLs	1.22	1.22	1.24
self-rated health	2.97*	2.93*	3.06*
exercise	0.51	0.50	0.48
Psychosocial			
chronic stress	—	1.26	1.28
mastery	—	—	1.27
Pseudo R-square	0.277	0.2879	0.294

Note: *n*=183.
Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are odds ratios (OR).
*$p < .050$; **$p < .010$; ***$p < .001$.

Table 28f

Binomial Logistic Regression Models for Depression among Hispanic Females, 2006 LBQ Sample

	Without Stress & Mastery	Plus Stress	Plus Stress & Mastery
Socioeconomic Status			
education	0.98	0.98	0.98
household income	1.01	1.06	1.06
net worth	0.96	0.96	0.96
Sociodemographics			
age	0.93**	0.94*	0.94**
married	0.52	0.51	0.51
Social Engagement			
work for pay	1.25	1.25	1.22
volunteer	0.62	0.59	0.62
religious services	2.08	2.15	2.07
Health/Functional Status			
health conditions	1.15	1.06	1.06
ADLs	1.11	1.08	1.07
self-rated health	4.33***	4.45***	4.52***
exercise	0.22**	0.20***	0.21**
Psychosocial			
chronic stress	—	1.26	1.23
mastery	—	—	0.87
Pseudo R-square	0.238	0.253	0.256

Note: *n*=236.
Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are odds ratios (OR).
*$p < .050$; **$p < .010$; ***$p < .001$.

Table 29

Descriptive Statistics among Total Study Sample for 2-Year Follow-Up in 2008, HRS Core Sample

	Total (*n*=14,634)		Non-Attritors (*n*=13,854)		Died (*n*=780)			
Variable	*M*[a]	*SD*	*M*[a]	*SD*	*M*[a]	*SD*	*statistic*[b]	*p-value*
2008 Depression								
depression	—	—	0.20	0.39	—	—	—	—
Sociodemographics								
age	65.29	10.00	64.85	9.70	74.74	11.44	62657.20	.000
female	0.56	0.49	0.56	0.49	0.53	0.49	1.65	.198
White	0.83	0.37	0.82	0.38	0.84	0.36	1.62	.202
Black	0.09	0.28	0.09	0.28	0.09	0.29	0.68	.408
Hispanic	0.07	0.24	0.07	0.24	0.05	0.21	2.96	.085
other race	0.02	0.14	0.02	0.15	0.01	0.10	3.75	.053
married	0.62	0.48	0.63	0.48	0.43	0.49	106.87	.000
Socioeconomic Status								
education	12.94	2.99	12.99	2.97	11.97	3.13	656.89	.000
household income[c]	$43,752	114,570	$45,010	116,588	$23,335	43,085	220.87	.000[d]
net worth[c]	$183,193	2,233,890	$188,000	2,278,570	$97,221	783,876	967.99	.000[d]
Social Engagement								
work for pay	0.45	0.49	0.47	0.49	0.13	0.33	305.95	.000
volunteer	0.36	0.48	0.37	0.48	0.16	0.36	127.74	.000
religious services	0.39	0.48	0.39	0.48	0.34	0.47	7.62	.006
Health/Functional Status								
health conditions	1.93	1.43	1.88	1.41	3.07	1.51	903.25	.000
ADLs limitations	0.30	0.87	0.27	0.80	1.04	1.60	387.07	.000
self-rated health	0.25	0.43	0.24	0.42	0.59	0.49	424.04	.000

continuation of Table 29

exercise	0.40	0.49	0.41	0.49	0.16	0.36	165.62	.000

Note: Means were weighted using HRS 2006 person level weight.
[a]For binary or categorical variables, the percent distributions are provided. For continuous variables, the means are provided.
[b]For categorical variables, Pearson chi-square test was performed. For continuous variables, ANOVA means test was performed.
[c]Median reported.
[d]To test for differences between non-attritors and deceased respondents, the mean of the logged household income and logged net worth measures were used.

Table 30

Descriptive Statistics by Gender for 2-Year Follow-Up in 2008, HRS Core Sample

	Male (*n*=6,005)		Female (*n*=8,629)			
Variable	*M*[a]	*SD*	*M*[a]	*SD*	*statistic*[b]	*p-value*
2008 Depression						
depression	0.17	0.37	0.22	0.41	65.17	.000
Sociodemographics						
age	64.63	9.63	65.81	10.25	5149.85	.000
White	0.84	0.36	0.81	0.38	18.82	.000
Black	0.08	0.26	0.10	0.29	16.96	.000
Hispanic	0.06	0.24	0.07	0.25	2.59	.107
other race	0.02	0.14	0.02	0.15	0.37	.538
married	0.72	0.44	0.54	0.49	541.69	.000
Socioeconomic Status						
education	13.21	3.12	12.73	2.87	866.59	.000
household income[c]	$52,600	124,378	$37,208	105,493	422.35	.000[d]
net worth[c]	$203,800	2,233,190	$167,304	2,234,080	595.26	.000[d]
Social Engagement						
work for pay	0.52	0.49	0.40	0.48	234.42	.000
volunteer	0.35	0.47	0.37	0.48	9.62	.002
religious services	0.33	0.47	0.44	0.49	184.41	.000
Health/Functional Status						
health conditions	1.83	1.43	2.01	1.43	118.68	.000
ADLs limitations	0.23	0.75	0.36	0.95	55.80	.000
self-reported health	0.24	0.42	0.26	0.44	8.35	.004
exercise	0.49	0.49	0.33	0.47	351.92	.000

Note: n=14,634.

Note: Depression only included non-attritors: male (*n*=5,637) and female (*n*=8,217).

Note: Means were weighted using HRS 2006 person level weight.

[a]For binary or categorical variables, the percent distributions are provided. For continuous variables, the means are provided.

[b]For categorical variables, Pearson chi-square test was performed. For continuous variables, ANOVA means test was performed.

[c]Median reported.

[d]To test for gender differences, the mean of the logged household income and logged net worth measures were used.

Table 31

Descriptive Statistics by Race and Ethnicity for 2-Year Follow-Up in 2008, HRS Core Sample

	White (*n*=11,119)		Black (*n*=1,957)		Hispanic (*n*=1,265)		Other Race (*n*=293)			
Variable	*M*[a]	*SD*	*M*[a]	*SD*	*M*[a]	*SD*	*M*[a]	*SD*	*statistic*[b]	*p-value*
2008 Depression										
depression	0.18	0.38	0.24	0.42	0.31	0.46	0.26	0.44	119.47	.000
Sociodemographics										
age	65.73	10.12	63.44	9.29	63.08	9.00	62.70	8.81	13975.10	.000
female	0.55	0.49	0.61	0.48	0.58	0.49	0.57	0.49	21.57	.000
married	0.65	0.47	0.38	0.48	0.59	0.49	0.60	0.49	350.38	.000
Socioeconomic Status										
education	13.33	2.57	12.00	3.14	9.41	4.51	12.73	3.59	15305.61	.000
household income[c]	$48,003	122,556	$23,365	59,225	$22,000	51,944	$42,755	63,026	1443.89	.000[d]
net worth[c]	$220,000	2,445,000	$42,595	362,157	$53,217	392,849	$109,000	813,976	16072.59	.000[d]
Social Engagement										
work for pay	0.46	0.49	0.43	0.49	0.41	0.49	0.49	0.50	14.52	.002
volunteer	0.38	0.48	0.36	0.48	0.19	0.39	0.28	0.44	145.94	.000
religious services	0.37	0.48	0.54	0.49	0.45	0.49	0.31	0.46	156.15	.000
Health/Functional Status										
health conditions	1.92	1.42	2.16	1.48	1.81	1.43	1.95	1.51	84.44	.000
ADLs limitations	0.27	0.82	0.52	1.10	0.45	1.07	0.32	0.83	99.08	.000
self-reported health	0.22	0.41	0.39	0.48	0.49	0.50	0.35	0.47	538.49	.000
exercise	0.42	0.49	0.32	0.46	0.31	0.46	0.42	0.49	76.56	.000

Note: n=14,634.
Note: Depression only included non-attritors: White (*n*=10,515), Black (*n*=1,848), Hispanic (*n*=1,208), and 'other race' (*n*=283).

continuation of Table 31

Note: Means were weighted using HRS 2006 person level weight.
[a]For binary or categorical variables, the percent distributions are provided. For continuous variables, the means are provided.
[b]For categorical variables, Pearson chi-square test was performed. For continuous variables, ANOVA means test was performed.
[c]Median reported.
[d]To test for race and ethnic differences, the mean of the logged household income and logged net worth measures were used.

Table 32

Descriptive Statistics among Total Study Sample for 2-Year Follow-Up in 2008, LBQ Sample

	Total Sample (*n*=5,942)		Non-Attritors (*n*=5,682)		Died (*n*=260)			
Variable	*M*[a]	*SD*	*M*[a]	*SD*	*M*[a]	*SD*	*statistic*[b]	*p-value*
2008 Depression								
depression	–	–	0.18	0.38	–	–	–	–
Sociodemographics								
age	64.90	9.67	64.60	9.48	72.79	11.35	14842.24	.000
female	0.54	0.49	0.54	0.49	0.48	0.50	4.32	.037
White	0.86	0.34	0.86	0.35	0.89	0.31	1.66	.197
Black	0.07	0.25	0.07	0.25	0.07	0.25	0.02	.885
Hispanic	0.05	0.21	0.05	0.21	0.04	0.19	0.54	.459
other race	0.02	0.14	0.02	0.14	0.00[d]	0.06	3.15	.076
married	0.66	0.47	0.67	0.47	0.54	0.49	17.34	.000
Socioeconomic Status								
education	13.15	2.77	13.18	2.76	12.25	2.96	194.59	.000
household income[c]	$47,800	124,824	$48,632	126,683	$27,896	46,815	46.78	.000[e]
net worth[c]	$201,137	2,467,180	$204,906	2,509,450	$129,937	720,954	206.43	.000[e]
Social Engagement								
work for pay	0.48	0.49	0.49	0.50	0.14	0.34	111.75	.000
volunteer	0.39	0.48	0.39	0.48	0.19	0.39	36.21	.000
religious services	0.39	0.48	0.39	0.48	0.35	0.47	2.18	.139
Health/Functional Status								
health conditions	1.86	1.40	1.81	1.37	2.95	1.56	288.35	.000
ADLs limitations	0.26	0.79	0.23	0.74	0.94	1.51	111.32	.000
self rated health	0.22	0.41	0.21	0.40	0.57	0.49	173.37	.000

continuation of Table 32

exercise	0.40	0.49	0.41	0.49	0.21	0.41	36.14	.000
Psychosocial								
mastery	4.81	1.06	4.83	1.05	4.37	1.15	45.96	.000
stress	1.32	1.47	1.31	1.47	1.72	1.49	36.84	.000

Note: Means were weighted using HRS 2006 person level weight.
[a]For binary or categorical variables, the percent distributions are provided. For continuous variables, the means are provided.
[b]For categorical variables, Pearson chi-square test was performed. For continuous variables, ANOVA means test was performed.
[c]Median reported.
[d]0.0044.
[e]To test for race and ethnic differences, the mean of the logged household income and logged net worth measures were used.

Table 33

Descriptive Statistics by Gender for 2-Year Follow-Up in 2008, LBQ Sample

	Male (*n*=2,533)		Female (*n*=3,409)			
Variable	*M*[a]	*SD*	*M*[a]	*SD*	*statistic*[b]	*p-value*
2008 Depression						
depression	0.16	0.36	0.21	0.40	23.50	.000
Sociodemographics						
age	64.23	9.23	65.47	10.00	2425.29	.000
White	0.87	0.33	0.85	0.36	7.76	.005
Black	0.06	0.23	0.08	0.27	10.45	.001
Hispanic	0.05	0.21	0.05	0.21	0.00	.976
other race	0.02	0.13	0.02	0.14	1.01	.313
married	0.75	0.43	0.59	0.49	162.89	.000
Socioeconomic Status						
education	13.39	2.93	12.95	2.61	303.71	.000
household income[c]	$56,000	135,796	$40,557	114,245	137.74	.000[d]
net worth[c]	$223,800	2,302,300	$191,452	2,598,990	102.71	.002[d]
Social Engagement						
work for pay	0.55	0.49	0.42	0.49	95.01	.000
volunteer	0.36	0.48	0.40	0.49	9.69	.002
religious services	0.33	0.47	0.44	0.49	80.23	.000
Health/Functional Status						
health conditions	1.76	1.39	1.94	1.40	47.58	.000
ADLs limitations	0.21	0.68	0.30	0.87	14.23	.000
self- reported health	0.22	0.41	0.22	0.41	0.48	.486
exercise	0.48	0.49	0.34	0.47	127.41	.000
Psychosocial						
mastery	4.85	1.03	4.79	1.09	5.64	.026
stress	1.17	1.36	1.45	1.55	124.63	.000

Note: n=5,942.
Note: Depression only included non-attritors: male (*n*=2,397) and female (*n*=3,285).
Note: Means were weighted using HRS 2006 person level weight.
[a]For binary or categorical variables, the percent distributions are provided. For continuous variables, the means are provided.
[b]For categorical variables, Pearson chi-square test was performed. For continuous variables, ANOVA means test was performed.
[c]Median reported.
[d]To test for gender differences, the mean of the logged household income and logged net worth measures were used.

Table 34

Descriptive Statistics by Race and Ethnicity for 2-Year Follow-Up in 2008, LBQ Sample

	White (*n*=4,755)		Black (*n*=683)		Hispanic (*n*=396)		Other Race (*n*=108)			
Variable	*M*[a]	*SD*	*M*[a]	*SD*	*M*[a]	*SD*	*M*[a]	*SD*	*statistics*[b]	*p-value*
2008 Depression										
depression	0.17	0.37	0.23	0.42	0.31	0.46	0.23	0.42	47.59	.000
Sociodemographics										
age	65.21	9.79	63.54	8.91	62.62	8.60	62.28	8.29	3860.80	.000
female	0.53	0.49	0.61	0.48	0.54	0.49	0.59	0.49	11.82	.008
married	0.68	0.46	0.41	0.49	0.64	0.47	0.67	0.47	141.69	.000
Socioeconomic Status										
education	13.42	2.48	12.06	3.03	10.18	4.32	12.94	3.46	3674.02	.000
household income[c]	$50,741	132,119	$25,094	62,330	$27,725	46,535	$50,000	64,893	453.58	.000[d]
net worth[c]	$235,000	2,654,660	$48,000	319,436	$66,275	452,545	$191,708	546,263	5603.64	.000[d]
Social Engagement										
work for pay	0.48	0.49	0.42	0.49	0.48	0.50	0.58	0.49	11.40	.010
volunteer	0.40	0.48	0.38	0.48	0.21	0.40	0.29	0.45	47.72	.000
religious services	0.38	0.48	0.52	0.50	0.47	0.50	0.32	0.46	49.08	.000
Health/Functional Status										
health conditions	1.84	1.38	2.13	1.51	1.77	1.45	1.93	1.53	39.16	.000
ADLs limitations	0.23	0.75	0.47	1.04	0.36	1.02	0.24	0.80	27.23	.000
self-rated health	0.19	0.39	0.38	0.48	0.41	0.49	0.30	0.46	166.92	.000
exercise	0.41	0.49	0.33	0.46	0.34	0.47	0.38	0.48	19.25	.000
Psychosocial										
mastery	4.82	1.05	4.76	1.15	4.75	1.20	4.70	0.93	4.81	.238
stress	1.31	1.44	1.34	1.55	1.45	1.62	1.70	1.85	25.15	.009

continuation of Table 34

Note: n=5,942.
Note: Depression only included non-attritors: White (*n*=4,540), Black (*n*=657), Hispanic (*n*=379), and other race (*n*=106).
Note: Means were weighted using HRS 2006 person level weight.
[a]For binary or categorical variables, the percent distributions are provided. For continuous variables, the means are provided.
[b]For categorical variables, Pearson chi-square test was performed. For continuous variables, ANOVA means test was performed.
[c]Median reported.
[d]To test for race and ethnic differences, the mean of the logged household income and logged net worth measures were used.

Table 35

Multinomial Logistic Regression Models for Depression Recovery, HRS Core Sample

	Model 1		Model 2		Model 3		Model 4		Model 5	
	depression recovery	died	depression recovery	died	depression recovery	died	depression recovery	died	depression recovery	died
SES										
education	1.07***	1.03*	1.07***	1.00	1.08***	1.08***	1.07***	1.09***	1.05**	1.08***
household income	1.04	0.95	1.06	0.92	1.03	0.94	0.97	0.95	0.97	0.95
net worth	1.04**	1.03*	1.04***	1.02	1.04**	0.98	1.04**	0.98	1.02	0.98
Sociodemographics										
female	—	—	1.26*	0.66***	1.26*	0.55***	1.29*	0.54***	1.33*	0.55***
Black[a]	—	—	1.33	0.79	1.37	1.17	1.34	1.17	1.40	1.18
Hispanic[a]	—	—	1.02	0.33***	1.04	0.59*	1.00	0.59*	0.93	0.61*
other race[a]	—	—	0.94	0.27**	0.97	0.44	0.99	0.44	0.98	0.45
age	—	—	—	—	1.00	1.09***	1.01**	1.09***	1.01**	1.09***
married	—	—	—	—	1.21	1.39*	1.23	1.38*	1.22	1.34
Social Engagement										
work for pay	—	—	—	—	—	—	1.74***	0.77	1.25	0.76
volunteer	—	—	—	—	—	—	1.23	0.74	1.16	0.73
religious services	—	—	—	—	—	—	1.06	1.06	1.00	1.05
Health Status										
health conditions	—	—	—	—	—	—	—	—	0.84***	1.04
ADLs limitations	—	—	—	—	—	—	—	—	0.88*	0.99
self-rated health	—	—	—	—	—	—	—	—	0.71**	0.89
exercise	—	—	—	—	—	—	—	—	1.13	1.07
Pseudo R-square	0.011		0.029		0.082		0.090		0.106	

Note: n=3,506.

Note: Relative risk ratios were from weighted multinomial logistic regression models adjusted for complex survey design using Stata's svy procedure.

Note: Depressed in both waves (2006 and 2008) was base outcome group.

[a]Non-Hispanic White was reference group.

*p < .050; **p <.010; ***p < .001.

Table 36

Multinomial Logistic Regression Models for Depression Onset, HRS Core Sample

	Model 1		Model 2		Model 3		Model 4		Model 5	
	depression onset	died	depression onset	died	depression onset	died	depression onset	died	depression onset	died
SES										
education	0.94***	0.91***	0.93***	0.88***	0.93***	0.94**	0.94***	0.97	0.96*	1.01
household income	0.83***	0.79***	0.84***	0.77***	0.87***	0.84***	0.89***	0.90*	0.91**	0.94
net worth	0.95***	0.92***	0.95***	0.91***	0.95***	0.89***	0.96***	0.90***	0.98	0.94***
Sociodemographics										
female	–	–	1.34***	0.90	1.31***	0.69***	1.32***	0.73***	1.31***	0.65***
Black	–	–	1.03	0.66**	1.01	0.85	1.04	0.90	0.89	0.69*
Hispanic	–	–	0.84	0.30***	0.86	0.53**	0.88	0.56**	0.86	0.63*
other race	–	–	1.16	0.48	1.16	0.58	1.15	0.58	1.08	0.56
age	–	–	–	–	1.00	1.08***	0.99	1.06***	0.98*	1.05***
married	–	–	–	–	0.82*	0.68**	0.82*	0.68**	0.81**	0.60***
Social Engagement										
work for pay	–	–	–	–	–	–	0.78**	0.33***	0.97	0.56**
volunteer	–	–	–	–	–	–	0.77**	0.41***	0.83	0.51***
religious services	–	–	–	–	–	–	0.91	0.78*	0.96	0.96
Health Status										
health conditions	–	–	–	–	–	–	–	–	1.12***	1.32***
ADLs limitations	–	–	–	–	–	–	–	–	1.25***	1.58***
self-rated health	–	–	–	–	–	–	–	–	2.01***	3.13***
exercise	–	–	–	–	–	–	–	–	0.84	0.68**
Pseudo R-square	0.030		0.037		0.072		0.087		0.141	

Note: n=11,908.
Note: Relative risk ratios were from weighted multinomial logistic regression models adjusted for complex survey design using Stata's svy procedure.
Note: Not depressed in both waves (2006 and 2008) was base outcome group.
[a]Non-Hispanic White was reference group.
*p < .050; **p <.010; ***p < .001.

Table 37

Education Interactions on Depression Recovery, HRS Core Sample

	Unadjusted for Income & Net Worth[a]		Adjusted for Income & Net Worth[b]	
	depression recovery	died	depression recovery	died
Gender				
education	1.03	1.08***	1.03	1.08***
female	0.86	0.57	0.87	0.54
education x female	1.03	0.99	1.03	1.00
Pseudo R-square	0.105		0.106	
Race and Ethnicity[c]				
education	1.05*	1.08***	1.05*	1.09***
Black	0.83	1.22	0.88	1.17
Hispanic	0.99	0.84	1.02	0.80
other race	0.70	0.03*	0.73	0.03*
education x Black	1.04	1.00	1.04	1.00
education x Hispanic	0.98	0.96	0.98	0.96
education x other race	1.02	1.22	1.02	1.21
Pseudo R-square	0.106		0.107	

Note: n=3,506.
Note: Relative risk ratios were from weighted multinomial logistic regression models adjusted for complex survey design using Stata's svy procedure.
Note: Depressed in both waves (2006 and 2008) was base outcome group.
[a]Models were adjusted for control variables except household income and net worth.
[b]Models were adjusted for control variables including household income and net worth.
[c]Non-Hispanic White was reference group.

continuation of Table 37

*$p < .050$; **$p < .010$; ***$p < .001$.

Table 38

Household Income Interactions on Depression Recovery, HRS Core Sample

	Unadjusted for Education & Net Worth[a]		Adjusted for Education & Net Worth[b]	
	depression recovery	died	depression recovery	died
Gender				
household income	0.97	0.99	0.93	0.95
female	0.76	0.64	0.72	0.53
household income x female	1.05	0.98	1.06	1.00
Pseudo R-square	0.104		0.107	
Race and Ethnicity[c]				
household income	0.97	0.94	0.93	0.91
Black	1.23	0.29	1.20	0.30
Hispanic	0.19	0.20	0.24	0.26
other race	1.03	0.00	0.74	0.00
household income x Black	0.99	1.14	1.01	1.15
household income x Hispanic	1.14	1.08	1.14	1.09
household income x other race	0.98	1.77	1.02	1.85
Pseudo R-square	0.103		0.107	

Note: n=3,506.
Note: Relative risk ratios were from weighted multinomial logistic regression models adjusted for complex survey design using Stata's svy procedure.
Note: Depressed in both waves (2006 and 2008) was base outcome group.
[a]Models were adjusted for control variables except education and net worth.
[b]Models were adjusted for control variables including education and net worth.
[c]Non-Hispanic White was reference group.

continuation of Table 38

*$p < .050$; **$p < .010$; ***$p < .001$.

Table 39

Net Worth Interactions on Depression Recovery, HRS Core Sample

	Unadjusted for Education & Income[a]		Adjusted for Education & Income[b]	
	depression recovery	died	depression recovery	died
Gender				
net worth	1.01	1.00	1.01	0.99
female	1.16	0.65	1.18	0.65
net worth x female	1.01	0.98	1.01	0.98
Pseudo R-square	0.103		0.106	
Race and Ethnicity[c]				
net worth	1.01	0.98	1.01	0.97
Black	1.51	1.07	1.58	1.17
Hispanic	0.33***	0.40*	0.41*	0.55
other race	0.56	0.44	0.58	0.44
net worth x Black	0.97	0.99	0.97	0.99
net worth x Hispanic	1.10**	1.01	1.09**	1.01
net worth x other race	1.05	0.99	1.05	0.99
Pseudo R-square	0.104		0.107	

Note: n=3,506.
Note: Relative risk ratios were from weighted multinomial logistic regression models adjusted for complex survey design using Stata's svy procedure.
Note: Depressed in both waves (2006 and 2008) was base outcome group.
[a]Models were adjusted for control variables except education and household income.
[b]Models were adjusted for control variables including education and household income.
[c]Non-Hispanic White was reference group.

continuation of Table 39

*$p < .050$; **$p < .010$; ***$p < .001$.

Table 40

Education Interactions on Depression Onset, HRS Core Sample

	Unadjusted for Income & Net Worth[a]		Adjusted for Income & Net Worth[b]	
	depression onset	died	depression onset	died
Gender				
education	0.93***	0.99	0.94**	1.00
female	0.76	0.55	0.74	0.49
education x female	1.04	1.01	1.04	1.02
Pseudo R-square	0.138		0.142	
Race and Ethnicity[c]				
education	0.95**	0.99	0.96*	1.01
Black	0.75	0.93	0.68	0.78
Hispanic	0.66	0.57	0.63	0.51
other race	1.70	0.18	1.69	0.19
education x Black	1.01	0.98	1.02	0.98
education x Hispanic	1.03	1.02	1.03	1.02
education x other race	0.96	1.09	0.96	1.08
Pseudo R-square	0.139		0.142	

Note: n=11,908.

Note: Relative risk ratios were from weighted multinomial logistic regression models adjusted for complex survey design using Stata's svy procedure.

Note: Not depressed in both waves (2006 and 2008) was base outcome group.

[a]Models were adjusted for control variables except household income and net worth.

[b]Models were adjusted for control variables including household income and net worth.

[c]Non-Hispanic White was reference group.

continuation of Table 40

*p < .050; **p <.010; ***p < .001.

Table 41

Household Income Interactions on Depression Onset, HRS Core Sample

	Unadjusted for Education & Net Worth[a]		Adjusted for Education & Net Worth[b]	
	depression onset	died	depression onset	died
Gender				
household income	0.84***	0.85**	0.86***	0.89*
female	0.43	0.22*	0.43	0.20*
household income x female	1.11*	1.11	1.11*	1.11
Pseudo R-square	0.139		0.142	
Race and Ethnicity[c]				
household income	0.88***	0.88**	0.89**	0.91
Black	1.15	0.51	1.04	0.40
Hispanic	0.45	0.18	0.40	0.16
other race	0.15	0.00	0.11	0.00
household income x Black	0.98	1.04	0.98	1.05
household income x Hispanic	1.08	1.14	1.08	1.14
household income x other race	1.20	1.69	1.23	1.74
Pseudo R-square	0.139		0.141	

Note: n=11,908.
Note: Relative risk ratios were from weighted multinomial logistic regression models adjusted for complex survey design using Stata's svy procedure.
Note: Not depressed in both waves (2006 and 2008) was base outcome group.
[a]Models were adjusted for control variables except education and net worth.
[b]Models were adjusted for control variables including education and net worth.
[c]Non-Hispanic White was reference group.

continuation of Table 41

*p < .050; **p <.010; ***p < .001.

Table 42

Net Worth Interactions on Depression Onset, HRS Core Sample

	Unadjusted for Education & Income[a]		Adjusted for Education & Income[b]	
	depression onset	died	depression onset	died
Gender				
net worth	0.93***	0.92***	1.01	0.99
female	0.70	0.47**	1.18	0.65
net worth x female	1.05**	1.03	1.01	0.98
Pseudo R-square	0.141		0.142	
Race and Ethnicity[c]				
net worth	0.95**	0.93***	1.01	0.97
Black	0.77	0.62	1.58	1.17
Hispanic	0.59	0.45*	0.41*	0.55
other race	0.91	1.23	0.58	0.44
net worth x Black	1.01	1.00	0.97	0.99
net worth x Hispanic	1.05	1.03	1.09**	1.01
net worth x other race	1.01	0.91	1.05	0.99
Pseudo R-square	0.140		0.142	

Note: n=11,908.
Note: Relative risk ratios were from weighted multinomial logistic regression models adjusted for complex survey design using Stata's svy procedure.
Note: Not depressed in both waves (2006 and 2008) was base outcome group.
[a]Models were adjusted for control variables except education and household income.
[b]Models were adjusted for control variables including education and household income.
[c]Non-Hispanic White was reference group.

continuation of Table 42

*$p < .050$; **$p < .010$; ***$p < .001$.

Table 43

Ordinary Linear Regression Models for Stress and Mastery among Depressed in 2006 Group, LBQ Sample

	Chronic Stress		Mastery	
	b[a]	*SE*[b]	*b*[a]	*SE*[b]
Socioeconomic Status				
education	0.05**	0.01	-0.03*	0.01
household income	-0.11*	0.05	0.08*	0.04
net worth	-0.05***	0.01	0.03***	0.01
Gender				
female	0.29**	0.11	-0.03	0.07
Race and Ethnicity[c]				
Black	-0.33	0.17	0.33*	0.13
Hispanic	-0.44*	0.20	0.41**	0.13
other race	0.79	0.47	0.08	0.20
Adjusted R-squared	0.187		0.057	

Note: n=1,249.
Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
[a]Unstandardized coefficient.
[b]Standard error.
[c]Non-Hispanic White was reference group.
*$p < .050$; **$p < .010$; ***$p < .001$.

Table 44

Multinomial Logistic Regression Models on Stress and Mastery Mediating between SES and Depression Recovery, LBQ Sample

	Without Stress & Mastery		Plus Stress		Plus Stress & Mastery	
	depression recovery	died	depression recovery	died	depression recovery	died
Socioeconomic Status						
education	1.05	1.05	1.06	1.06	1.07*	1.07*
household income	1.06	1.09	1.04	1.07	1.03	1.06
net worth	1.04	0.98	1.03	0.97	1.02	0.96
Sociodemographics						
female	1.32	0.51***	1.39	0.54**	1.40	0.54**
Black[a]	1.71*	0.99	1.59	0.96	1.53	0.92
Hispanic[a]	0.92	0.45*	0.84	0.41*	0.78	0.39**
other race[a]	1.37	0.17*	1.60	0.19*	1.55	0.19*
age	1.03***	1.08***	1.02*	1.07***	1.02**	1.07***
married	0.95	1.34	1.00	1.42	1.02	1.44
Social Engagement						
work for pay	1.49	0.54	1.52	0.55	1.50	0.55
volunteer	1.12	0.75	1.13	0.77	1.10	0.76
religious services	1.00	1.13	0.99	1.12	1.01	1.13
Health Status						
health conditions	0.90	1.01	0.93	1.04	0.92	1.03
ADLs limitations	0.84*	0.99	0.86*	1.00	0.86	1.01
self-rated health	0.76	1.10	0.77	1.11	0.81	1.15
exercise	1.30	1.78*	1.25	1.73*	1.21	1.67
Psychosocial						
chronic stress	–	–	0.83***	0.83*	0.85**	0.84*
mastery	–	–	–	–	1.18*	1.14
Pseudo R-square	0.099		0.108		0.110	

Note: *n*=1,249.

Note: Depressed in both waves (2006 and 2008) was base outcome group.

continuation of Table 44

Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are relative risk ratios (RRR).
[a]Non-Hispanic White was reference group.
*$p < .050$; **$p < .010$; ***$p < .001$.

Table 45

Ordinary Linear Regression Models for Stress and Mastery among Not Depressed in 2006 Group, LBQ Sample

	Chronic Stress		Mastery	
	b[a]	*SE*[b]	*b*[a]	*SE*[b]
Socioeconomic Status				
education	0.02**	0.00	0.00	0.00
household income	-0.03	0.02	0.03	0.01
net worth	-0.04***	0.00	0.01*	0.00
Gender				
female	0.26***	0.04	0.00	0.03
Race and Ethnicity[c]				
Black	-0.32***	0.07	0.08	0.06
Hispanic	-0.07	0.11	0.05	0.09
other race	-0.16	0.16	-0.04	0.10
Adjusted R-squared	0.105		0.051	

Note: n=4,953.

Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.

[a]Unstandardized coefficient.

[b]Standard error.

[c]Non-Hispanic White was reference group.

*$p < .050$; **$p < .010$; ***$p < .001$.

Table 46

Multinomial Logistic Regression Models on Stress and Mastery Mediating between SES and Depression Onset, LBQ Sample

	Without Stress & Mastery		Plus Stress		Plus Stress & Mastery	
	depression onset	died	depression onset	died	depression onset	died
Socioeconomic Status						
education	0.98	1.00	0.97	0.99	0.97	0.99
household income	0.87**	1.06	0.88**	1.09	0.88*	1.10
net worth	0.99	0.95	1.01	0.96	1.01	0.97
Sociodemographics						
female	1.34*	0.59**	1.22	0.53***	1.22	0.53***
Black[a]	0.85	0.53*	0.95	0.57	0.96	0.57
Hispanic[a]	1.09	0.63	1.13	0.67	1.14	0.68
other race[a]	1.02	0.23	1.06	0.26	1.05	0.26
age	0.98**	1.03**	0.99	1.04***	0.98	1.04***
married	0.71*	0.59**	0.70*	0.55**	0.68**	0.53***
Social Engagement						
work for pay	0.95	0.40**	0.92	0.38***	0.93	0.39***
volunteer	0.85	0.56**	0.83	0.54**	0.83	0.54**
religious services	1.11	1.07	1.17	1.15	1.14	1.13
Health/Functional Status						
health conditions	1.14**	1.36***	1.09	1.32***	1.09	1.31***
ADLs limitations	1.28**	1.65***	1.24**	1.60***	1.22*	1.57***
self-rated health	2.30***	3.46***	2.09***	3.07***	2.05***	2.96***
exercise	0.76	0.83	0.77	0.84	0.79	0.86
Psychosocial						
chronic stress	–	–	1.34***	1.39***	1.32***	1.36***
mastery	–	–	–	–	0.83***	0.80**
Pseudo R-square	0.127		0.142		0.146	

Note: *n*=4,953.

Note: Not depressed in both waves (2006 and 2008) was base outcome group.

Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.

continuation of Table 46

Note: Coefficients are relative risk ratios (RRR).
[a]Non-Hispanic White was reference group.
*$p < .050$; **$p < .010$; ***$p < .001$.

Table 47

Intersectionality Analyses for Gender-Race-Ethnic Groups on Depression Recovery, HRS Core Sample

	Unadjusted Model[a]		Adjusted Model[b]	
	depression recovery	died	depression recovery	died
White females	1.20	0.66***	1.34*	0.53***
Black males	0.79	0.53*	1.07	0.74
Black females	1.27	0.62**	2.14***	0.83
Hispanic males	1.01	0.42*	1.43	0.67
Hispanic females	0.63***	0.19***	1.03	0.31***
Pseudo R-square	0.016		0.104	

Note: n=3,422.
Note: Excluded non-Hispanic other race from these analyses due to small sample size (*n*=84).
Note: Relative risk ratios were from weighted multinomial logistic regression models adjusted for complex survey design using Stata's svy procedure.
Note: Depressed in both waves (2006 and 2008) was base outcome group.
Note: White males was reference group.
[a]Unadjusted model did not include any control variables (without SES, sociodemographics, social engagement, and health status variables).
[b]Adjusted model included control variables (with SES, sociodemographics, social engagement, and health status variables).
*$p < .050$; **$p < .010$; ***$p < .001$.

Table 48

Intersectionality Analyses on Depression Recovery with Mediation of Stress and Mastery, LBQ Sample

	Without Stress & Mastery				With Stress & Mastery			
	Unadjusted Model[a]		Adjusted Model[b]		Unadjusted Model[a]		Adjusted Model[b]	
	depression recovery	died	depression recovery	died	depression recovery	died	depression recovery	died
White females	1.30	0.59*	1.45	0.48**	1.40	0.63*	1.54*	0.51**
Black males	0.75	0.41	1.40	0.40	0.78	0.43	1.29	0.38
Black females	1.34	0.58	2.81**	0.85	1.43	0.63	2.53**	0.81
Hispanic males	1.09	0.41	2.11	0.50	1.00	0.39*	1.83	0.46
Hispanic females	0.46*	0.15***	0.85	0.22**	0.41*	0.13***	0.72	0.19**
Chronic stress	—	—	—	—	0.79***	0.73***	0.83**	0.84*
Mastery	—	—	—	—	1.31***	1.10	1.22**	1.16
Pseudo R-square	0.018		0.099		0.047		0.111	

Note: n=1,221.
Note: Excluded non-Hispanic other race from these analyses due to small sample size (*n*=28).
Note: Depressed in both waves (2006 and 2008) was base outcome group.
Note: White males was reference group.
Note: Models are not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are relative risk ratios (RRR).
[a]Unadjusted model did not include any control variables (without SES, sociodemographics, social engagement, and health status variables).
[b]Adjusted model included control variables (with SES, sociodemographics, social engagement, and health status variables).
**p* < .050; ***p* <.010; ****p* < .001.

Table 49a

Multinomial Logistic Regression Models for Depression Recovery among White Males, LBQ Sample

	Without Stress & Mastery		Plus Stress		Plus Stress & Mastery	
	depression recovery	died	depression recovery	died	depression recovery	died
Socioeconomic Status						
education	1.01	1.03	1.01	1.04	1.02	1.05
household income	0.80	0.70	0.80	0.67	0.76	0.64
net worth	1.14*	1.00	1.14	0.98	1.13	0.97
Sociodemographics						
age	1.01	1.08***	1.01	1.07***	1.01	1.07***
married	0.96	2.22*	0.98	2.61*	1.02	2.73*
Social Engagement						
work for pay	0.84	0.60	0.82	0.59	0.85	0.62
volunteer	1.25	1.13	1.23	1.15	1.19	1.12
religious services	1.26	1.58	1.29	1.61	1.32	1.65
Health/Functional Status						
health conditions	1.04	1.01	1.04	1.02	1.04	1.02
ADLs Limitations	0.63*	0.88	0.64*	0.88	0.64*	0.89
self-rated health	0.85	1.68	0.84	1.69	0.86	1.82
exercise	1.49	2.54*	1.49	2.59*	1.43	2.47*
Psychosocial						
chronic stress	–	–	0.97	0.79	0.98	0.80
mastery	–	–	–	–	1.13	1.21
Pseudo R-square	0.120		0.126		0.129	

Note: *n*=352.
Note: Depressed in both waves (2006 and 2008) was base outcome group.
Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are relative risk ratios (RRR).
*p < .050; **p <.010; ***p < .001.

Table 49b

Multinomial Logistic Regression Models for Depression Recovery among White Females, LBQ Sample

	Without Stress & Mastery		Plus Stress		Plus Stress & Mastery	
	depression recovery	died	depression recovery	died	depression recovery	died
Socioeconomic Status						
education	1.14**	1.07	1.18**	1.09	1.19***	1.09
household income	1.35	1.52	1.30	1.49	1.30	1.50
net worth	0.97	0.95	0.95	0.95	0.94	0.94
Sociodemographics						
age	1.04***	1.08***	1.02*	1.07***	1.02*	1.07***
married	0.94	0.99	0.98	0.99	1.00	1.00
Social Engagement						
work for pay	1.25	0.27*	1.40	0.29	1.24	0.27*
volunteer	1.22	0.64	1.25	0.65	1.27	0.65
religious services	0.77	0.74	0.77	0.74	0.81	0.74
Health/Functional Status						
health conditions	0.83	1.09	0.88	1.13	0.85	1.11
ADLs Limitations	0.89	0.96	0.91	0.96	0.94	0.98
self-rated health	0.71	0.84	0.73	0.85	0.82	0.90
exercise	1.36	1.53	1.23	1.48	1.18	1.44
Psychosocial						
chronic stress	—	—	0.78**	0.90	0.80**	0.91
mastery	—	—	—	—	1.45***	1.18
Pseudo R-square	0.117		0.130		0.145	

Note: *n*=576.
Note: Depressed in both waves (2006 and 2008) was base outcome group.
Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are relative risk ratios (RRR).
*p < .050; **p <.010; ***p < .001.

Table 49c

Multinomial Logistic Regression Models for Depression Recovery among Black Males, LBQ Sample

	Without Stress & Mastery		Plus Stress		Plus Stress & Mastery	
	depression recovery	died	depression recovery	died	depression recovery	died
Socioeconomic Status						
education	0.97	0.94	1.02	0.91	1.09	0.94
household income	2.17*	1.98*	2.44*	1.98*	4.19	1.82
net worth	0.62*	0.87	0.57*	0.89	0.60*	0.90
Sociodemographics						
age	0.94	0.97	0.94	0.96	0.89	0.96
married	184.26*	1.06	636.83*	1.12	2521.08*	1.29
Social Engagement						
work for pay	67.83**	1.94	118.24**	2.77	73.56*	2.21
volunteer	0.33	0.44	2.14	0.29	32.63	0.30
religious services	1.84	4.50	1.06	5.54	0.05	4.94
Health/Functional Status						
health conditions	0.18**	0.19**	0.14*	0.19**	0.12*	0.22**
ADLs Limitations	1.77	1.61	2.10	1.59	1.89	1.51
self-rated health	0.05	0.77	0.09	0.79	0.05	0.79
exercise	0.16	0.11	0.36	0.10	0.69	0.13
Psychosocial						
chronic stress	—	—	0.48	1.12	0.25*	1.02
mastery	—	—	—	—	0.26	0.82
Pseudo R-square	0.520		0.549		0.561	

Note: *n*=50.
Note: Depressed in both waves (2006 and 2008) was base outcome group.
Note: Models are not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are relative risk ratios (RRR).
*p < .050; **p <.010; ***p < .001.

Table 49d

Multinomial Logistic Regression Models for Depression Recovery among Black Females, LBQ Sample

	Without Stress & Mastery		Plus Stress		Plus Stress & Mastery	
	depression recovery	died	depression recovery	died	depression recovery	died
Socioeconomic Status						
education	1.26	1.36**	1.24	1.35*	1.23	1.34*
household income	1.10	1.29	1.04	1.24	1.01	1.32
net worth	0.87	0.87	0.86	0.86	0.87	0.87
Sociodemographics						
age	1.10*	0.99	1.09*	0.99	1.08*	0.99
married	1.29	3.36	1.83	4.54	1.91	3.67
Social Engagement						
work for pay	4.97	0.20	5.22*	0.23	5.31*	0.26
volunteer	0.07**	0.06*	0.09*	0.07*	0.10*	0.05*
religious services	5.92**	1.54	6.51**	1.65	6.55**	1.88
Health/Functional Status						
health conditions	0.86	0.64	0.94	0.71	0.95	0.69
ADLs Limitations	0.91	1.23	0.97	1.29	0.96	1.35
self-rated health	0.30	0.36	0.39	0.48	0.42	0.54
exercise	21.67***	25.00**	19.56**	24.10**	17.98**	24.65**
Psychosocial						
chronic stress	—	—	0.67*	0.72	0.66*	0.75
mastery	—	—	—	—	0.93	1.72
Pseudo R-square	0.281		0.301		0.316	

Note: *n*=116.
Note: Depressed in both waves (2006 and 2008) was base outcome group.
Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are relative risk ratios (RRR).
*p < .050; **p <.010; ***p < .001.

Table 49e

Multinomial Logistic Regression Models for Depression Recovery among Hispanic Males, LBQ Sample

	Without Stress & Mastery		Plus Stress		Plus Stress & Mastery	
	depression recovery	died	depression recovery	died	depression recovery	died
Socioeconomic Status						
education	1.26	1.31	1.41	1.46	1.35	1.34
household income	0.83	0.73	0.83	0.63	0.87	1.06
net worth	1.21	0.96	1.20	0.98	1.16	1.01
Sociodemographics						
age	1.04	1.31**	1.03	1.31**	1.03	1.40**
married	0.72	78.64*	0.82	79.56*	0.87	126.55*
Social Engagement						
work for pay	211.50*	137.42	126.95**	94.68	135.39**	58.52*
volunteer	0.12	0.88	0.10	0.84	0.17	0.39
religious services	9.61	38.02*	6.71	29.26*	5.67	37.73*
Health/Functional Status						
health conditions	0.95	0.81	0.96	0.77	0.97	1.17
ADLs Limitations	0.58	0.72	0.65	0.77	0.62	0.61
self-rated health	3.49	16.22	7.01	38.30	5.58	22.94
exercise	0.23	0.26	0.26	0.35	0.24	0.29
Psychosocial						
chronic stress	–	–	0.49	0.46	0.50	0.53
mastery	–	–	–	–	0.85	2.66
Pseudo R-square	0.552		0.569		0.589	

Note: *n*=48.
Note: Depressed in both waves (2006 and 2008) was base outcome group.
Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are relative risk ratios (RRR).
*p < .050; **p <.010; ***p < .001.

Table 49f

Multinomial Logistic Regression Models for Depression Recovery among Hispanic Females, LBQ Sample

	Without Stress & Mastery		Plus Stress		Plus Stress & Mastery	
	depression recovery	died	depression recovery	died	depression recovery	died
Socioeconomic Status						
education	0.74***	0.88	0.75***	0.97	0.74**	1.05
household income	1.40*	1.10	1.34*	1.08	1.36*	1.34
net worth	1.27*	0.97	1.28**	0.95	1.28*	1.01
Sociodemographics						
age	1.08	1.16**	1.05	1.12	1.05	1.23*
married	0.65	0.32	0.73	1.27	0.74	0.56
Social Engagement						
work for pay	1.29	1.99	1.24	2.94	1.27	8.13
volunteer	0.86	7.72e-06***	1.10	3.77e-06***	1.01	3.50e-06***
religious services	0.23*	0.30	0.20*	0.18	0.20*	0.55
Health/Functional Status						
health conditions	0.48*	1.81	0.54	3.35	0.53	4.37
ADLs Limitations	1.38	2.06	1.44	2.34	1.44	1.46
self-rated health	0.22*	0.24	0.22	0.35	0.23	0.08
exercise	0.22	144.53	0.25	276.98	0.24	157.58
Psychosocial						
chronic stress	–	–	0.79	0.34	0.83	0.36
mastery	–	–	–	–	1.19	0.30
Pseudo R-square	0.462		0.472		0.479	

Note: *n*=79.
Note: Depressed in both waves (2006 and 2008) was base outcome group.
Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are relative risk ratios (RRR).
*p < .050; **p <.010; ***p < .001.

Table 50

Intersectionality Analyses for Gender-Race-Ethnic Groups on Depression Onset, HRS Core Sample

	Unadjusted Model[a]		Adjusted Model[b]	
	depression onset	died	depression onset	died
White females	1.47***	1.00	1.36***	0.65***
Black males	1.47*	1.03	1.01	0.62*
Black females	2.02***	1.38	1.16	0.49***
Hispanic males	1.43	0.83	0.88	0.62
Hispanic females	2.17***	1.05	1.17	0.42**
Pseudo R-square	0.005		0.141	

Note: n=11,689.
Note: Excluded non-Hispanic other race from these analyses (*n*=219).
Note: Relative risk ratios were from weighted multinomial logistic regression models adjusted for complex survey design using Stata's svy procedure.
Note: Not depressed in both waves (2006 and 2008) was base outcome group.
Note: White males was reference group.
[a]Unadjusted model did not include any control variables (without SES, sociodemographics, social engagement, and health status variables).
[b]Adjusted model included control variables (with SES, sociodemographics, social engagement, and health status variables).
*p < .050; **p <.010; ***p < .001.

Table 51

Intersectionality Analyses on Depression Onset with Mediation of Stress and Mastery, LBQ Sample

	Without Stress & Mastery				With Stress & Mastery			
	Unadjusted Model[a]		Adjusted Model[b]		Unadjusted Model[a]		Adjusted Model[b]	
	depression onset	died	depression onset	died	depression onset	died	depression onset	died
White females	1.60***	0.82	1.47**	0.59**	1.44**	0.73	1.32*	0.53***
Black males	1.74	0.68	1.19	0.46	1.72	0.64	1.26	0.47
Black females	2.19***	1.13	1.07	0.34**	2.04**	1.04	1.13	0.34*
Hispanic males	1.87	0.91	1.37	0.61	1.73	0.83	1.36	0.63
Hispanic females	2.27**	0.80	1.45	0.39	2.06*	0.67	1.42	0.39
Chronic stress	—	—	—	—	1.39***	1.37***	1.32***	1.36***
Mastery	—	—	—	—	0.77***	0.65***	0.82***	0.80**
Pseudo R-square	0.007		0.127		0.050		0.146	

Note: n=4,871.
Note: Excluded non-Hispanic other race from these analyses (*n*=82).
Note: Not depressed in both waves (2006 and 2008) was base outcome group.
Note: White males was reference group.
Note: Models are not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are relative risk ratios (RRR).
[a]Unadjusted model did not include any control variables (without SES, sociodemographics, social engagement, and health status variables).
[b]Adjusted model included control variables (with SES, sociodemographics, social engagement, and health status variables).
*$p < .050$; **$p < .010$; ***$p < .001$.

Table 52a

Multinomial Logistic Regression Models for Depression Onset among White Males, LBQ Sample

	Without Stress & Mastery		Plus Stress		Plus Stress & Mastery	
	depression onset	died	depression onset	died	depression onset	died
Socioeconomic Status						
education	0.95	0.99	0.94	0.99	0.94	0.99
household income	0.91	1.04	0.93	1.07	0.92	1.09
net worth	0.94	0.95	0.96	0.97	0.96	0.97
Sociodemographics						
age	1.00	1.03	1.01	1.03*	1.01	1.03*
married	0.49**	0.52*	0.47**	0.49*	0.45**	0.46**
Social Engagement						
work for pay	0.94	0.53	0.93	0.51	0.95	0.51
volunteer	1.11	0.71	1.07	0.69	1.09	0.71
religious services	1.45	1.44	1.55	1.56	1.51	1.50
Health/Functional Status						
health conditions	1.06	1.40***	1.04	1.37**	1.04	1.37**
ADLs Limitations	1.49**	1.80**	1.41*	1.72**	1.37*	1.67*
self-rated health	3.36***	4.38***	2.95***	3.89***	2.85***	3.70***
exercise	0.82	0.74	0.83	0.73	0.84	0.75
Psychosocial						
chronic stress	–	–	1.35***	1.34*	1.34***	1.33*
mastery	–	–	–	–	0.77*	0.77*
Pseudo R-square	0.159		0.174		0.180	

Note: *n*=1,837.
Note: Not depressed in both waves (2006 and 2008) was base outcome group.
Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are relative risk ratios (RRR).
*p < .050; **p <.010; ***p < .001.

Table 52b

Multinomial Logistic Regression Models for Depression Onset among White Females, LBQ Sample

	Without Stress & Mastery		Plus Stress		Plus Stress & Mastery	
	depression onset	died	depression onset	died	depression onset	died
Socioeconomic Status						
education	1.01	0.97	0.99	0.95	1.00	0.95
household income	0.88	1.13	0.89	1.18	0.89	1.18
net worth	1.02	0.95	1.04	0.97	1.04	0.98
Sociodemographics						
age	0.98	1.04*	0.99	1.06***	0.99	1.06***
married	0.76	0.66	0.76	0.64	0.73	0.62
Social Engagement						
work for pay	1.11	0.23*	1.07	0.21**	1.10	0.23*
volunteer	0.81	0.49*	0.78	0.47*	0.78	0.48*
religious services	1.00	0.74	1.05	0.76	1.02	0.76
Health/Functional Status						
health conditions	1.14*	1.32**	1.08	1.26*	1.08	1.26*
ADLs Limitations	1.39**	1.67***	1.38**	1.62***	1.35*	1.58***
self-rated health	2.24***	3.00***	2.01***	2.64***	1.98**	2.57***
exercise	0.73	0.83	0.74	0.86	0.77	0.91
Psychosocial						
chronic stress	–	–	1.35***	1.54***	1.32***	1.50***
mastery	–	–	–	–	0.82**	0.79*
Pseudo R-square	0.127		0.152		0.157	

Note: *n*=2,205.
Note: Not depressed in both waves (2006 and 2008) was base outcome group.
Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are relative risk ratios (RRR).
*p < .050; **p <.010; ***p < .001.

Table 52c

Multinomial Logistic Regression Models for Depression Onset among Black Males, LBQ Sample

	Without Stress & Mastery		Plus Stress		Plus Stress & Mastery	
	depression onset	died	depression onset	died	depression onset	died
Socioeconomic Status						
education	1.15	1.09	1.19	1.07	1.18	1.07
household income	0.58*	0.52*	0.55*	0.51*	0.55*	0.74*
net worth	0.83**	0.79**	0.87	0.82*	0.86	0.82*
Sociodemographics						
age	0.91	1.12	0.89**	1.15	0.89**	1.16
married	0.85	0.45	0.53	0.37	0.52	0.32
Social Engagement						
work for pay	0.20	0.49	0.21	0.84	0.21	0.63
volunteer	0.26	0.26	0.21*	0.03*	0.21*	0.03*
religious services	3.13	2.85	3.72*	3.17	3.77*	2.23
Health/Functional Status						
health conditions	1.47	0.71	1.62*	0.81	1.61*	0.75
ADLs Limitations	0.12**	4.62*	0.06*	5.10	0.05*	6.39
self-rated health	5.13	8.88	4.22	4.75	4.18	5.90
exercise	1.46	6.07	1.57	16.15	1.57	20.62
Psychosocial						
chronic stress	—	—	1.66*	2.08**	1.68*	2.15***
mastery	—	—	—	—	0.99	1.49
Pseudo R-square	0.472		0.507		0.508	

Note: *n*=195.
Note: Not depressed in both waves (2006 and 2008) was base outcome group.
Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are relative risk ratios (RRR).
*p < .050; **p <.010; ***p < .001.

Table 52d

Multinomial Logistic Regression Models for Depression Onset among Black Females, LBQ Sample

	Without Stress & Mastery		Plus Stress		Plus Stress & Mastery	
	depression onset	died	depression onset	died	depression onset	died
Socioeconomic Status						
education	0.98	1.06	0.98	1.09	0.99	1.09
household income	1.11	1.14	1.10	1.13	1.11	1.12
net worth	1.03	0.96	1.04	0.97	1.04	0.97
Sociodemographics						
age	0.97	0.92*	0.97	0.92*	0.97	0.92*
married	0.70	1.15	0.70	1.19	0.68	1.18
Social Engagement						
work for pay	0.69	0.14	0.61	0.10	0.62	0.11
volunteer	0.73	0.35	0.71	0.29	0.71	0.30
religious services	0.93	0.72	1.03	0.89	1.04	0.88
Health/Functional Status						
health conditions	1.15	1.07	1.06	0.85	1.05	0.86
ADLs Limitations	1.13	1.48	1.10	1.43	1.10	1.42
self-rated health	0.81	2.05	0.78	2.42	0.76	2.38
exercise	0.70	0.94	0.70	0.91	0.71	0.89
Psychosocial						
chronic stress	—	—	1.33*	1.65***	1.33*	1.65***
mastery	—	—	—	—	0.88	1.03
Pseudo R-square	0.093		0.123		0.125	

Note: *n*=348.
Note: Not depressed in both waves (2006 and 2008) was base outcome group.
Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are relative risk ratios (RRR).
*p < .050; **p <.010; ***p < .001.

Table 52e

Multinomial Logistic Regression Models for Depression Onset among Hispanic Males, LBQ Sample

	Without Stress & Mastery		Plus Stress		Plus Stress & Mastery	
	depression onset	died	depression onset	died	depression onset	died
Socioeconomic Status						
education	0.91	0.93	0.89	0.91	0.88	0.90
household income	0.57***	2.40	0.53***	1.89	0.53***	2.54
net worth	1.18	0.69**	1.27	0.67***	1.27	0.68***
Sociodemographics						
age	1.01	1.20**	1.01	1.20**	1.01	1.20**
married	0.13**	15.84**	0.12**	18.77**	0.12**	16.05**
Social Engagement						
work for pay	4.59	2.70	4.87	4.21	4.96	3.00
volunteer	0.07	0.23	0.13	0.14	0.13	0.13
religious services	0.83	13.72*	0.65	19.19*	0.64	17.50*
Health/Functional Status						
health conditions	1.82*	1.17	1.65	1.14	1.64	1.33
ADLs Limitations	1.07	1.07	1.22	1.09	1.22	1.19
self-rated health	0.27	16.93**	0.24	26.84*	0.24	27.00**
exercise	1.13	0.09	0.99	0.08*	1.00	0.08*
Psychosocial						
chronic stress	–	–	1.72*	0.51	1.72*	0.54
mastery	–	–	–	–	0.93	1.56
Pseudo R-square	0.390		0.430		0.433	

Note: *n*=136.
Note: Not depressed in both waves (2006 and 2008) is base outcome group.
Note: Models are not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are relative risk ratios (RRR).
*p < .050; **p <.010; ***p < .001.

Table 52f

Multinomial Logistic Regression Models for Depression Onset among Hispanic Females, LBQ Sample

	Without Stress & Mastery		Plus Stress		Plus Stress & Mastery	
	depression onset	died	depression onset	died	depression onset	died
Socioeconomic Status						
education	1.10	1.21	1.12	1.18	1.13	1.17
household income	0.77	1.10	0.79	0.60	0.79	0.56
net worth	0.97	0.89	0.99	0.91	0.99	0.85
Sociodemographics						
age	0.95	1.17	0.96	1.13	0.95	1.11
married	1.58	0.09	1.76	0.64	1.76	1.21
Social Engagement						
work for pay	0.43	5.68	0.41	4.88	0.40	6.87
volunteer	1.23	5.08e-07***	1.61	7.83e-09***	1.54	3.01e-09***
religious services	1.16	0.16	1.03	0.19*	0.98	0.09**
Health/Functional Status						
health conditions	1.85**	4.04*	1.64*	3.82*	1.64*	4.15**
ADLs Limitations	0.86	5.73	0.73	5.06	0.78	5.24
self-rated health	1.13	8.14	1.05	11.30	1.09	38.78*
exercise	0.30	2203.79	0.20*	1203.39	0.22	17167.58
Psychosocial						
chronic stress	—	—	1.54*	0.37	1.47	0.26
mastery	—	—	—	—	0.83	0.28
Pseudo R-square	0.362		0.395		0.403	

Note: *n*=150.
Note: Not depressed in both waves (2006 and 2008) was base outcome group.
Note: Models were not adjusted for complex survey design using Stata's svy procedure due to sparse number of cases in strata.
Note: Coefficients are relative risk ratios (RRR).
*$p < .050$; **$p < .010$; ***$p < .001$.

APPENDIX A

MULTINOMIAL LOGISTIC REGRESSION MODELS FOR DEPRESSION WITHOUT AND WITH BASELINE ADJUSTMENT, HRS CORE SAMPLE

	Without Baseline Depression Status (2006)		With Baseline Depression Status (2006)	
	has depression (*n*=2,727)	died (*n*=780)	has depression (*n*=2,727)	died (*n*=780)
Baseline Adjustment				
depression in 2006	—	—	5.30***	2.04***
Socioeconomic Status				
education	0.95***	1.01	0.96***	1.01
household income	0.95	0.94	0.96	0.94
net worth	0.97**	0.94***	0.97*	0.95***
Sociodemographics				
female	1.17*	0.64***	1.08	0.62***
Black[a]	0.76*	0.76	0.82	0.79
Hispanic[a]	1.01	0.63*	0.96	0.62*
other race[a]	1.15	0.56	1.06	0.55
age	0.97***	1.05***	0.98***	1.06***
married	0.70***	0.73*	0.80**	0.76*
Social Engagement				
work for pay	0.83*	0.59**	0.89	0.61**
volunteer	0.79**	0.52***	0.84	0.53***
religious services	0.95	0.94	0.98	0.95
Health Status				
health conditions	1.20***	1.31***	1.15***	1.28***
ADLs limitations	1.33***	1.41***	1.17***	1.33***
self-rated health	2.24***	2.59***	1.71***	2.36***
exercise	0.78***	0.71*	0.84**	0.72*
Pseudo R-square	0.149		0.195	

Note: n=14,634.
Note: Relative risk ratios were from weighted multinomial logistic regression models adjusted for complex survey design using Stata's svy procedure.
Note: No depression in 2008 was base outcome group (*n*=11,127)
[a]Non-Hispanic White was reference group.
*$p < .050$; **$p < .010$; ***$p < .001$.

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APPENDIX B

DESCRIPTIVE STATISTICS AND COMPARISONS FOR EXCLUDED RESPONDENTS DUE TO PROXY STATUS IN 2008, HRS CORE SAMPLE

	Proxy Status in 2008 (*n*=1,705)		Self-Respondents both Waves[a] (*n*=13,845)			Died[b] (*n*=780)		
Variable	*M*[c]	*SD*	*M*[c]	*SD*	*p-value*[d]	*M*[c]	*SD*	*p-value*[d]
2008 Depression								
depression	—	—	0.20	0.39	—	—	—	—
Sociodemographics								
age	69.73	12.07	64.85	9.70	.000	74.74	11.44	.000
female	0.52	0.49	0.56	0.49	.003	0.53	0.49	.372
White	0.79	0.40	0.82	0.38	.002	0.84	0.36	.000
Black	0.11	0.30	0.09	0.28	.004	0.09	0.29	.191
Hispanic	0.07	0.25	0.07	0.24	.641	0.05	0.21	.008
other race	0.03	0.17	0.02	0.15	.063	0.01	0.10	.000
married	0.54	0.49	0.63	0.48	.000	0.43	0.49	.000
Socioeconomic Status								
education	12.26	3.11	12.99	2.97	.000	11.97	3.13	.001
household income[e]	$32,007	1,197,670	$45,010	116,588	.000[f]	$23,335	43,085	.000[f]
net worth[e]	$141,000	4,947,650	$188,000	2,278,570	.000[f]	$97,221	783,876	.000[f]
Social Engagement								
work for pay	0.30	0.46	0.47	0.49	.000	0.13	0.33	.000
volunteer	0.23	0.42	0.37	0.48	.000	0.16	0.36	.000
religious services	0.32	0.46	0.39	0.48	.000	0.34	0.47	.209
Health/Functional Status								
health conditions	2.48	1.60	1.88	1.41	.000	3.07	1.51	.000
ADLs limitations	0.66	1.36	0.27	0.80	.000	1.04	1.60	.000

continuation of Appendix B

self-rated health	0.42	0.49	0.24	0.42	.000	0.59	0.49	.000
exercise	0.27	0.44	0.41	0.49	.000	0.16	0.36	.000

Note: Means were weighted using HRS 2006 person level weight.

[a]Comparison between respondents who were 2006 self-respondents and then had proxy respondents in 2008 vs. self-respondents in both waves (2006 & 2008).

[b]Comparison between respondents who were 2006 self-respondents and then had proxy respondents in 2008 vs. respondents who died in 2008.

[c]For binary or categorical variables, the percent distributions are provided. For continuous variables, the means are provided.

[d]For categorical variables, Pearson chi-square test was performed. For continuous variables, ANOVA means test was performed.

[e]Median reported.

[f]To test for differences, the mean of the logged household income and logged net worth measures were used.

APPENDIX C

BINOMIAL LOGISTIC REGRESSION MODELS FOR DEPRESSION WITH ALTERNATIVE LOGGED NET WORTH MEASURE, HRS 2006 CORE SAMPLE[a]

	Model 1	Model 2	Model 3	Model 4	Model 5
Socioeconomic Status					
education	0.92***	0.92***	0.91***	0.93***	0.97**
household income	0.83***	0.84***	0.88***	0.94**	0.98
net worth[a]	0.94***	0.94***	0.95***	0.95***	0.97**
Sociodemographics					
female	—	1.43***	1.34***	1.36***	1.33***
Black[b]	—	0.99	0.89	0.94	0.76**
Hispanic[b]	—	1.17	1.14	1.20	1.19
other race[b]	—	1.42*	1.37*	1.34	1.20
age	—	—	0.98***	0.97***	0.96***
married	—	—	0.60***	0.59***	0.60***
Social Engagement					
work for pay	—	—	—	0.47***	0.79***
volunteer	—	—	—	0.62***	0.74***
religious services	—	—	—	0.80***	0.90
Health/Functional Status					
health conditions	—	—	—	—	1.21***
ADLs limitations	—	—	—	—	1.45***
self-rated health	—	—	—	—	2.69***
exercise	—	—	—	—	0.73***
Pseudo R-square	0.052	0.059	0.068	0.089	0.179

Note: n=15,633.

Note: Odds ratios were from weighted binomial logistic regression models adjusted for complex survey design using Stata's svy procedure.

[a]Logged net worth variable is from the approach used by Bradley et al. (2008).

continuation of Appendix C

[b]Non-Hispanic White was reference group.
*$p < .050$; **$p < .010$; ***$p < .001$.

APPENDIX D

NET WORTH INTERACTIONS ON DEPRESSION WITH ALTERNATIVE LOGGED NET WORTH MEASURE, HRS 2006 CORE SAMPLE[a]

	Unadjusted for Education & Income[b]	Adjusted for Education & Income[c]
Gender		
net worth[a]	0.96***	0.97**
female	1.14	1.14
net worth x female	1.01	1.01
Pseudo R-square	0.178	0.179
Race and Ethnicity[d]		
net worth[a]	0.97**	0.97*
Black	0.77	0.75
Hispanic	1.26	1.14
other race	1.57	1.53
net worth x Black	1.00	1.00
net worth x Hispanic	1.00	1.00
net worth x other race	0.97	0.97
Pseudo R-square	0.177	0.179

Note: n=15,633.

Note: Odds ratios were from weighted binomial logistic regression models adjusted for complex survey design using Stata's svy procedure.

[a]Logged net worth variable is from the approach used by Bradley et al. (2008).

[b]Models were adjusted for control variables except education and household income.

[c]Models were adjusted for control variables including education and household income.

[d]Non-Hispanic White was reference group.

*$p < .050$; **$p < .010$; ***$p < .001$.

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