SOCIOECONOMIC STATUS, RACE-ETHNICITY, AND THE HEALTH OF RETIREMENT-AGE WOMEN: THE PARADOX OF SOCIAL RELATIONSHIPS

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Abstract

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Often, women who experience socioeconomic disadvantage are particularly deeply immersed within their social networks, and minority women have been shown to be most involved in social networks. While social engagement is expected to be positively associated with health, this research investigates how this relationship may be altered across socioeconomic and racial-ethnic group.

The findings suggest negative health consequences flowing from the cumulative nature of stress associated with disadvantaged work and family roles. Provision of support may contribute to women becoming stressed and overburdened, and compound health risk already present due to economic hardship. A paradox of social relationships seems to exist, where social involvement is beneficial for some, but increases illness for others.

I investigate whether lower levels of income and minority status moderates the influence of social capital (measured as social networks, integration, and support) on depression, mobility limitations, and number of health conditions on a sample of American women age 55-65 in the Health and Retirement Study. I find a paradoxical

relationship, where certain types of social relations do provide health benefits for older women, but for some women relationships with family and friends are detrimental to health. This research on a nationally representative sample of retirement-age women challenges existing notions of social capital and health.

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CHAPTER ONE

INTRODUCTION

While overall health in the United States has improved over the last two decades, there still exist striking disparities in terms of illness and longevity by social class. Lower levels of income and education levels are associated with shorter life expectancy, and increased illness such as heart disease, diabetes, obesity, elevated lead blood level, and low birth weight (National Institutes of Health, 2000). Further, the burden of poor health is often borne by African Americans, Hispanics, Native Americans, Alaska Natives, and Pacific Islanders in terms of increased incidence, prevalence and mortality from diseases and other adverse health conditions (National Institutes of Health, 2000). This is due to the fact that lower socioeconomic status is associated with race and ethnic minority status. Racial and ethnic minorities are more likely to have lower socioeconomic status as measured in a variety of ways, including income, wealth, and education (National Research Council, 2001). These socioeconomic differences primarily explain health differences between racial and ethnic groups in the United States (Williams and Collins 2001).

Further, differences in health by socioeconomic status and race-ethnicity have also been shown to persist throughout the life course, into older adulthood (House et al 1994, Mirowsky and Ross 1999). It seems that individuals continue to be vulnerable to risks stemming from poverty throughout life. Economic disadvantage affects the process of normal aging (Rowe and Kahn 1997, Featherman and Lerner 1985). For racial and ethnic minorities, the aging process is particularly adversely impacted by structural inequalities of socioeconomic status coupled with other risk factors associated with racial discrimination (Markides and Black 1996, House et al 1994). Large and persistent socioeconomic and racial-ethnic disparities in health continue over time.

These phenomena are important for a number of reasons. Of primary concern is the number of older adults who will experience health problems in years to come, and providing care for them. Older individuals have the majority of health problems in developed countries (Grundy and Sloggett 2003). By 2030, when the entire baby boom cohort has entered old age, about 20% of the population will be over 65 (Friedland & Summer 1999) and as the elderly population grows in the United States, so will the proportion of minority elders. This is likely to result in increasing numbers of elders that face serious risks to health associated with their socioeconomic status and racial-ethnic background. A striking example of exposure to increased health risk is that racial and ethnic minorities currently have higher mortality rates on most health conditions (IOM 2001a, 2002b). Without intervention, such patterns are expected to continue, if not worsen, in coming years.

Health outcomes during the aging process seem to differ across gender as well as by socioeconomic status and race-ethnicity. Those who experience the most chronic

conditions in the United States are older women, and, in particular, women of color who are also of lower socioeconomic status (Trotman 2002). The primary reason is women experience poverty more often throughout life than men. The poverty rate among women over 65 is 13% compared to 7% for older men (U.S. Bureau of the Census 1999a). Further, minority women have higher rates of poverty than minority men or white women that persist into old age (Choudhury and Leonesio 1997, Whitfield and Baker-Thomas 1999). As a result, older women of color experience the most disadvantage in terms of health overall. Over the life course, health disparities are most striking for African American women (Ferraro and Farmer 1996). Socioeconomic disadvantage largely accounts for the poorer health of older women versus older men, and the exacerbated effects for racial and ethnic minority women (Atchley 1997, Browne 1998, House et al 1994, Mirowsky and Ross 1992).

This discussion suggests that there is a systematic pattern of disease and mortality in the United States that varies markedly by privilege and status. Race and ethnicity, education, income and wealth have largely determined and continue to determine the nature of human health and survival, according to structural inequality.

During the twentieth century, the world has experienced an epidemiologic transition in the leading causes of death from infectious disease and acute illness to chronic and degenerative disease. Chronic diseases affect older adults disproportionately, contribute to disability, diminish quality of life and increase health and long-term care costs (Goulding et al 2003). For example, in the United States, approximately 80% of all persons aged 65 and older have at least one chronic condition and 50% have at least two (Centers for Disease Control and Prevention 1999). Depressed mood is also common in

later life, is more prevalent among the chronically diseased than in the general population, and has various health-related consequences (van Gool et al 2003).

Despite this epidemiologic shift to chronic health problems, noteworthy divisions by social class and race persevere. Health disparities now exist in these more tenacious domains of health (Blane et al 1999). Social epidemiology as an etiologic science, however, has been somewhat ineffective in moving toward causal explanations of these observed patterns (Kaufman and Cooper 1999). Researchers have attempted to understand what factors shape this process and how it occurs.

Socioeconomic position and race-ethnicity shape individuals' exposure to and experience of virtually all known psychosocial, as well as many environmental and biomedical, risk factors (House 2002). These risk factors help to explain the size and persistence of social disparities in health. Existing research has investigated many different aspects of socioeconomic status and its relationship to health, as the primary causal link between poverty and health is well established (Cockerham 2001, Duncan et al 1997, McDonough et al 1999, Pappas et al 1993, Ross and Wu 1995).

Generally speaking, that increased poverty and socioeconomic disadvantages translate to poorer health for both men and women is largely unchallenged. In addition, other research repeatedly links social stratification and race-ethnicity to explain differences in morbidity and mortality that favor Non-Hispanic Whites (Adler et al 1993, House and Mortimer 1990, Feinstein 1993, Longino et al 1989, Marmot et al 1987, 1998, Sorlie et al 1995, Syme and Berkman 1976). However, prior research has not fully accounted for the associations between socioeconomic status and race-ethnicity for

mental and physical outcomes. Most importantly, *how* these processes operate, along with how each may occur differently across gender, remains not well understood.

Understanding the linkages between health and socioeconomic status is a prominent, important, and, as yet, largely unfulfilled research agenda. That said, some factors have been identified that mediate the relationship between socioeconomic status and health. These include living and working conditions, limitations on resources, and individual life style factors such as smoking, alcohol consumption, exercise and diet (Fiscella et al 2000, Mirowsky and Ross 1998, 2000, Shaw et al 2001). However, researchers have not adequately identified explanations for why those with lower levels of income, wealth, education or minority status continue to suffer from increased illness and death. Scholarly attention has begun to turn to the role of social support in this process.

Links between socioeconomic status, social support networks, and health have not been studied extensively. Researchers often define social support in terms of a resource that provides someone with emotional, instrumental, self-esteem enhancing, or informational support (Unger et al 1999). The characteristics of various social relationships have been explored to a limited extent as possible mediators of socioeconomic status and health relationships (Berkman et al 2000, Lin 2003). While there is some evidence that there is a differential distribution of social support by social class, there is yet to be a clear influence of social class together with social support in terms of the tested outcomes of depression (Stansfeld et al 1998) and sickness (Rael et al 1995). Wilkinson (1996b) addresses social inequalities in relationship to health inequalities, and finds that social inequalities such as income, wealth, and race and ethnic

inequalities have a fundamental influence on social relations and interactions on a societal level. Research efforts are now initiating a focus on the interaction between health, socioeconomic status and interpersonal relationships (Wilson 2001). To date, no research currently explores how socioeconomic status modifies social support networks to produce health outcomes for older individuals over time.

Consequently, this research seeks to explore the associations between social relationships and health for women in the U.S. population, and how these interact with socioeconomic and race-ethnic effects to produce health. This study is designed to amplify our understanding of how various dimensions of social relationships are associated with socioeconomic status, race-ethnicity, and health progression.

Until recently, a major problem with existing research was the inability of researchers to demonstrate which comes first, in this case, health or socioeconomic and social circumstances. That is, earlier research often was unable to clarify whether selection of individuals with lower socioeconomic status into poor health occurs versus the causation of poor health by lower socioeconomic status. Longitudinal studies allow a judgment of appropriate causation.

Further, prior studies of race, poverty, and health focused primarily on older African Americans and Whites. There is much less research on aging and health for other minority groups, such as Hispanics. This lack of attention is problematic, as researchers need to understand the health experiences of all groups, which are likely to differ. For instance, although gaps between African American and White life expectancies have endured in recent decades, there have been significant relative improvements among Latinos (Pollard 1999, Serow 2001). Current research that

includes diverse samples of older Americans can investigate the reasons behind such findings. Finally, the National Institutes of Health (2000) has identified as a research priority the inclusion of females that are historically underrepresented in health research, such as those affected by poverty and lower socioeconomic status and minority women. This study focuses on older women at risk to contribute to a body of research that aims to strengthen, develop, and increase knowledge about diseases, disorders, and conditions that occur differentially.

1.1 General Research Objectives

The theoretical and empirical literature on social support and health has not fully investigated how socioeconomic status and race-ethnicity modify various domains of health for those approaching old age. Moreover, studies such as those focusing on poverty, health, and aging have often overlooked the role of social relationships in this process. The primary research objective of this dissertation is to test the health outcomes of older women by socioeconomic status along with characteristics of social relationships. Social support is conceptualized in terms of relationship structure and function, or by social network composition, social integration, and relational content (House and Kahn 1985, Vaux 1988). African American, Hispanic, and White women are compared to highlight an important gap in the literature: the important role socioeconomic status plays in the social relationships of women that in turn may determine health or illness.

Accomplishing this objective requires several steps. First, socioeconomic status and race-ethnicity likely influence health outcomes. The first section of the dissertation

identifies differences in health by these categories. Specifically, health is compared by African American, Hispanic, and White status. Associations between income, wealth, and ownership of a house and car, are also compared. Next, health variations are partially explained by social network characteristics, levels of social integration, and instrumental social support provided to others. There is currently no established process for whether or how these characteristics may operate together to influence health outcomes. Thus, these characteristics are tested for explanatory power, including their collective action in prediction of various health outcomes for retirement age women. Lastly, past research has not attempted to specify how health changes may be produced dissimilarly according to the factors discussed above. It is likely that some factors have more immediate effects on health, while others lagged effects. Therefore, this project tests for effects on health outcomes over time during later mid-life.

Three health outcomes are tested here: Total number of health conditions, mobility limitations, and depression. These selected measures of health capture dimensions of a health-related quality of life that fits with the World Health Organization's 1948 definition of health as "a state of complete physical, mental, and social well-being, not merely the absence of disease or infirmity." Patrick and colleagues (Patrick and Bergner 1990, Patrick and Erikson 1993) have suggested a framework including five major domains of health-related quality of life: 1) duration of life (mortality); 2) impairments (physical symptoms, self-reported diseases); 3) functional status (physical activity restrictions and limitations in social role functioning); 4) health perceptions (self-rating of health and health satisfaction); and 5) opportunities (measured by an indicator of disadvantage due to health). This research includes analyses of

measures from three of the five domains: impairments (report of number of health conditions), functional status (mobility limitation measures) and health perceptions (depression). Each outcome was selected to represent a distinct component of health as experienced by an individual. These health measures together provide various dimensions of mental and physical health.

Data from the Health and Retirement Study (HRS) and the RAND HRS data files are used to accomplish the research objectives. The HRS data were gathered by the Survey Research Center at the University of Michigan. The HRS is a nationally representative sample of American women age 51-61 at the survey baseline, including appropriate numbers of women of racial and ethnic minority status, making HRS findings generalizable to the United States population. HRS and RAND HRS data provide detailed information about the health status of women between 1992-1996, with established health indices that have undergone rigorous validation. Lastly, the HRS provides rich information about individual and household income, wealth and education, and social relationships with family, friends, and relationships within the community.

1.2 Organization of the Dissertation

The dissertation is organized as follows: Chapter Two provides a review of the literature that investigates the relationship between social relationships and health, including across gender, socioeconomic status, and race-ethnicity. Chapter Two also details the social differences between health and social class in the United States. Contemporary variation between these factors across race is outlined. The existence of contrasts between groups is presented to indicate that the composition of health varies

strongly by social and economic advantage. Lastly, Chapter Two provides a review of existing literature on the relationship between socioeconomic status and health. Chapter Three outlines social capital theory in framing health inequalities experienced by women.

Chapter Four discusses the data and methods used in the analysis. Specifically, I describe the HRS and RAND HRS datasets and operationalization of variables. I also explain the statistical techniques used in the dissertation. Chapter Five reports the quantitative results. The findings are presented in four sections: 1) Significant differences in the number of health conditions, mobility limitations, and depression symptoms across race; 2) Significant associations between each health domain and income and wealth; 3) Regression analyses of total number of health conditions, functional and mobility limitations, and depression; 4) Longitudinal analysis of change in total number of health conditions, functional and mobility limitations, and depression. A discussion of the findings is also included in this chapter. Chapter 6 provides a broader interpretation of the results and the implications of the findings for health inequalities research.

This dissertation makes an important contribution to the growing literature on social relationships, aging, and health. Social relationships are conceptualized as a paradox; they may be positive or negative, depending upon social structural characteristics. Additionally, it provides further insight into how socioeconomic status may affect the health of women: through effects on social relationships. First, the descriptive portion of the dissertation confirms that mental and physical health vary by socioeconomic and racial-ethnic characteristics. Second, the project conducts a

comprehensive examination of social relationships and socioeconomic factors associated with worsened health outcomes. Third, how social relationships and socioeconomic status conjointly produce changes in health is explored. In sum, the results show that the health of older American women is both positively and negatively associated with educational, monetary and social ties.

The current findings suggest that the relationship between the health status and the daily lives of women warrants further research. This project begins to probe the social environment of women, which often includes many social relationships and socioeconomic disadvantages. Rather than conceptualizing women's social environments as inchoate or amorphous, this research accomplishes the more comprehensive specification of social determinants of health and how these operate across group.

Preceding research has failed to recognize the intricate relationships between social support, socioeconomic status and health, and how these build upon each other. Extensive cooperation is expected between these contextual factors and social support, which appear to be interdependent functions.

CHAPTER TWO

SOCIAL SUPPORT AND THE HEALTH OF OLDER WOMEN: BACKGROUND TO THE PROBLEM

The purpose of this chapter is to provide a rationale for examining the relationship between social support, socioeconomic status, and race-ethnicity and the health of women in perimenopausal to mature years. This chapter presents existing literature on the role of social support in the lives of older women and more detailed differences in social support by socioeconomic status, gender, and race-ethnicity. Acknowledging that significant social support differences exist by subgroup motivates further exploration of what effects these variations have on health. Variation in the social support experiences of older women also indicates that the process of achieving beneficial social support remains elusive to many who experience disadvantage. Creative and new explanations are needed to understand and promote healthy lifestyles.

Specifying the manner in which social support operates to produce health will be an important contribution of medical sociology in the 21st century. This will be accomplished by the use of better theoretical frameworks, study designs, and appropriate

analytic techniques. This project aims to add to the effort by investigating the role that socioeconomic status plays in the progression of how social relationships shape health. An understanding of *how* poverty affects one's social support network is necessary to effectively deal with ameliorating health disparities.

This dissertation focuses on women who confront low socioeconomic status and related demands. It aims to provide broader context for understanding why women with lower levels of wealth, income and education are almost invariably sicker than their counterparts with socioeconomic advantages. One explanation may be the effects that lower socioeconomic status has on the social support networks of women, and the efficacy of meeting the needs of those within these networks.

2.1 Social Relationships and Older Women

2.1.1 Social Involvement

Social relationships are shaped by gender in the second half of the life course. In particular, women tend to be more integrated into larger social networks than men (Campbell and Lee 1992, Wethington 2000) and these gender differences are socially constructed and reinforced throughout life (Bem 1999). Social relationships appear to be particularly important to women as a whole in terms of natural supports, group activities, and friendships (Hurdle 2001). As a result, the process of retirement and aging is different for women than men, just as they were earlier in life.

This may be due in part to labor force attachment. Historically, women have experienced greater discontinuity than men, moving in and out of the labor force and in and out of part time jobs, and were more connected to increased family responsibilities

(Han and Moen 1999b, Moen 1985, Rosenfeld 1980, Sorensen 1983). Over time, women tended to be more attached to social networks, even if they consistently worked outside the home. Women have continued to take major responsibility for child care and domestic labor despite increased levels of involvement in the paid workforce (Lee and Powers 2002). The basis of these patterns is not yet fully determined, but it seems almost inevitable that women will continue to be more involved in the lives of those around them than men.

Older African American women and women of Hispanic origin have been documented as having family as well as church as a central focus in their lives, as compared to White women (McAdoo 2001, Hine 1993). African American women in particular have more contact with social network members and have more family members in their networks as compared to White women (Ajrouch et al 2001). Social functioning may be more frequent for older African American women in terms of visiting with friends and family, participating in community activities and helping others (Cunningham et al 2003). Family and community involvement remain a source of significance for many women of color.

2.1.2 Variation in Social Support

It is also the case that some older women will have very different experiences of social support relationships than others. Just as there are clear variations in social network involvement by gender, there seem to be divergence in social supportive relationships across socioeconomic status and race-ethnicity. Higher household income is associated with bolstering social support and social involvement for older individuals

(Kosteniuk and Dickinson 2003). Perhaps social support erodes with socioeconomic status. Or alternatively, social support may carry different repercussions for women of low socioeconomic status. For example, women who experience poverty tend to have more chronic stressors, or hassles associated with social support networks. These hassles include children that overwhelm them, children and other family with chronic illness, and negative social network members and interactions with them (Wijnberg and Reding 1999). Social relationships bring with them more difficulties for women who experience economic disadvantages.

There also seems to be race differences in social support network dimensions that are independent of social structural variables such as income and education (Peek and O'Neill 2001). For African Americans, social support may be represented more often by co-residence. Older African Americans are more likely to receive help from family members than Whites, but this advantage does not extend across all types of family members. It is only the case with help from grandchildren who most often co-reside with their grandparents (Peek et al 2000). This may be problematic as most adult children who live with parents or grandparents are less likely to work or contribute financially to the household (Choi 2002). Many more differences are probably present in the functioning of social support networks, and warrant further attention. The investigation of how diversity in social support across group affects health is in its infancy.

2.1.3 The Paradox of Social Relationships

Research has uncovered unexpected negative consequences of social ties and social support. Both insidious and positive effects need to be considered to understand the

production of health outcomes (Burg 1994). Social relationships emerge as a paradox for some individuals. While there are many robust positive effects of social relationships, there are drawbacks as well. First is the risk of desolation. The death of a close and valued member of one's social network has a strong and usually negative effect on people of any age (Carnelley et al 1999). Ironically, those with large or more closely-knit families may suffer more losses. Those with histories of social isolation may in later life be spared these stresses associated with social loss.

Other drawbacks of social relationships include unmet expectations from others within the social support network. This includes unfulfilled or missing offers of assistance, fewer than desired social interactions, and conflict with social support network members (Neufeld and Harrison 2003). Thoits (1995) has found that the costs of social support, both for a supporter and recipient, can sometimes outweigh its benefits for health. For some, social support may not bear the same profits that one foresaw from previous social investments. Social support relationships have the potential to create burden. The presence and level of burden depends on many factors such as amount of support provided to others, gender of providers and recipients, past relationships between individuals, and personality factors (Dyck et al 1999). These findings are far from conclusive, and encumbrance created from social support remains ambiguous. Burden conceivably flows from multiple conditions and circumstances.

2.1.4 Caregiving

One such circumstance where hardship occurs with social relationships is in caregiving situations. Of particular importance is the fact that women are more likely than men to care for grandchildren, ailing or infirm spouses, other relatives, or friends (Moen et al 1995, Moen et al 1994, Pavalko and Artis 1997, Pavalko and Smith 1999, Robison et al 1995). Care of an ill or disabled family member or friend is disproportionately done by women, is typically done in late midlife, and this type of care is increasing (Pavalko and Artis 1997, Dentinger and Clarkberg 2002). Those who provide informal care to others are mostly older women. Of these women, the majority are 65 years of age of older, African American, married, and have difficulty balancing caregiving with other family and employment obligations (Navaie-Waliser et al 2002).

An expansive literature has explored the costs and problems associated with providing this type of social support to others. Although caregiving can have positive aspects for the caregiver (Beach et al 2000, Walker et al 1996), there are also clear negative psychological and physical consequences for many women (Alspaugh et al 1999, Son et al 2003).

In the past, women traditionally cared for their parents and others in need. Yet unlike their mothers before them, women now have more roles and role demands placed upon them (Singleton 2000). This is of concern. There is an aging population with limited accessible and affordable formal care services for all. As a result, informal caregivers, mostly women, will continue bearing the overwhelming responsibility for home and long-term care provision (Navaie-Waliser et al 2002).

Many demographic factors contribute to this prospect. Some of these are longer life expectancy of elderly parents, fewer adult children to share responsibilities, and more children within single parent families in which grandchildren are cared for by grandparents, particularly grandmothers. These patterns are reflective of a larger trend in which a much higher proportion of individuals now occupy multiple roles over their life course than ever before. These roles include paid work along with care of others with health problems and disabilities, and child co-residence (Evandrou et al 2002). Certain women experience these role challenges more than others. Ironically, these are often women with fewer resources themselves. This is evidenced by the fact that women of lower income and education levels are more involved in caregiving activities and report greater anxiety about their own aging process (Cummings et al 2000).

Minority women in particular often serve as critical actors in the lives of their parents, children and grandchildren. These roles in family relationships serve as both a source of strength and stress for women. This is especially evident in the caregiver role, which is common for many older women of color, as well as involvement in paid employment. Compared with Whites, African American women were 30% more likely to be caregivers, spent almost 13 more hours each week in caregiving activities, and were more likely to assist friends. African American women are also more often in severe caregiving situations than their White counterparts, have no greater number of supports for themselves, and experience a wide range of caregiver role strain (Wallace et al 2003). For Hispanic women, many live in communities where few home health care or community based social services are utilized. Rather, older Hispanic women almost solely care for others in line with cultural norms (Angel et al 1996).

Clearly, caregiving experiences and outcomes vary across racial and ethnic groups. Regardless of their frequent status of economic vulnerability, older women of color assist family members, give their time in the community, and negotiate complex systems of intergenerational exchange (Conway-Turner 1999). However, use of non-theoretical approaches, non-probability samples, and inconsistent measures, have limited understanding of care given among diverse populations (Dilworth-Anderson.et al 2002). What environment surrounds providing this type of social support to others merits more research.

2.1.5 Compounded Risk

When optimally functioning, women receive many returns from social involvement. Gains flow from participating in social networks and social relationships such as services, and information to those around them. Presumably, social relationships are mostly beneficial and reciprocal in nature. However, when viewed as a set of available resources versus demands, social relationships could entail more costs than benefits. There might be resource imbalances within the social networks of low-income women (Hughes and Waite 2002). In these instances, all needs may not be met easily. When both expectations and obligations within women's social networks are high, this is likely chronically stressful. In this way, the social context of poverty may have unique and powerful negative effects on women through the demands of social relationships.

Poverty can be conceptualized not only in terms of wealth, income and education, but also as a pervasive undercurrent of distress in people's lives (Marmot et al 1998). Low socioeconomic status limits options for individuals and families, such as the

availability of time and material resources, the ability to purchase services, mobility, and leisure. For those who are poor, there often are no choices to buy items and services to make life easier, take time to rest and relax, or escape circumstance that are difficult, all of which are benefits of economic advantage. Since social support networks are primarily comprised of people of similar social and economic background (Peek and Lin 1999), these deficits affect almost everyone within the impoverished network and hardship is shared.

This increases need for individuals in social networks to take care of one another. In response to environments devoid of resources, individuals of lower socioeconomic status participate in informal helping systems that often provide a safety net to a wide circle of needy members (Julion et al 2000). Individuals depend heavily on the assistance of family and friends for money, transportation, housing, employment, child and elder care, and emotional support. It is older, but not old, women who primarily facilitate this system of triage and delicate balancing act of obligation and reciprocity. However, some have questioned whether women indeed receive reciprocal support when they need it, after years of providing it to others (Liang et al 2001). Regardless, providing help to others is highly valued among the poor.

Providing social support is often viewed as more important by those who live with poverty than participating in low-wage work that may only slightly improve an individual life. Friends and loved ones may be one of the few and most important resources for those who live in poverty. Thus, it is unlikely that the sacrifices that women make for them will change, even if demands are heavy. The consequence of immersion in social networks might become overwhelmed by the unrelenting demands of

life marked by socioeconomic scarcity and strain. This may be exhibited in unhealthy coping behaviors and increased anxiety.

Social support seems critically important for those who possess social or economic deprivation. This is paradoxical as social support resources might decline overall with socioeconomic status. From this, older women with fewer resources (education and economic resources) are perhaps less able to balance the outlays to family and community that may be desperately needed. Women who attempt to substitute these may be negatively impacted, suffering serious and threatening health consequences. Research findings have begun to suggest that social connections may indeed increase levels of mental illness symptoms among women of low resources, especially if those social relationships include expectations to provide support for others (Hardy and Shuey 2000, Kawachi and Berkman 2001). As previously discussed, women of color have the most limited socioeconomic resources, but also provide the most support to others. This may help explain why older women of minority status face the greatest threats to health.

It is apparent that older women attempt to shoulder many responsibilities within families, and this may be dangerous in terms of health when disadvantages associated with poverty are already present. The health of older women may be increasingly compromised as women attempt to face the challenges of their own aging process. While social integration and providing social support can have positive health benefits (Beach et al 2000, Walker et al 1995), there can also be negative consequences, including compromised self-efficacy, subjective well-being, and increased depression and coronary heart disease (Alspaugh et al 1999, Lee et al 2003, Pinquart and Sorensen 2003). The following section describes the effects of social support on health in detail.

2.1.6 Summary

Prior research indicates that older women clearly have distinct social relationships from men, and poor and minority women distinct social relationships from wealthier and White women. Social relationships can be both positive and negative in the lives of women, yet providing support to others can be especially difficult. Specified risks of social involvement, including health risks, seem to occur for women of low income and education.

2.2 Social Support and Health

The nature and causal impact of various aspects of social relationships on health has been of burgeoning research interest in recent years. Variations in the characteristics and intensity of social ties have been clearly shown to influence mental and physical health. The density of social networks, levels of social integration, and providing instrumental support such as money and care to others, have each been tested in the existing literature. The links between each of these aspects of social involvement and wellness have been established, where biomedical researchers and psychologists have been the major contributors.

Despite such research efforts, there is not a clear understanding about which aspects of social support benefit health and whether negative aspects of social support may affect certain groups more than others. Research on these topics is neither extensive nor conclusive. The beneficial effects of social support on health may change with gender, socioeconomic status, and race. Earlier research has not explored this alternative

extensively. The following section reviews the substantial body of research that has examined social support and health.

Recent decades have brought the marked expansion of research that examines how support networks and social support itself affect health. The positive effects of an individual's social support network for both mental and physical health outcomes have been documented previously (Buckley et al 2000, Holahan and Brennan 1995, Holahan et al 1997, Idler and Kasl 1998, Pierce et al 1997). Social support seems to have the most beneficial effects on psychological health (Grundy and Sloggett 2003). The density of an individual's social network, the degree to which one interacts with others, and how much one gives and receives instrumental support, are all associated with health indicators, subjective well-being and quality of life measures (Fernandez-Ballesteros 2002).

Social networks that provide individuals with resources and various coping strategies are indeed influential in determining health. One such resource is increased social involvement, or integration, which has been shown to influence key aspects of health. Social integration in one's social network has been shown to have positive effects on health throughout life by increasing health maintenance behaviors, preventing and improving recovery from disease, and increasing longevity (Berkman and Syme 1979, Berkman 1995, Cohen 1995, House 1988, Kawachi et al 1996). The benefits of social integration stem from positive behavior modeling, socializing and a sense of coherence in one's life (Cohen et al 1988, Thoits 1984). Further, relationships with spouses, relatives, friends, neighbors and community organizations represent the possibility of receiving support when needed, which is another resource that can flow from social networks.

The receipt of social support and satisfaction with one's network seem to be principally influential in whether individuals develop chronic illness and report good subjective health (Rennemark and Hagberg 1999, Penninx et al 1999). If people feel supported by those around them and expect to receive assistance when needed, they tend to live longer and healthier lives. In fact, most of the impact on health of supportive relationships appears to be a direct result of projected security about the future (Ross and Mirowsky 2002). This suggests that whether someone feels they can depend on their social networks to take care of them is critical in terms of health.

2.2.1 Positive Effects of Social Support on Health

Social relationships affect a range of biological systems, including cardiovascular, endocrine, and immune functioning and allostatic load (Seeman et al 2002, Uchino et al 2001). Having a strong support network seems to bolster certain health outcomes more than others, including mortality, physical functioning, and depression, which influences reports of overall health (Connell et al 1994, Klein et al 2002, Menec 2003, Tyler and Hoyt 2000). Of particular interest here is prior research on physical functioning and depression as related to social support.

The Disablement Process model (Verbrugge and Jette 1994) describes a pathway leading from pathology to impairment to physical functional limitations, and ultimately, to disability. Recent research establishes that social support plays a significant role in this process. In particular, involvement in a social network of relatives and friends reduces the risk of, and enhances recovery from, ADL disability (de Leon et al 1999). Levels of social support have also been shown to determine reports of subjective physical

functioning (Koukouli et al 2002). Overall satisfaction with one's social support decreases the likelihood of disability and buffers the adverse effect of disability on depression (Jang et al 2003, Jang et al 2002). Beyond these findings, a wider array of social risk factors is needed to better understand the disablement process, and few studies have examined this process across race and ethnic categorization (de Leon et al 2001, 2002, Peek et al 2002).

Social support is also a critical component in the development of depression. Social isolation is an especially strong prospective predictor of depressive symptomatology, yet the quality of social relationships is more important than the quantity in accounting for depression (Vandervoort 1999, Wildes et al 2002). If one has close relationships, even if not many of them, depression likelihood decreases. This is also true if individuals tend to be pessimistic in their general outlook overall. The relationships between psychological well-being measures such as depression, loneliness, and life satisfaction and social support remain significant even after controlling for personality characteristics such as negative affectivity (Kahn et al 2003). The possible benefits from social relations are evident, and seem to endure over time.

2.2.2 Social Support and the Health of Older Individuals

A broader social network, more social integration, and instrumental support contribute to better health, particularly for elderly individuals (Bisconti and Bergeman 1999, Choi and Wodarski 1996, Pinquart and Sorenson 2000). Family resources in particular are an indicator of social support that relate to the health of older individuals (Due et al 2003, Ingersoll-Dayton and Antonucci 1988). Beyond contact with family

members, it seems that friendship may be distinctly influential in determining subjective reports of health status in later life (Lennartsson 1999, Pinquart and Sorensen 2000, Siebert et al 1999). Research unmistakably demonstrates that social support advances health over the life course. This appears to be the case whether support is conceptualized by the extent of the social network, social integration or instrumental support. However, whether social support operates the same for everyone over time is uncertain. Other scholarly work has sought to understand how the effects of social support may diverge across group, such as gender, socioeconomic status, and race. The following sections outline this work.

2.2.3 Social Support and Women's Health

Women often maintain closer and more involved social relationships within families and communities, provide more social support to others, and benefit from social ties by improved health (Denton and Walters 1999, Michael et al 2001, Moen et al 1992, Lynam 1985, Rennemark and Hagberg 1999). The contribution of social support to women's health has been shown as particularly protective (Rogers 1996, Worobey and Angel 1990, Wolf 1994), especially if women are experiencing chronic stress and need assistance themselves (Israel et al 2002).

Recent research suggests that findings of a positive association between social relationships and improved health for women may be driven by reciprocity. Health benefits for women may be dependent upon expecting and getting comparable amounts of instrumental support to that which they have provided for others. Expectations of and receipt of social support may be more important for women than men. This is suggested

by the finding that female mortality rates are more closely connected with perceptions of reciprocity within social networks than for men (Skrabski et al 2003). Hence, anticipating support from others that matches what women have given may have special value. The role of social support may likely vary by gender and other individual characteristics.

The most influential of these characteristics may be the experience of poverty. For those who experience poverty, outlays of social support may be necessary for survival. What may be missing is the reciprocation of social support in this context. Studies have begun to reveal that social support may impact health differently across class. As a critical predictor of health, it seems that the availability and quality of social support are positively related to one's socioeconomic status (Cattell 2001, Kopp et al 2000). Social relationships may in fact be most needed by those who experience poverty, but may also be limited.

2.2.4 The Environment of Poverty and Health

The context of a lifestyle marked by poverty creates a daily environment that undermines remaining healthy. There have been clues in the literature about what this daily environment contains. Along with many other factors, these include psychosocial factors such as stress, poor coping mechanisms, and lack of social support. These factors have been previously identified as contributing to socioeconomic gaps in health (Adler et al 1994, Ross 1996, Siegrist 1995). It seems that social support runs out, or at least social support networks suffer from long-term stress such as economic deprivation.

Again, social relationships generally refer to relationships with friends, family, and the community that may provide material and emotional resources and are often provided by women more often than men. When available, social support may help to diminish the destructive nature of living with poverty. Recent research has begun to test this prospect. Murrell and Meeks (2002) find that social support mediates the education-health relationship in older adults. While low educational attainment continues to have significant damaging effects on all health measures, strong social support reduces these effects. Social relationships may be a powerful safeguard for health and contribute to health in unique ways for those of low socioeconomic status.

Sufficient levels of social support may actually buffer the effects of poverty on health. Social support networks have compensated for many of the many deficits associated with low socioeconomic status, such as inadequate housing, lack of access to health and child care, and employment problems. Social support (most often provided by older women) frequently serves as a functional alternative to economic resources for groups who often are of lower socioeconomic status, such as single mothers (Edin and Lein 1997), the poor (Burton et al 1994, Phillips and Burton 1995), immigrants (Jasso and Rosenzweig 1990) and older minorities (Angel et al 1996). In the absence of more formal, structural supports available to those who are disadvantaged, daily needs of individuals are met informally, often by women.

As mentioned earlier, for women of lower socioeconomic status, the provision of social support may be necessary and extensive in communities where there may be the absence of other formal social support such as purchased health care and child-care. Neighborhood level poverty often carries with it many forms of social exclusion from

economic, political and cultural systems. Areas of concentrated low socioeconomic status are often areas where deprivation is particularly acute, with deficiencies in employment, social services, preventative health care, and housing. It is possible that, over time, low socioeconomic status has restricted or deteriorated formal social support within neighborhoods and, in turn, necessarily increased informal social support provided by women. This is problematic for women who live in areas of lower socioeconomic status, who themselves likely possess fewer time and material resources to share.

2.2.5 Health Costs of Social Relationships

Along with women of low socioeconomic status becoming more ill over time due to social isolation and social disintegration, it may also be the case that when women are extremely socially connected, their health may be compromised. If women have more dense social networks and are more integrated within them, they are more likely to be called upon for support by others. Providing resources to those within a social network creates the possible health risk of long-term stress and strain.

Stress has serious consequences for health, and family strain has been shown to be highly predictive of health outcomes for women (Walen and Lachman 2000). If women are providing informal support to replace formal social support such as pubic infrastructures and adequate human services delivery, these efforts may be significant. Such sacrifices would likely increase the already present health risks of living in neighborhoods that experience socioeconomic disadvantage.

It remains unknown what exactly the health costs are of women, often of retirement age, caring for grandchildren or elderly parents, or sharing housing with adult

children. However, attempting to provide for the daily needs of others may become overwhelming quickly for these women. In this way, social relationships may actually contribute to compounded health risks for those of low socioeconomic status. This is evidenced by the fact that giving substantial amounts of social support contributes to women being at risk of strain from their roles within social networks (Burg 1994). It is reasonable to expect that this strain is greater for poor women.

Examining caregiving and social relationships is vital in understanding the health of older women of lower socioeconomic status, as these events can generate more difficulty to already difficult circumstances. Membership in overburdened social networks, in which women struggle to meet the demands of daily life, will likely negatively affect the progression of health outcomes cumulatively. While social support is helpful, it may not always translate to a better quality of life. Recent research provides evidence that as a group, persons of lower socioeconomic status benefit less from social support relationships in terms of health (Bae et al 2001, Krause and Shaw 2000, Wilson 2001). While some research indicates that social support reduces mortality independent of stress (Klein et al 2002), other research does not point to this conclusion. Women who give time and money to others from mid life forward may be especially at risk of illness. While social relationships and strong social networks seem to have a special relationship with women's health, it may be a relationship of diminishing returns for women of low socioeconomic status. This research tests this proposition.

2.2.6 Social Relationships and the Health of Minority Women

Finally, I argue that African-American and Hispanic women of low socioeconomic status may face the greatest health risk by the multiple health hazards they experience. In addition to the characteristics shared with all older women, women of color of low socioeconomic status bring to their later years the cumulative effects on their health of racial discrimination and economic disadvantage. Similar to other women of lower socioeconomic status, older African-American and Hispanic women may give much, and receive little, social support. In addition, they may experience even more diminished neighborhood resources due to residential segregation and racial discrimination.

For minorities in the United States, particularly African-Americans, social environments are often marked by historical and economic exploitation (Lillie-Blanton et al 2000, Massey et al 1991). These factors may continue to have serious effects on whether social networks of minority persons are able to provide resources to their members over time. Recent research indicates that social support operates in distinct ways within minority communities, where individuals are most immersed in social networks (Baxter et al 1998). This may be due in part to cultural norms, paired with living in places that are racially segregated and isolated from more formal support systems. The costs of racial discrimination and residential segregation may further jeopardize the health of older minority women of low socioeconomic status.

2.2.7 Summary

It seems that social relationships may have unique effects on women's health that may depend upon other characteristics such as poverty and race-ethnicity. Because women tend to be more actively involved in social support networks, social support may especially benefit or detriment older women over time according to these factors. Nevertheless, how this process works is yet unidentified. The analyses that follow test if social relationships can be viewed as having a straightforward relationship to health, or one that depends on race and class influences.

Socioeconomic status and race might operate together with social relationships to produce health. This may be due to the fact that socioeconomic status and race-ethnicity are the strongest single influences on the health of Americans, and likely have some bearing on all facets of life. This is evident in the fact that health disparities by these factors remain robust. The next section reviews these health inequalities and provides a review of the vast literature that examines socioeconomic status, race-ethnicity, and health. If we are to consider how social relationships affect health outcomes, the consideration of these influences is also warranted.

2.3 Investigation of Health Inequalities

In this dissertation, I argue that social relationships operate together with socioeconomic status and race-ethnicity to influence health. In order to grasp the impact these characteristics may have on social support, their general relationships with health are described. Discussion of social inequalities has a long tradition in sociological research. One outgrowth of this tradition has been found in medical sociology.

Researchers have explored the linkages between social factors, such as social class, and health outcomes. It seems that health inequalities mirror social inequalities. Some of the earliest studies identified as medical sociology focus on the role of stratification in life and death (Koos 1954, Merton et al 1957). By recognizing the social context in which people live, we understand that an individual's risk of illness cannot be understood in isolation from disease risk of the population (Rose 1991). The incidence of disease and illness does not occur randomly or distinctively from where someone lives, or from the health of those who are proximate. Rather, unmistakable patterns exist by social group.

Resources in the United States have not been distributed fairly. It seems that there are in fact two Americas: one, a healthy, vibrant, prosperous, advantaged class; the other, an unhealthy, disadvantaged, economically impoverished sub-population without access to health or social assets (Quill and DesVignes-Kendrick 2001). Income equality in the worst it has been in 50 years, due to the larger income accumulation among wealthier groups (National Center of Health Statistics 1998). Older African Americans and Hispanics experience the most poverty in the United States, along with the lowest levels of educational attainment (U.S. Census Bureau, Statistical Abstract of the United States; 2002).

2.3.1 Health Disparities by Social Class

In general, lower socioeconomic status and being African American are associated with lower reported health status and higher mortality, while Latinos report better health status and exhibit lower mortality overall, and women report worse health status but lower mortality than men (Franks et al 2003). Specifically, when compared

with Whites, African Americans report higher rates of hypertension, diabetes and arthritis, while Hispanics report higher rates of hypertension and diabetes and a lower rate of heart conditions (Kington and Smith 1997). Differences in education, income, and wealth account for much of the variation in functional status associated with these chronic diseases, but socioeconomic status plays a relatively small role in explaining differences in the prevalence of chronic disease (Kington and Smith 1997). This reflects unexplored causal pathways to disease across groups. Racial disparities are seen to be a result of the complex interaction among biological factors, the environment, and specific health behaviors (Crown 2000), but much of the published research on racial disparities in terms of health has focused on descriptions rather than explanations (LaViest et al 2000). This study attempts to add to existing interpretations by considering social relationships in this process.

It has been acknowledged that higher levels of socioeconomic status produce valuable resources such as knowledge, power, prestige, and money for individuals, families, and communities. Socioeconomic status presumably affects how people act, the risks they take, and how they utilize the health care system. As socioeconomic status declines, factors such as adequate housing, good nutrition, diet, exercise, relaxation and rest, coping with stress, personal hygiene, seatbelt use, preventative care and other health related activities also decline, and factors such as smoking and alcohol and drug use increase (Berrigan et al 2003, Cockerham et al 2002). Therefore, socioeconomic status does not seem to influence health directly. Its effect is mediated by intervening factors, some of which have been specified. In addition, it has been established that social stratification and operates on health. This association has been demonstrated as a

gradient relationship, not a threshold effect of poverty v. non-poverty (Marmot et al 1991, 1997, 1998, Rose and Marmot 1981). As socioeconomic status improves, so does one's health and life span.

This body of research demonstrates that the socioeconomic status gradient is negatively related to most forms of morbidity and positively related to longevity (Cockerham 2000). Health outcomes and mortality seem to be sensitive to even fine gradations of material resources such as home and car ownership, having a home with a garden, and healthier food (Macintyre et al 1998, and Blane et al 1997). These factors represent the presence of disposable income for individuals and families. It seems that groups with the least disposable income are subject to the largest cumulative burden of socioeconomic stressors (McLeod and Kessler 1990, Ross and Wu 1996, Turner 1998). Stressors are conceptualized as 'environmental demands that tax or exceed the adaptive capacity of an organism resulting in psychological and biological changes that place persons at risk of disease (Cohen et al 1997).

Resultant stress is an important component of the relationship between poverty and health. Exposure to chronic stress is related to lower socioeconomic status, and may increase morbidity and mortality (Adler and Newman 2002). Thus, the cumulative burden of such stress may have even farther-reaching physiologic consequences in terms of health that are yet unexamined (McEwen 1998). Preceding research has begun to recognize stress as an important factor in the differences in health by socioeconomic status. I argue that social relationships may be another source of stress to consider.

2.3.2 Investigating Women

The group in the United States that most often experiences the least disposable income and the most socioeconomic stress over the life course is women (Schulz et al 2000). Poverty has become feminized with the rise of single female-headed households. As a result, poverty affects women disproportionately more than men, and older women are nearly twice as likely to be poor than older men (Elmelech and Lu 2004, Cantillon and Nolan 2001). This comparison is even more pronounced for minority women. Older women of color, although often immersed in the labor force, have consistently and severely been disadvantaged socio-economically in the United States (Conway-Turner 1999, Holden et al 1986).

In terms of women in later mid-life, the effects of low socioeconomic status on health seem to have the greatest harmful impact for these "young-old" women approaching retirement, rather than women in their late sixties and older (Mishra et al 2002). The effects of socioeconomic disadvantage on women, and specifically women of minority status, cannot be overestimated. This includes effects on the health of their minds and bodies through disorganization, disruption, perceived helplessness, self-neglect and other adverse factors associated with low educational attainment and poverty (Wadsworth 1997). While women are over-represented among the poor, the association between socioeconomic status and older women's health has not been studied extensively. Therefore, women aged 51-61, who were followed for four years, are included in the current project, and social relationships are included as an intervening factor between socioeconomic status and health.

An auxiliary reason that women are analyzed is that they simply have distinct persistent health problems from men as they age. Diminished health is related to aging for everyone to a certain extent, but this varies significantly across gender (House et al 1994, Mirowsky and Ross 1992). Women seem to grow older differently than men, and gender shapes biological outcomes in older adulthood (Farkas and O'Rand 1998, Han and Moen 1999, Moen et al 2000). Women have a higher incidence of acute conditions and higher prevalence of most non-fatal chronic conditions, while males' mortality rate is higher overall from these conditions (Verbrugge et al 1996). Women live longer lives, but with more ongoing health problems, than men. This research attempts to understand the social explanations for these ailments across gender.

2.3.3 Health Disparities by Race-Ethnicity

Differences by race and ethnicity affecting disadvantaged groups characterize an uneven distribution of health, prosperity, and disease burden (Quill and DesVignes-Kendrick 2001). A relatively large African American disadvantage in chronic conditions and disabilities is apparent for retirement-age women who between 45-64 years of age (Clark et al 1997). The worsened health of older African American women reflects a larger health picture of African Americans in general. Many African Americans expect illness in later life, as evidenced by the reporting of serious health problems as a normal part of aging, and are nihilistic in terms of treating illness (Goodwin et al 1999). African Americans have the worst health profile overall among all major American racial and ethnic groups, with a 60% higher mortality rate than that of Whites in 1995, the same as it was in 1950 (Ferraro and Farmer 1996, McKinney Edmonds 1993, Williams and

Rucker 2000). Older Hispanic women seem to suffer from disadvantages in health related to disability and cancer (Quill and DesVignes-Kendrick 2001).

However, mortality outcomes of Hispanic Americans continue to support the "epidemiological paradox" identified almost two decades ago (Markides and Coreil 1986), in which Hispanic populations have an equal or higher life expectancy than Whites at all ages, despite their relatively poor socioeconomic circumstances. One possible explanation for the epidemiological paradox may be selective immigration to the U.S. that results in a "healthy immigrant" population (Markides and Coreil 1986, Sorlie et al 1993). However, these health advantages seem to deteriorate over time, and apply mostly to males in terms of mortality from cardiovascular disease and cancer (Roland et al 1999). It is important to bear in mind that while researchers note such patterns, generalizations about Hispanic Americans must be approached with caution.

There are vast differences among Hispanic groups that will influence social class and health outcomes (Marotta and Garcia 2003). While Hispanics are primarily Roman Catholic and share a common language, characteristics that differ between older members of Hispanic groups are substantial. Older Mexican Americans are more likely to be born in the U.S. than other groups, tend to have lower educational opportunities and average English skills, and relatively high poverty rates (Markides and Miranda 1997). Older Cubans are mostly foreign born, are disproportionately professionals, and have high education levels (Portes et al 1986). Older Puerto Ricans share the low socioeconomic and occupational status of Mexican Americans, and mostly migrated after World War II (Sanchez and Ayendez 1988). Even less similar characteristics exist among Hispanic groups originating in Central America. This emphasizes the fact that while overall

findings about the health of older Hispanics are useful, they mark a beginning point for further study. Many gaps in knowledge remain with regard to variation in the aging and health outcomes of the very diverse Hispanic population, and this research attempts to progress in this area.

The overall poorer health of older minority groups is described as the "double jeopardy hypothesis," meaning that there is an amplified effect of normal biological aging when one has lived in an impoverished environment and possibly under the stress of racism (Kart and Ford 2002, Kim et al 1998). Racial gaps in health are spread across all domains of health, and poverty is the primary explanation for racial and ethnic disparities in health, along with prolonged exposure to stress from poverty (Hayward et al 2000, Williams and Kurina 2002). Economic hardship drains physical and psychological resources and this creates chronic strain, especially for older people (Turner 1999). Older people and those from lower socioeconomic groups may be more vulnerable to ill effects of stress, especially from social relationships.

On the other hand, being African American itself is still strongly associated with cardiovascular disease even after accounting for socioeconomic status (Rooks et al 2002). This indicates that other factors that explain this racial association need to be discovered. There is empirical support for the notion that racism is a separate and unique source of stress for African Americans (Nazroo 2003, Thompson 2002). Social and economic inequalities, underpinned by racism, may be fundamental causes of ethnic inequalities in health.

2.3.4 Social Structural Inequality

Racial and ethnic discrimination has historically hampered the ability of African and Hispanic Americans in terms of economic, social and geographic mobility. Residential segregation in particular creates social exclusion or multidimensional disadvantage in many domains that are related to premature mortality (Cooper et al 2001, Lobmayer and Wilkinson 2002, Schulz et al 2002). Poor African American families have been uniquely discriminated against historically, and this is still evident through current residential segregation and less accumulated wealth (Schulz et al 2000). Specifically, residential segregation of African Americans in aging urban areas seems to influence health by determining access to economic, social, and physical resources essential to good health (Fischer 2003).

When gender is factored in to this equation, a situation of "multiple jeopardy" may exist with a combination of social disadvantages that also accumulate over time (Hammond 1995, Hardy and Shuey 2000). Certain disadvantages that make up "multiple jeopardy" have already been identified, and serve as partial explanations for the reproduction of health inequalities. As previously mentioned, minority women are more likely to face societal circumstances that put them at risk for illness and decreased longevity (Conway-Turner 1999). A critical circumstance is racial discrimination that is related to chronic stress and disease, especially for older African American women (Schulz et al 2000, Troxel et al 2003). Everyday experiences with unfair treatment and acute life events make a significant contribution to differences in health status.

Poverty, discrimination, and residential segregation explain a portion of the racial and ethnic differences in health, but not all of the variation (Wallace 1999, Williams and

Collins 2001). This research attempts to understand how social relationships are affected by socioeconomic disadvantage, and how these relationships may actually harm health and longevity over time. It is understood that social networks, integration, and support shape health, but how or why is not known. This research turns to the interaction of socioeconomic and race effects with social relationships for guidance. First, other established literature on socioeconomic status and health is detailed.

2.4 Socioeconomic Status and Health

The prior section demonstrates that there are continual differences in socioeconomic status that influence health outcomes of older women, arguably through stress and strain. This study contends that the source of some of this affliction may be through involvement in social support networks. Many studies report an association between socioeconomic status and health, but how these interact over time is uncertain. The following section reviews this body of inquiry.

Empirical literature supports that over time broad social and structural factors shape and determine the experience of aging in the United States. Research efforts have evolved in epidemiology, public health, and sociology to understand the patterns of disease and death as shaped by a complex interaction of social, economic, political, and cultural factors (Link and Phelan 1995, 1996, Phelan et al 2000). These forces are viewed as shaping every aspect of life, including the functioning of the human body, but much remains unknown about how this happens. What is clear is that the single most powerful determinant of human health is contained in elements of socioeconomic status.

Prior research demonstrates that social factors such as socioeconomic status and social support are fundamental determinants of disease and mortality (Abdulah et al 1999, Berkman 2000, Chou 1999, Marmot et al 1987, Michael et al 2001). Socioeconomic status and social support are important resources that affect health outcomes through multiple mechanisms (Link and Phelan 1995, Ross and Mirowsky 1999). Overall, individuals with greater financial and socio-cultural resources report better health (Chang et al 2001, Williams and Collins 1995).

There are a variety of ways that higher socioeconomic status and greater levels of social support seem to improve health. Financial resources contribute to healthier lifestyles as well as better access to medical care and health insurance (Feinstein 1993, Gold et al 2000, Ross and Mirowsky 2000). As discussed earlier, social support, both formal and informal, often provides instrumental assistance to individuals when needed and psychological benefits that promote mental and physical wellness (Phillips et al 2000).

Thus, the links between socioeconomic status and health are well-founded. The associations between social support and health are also entirely present in the existing literature, but how socioeconomic status and social relationships function together is not well established to date. How low socioeconomic status affects social support networks remains ambiguous. Further, no studies have examined how low socioeconomic status and the provision of social support, both experienced more often by women than men, shape the health of women over time. Prior to this investigation here, the following section reviews prior studies that document the strong relationship between socioeconomic status, health and longevity.

2.4.1 Social Class and Health

Higher socioeconomic status has been clearly established as beneficial in terms of health outcomes. Specific socioeconomic factors such as low levels of income and education have been shown to be powerful predictors of poor health (George 1996, House 2001, Mead et al 2001). These factors, along with occupation and residential location, have all been shown to be critical factors contributing to illness and death (Bosma et al 2001, Pickett and Pearl 2001, Smith 1999). The association between wealth and health is robust, and differentials in health outcomes exist by social class in terms of self-reported health status, health beliefs, mortality and infectious disease (Feldman et al 1989, Fiscella and Franks 1997, Kaufman et al 1998, Pappas et al 1993, Ross and Wu 1995, Sorlie et al 1995). In addition to low levels of socioeconomic factors such as income and education, income inequality also seems to demonstrate distinct deleterious effects on overall mortality and, especially, deaths from heart disease, homicide, and cancer (Cooper et al 2001, Kennedy et al 1996). Differences in morbidity and mortality between socioeconomic groups, continues to be one of the most consistent findings in epidemiologic research.

Specifically, there are strong and consistent associations between material wealth indicators and particular health aliments. These include chronic diseases, mobility and functional status and depression, with little evidence for reverse causation (Avlund et al 2003, Blazer et al 2002, Everson et al 2002, Lynch et al 1997). That is, it is disputed that episodes of illness may have caused subsequent economic hardship. Disability status is more common among individuals of low socioeconomic status and is often associated with numerous disease conditions including high blood pressure, diabetes, heart attack,

arthritis, osteoporosis and cancer (Grundy and Holt 2000, Pope et al 2001). Despite impressive progress in reducing cardiovascular mortality over the past several decades, there still exists a disproportionate burden of death and disability from cardiovascular disease in minority and low-income population (Diez-Roux et al 2000, National Institutes of Health 2000).

It also appears as if aspects of socioeconomic status may be more influential on health for older individuals than others. Socioeconomic resources and economic stress have been shown to be distinct determinants of emotional wellbeing and levels of depression in older adults that worsen with time (Miech and Shanahan 2000, Rios et al 2001, Turner and Lloyd 1999, Turner et al 1999) for older women in particular (Gatz and Fiske 2003). This is significant, as the most common mental health concern of elders is depression, and many mask it with somatic complaints (Hall, 1985, Straton et al 2004). The discrete impacts of education and racial and ethnic minority status also may be predictive of chronic disease for older women (Laditka and Laditka 2002). Being of low socioeconomic status, living in poverty, or being a person of color in later life may have specific hazardous effects on health that increase with age (Everson et al 2002, Lynch 2003). The greatest risk of poor mental and physical health has been documented among those who experience sustained deprivation over time (Everson et al 2002). In light of the above findings, this research will further investigate the relationship between the socioeconomic status of older women and total number of health conditions, depression, and functional and mobility limitations.

While it is apparent that socioeconomic status powerfully influences the health outcomes of individuals, which aspects of social class most influence the development of

illness are yet undetermined (Kaplan 1996). Further, how socioeconomic status produces health risks remains unclear. While substantial empirical research has tested the intervening mechanisms between social class and health, only certain explanatory factors have been identified. The following section presents these findings.

2.4.2 Intervening Factors between Socioeconomic Status and Health

One path through which low socioeconomic status seems to create health problems is psychological processes. Specifically, socioeconomic disadvantage seems to create lower levels of perceived control over one's life. Reduced perceptions of personal control contribute to health problems such as chronic conditions, functional capacity, self-rated health and depression (Bailis et al 2001) and seem to particularly affect women and worsen with age (Ross and Mirowsky 2002).

Other related factors that seem to mediate the relationship between poverty and health have also been exposed. These include decreased access to resources such as adequate income, information, housing and community services (Adler et al 1994, Mechanic 1989), all of which benefit individual health. Negative job experiences such as low job control, high job strain and increased job hazards also are more often experienced by those of lower socioeconomic status and deteriorate health (Johnson et al 1995, Siegrist 1995). Lastly, it has been shown that there are fewer available health services and less access to medical care for those living in communities with fewer economic resources. This also worsens overall health over time (Feinstein 1993, Williams 1990, Williams and Collins 1995). Many individuals of low socioeconomic status reside in areas with others who also shoulder socioeconomic disadvantages. As a result, existing

literature has tested whether the health risks present for those of low socioeconomic status may not only originate from individual level factors, but also from the neighborhoods in which they live.

2.4.3 Neighborhoods and Health

A growing body of research has linked neighborhood socioeconomic characteristics such as aggregate levels of income and education to health outcomes (Diez-Roux 1998, 1999, O'Campo et al 1999, O'Campo 2000, Robert 1999, Schultz et al 2000). Low socioeconomic status at the neighborhood level has been demonstrated to increase social stressors, health problems and levels of psychological distress (Boardman et al 2001, Robert 1998, Robert 1999, Shultz et al 2000). Neighborhood socioeconomic contexts have been found to make an independent contribution to health outcomes, especially to cardiovascular disease (Hart 1997, Robert 1999, Roux et al 2001, Sundquist et al 1999) and depression (Ross et al 2000). Ecological studies have connected area characteristics to morbidity and mortality, and contextual analyses have related socioeconomic factors to illness and injury (Blakely and Woodward 2000, Cubbin and LeClere 2000, Shouls et al 1996). Urban areas with lower socioeconomic status overall display more health problems, including high blood pressure, cirrhosis, cancer, asthma, lead poisoning and "weathering," a condition of physical breakdown and carry increased disease risk (Geronimus 2000, Schalick et al 2000). Additionally, being a woman of low socioeconomic status, paired with living in a neighborhood that experiences socioeconomic disadvantage, seems to create a double health burden (LeClere et al 1998).

Socioeconomic characteristics of neighborhoods have been clearly associated with the incidence of disease and mortality risks, independent of individual risk factors. It is precarious in terms of health to live proximate to others with similar socioeconomic disadvantages, but what exactly this means has not been fully articulated.

New conceptual models are necessary to address the complex and dynamic nature of poverty and its influences on the most basic of human resources, health. Previously, it has been demonstrated that individuals, men and women alike, who have lower socioeconomic status are more likely to engage in a wide range of risk behaviors and less likely to engage in health promoting ones, or that "poor people behave poorly"(Lynch et al 2000). Rather, perhaps it is the case that individuals of lower socioeconomic status behave particularly well within social networks. In particular, some older women may overextend themselves it terms of their involvement in social relationships. Specifically, when poor women are involved in giving assistance, care, and time to parents, spouses, children and grandchildren, health risks may increase over time. The implication is that research must incorporate these relational behaviors, as well as structural factors, into explanations of why some women stay healthy while others become ill as they age.

2.4.4 Summary

There are persistent differences in socioeconomic status that influence health outcomes of older women, arguably through stress and strain. The source of some of this affliction may be through involvement in social support networks. These health disadvantages serve as the motivation for this dissertation. The following chapter reviews the general theory on social support and health. It also provides a more focused

and inclusive examination of the theoretical perspectives on this relationship for women in late middle age, and explores social capital theory as a framework for understanding this process.

CHAPTER THREE

CONCEPTUAL APPROACHES TO SOCIAL SUPPORT

3.1 Overview

The preceding chapter presents a broad empirical review of social support, including research relevant to the specific analytical topics of interest in this dissertation: 1) the identification of how elements of social support networks, socioeconomic status, and racial-ethnic group determine health outcomes in later life, and 2) how these factors may perform in conjunction over time. The preceding chapter also describes the divergence in health outcomes in the United States by gender, social class and race. This description leads to the argument that the repeated contrasts in social class that determine health outcomes may occur through social support connections.

Social relationships and socioeconomic status are examined in the dissertation because past studies of how these may modify health in combination have been limited in scope. In this manner, the dissertation addresses incompletely determined conditions of aging and health. This chapter describes relevant theory that applies to social support and health, which are then applied to the case of retirement age women in the United States.

3.2 Conceptual Approaches to Social Factors and Health

Past empirical and theoretical research has focused on distinct areas: the distinct effects of social support on health, the effects of socioeconomic status on health, and certain explanatory factors that mediate this process. The following discussion reviews the most significant theoretical work on social support and health, and proposes social capital theory as applicable to understanding how socioeconomic status and social support may function together to create health outcomes over the life course for women.

I argue that past theory has not fully explored social support when explaining the incidence and perpetuation of health problems. This is especially true for women in the United States, since many scholars have assumed that accumulating health problems is a similar process for all. Yet, as the previous chapter demonstrates, the course of aging and health in the United States varies dramatically according to social relationships. Thus, a lack of attention to social context is problematic as it likely contributes to how social relationships influence health.

In the following section, I suggest how social capital theory may be modified to account for differential health outcomes. The concept of social capital is adapted to include features of social networks, integration, and instrumental social support given. Social capital theory is adapted by considering social capital as a resource that varies according to socioeconomic status and race that is possibly affected over time by degeneration, lack of access to outside resources, or strain for those who maintain social capital.

3.2.1 Theories of Social Support

Certain conceptual models have been formulated to better understand the significance of social support. Role identity models emphasize the diverse roles that individuals occupy (Siebert et al 1999). Resource models emphasize the use of the individual's social resources (Lin 1999). Stress models emphasize supports as mediators or buffers (Cohen et al 1997). Beneath much of the support literature are notions of reciprocity and "beneficence," or that people should be given what they need without consideration of what they give in return. These concepts of reciprocity and beneficence emerge as key concepts in two theories that have been developed to understand social interactions.

First, exchange theories propose that people are primarily concerned with minimizing their costs and maximizing their profits. When confronted with someone who is in need of support, exchange theory holds that the costs of support are weighed against benefits and the relative power and dependency of the giver are intervening factors. Individuals are willing to incur costs in anticipation of an ultimately profitable exchange. Indeed, if the outcome is judged to be sufficiently ineffectual, persons may be reluctant to provide support or may experience greater burden (Call et al 1999).

Recent literature does not support the nature of exchange theory. Many individuals, particularly women, consistently provide more support to others than they themselves receive or expect to receive (Hughes and Waite 2002, Wallace et al 2003, Wallsten 2000). The motivation for this social functioning is not well understood, but it is comprehensible that social relationships are not based on strict barter. Rather, a

process much more elaborate appears to be at work, based on social context that is powerful enough to affect health across the life course.

In contrast to exchange theory, models based on the notion of distributive justice present certain rules of entitlement as playing a central rather than secondary role in a person's social transactions with others. According to this model, people become invested in their view of how things do, and should, happen. It is proposed that people are guided not by personal profit maximization, but by the attitudes of who is entitled to what from whom.

Distributive justice may indeed guide whether social support that is made available to certain parties in one's social network through emotional sustenance, aid, and information (Unger et al 1999). However, the sometimes irrational and unequal distribution of social support to family and friends is unexplained by ideas of distributive justice. In this light, theories of distributive justice fall short in explaining how individuals support one another. There is no attention to what role social environments may play and why normative standards of behavior simply influence health outcomes.

This study incorporates social capital theory in order to study the health disparities that exist among older American women. Social capital embraces the embeddedness of individual social ties within a broader social structure (Kawachi and Berkman 2001). Consequently, this project attempts to elucidate how certain aspects of social support differ by race and socioeconomic status and how this, in turn, affects the mental and physical health of older women. Social capital theory is used to guide this process. Various aspects of social relationships serve as alternate interpretations of social capital. I argue the process of sustaining social capital resources, mainly in the form of

providing social support, may carry the high cost of strain for women of minority and low socioeconomic status, negatively affecting their health outcomes.

3.2.2 Social Capital Theory

Bourdieau (1985) defines social capital as “the aggregate of the actions or potential resources which are linked to or possessed by a durable network of more or less institutionalized relationships.” Social capital has been used to encompass available resources to those within socially structured relationships, such as trust, norms, reciprocity, participation in social networks, pooled material resources and expectation of support (Coleman 1990, Putnam 1995, Putnam et al 1993). The term “social capital” has been applied to describe many aspects of social relationships, including as a result of shared experience, culture and norms of group membership (Fukuyama 2001). Putnam’s (1993, 1995) investigation of civic participation and membership in voluntary associations identified byproducts of social capital such as norms of reciprocity and trust for individuals in such groups.

Coleman (1988) was among the first to bring the term “social capital” to widespread attention. Putnam has expanded on many of Coleman’s themes and has written more comprehensively about social capital than any other scholar. Putnam (1995) identified some primary elements of social capital, which are available at either the individual or collective level. These include social resources, collective resources of neighborhoods or communities, economic resources and cultural resources (Putnam 1995). As Coleman (1988), Gillies (1998) and many others have pointed out, social

capital is a resource that is generated among people and enables them to collaborate for the benefit of all.

Individual outcomes such as labor market success (Granovetter 1995)and educational attainment (Coleman 1988, Smith et al 1995, Teachman et al 1996), and collective goods such as economic growth and effectiveness of government (Brehm and Rahn 1997, Fukuyama 1995, Putnam 1993) are only some of the phenomena that have been associated with higher levels of social capital.

3.2.3 Measuring Social Capital

No firm agreement exists among researchers as to the exact components of social capital, although a number of international meetings and conferences have taken place to decide a working definition of the concept. At present, many scholars accept Putnam's definition of social capital, that is, 'the features of social life such as networks, norms, and social trust that facilitate coordination and co-operation for mutual benefit' (Putnam 1995). Following this logic, the larger and more diverse an individual's social network, the more access he or she would have to functional social relationships, and the more potential there is likely to be for related advantages.

More recently, Putnam (1999) has suggested that the social networks resulting from association memberships more accurately measures social capital than norms of trust and reciprocity (Foley and Edwards 1997, Putnam 1999). At a more personal level, involvement in a social network of family and friends has also been conceptualized as another important component of social capital (Granovetter 1973, Portes 1998, Woolcock 1998). Various types of social connectedness, or social cohesion, seem to be generated

by social network interaction and comprise social capital. Both formal and informal social ties that foster a sense of belonging represent social capital.

Uchino et al (1996) argue that it is important to measure social capital as a multidimensional construct, and Stafford et al (2001) state that the ideal study of social integration and support would take into account factors such as variation in social relationships over time and gender differences in support. Therefore, in this project, various aspects of social relationships, namely social networks, integration and instrumental support given, are used to measure social capital.

According to Kawachi, Kennedy and Lochner, social capital is the 'invisible glue' which binds communities of people together, gives them a shared sense of identity and enables them to work together (Kawachi et al 1997). The adhesive quality of social capital can positively influence many dimensions of human life, including health.

3.2.4 Social Capital and Health

There is consent in recent literature that the construct of social capital may be applied to the study of health and health-related behavior. Interest in the role that social capital plays in illness and mortality has increased dramatically in the past decade. Research previously determined that social involvement, especially in supportive relationships, benefits health and mortality (Berkman 1995, House 1988). Other research had also suggested that strong social ties might predict disease progression and population health (Koopman and Lynch 1999, Wilkinson 1996). However, testing newer conceptualizations of social ties, specifically social capital, is a recent addition to the literature.

Empirical work has investigated social capital and its relationship to health on a number of domains. There are both direct and indirect returns of social capital on the production and accumulation of health (Bolin et al 2003). Civic engagement, both formal and informal, and trust have been shown to reduce violence and deaths involving firearms (Galea et al 2002, Hemenway et al 2001). Social capital, measured by relationships with friends, trust, control, and religious involvement, has been shown to benefit self-rated health and the mental health of women in particular (Hyyppa and Maki 2001, Kawachi et al 1999). The degree of involvement in social networks specially benefits self-rated health and mental outcomes of women during stressful experiences (Achat et al 1998, Rose 2000). In addition, deaths from heart disease are reduced from building social capital in community-based interventions (Lomas 1998).

Despite present empirical findings, there are significant criticisms of social capital theory as tested to date for effects on health. Studies have conceptualized social capital to include many of the social, collective, economic and cultural resources available to families, neighborhoods, and communities (Cooper et al 1999). As a result, some researchers argue that social capital is too vague and does not specifically identify the critical resources inherent in social relations, nor how these are formed (Hawe and Shiell 2000, Woolcock 1997, 1998). The vagueness of social capital makes it widely acceptable but open to widely varying interpretations, and offers little in the way of effective interventions.

Further, some assert that many of the effects of social capital that have been claimed are spurious, as they disappear in analytic models after controlling for other factors, especially in public health research (Earls and Carlson 2001, Kennelly et al 2003,

Portes 1998). A recent cross-sectional study found that measures of social capital, as measured by social trust, were only weakly and inconsistently associated with cause-specific mortality, and greater distrust was actually associated with *lower* mortality from coronary heart disease (Lynch et al 2000).

Other research simply cast doubt on the widely accepted hypothesis that social capital has a blanket positive effect on health. New research and challenges this hypothesis and calls for more extended models of social capital and health (Kennelly et al 2003). Social capital as a potentially important determination of health and health differentials clearly needs to be explored in more detail. More work needs to be carried out, including a means of establishing standards of measurement and exploring the "downsides" of social capital.

3.2.5 Social Capital and Social Inequality

Additionally, the mechanisms that either mediate or moderate the relationship between social capital and health are yet undetermined. To link social capital to health, several possible causal mechanisms have been put forth. These include the influence of social cohesion on health-related behaviors, differential procurement of social services, and variation in access to life opportunities and material resources (Kawachi and Berkman 2001, Kawachi and Kennedy 1999). There has been scant support for a reverse causality relationship between social capital, economic disadvantage, and health (Pearce and Smith 2003). That is, low levels of social capital do not cause lower socioeconomic status, and then, compromised health.

Alternatively, a psychosocial definition of the mechanisms linking social capital to health has been the most accepted (Kawachi et al 1999). These responses of shame and distrust that low position in a social hierarchy cultivates may be translated into poor health through social isolation, neuro-endocrine mechanisms and stress-induced behaviors (Wilkinson 1996). Social stratification may underlie the psychosocial responses that have an effect on social capital.

Veenstra (2002) and others argue that economic inequality undermines social capital by less coherence among individuals, increased hostility and mistrust (Kawachi and Kennedy 1999, Putnam 1993, Veenstra 2002) and in turn, worsened health and increased mortality (Kawachi and Kennedy 1997, Kennedy et al 1999). Furthermore, perception of economic inequality by individuals has been shown to diminish overall psychological wellbeing, social capital, and health (Wilkinson et al 1998). Inequality may consume social capital through degeneration of social networks.

This rationale follows Putnam (1993, 1995, 2000) who claims that social capital has declined overall in recent decades. On the contrary, some assert that there is not sufficient evidence to support the decline of social networks or social capital (Fukuyama 1999, Kawachi and Kennedy 1999, Paxton 1999 Skocpol et al 2000). Rather than social capital being perceived as a quantity to measure, it may be more qualitative in nature. Instead of social capital "running out," social capital may merely differ for different individuals and groups and be transformed according to various societal factors. Social stratification, social capital, and health may all be consequences of more macro-level social and economic processes that influence health across the life course (Pearce and Smith 2003). Social capital may not be an undifferentiated good that is either increased

or decreased according to various social factors, but may be a resource that is unique according to these factors. A limited amount of studies have begun to demonstrate social capital as a contextual construct (Subramanian et al 2002).

3.2.6 Social Capital and Context

There is a continued need to explore the complex interplay between health inequalities, social capital and macro level determinants (Mallison et al 2003). Social capital cannot serve as a readymade explanation that can simply be "verified" in isolation (Pearce 2003, Kawachi et al 1997). Instead, it seems that specific environmental contexts must be taken into account to capture the dynamic nature of social capital. Researchers should avoid attributing social capital to social behaviors in isolation of context and interaction (Hean et al 2003). The danger is that social capital as a nebulous, popular concept diverts attention from the macro-level economic and social milieu that set the bounds within which individuals live.

There is extant empirical evidence that social capital is contextual in nature and is shaped by ecological characteristics (Lindstrom et al 2002, Lochner et al 1999). For instance, there has been a continuous marked drop in mortality rates in New Zealand in the past 15 years, where there are large socioeconomic inequalities and few investments in social capital. If social capital and psychosocial consequences of one's position in a hierarchy were direct predictors of health, then it would be expected that health should have deteriorated in New Zealand. It has not. The effect of social capital on health may depend on the conditions of the environment in which it arises. Other explanations such

as structural and material causes of inequality may be a starting point to understand health differences (Pearce 2003), including how social capital affects health across group.

All groups within a population likely possess some type of social capital, yet it is probably distinctive to their circumstances. Differences in social capital resources (social networks in particular) have been manifested by age, race, gender, income, education and neighborhood (Boisjoly et al 1995, Veenstra 2002). Social capital is not necessarily diminished, but possibly distinct according to each of these factors (Bourdieau 1985). These decreases may be the case due to exclusion from other opportunities to develop alternative social capital resources.

There is some limited confirmation that social capital may be exhibited differently across group. Social capital may be diverse, according to the social structural categories of race, gender, and social class. For instance, research on homeless youth and immigrant families shows these groups tend to utilize almost exclusively family or fictive kin as a primary source of social capital due to a lack of availability to other, more formal resources (McCarthy et al 2002).

As suggested by research by Campbell and McLean (2002), racial and class identification in particular may reduce the likelihood of participation in community organizations or networks beyond that of family and friends due to exclusion (Campbell and McLean 2002). This was the case with African–Caribbean individuals in England who did not venture beyond their immediate social network due to perceived racial discrimination, and for that reason had a specific type of social capital resource available to them. This is similar to minority networks and those of lower socioeconomic status in the United States that maintain dense and constricted social networks that are crucial for

survival, and maintain closed boundaries (Baum and Palmer 2002, Sanders 2002, Waldinger 1995).

While social capital may be a universal resource for all groups, increased social involvement may not necessarily be good for health (Kunitz 1994). This is especially the case for individuals and groups disadvantaged by structural obstacles such as racial discrimination and socioeconomic disadvantage. Their investments in social capital as measured by membership in social networks, social integration, and providing social support, may create stress. As Portes (1998) discussed, social capital is not necessarily positive or negative, but is measured by its effect. I argue that the effect of social capital can be both positive and negative on health, but these effects vary according to socioeconomic status and race.

Compositional effects of social capital on health are ambiguous in limited studies. While some scholars find little evidence, others indicate that social capital influences work concurrently with human capital, such as age, gender and income, to generate health (Rose 2000, Veenstra 2000). Social capital may also affect health according to race. Initial work reveals that social capital improves mortality for Whites significantly more than African Americans (Lochner et al 2003).

The reasons for these varied social capital influences are unknown, but likely find their causes in wider structural and cultural forces. A better grasp of how the process of sustaining social capital resources, mainly in the form of providing social support, is indicated. Social capital may carry the high cost of strain for women of minority and low socioeconomic status, negatively affecting their health outcomes.

3.2.7 Maintaining Social Capital

While low socioeconomic status does not necessarily lessen social capital, it may indeed make it difficult to maintain in the absence of various other economic and structural resources. For example, in inner cities with socioeconomic problems, several studies have shown fairly high levels of social capital (Portes and Landholt 2000), but the networks within these inner cities often do not provide access to needed resources and individuals cope accordingly (Bourdieau 1998). Neighborhoods that experience poverty are often insulated from formal structures such as social services, employment, and health care services. Informal social networks often absorb these deficits and attempt to address these needs in a fragmented manner (Burton 1992, Burton et al 1994, Angel and Angel 1997). As a result, social capital resources such as social support and pooled resources are frequently spent in the absence of educational, occupational, and health resources. In this way, strong social networks can be coercive and a source of struggle as well as support (Lynch et al 2001). This may result in increased vulnerability to poor health for those who spend social capital on others without other formal resources for themselves. This may be aging women of low socioeconomic status.

Putnam (1995) refers to social capital as the obligations from strong social ties that provide resources for mutual assistance and enhance group solidarity. There is evidence that women have traditionally been the pillars of social relationships within communities, especially those of lower socioeconomic status and minority status. It is older women, through their informal and unpaid labor, who are often called upon to cash in social capital resources to benefit those around them through enforceable trust or interdependence (Portes and Sensenbrenner 1993).

Through strong notions of debt and obligation to family and friends, women of low socioeconomic status in particular may continue to absorb the costs of social relationships, both time and material. This may be the case even if extreme pressure and hardship is present. In sum, older women will likely continue to maintain social capital, but at risk to their own survival.

Coleman (1988, 1990) and others assert that social capital is a collective public good. Goods such as norms, trust, reciprocity and involvement, once established, benefit even those who did not create them or contribute to their maintenance. This suggests that social capital is accessible to all who require it. If measured by social support, then aid or support would be available to those such as the old, young, dependent or ill as needed in all social networks. However, this assertion is problematic within social networks where there are higher numbers of those in need of support and fewer available to give it, such as communities that are economically and socially impoverished. Social capital may in fact not be an unlimited public good for all groups, and the sources and beneficiaries of social capital may be distinct (Portes and Landholt 2000). Putnam (1995) describes social capital as follows:

> For a variety of reasons, life is easier in communities blessed with a substantial stock of social capital. In the first place, networks of civic engagement foster sturdy norms of generalized reciprocity and encourage the emergence of social trust. Such networks facilitate coordination and communication, amplify reputations, and thus allow dilemmas of social action to be resolved…Finally, dense networks of interaction probably broaden the participants' sense of self, developing the "I" into the "we", or…enhancing the participants' "taste" for collective benefits.

In terms of social capital, life may be easier for some, but not all. Indeed, the sense of "we" seems to be present particularly in disadvantaged communities, but the collective benefits that Putnam refers to may not extend to those who maintain social capital.

For those who experience poverty, it may be necessary to depend on social capital resources such as mutual obligations and trust. This is the case because other more limited tangible resources of support and aid may be at a premium. Individuals may experience strain in attempting to disperse scarce informal resources. They may also anticipate reciprocity for their expenditures to be difficult, if not impossible, to obtain from others. These factors together may help explain the health risk experienced by many women of low socioeconomic status.

One analogy present in existing research explored businesses owned by lower income minorities that failed due to continued favors and support of family and friends within the social network (Portes 1998, Portes and Sensenbrenner 1993, Portes and Landolt 2000). The same may be true of older women who compromise their own health in the process of providing support for those around them, without guarantee of reciprocal support. Women may give to others much more than they receive, with negative health consequences. This has been suggested by the fact that family has been found as both a source and user of social capital that it is particularly important for older adults. Research also supports that in terms of family exchanges, one study demonstrates no relationship between investments in family and access to family-based assistance for providers themselves (Hofferth et al 1999). Indeed, in terms of support provided and support received, a risky imbalance for older women may exist.

This inequity is demonstrated by research by Morrow (1999) on adolescents. In this work, social environments are shown to produce paradoxes based on social status; on one hand these, environments supported adolescents, but on the other they further excluded, strained, and challenged them (Morrow 1999). I argue this is the case with

women of minority and lower socioeconomic status. They indeed possess significant amounts of social capital, yet may maintain it with stress and strain. In this way, social capital may work to replicate social inequality (Bordieau 1986) in terms of health.

Existing research has begun to explore the idea that social capital may paradoxically increase distress for those of low resources. Social capital as derived from social relationships can increase stress reactions and psychological distress, such as depressive symptoms and anxiety, for women with social and economic deficits (Kawachi and Berkman 2001). Schulz et al (2000) hypothesize that for African American women, residential segregation, reduced socioeconomic status, and discrimination affect social capital and produce stress which adversely affects health outcomes. They point to further research on this topic that takes into account social capital and socioeconomic factors when explaining health differentials among women (Schulz et al 2000). It is becoming evident that women, and predominantly minority women, who do not receive sufficient benefit from their social environments and also lack economic resources, may be at greater risk of stress and poor health.

In sum, prior theoretical perspectives explaining the operation of social support have not effectively considered how the social context may modify social relationships. This omission is significant, as social support networks are likely predisposed by features inherent to the social environment. Including social and economic factors could improve the explanatory power of theoretical frameworks about social support. The same holds for social capital theory, which may also be modified according to socioeconomic status and race-ethnicity. Beneficial resources that flow from social relationships may be altered, with considerable health consequences.

Accordingly, I hypothesize that social networks, social integration, and provision of instrumental social support will have both protective benefits on health, as well as detrimental effects. Most importantly, I hypothesize that participation in a social support network will create increased health risks for women of low socioeconomic or minority status that are unique, or not present for other older women. I also argue that these effects will persist over time.

When various resources are lacking in the environments in which minority or disadvantaged women live, it is likely that those in mid-to-later life will substitute for missing resources. The expenditures of time and money of these women will most likely carry high health costs for them. These assertions are established by the fact that the influence of social support networks on health across group occurs is yet unspecified. No evidence exists that demonstrates that social support networks have distinct effects on health that are dependent on or magnified by characteristics such as race and social class. Grundy and Sloggett (2003) specify that there is a need to consider both socioeconomic and social psychological resources' influences on health in later life.

This dissertation contributes to existing work by attempting to specify macro-social determinants of the association between social relationships and health. This is crucial as the investigation of social contact and health needs to distinguish between all aspects of social support in relationship to a range of health issues (Lennartsson 1999).

3.2.8 Summary

Several hypotheses are presented in this chapter. The general argument is that various aspects of social relationships will affect health differently for women of low socioeconomic status and minority status. Specific hypotheses are also proposed. First, social networks, social integration, and provision of social support will have positive effects on health outcomes. Second, social networks, social integration, and provision of social support may also have specific jeopardous effects on health. Third, detrimental health effects of social networks, social integration, and provision of social support will be uniquely present for women of lower levels of income and minority racial and ethnic group status.

This chapter reinforces certain themes. First, research about social capital and health has often not included more comprehensive measures of social capital such as indicators of social supportive relationships. Second, social capital is often portrayed as a uniform positive element of social relationships that does not require maintenance or costs that may harm as well as help for some. This is unfortunate as this approach limits the ability of the social capital theory to explain phenomena such as health.

CHAPTER FOUR

DATA AND METHODS

4.1 Overview

This research examines the determinants of health, including total number of health conditions, mobility limitations and depression experienced by older women over time. The analysis of each outcome examines effects across three time periods: 1992-1994, 1994-1996, and 1992-1996.

The methodology presented in this dissertation is innovative in a number of ways. The use of Waves I, II, III (1992-1996) of the Health and Retirement Study data provide the capability of examining individual health as determined by both present and prior causal factors. The analysis described below also utilizes statistical methods for estimating health decline. Lastly, this research is national in scope, and the results apply to the health of women aged 55-65 in the United States in 1994 and 1996.

4.2 Study Design

The analysis of the health of older women is based on a prospective design. First, characteristics of the respondents of the HRS, 1992-1996, are followed from the date of an interview in 1992 until 1996. Ordinary least squares regression and longitudinal growth curve models are used to model health outcomes. Demographic and social relationship measures are used as covariates. Each of three different health outcomes, all self-reported health measures, is investigated according to the techniques described above.

4. 3 Data Sources

The analyses for this dissertation originate from two data sources, The Health and Retirement Study (HRS), 1992-1996, and the 1992, 1994, and 1996 RAND HRS Data files.

4.3.1 The Health and Retirement Study

The HRS is a national panel survey of individuals, aged 51-61 at baseline (1992), and their spouses. Its main goal is to provide panel data that enable research and analysis in support of policies on retirement, health insurance, saving, and economic well-being. The survey elicits information about demographics, income, assets, health, cognition, family structure and connections, health care utilization and costs, housing, job status and history, expectations, and insurance.

The HRS is a national panel study, and is administered by the Survey Research Center at the University of Michigan. Since its inception, the HRS has become the

nation's leading data resource on combined health and economic circumstances of Americans as they age. The HRS sample design is very similar in its basic structure to the multi-stage designs used for major federal survey programs such as the National Health Interview Survey (NHIS) or the Current Population Survey (CPS). An important aspect of the survey population is its representativeness of the population as a whole, in which the diversity of individual circumstances related to health is present. The rich racial and ethnic diversity of respondents make possible targeted analyses of those in the United States who may be particularly vulnerable to poor health. HRS data are utilized to create demographic, socioeconomic and social relationship variables, as well as the dependent variables of depression and various physical health problems.

The HRS is well suited for this project primarily due to the age of its respondents, aged 55-65 in 1996, and its longitudinal design. This data set provides a nationally representative sample of retirement-age women in the United States. While many other data sources exist, most interview older individuals or lack the depth and breadth of measures present in the HRS.

To accomplish a nationally representative core sample, the HRS design includes three over-samples that are designed to increase the number of Black and Hispanic HRS respondents as well as the number of respondents who are residents of the State of Florida. To allow independent analysis of key subgroups, the 1992 core sample is augmented by a 1.86:1 over-sample of Black Americans, a 1.72:1 over-sample of Hispanics and a 2:1 over-sample of Florida residents.

The first HRS survey was administered face to face in 1992 to a nationally representative sample of 12,674 Americans aged 51-61 and their spouses or partners in

7,705 households. Sample members were re-interviewed by telephone in 1994 and 1996, and by proxy interview after death or in the event of physical or cognitive limitation. The target population for Wave 1 (1992) of the HRS includes all adults in the contiguous United States, born during the years 1931-1941, who reside in households. Persons institutionalized in 1992 are not included in the survey population. However, individuals were followed when they moved from households into institutions. Follow-up surveys were conducted by phone in 1994 and 1996 with proxy interviews after death. The re-interview response rates were 91.8 percent for 1994 and 93.1 percent for 1996.

4.3.2 The RAND Health and Retirement Study Data Files

In addition to the "raw" or original HRS data files, RAND HRS data files were also used in the present analyses. The RAND HRS files are a cleaned, processed and streamlined version of the Health and Retirement Study (HRS) developed for policy analysis use by the Social Security Administration (SSA). Only a few variables in the RAND HRS Data files are unchanged copies of raw HRS variables. Most variables have undergone some processing, and many are the result of more than one HRS variable. The original HRS and RAND data files were merged with a single unique identifier, as well as data merged across waves into one master file.

4.4 The Sample

To construct the current sample, I selected only women, as they are focus of the current project. Prior research suggests that older women are overwhelmingly are more involved in their social networks than men and are most likely to provide support for others around them (Lee et al 2001).

I also excluded from the sample "non-Family Respondents" or those who do not provide information about family and social measures. Information about parents, siblings, and children are reported in the Family Section at each wave. In a couple household, the designated Family Respondent answers all questions about parents, siblings, and children, including in-laws, and this is usually the female respondent. Each couple interviewed was asked to identify which of them would have the most information about family and this was usually identified as a female. Finally, I also excluded any proxy interviews, and those respondents who were not present in each wave.

With longitudinal data, respondents are lost to follow-up in later waves of data collection due to death, relocation, illness, disinterest, and so on. It is likely that those respondents who are lost may differ from those who are retained in some systematic way; they may have had different characteristics to begin with or may have changed in ways different from the rest of the sample (Menard 1991). That is, a substantial amount of missing data may be non-random and affect the internal and external validity of a longitudinal study. The characteristics of the women lost to follow-up in the HRS were investigated and they are similar in terms of race and Hispanic status. However, more women of lower educational status and lower levels of income and wealth were lost to

follow-up (See Appendix A). However, these proportions are not large enough to expect them to have significant effects on inference.

4.5 Measurement

The data items chosen from the RAND HRS Data file are: age, sex, race/ethnicity, marital status, education, total household income, total household wealth, and whether respondent owns a car and/or home. Age is measured in continuous years and sex is a dichotomous measure. Race/ethnicity is a categorical variable: non-Hispanic White, non-Hispanic Black, Hispanic. Black is used to represent African American status. Dummy variables were created with non-Hispanic White as the reference category. Since other races constituted a small percentage of the sample (3%), and preliminary multivariate analyses found no statistically different health outcomes compared to non-Hispanic Whites, they are excluded from the analyses. For these analyses, marital status is measured as currently married, never married, divorced or separated, and widowed, at each wave. This variable does not distinguish between married couples and partnered couples that are not married but live together much like a married couple. Dummy variables were created with married or partnered as the reference category.

4.5.1 Measures of Socioeconomic Status

Education is measured as a categorical variable in 1992: less than high school, GED, high school, some college, college and above. Dummy variables were created, with high school as the reference category. In this research, a common indicator of socioeconomic status, employment/occupational status, is not included. The rationale is

that for many women born 1931-1941, employment history may be spotty and selective. This cohort of women was largely not a part of the significant entry of many more women into the labor force beginning in the 1970s. While most of the women in the sample have some employment experiences, they are extremely varied in timing and type. Thus, alternate measures of socioeconomic status are utilized.

Total household income is the sum of all household or family income. That is, the sum of respondent and spouse individual earnings, household capital income, respondent and spouse income from employer pension or annuity, respondent and spouse income from Social Security DI or SSI, respondent and spouse income from Social Security Retirement, Spouse, or Widow benefits, respondent and spouse individual unemployment or workers compensation, respondent and spouse government transfers, and all other income. The net value of wealth is calculated as the sum of all wealth components less all debt. That is, the sum of the value of primary residence, vehicles, real estate, businesses, IRA and Keough accounts, stocks and bonds, checking, savings, and money market accounts, CDs, government savings bonds, T-bills, bonds and bond funds, and other savings, minus other debt, mortgages, and other home loans. Income more accurately captures the financial resources of minorities than Whites, who are more likely to own real estate and have other investments and assets (Oliver and Shapiro 2001, Smith 2001).

Ownership of a car and home at each time point is also included as a categorical measure. The absence of ownership of either for older women of this age group may indicate poverty status and is coded accordingly. Prior research has identified that

educational qualifications and financial assets indicators paired with a deprivation variable serves as the best measure of socioeconomic status (Grundy and Holt 2001).

Although three indicators of socioeconomic status, income, education and wealth, are related to health outcomes and each other, they are included separately rather than as an index. Distinct variables indicate income and wealth at each wave. Evidence from previous research has shown that although these measures are related, they are not highly correlated with each other (Abramson et al 1982, Liberatos et al 1988), and therefore it is acceptable to include them in the same model. Correlations among these measures in the current sample typically range from .03 to .04 (See Appendix B). Keeping the measures separate has the advantage of greater flexibility and it allows for the investigation of the relationship between each indicator and health outcome. In addition, more than one indicator may improve the ability of a model to predict outcomes and expose the intervening role of social relationships with socioeconomic status on health. The statistical consequence of multicollinearity in regression models is that when two or more predictors are measuring approximately the same construct, the sizes of the coefficients are unreliable. This makes it difficult to determine the effect on the outcome variable because changing the value of one coefficient will also change the other when multicollinearity is present. But since education, income, and wealth are not too highly correlated and because each contributes directly and indirectly to health outcomes (Link and Phelan 1995, Mead et al 2001), multicollinearity is not expected to hinder the present analyses.

The HRS developed special methods to collect information on variables that can be subject to high rates of non-response used in the analyses, such as income and

financial assets. A key feature of the process is the use of special questionnaire designs to elicit “bracket” information from respondents who are unable or unwilling to answer amount questions. Missing value imputation procedures have been developed to deal with various problems arising from the use of this “bracket” information. These “bracket” questions greatly improve the ability to impute reasonable values for missing data cases (Juster and Smith 1998, Heeringa et al 1995). Most HRS questions on wealth and income follow the same pattern. First, respondents are asked the income or assets question, and if the respondent is unable or unwilling to provide an exact amount, the interviewer then asks whether it is more than $25,000. Depending on the response, additional, smaller brackets are explored. For example, when asked about shares of stock or mutual funds, the range is as follows: $0-2,500; $2,500-25,000; $25,000-125,000; $125,000-400,000; $400,000 or more. Because income and wealth were measured in dollars, both were divided by 1000 at each wave in order to create more distinguishable effects on health.

4.5.2 Measures of Social Relationships

The data items chosen from the original HRS Data file are the various social relationship measures that are tested in the analytic models. These social relationship indicators were not among the variables processed by RAND. The social measures fall into three categories: social network, social integration, and instrumental social support provided to others. Each measure provided taps a distinct aspect of social involvement and are tested for their independent and joint effects in the analytic models. Measures

were selected according to these groupings because measures were collected at all three waves.

Social network measures indicate the number of individuals that comprise one's social network. These individuals may or may not be a source of support for the women in the sample. Number of residents in the respondent's household for Waves 1 and 2 is constructed by counting the number of people reported in the household roster. They are counted in processing that collapses the household roster to respondent-level observations. The number of residents in Wave 3 is taken directly from a variable in the data. Number of grandchildren is asked of respondents is asked in each wave. Number of living siblings is taken from given counts in all waves except Wave 2. In Wave 2, siblings are counted and their relationships checked, but the number of living siblings is not asked if both parents are deceased.

Social integration represents the amount of involvement with people that one has within his or her social network. Integration is measured by whether the respondent has friends or family in the neighborhood in which they live, and whether they visit with neighbors. In all three waves the respondents are asked, "(Besides the people living here living with you), Do you have any relatives in this neighborhood?" The response categories are 1=yes, 0=no. In all three waves the following question is also asked: "How often do you get together with any of these neighbors just to chat or for a social visit?" This variable is coded 0 = respondent either does not know neighbors or rarely visits and 5= respondent visits with neighbors daily.

The instrumental social support provided to others variables are measured by caring for grandchildren and helping parents and in-laws with basic needs. These are

incorporated as measures of provision of social support, specifically caregiving by women. A developing literature documents potentially harmful effects of caregiving responsibilities for older women through stress experiences (Alesina and La Ferra 2000, Brehm and Rahn 1997, Putnam 2000). Alternatively, receipt of social support has also been demonstrated to be a highly positive influence on health in other work (Tyler and Hoyt 2000). However, the receipt of social support by respondents is not included for several reasons. First, receipt is measured by the HRS only as receiving money from children, parents or in-laws or relatives, while other types of support that may be received from others are not measured. Secondly, only between 8 and 15 percent of the sample ever received such monetary support. Lastly, receipt of social support was highly correlated with giving financial support and help to parents and in-laws (.60-.80).

The amount of time spent caring for grandchildren is measured in Waves 1 and 2 by asking the question, "In the past 12 months, have you (or your husband/partner) spent 100 hours (Wave 1)/50 hours (Wave2) or more hours altogether taking care of the grandchild/grandchildren?" In Wave 3 the question changes to, "Did you (or your husband/wife/partner or your late husband/wife/partner) spend 100 or more hours in total since the previous wave interview or in the last two years taking care of grandchildren or great-grandchildren?" The response categories are 1=yes, 0=no.

Helping parents or parents-in-law with basic needs is measured in Waves 1 and 2 by asking the question, "Have you (or your husband/wife (Wave 2)/partner) spent 100 (Wave 1)/ 50 (Wave 2) or more hours in the past twelve months helping your parent(s) (or stepparents) with basic personal needs like dressing, eating, and bathing? In Wave 3, the question asks, "Did you (or your (late) husband/wife/partner) spend a total of 100 or

more hours since the previous wave interview or in the last two years helping your (deceased) parents/mother/father with basic personal needs like dressing, eating, and bathing?" The response categories are 1=yes, 0=no. These questions are repeated to the respondent in each wave and ask about whether assistance was given to the respondent's husband's/wife's/partner's (late)/(step) parents.

As is evident above, between Wave 2 and Wave 3 there are discrepancies in both the reference periods and response categories for the social relationship measures. In order to explore whether these differences resulted in inconsistent responses across wave, responses on these variables were compared across race, ethnicity, income, education and wealth, and the most reliable were chosen. Care for grandchildren and helping parents and in-laws with basic needs all display consistent responses across group and across time, thus demonstrating that these inconsistencies were not problematic in terms of item response.

The coding for the social relationship measures is designed to tap both the availability of social ties and participation in social networks. If respondents have missing values on the social relationship variables, this indicates that the respondent reports not having relationships with, or having contact with grandchildren, parents or in-laws. Thus, each variable was coded 0 = there is not the opportunity to provide support as there is no person to provide it to, 1 = there is the opportunity to provide support, but respondent does not, and 2 = there is the opportunity to provide support and respondent does. Therefore, 0 scores indicate the absence of that relationship in a respondent's life at all.

This measurement strategy creates a more comprehensive measure of social support, beyond a dichotomous measure. The rationale follows the existing literature that suggests that available and anticipated social support may be a more effective coping resource than the actual interactions between social network members (Krause 1997a, 1997b). Most of the impact of supportive relationships appears to be the direct result of projected security in the future (Ross and Mirowsky 2002). Therefore, lower scores on social relationship measures may indicate not only a lack of participation in one's social network, but also the lack of one's network depth. This is the best approach available since the HRS does not ask respondents directly about perceived social support resources.

The selection of the current social measures was preceded by preliminary analyses. First, a correlation matrix was examined including all available HRS social relationship measures. Some correlations were high (.70-.90), and thus provided a selection criteria for the measures that were chosen. Secondly, initial OLS and logistic regression models demonstrated which of the social measures were not often associated with the health outcomes of depression, mobility limitations, and total number of health conditions. According to these criteria, financial assistance to and from children, parents, and relatives, whether respondent has friends living in the neighborhood, and whether the respondent currently supports any dependents were eliminated.

4.5.3 Measures of Health

To best measure the health of older women in the sample, three dependent variables related to health difficulties were tested. Overall health is measured by total number of health conditions reported by the respondent at each wave. Functional limitation is measured by mobility function. Depression is measured by using a score on the Center for Epidemiologic Studies Depression (CES-D) scale. The use of these particular constructs was intended to facilitate the most complete "snapshot" of health of women approaching retirement. In the HRS, chronic conditions were emphasized as they have characteristic patterns of preventability and health service needs and predictable functional outcomes and prognoses (Wallace and Herzog 1995).

In the HRS, health was conceptualized as multidimensional, with a general emphasis on physical and mental domains (Wallace and Herzog, 1995). Health is viewed as multi-axial (Cote 1982), attempting to capture as many axes as possible, including both subjective and objective assessments. Although the choice and format of specific questions vary from one measure to the next, most health assessment tools, including the HRS, derive from a similar conceptual and measurement tradition. According to that tradition, health is viewed as a multidimensional concept that includes social, behavioral, and psychological dimensions and health perceptions, in addition to medical pathophysiology and clinical phenomenology.

The functional dimensions of health have been articulated in the Institute of Medicine's (Pope and Tarlov 1991) disability model of health, which is in turn grounded in the World Health Organization's International Classification of Impairments, Disabilities and Handicaps in the functional limitation framework proposed by Nagi

(1965). The subjective or evaluative dimensions of health perceptions derive from the increasing emphasis on quality of life and clinical outcomes in medical research (Patrick and Erickson 1993) and the emphasis in those measures on subjective perception and expectations of health. Thus, functional limitations and depression were selected as well as total number of health conditions.

Recent innovations in health status assessment have included the construction of standardized health scales from survey measures, a technique that is viewed as an improvement over single survey items (Ware and Karmos 1976). Thus, all of the outcomes measures utilized here are indices. The number of conditions index is created from the sum of indicators for whether a doctor has ever told the respondent that he or she has ever had a particular disease. The eight included diseases are high blood pressure, diabetes, cancer, lung disease, heart disease, stroke, psychiatric problems, and arthritis. In interviews after baseline, prior responses were preloaded. The term "preloading" refers to information from a prior wave that the interviewer uses to prompt the respondent. For example, suppose a respondent indicated in Wave 2 that he had been diagnosed with diabetes. In Wave 3 questions, the interviewer will use this information. Typically, the respondent is allowed to challenge the preloaded information. Each disease indicator variable has a corresponding flag variable that indicates whether the respondent disputed the previous wave's indicator.

Aging is associated with higher prevalence and higher incidence of many chronic and acute diseases and with changes in physiological systems. Thus, researchers attempt to look at health status more broadly. Mortality and disease are still important gauges of health measurement, yet have been extended to include functional consequences of

diseases and quality of life (Guralnik et al 1996). Focusing on functional status elicits a more complex approach to risk factors (Kaplan et al 1999).

The mobility limitation index was chosen for its comparability with studies that measure functional limitations, the assessment of their quality, and for consistency across waves. First, the respondent indicates if she has difficulty performing a task (0 = no difficulty; 1 = difficulty). The four tasks included in the mobility index are walking one block, walking several blocks, walking across a room, climbing one flight of stairs and climbing several flights of stairs. Although the same items were asked in each wave to assess mobility function, the stem of the questions differed between waves and recoding attempts to create consistency between waves (See Appendix C). The distributions in Appendix D show only a slight increase in reported difficulty between waves. It appears likely that the mode of asking the questions in Waves 2 and 3 resulted in perhaps fewer reports of difficulty. I expect this measurement effect will bias our effects to zero. Therefore, I expect downward health transitions, the spurious improvements in mobility function act as conservative bias.

Depressive symptoms are an important indicator of general well-being and mental health among older Americans. Higher levels of depressive symptoms are associated with higher rates of physical illness, greater functional disability, and higher health care utilization (Barefoot and Schroll 1996, Wells et al 1989). The reliability and validity of the CES-D has been established previously (Husani et al 1980, Weissman et al 1977). The measure of psychological distress, or symptoms of depression, consists of a subset of items from the Center for Epidemiologic Studies Depression (CES-D) scale (Radlof, 1977). The CESD score is the sum of five "negative" indicators minus two "positive"

indicators. The negative indicators measure whether the respondent experienced the following sentiments all or most of the time: depression, everything an effort, sleep is restless, felt alone, felt sad, and could not get going. The positive indicators measure whether the respondent felt happy and enjoyed life all or most of the time. CES-D items measure how often in the past week they have felt lonely, sad, lacking energy, etc.

In Wave 1, the CESD questions begin, "Please tell me how often you have experienced the following feelings during the past week: All or almost all of the time, most of the time, some of the time, or none or almost none of the time." A series of statements follow and the respondent answers one of the four responses listed above. Only in Wave 1, imputations were used for missing values. In Waves 2 and Wave 3 the questions ask, "Now think about the past week and the feelings you experienced. Please tell me if each of the following was true for you much of the time during the past week…" A series of statements follows to which the respondent answers yes or no. The shortened form of the scale was designed for interviews with older respondents and has satisfactory psychometric properties (Turvey et al 1999). To make the CES-D measure consistent across waves, yes/no dummy variables were derived. To alter Wave 1 responses to match Waves 2 and 3, "All/almost all of the time" and "Most of the time" were coded as yes, while "Some of the time" and "None/almost none of the time" were coded no. This scheme creates a decline in reported depression symptoms between waves 2 and 3 (See Appendix D), and imparts a conservative estimate to the present findings.

4.6 Analytic Approach

Three kinds of hypotheses are tested. 1.) There are both protective and detrimental effects of social networks, social integration, and provision of social support on health. 2.) These attributes operate together with socioeconomic status and race-ethnicity to influence the incidence of health problems of older women. 3.) Social networks, social integration, and provision of social support attributes operate together with socioeconomic status and race-ethnicity to influence individual change in health outcomes of older women over time.

Rather than estimating the incidence of illness, these analyses enable the investigation of individual health trajectories for all women in the sample. That is, not only whether women develop illness, but how illness may progress is included in the measurement of health decline. The analyses allow for the determination of whether change is occurring and what are its correlates of change. Again, the general argument of this dissertation is that social relationships affect health together with socioeconomic status and race/ethnicity.

To begin, the characteristics of the women in the sample are explored. Health outcomes of women are then compared across race, ethnicity, socioeconomic status and social measures to investigate if they are significantly different. I compare means by calculating confidence intervals and identify whether the health status across group is statistically significant. If, as expected, there are variations in health, this suggests that the process of becoming ill or remaining healthy does not operate identically for all women. Perhaps the contextual influences of one's background, along with social ties, influence how health is achieved for various women.

Next, I investigate the associations between socioeconomic status and health, race-ethnicity and health, and social relationships and health, to reconfirm findings found in other studies. OLS regression models were utilized in this project to examine the relationships between socio-demographic characteristics along with social networks, integration and support provided and the incidence of health problems. To test effects over time, both OLS models with a baseline measure and longitudinal models are tested. Specifically, individual growth curve models were applied. The lagged multivariate models predict health at specific time points by health at prior time points, while longitudinal growth curve analyses model individual variability in health over time.

For each of the three health measures, independent variables were tested with block regression, which enters independent variables in an order specified by the researcher according to logical or theoretical considerations. In this case, control variables are entered first and then independent variables are evaluated as far as what they add to the model above and beyond the controls. In the analyses that follow, age and marital status are entered as control variables first, and income and wealth are added as a group. Then, car and house ownership, educational variables and African American and Hispanic status are added sequentially in that order. From this point forward, this group of control variables, socioeconomic status, and race-ethnicity variables are included in the statistical models together with income, wealth, and race-ethnicity as interaction terms with social relationship measures.

The effect of time on health decline is incorporated through the use of lagged models that test effects between waves. Wave 1 independent variables are tested on Wave 2 and Wave 3 health variables, and Wave 2 independent variables are tested on

Wave 3 health variables. This approach allows for the investigation of whether social relationship characteristics have specific effects across certain time intervals and whether these effects persist.

In order to test how individual and social attributes operate together to influence the incidence of health problems of older women, interaction terms are used. An interaction effect exists when the impact of one independent variable depends on the existence of another independent variable. In the current models, I investigate whether the impact of social characteristics on health may act uniquely in conjunction with socio-demographic characteristics. Interactions with income and wealth were tested here. The models do not include interaction terms between social characteristics and measures of education and indicators of ownership of a car or home. The rationale is that the socioeconomic status of older women is likely best measured by family income and wealth, along with measures of race and ethnicity. This is due to the fact that women in their fifties and sixties may not have high educational achievement or own their own car or house, but still be of relatively high socioeconomic status due to marital relationships.

Thus, interaction terms are created by multiplying each of the social measures by (1) total family income, (2) total family wealth, (3) African-American status, and (4) Hispanic status. The models including interactions were run separately by these groupings. The fact that the T values for the interactions are significant shows that differences are not just limited to the intercepts. In addition, I did incremental F tests to assess model fit with the OLS models. The test of significance of the interaction effect is accomplished by an incremental F test done with block regression. First, a main effects model is tested, followed by a full model regression including the product terms. Then,

an incremental F test is done comparing the main effects only model versus the full model (Jaccard et al 1990).

To begin to investigate whether change is occurring over time in terms of health, the use of a lagged dependent variable is referred to as the static-score or conditional change panel model (Plewis 1985). In this model, Yt is predicted from its earlier value Yt-1 from the independent variable X at the same time period, and from a random error term. This control regression to the mean or the negative correlation between initial scores on a variable and subsequent change (Finkel 1995). This research also focuses on antecedent health problems and their environmental causes.

While the HRS cannot explore the remote origins or early history of most health or other individual characteristics, it strives to characterize these features in the baseline range of 51 to 61 years of age and to follow their trajectories (Wallace and Herzog, 1995). Therefore, this longitudinal research serves two primary purposes: to describe patterns of changes in health, and to establish the direction and magnitude of causal relationships with social and socio-demographic factors. Multilevel or hierarchical linear models (MLM or HLM), represent an alternative to OLS for estimating individual growth or change curves (Bryk and Raudenbush 1992). Multivariate longitudinal change patterns in health are substantively and practically important in terms of understanding the aging process and which risk and protective factors influence these changes.

Individual growth curve modeling is a particular approach to hierarchical linear modeling and is a type of Latent Trajectory Models (LTM). Growth curve modeling characterizes the study of growth as a two-phase process. It involves the specification of predictors of change measured at the individual and group level. The Level 1 model for

intra-individual, or within-person, change describes the underlying growth for each person as a function of time and a set of model growth parameters that define the change function. The Level 2 model for inter-individual, or between-person, differences in change describes how differences in growth across persons are related systematically to differences in various predictors of growth (Collins and Sayer 2000).

In general, growth models of intra-individual difference utilize the following approach. The Level 1 model is:

$$Y_{ji}=\pi_{0i} + \pi_{1i}(Time_{ji}) + r_{ji}$$

Observation at time j for individual i is a function of systematic growth trajectory plus a random error representing deviation from the trajectory at a particular observation point. $Time_{ji}$ represents age from the first to last test. $\pi_{0i,}$ the intercept, is a woman's status at the first test. $\pi_{1i,}$ the slope, is the linear growth rate for person i over the testing period. The Level 2 model explains growth or inter-individual difference, or variation among persons in initial status and rates of change.

HLM is appropriate in this regard as individual health change over time is expected to vary systematically from individual to individual and this variation will likely be explained by individual and aggregate characteristics. The approach also models the between-subjects variation of the individual change curves with individual factors. The analysis of individual growth represents a social case of the nested data structure, as multiple observations are nested within the individual subject (Bryk and Raudenbush 1992). In such analyses, time is considered to be nested within the individual. Mixed models using the SAS MIXED procedure are used here for growth curve modeling.

Some advantages of this approach include fit of the data with unequal numbers of observations for each subject, variable timing considerations, and handling correlations in the data (Tate and Hokanson 1993). Further, HLM allows the fit of the data with unequal numbers of repeated observations for each subject, and gives unbiased estimates of non-random missing data (Tate and Hokanson 1993), both of which are likely present in longitudinal panel data. First, HLM makes it possible to separate the variance into components explaining the effects of different levels of analysis. HLM does not assume that errors within units are independent and adjusts for correlated error terms (Bryk and Raudenbush 1992). Rather than underestimating standard errors, HLM partitions errors between and across units in addition to estimating cross-level effects. HLM also handles variation in sample sizes across units, which avoids increased standard errors and likelihood of Type 1 error.

Analyses of individual health decline, or change over time, investigate the shape of mean growth as well as the variability in individual growth curves around the mean growth curve. Time is measured in the growth curve models by age in years, and linear and quadratic growth curves are modeled to attempt to best estimate individual level change in health.

There are several strengths and weaknesses of the data and analyses here. First, only three waves of HRS data are currently available for public use. Additional waves of data lead to higher precision for estimating the individual growth trajectory and greater reliability for the measurement of change (Willet 1989). As previously addressed, some of the indicators of social relationships included slightly different measurement across wave. Lastly, many of the processes examined in the dissertation are interrelated. It can

be very difficult to categorize variables as either exogenous or endogenous and to identify causal order. While this is a concern, I deal with this by interpreting the result as evidence of relationships rather than precise determinants or consequences. Despite these drawbacks present in the Health and Retirement Study, the overall strengths of the data and types of analysis utilized outweigh these limitations.

The longitudinal nature of the data and analytic techniques utilized here allow for the further understanding of how health is produced over time. This advantage, along with the ability to apply the findings to older Hispanic, African American and White women in the United States, exceeds the existing shortcomings.

CHAPTER FIVE

ANALYSIS AND DISCUSSION

The results of the dissertation are presented in several sections. First, the number of health conditions, mobility limitations, and depressive symptoms of women in the sample are compared across race and ethnicity. Second, correlation coefficients are presented between measures of health, wealth, and income. Third, descriptive findings outline the characteristics of this sample of older women. Fourth, lagged multivariate models are presented in which social relationships predict health outcomes. Finally, longitudinal growth curve models are utilized to identify whether individual health decline occurs in the current sample.

5.1 Descriptive Findings

Statistical analyses of the Health and Retirement Study data supported that there are significant differences in the number of health conditions, mobility limitations, and depressive symptoms across race. The analyses also indicate significant associations between all measures of health, income and wealth. Table 1 supports that there is

significant variation in White, Black, and Hispanic women's health across each domain measured.

Table 1 details differences in health that exist across race and ethnicity. Overall, there are significant differences on each health measure during each time interval. Over time, Black women experience the greatest number of health conditions. Hispanic women reported the most mobility limitations, except at Time 3, when Black women have slightly more on average. Hispanic women also reported the most depressive symptoms at each time point.

TABLE 1

DESCRIPTIVE COMPARISONS OF HEALTH OF WOMEN IN THE SAMPLE BY RACE

	Time 1: (1992)			Time 2: (1994)			Time 3: (1996)		
	White	Black	Hispanic	White	Black	Hispanic	White	Black	Hispanic
Number of Conditions	1.03	1.43*	1.17#^	1.20	1.65*	1.39#	1.37	1.85*	1.58#
Mobility Limitations	.522	.732*	.809	.671	1.01*	1.10^	.799	1.18*	1.13#^
Depression Symptoms	.699	1.08*	1.43#^	1.20	1.97*	2.81 #^	1.21	1.78*	2.41#^
N	4016	919	461	4016	919	461	4016	919	461

*,#,^ Statistically different at the .05 level.
*Indicates difference between White and Black. #Indicates difference between White and Hispanic.
^Indicates difference between Black and Hispanic.

Table 2 presents modest correlation coefficients between health, wealth and income. For all health measures at each time interval, greater income and wealth is associated with fewer health problems. These relationships are highly significant, yet

fairly small, which suggests that additional measured and unmeasured factors likely influence these particular health outcomes.

TABLE 2

CORRELATIONS BETWEEN INCOME AND WEALTH AND HEALTH OUTCOMES

Income	Conditions 1992	Conditions 1994	Conditions 1996	Mobility 1992	Mobility 1994	Mobility 1996	CESD 1992	CESD 1994	CESD 1996
1992	-.191	-.194	-.191	-.183	-.194	-.197	-.159	-.185	-.168
1994	-.148	-.154	-.153	-.147	-.160	-.156	-.122	-.157	-.150
1996	-.175	-.179	-.182	-.158	-.175	-.175	-.134	-.165	-.148
Wealth									
1992	-.133	-.137	-.140	-.122	-.125	-.134	-.116	-.139	-.116
1994	-.145	-.149	-.155	-.131	-.142	-.150	-.115	-.148	-.128
1996	-.130	-.139	-.143	-.128	-.146	-.144	-.112	-.141	-.117

* All correlations significant at the p < .0001 level.

Table 3 provides descriptive statistics regarding respondents' race, marital status, level of education, and age. Further, measures of wealth and income, as well as ownership of a car and house, are summarized.

TABLE 3

DESCRIPTIVE STATISTICS FOR VARIABLES USED IN THE ANALYSES

	Time 1: 1992 (N)	Time 2: 1994 (N)	Time 3: 1996 (N)
Age:			
Age in Years in 1992	53.71 (5512)	55.57 (5512)	57.58 (5512)
Race:			
White	72.93% (5507)		
Black	16.63% (5510)		
Hispanic	8.38% (5504)		
Education in 1992:			
Dropout	24.71% (5512)		
GED	4.64% (5512)		
High School	35.96% (5512)		
Some College	20.19% (5512)		
College	14.50% (5512)		
Marital Status:			
Never Married	2.83% (5510)	3.03% (5510)	2.81% (5489)
Separated/Divorced	13.74% (5489)	13.88% (5395)	13.79% (5378)
Widowed	7.99% (5510)	10.22% (5370)	11.53% (5489)
Married/Partnered	75.77% (5510)	73.36% (5489)	71.87% (5489)
Total Family Income:			
Nominal Dollars	$45,322 (5512)	$48,570 (5512)	$51,496 (5512)
Total Family Wealth:			
Nominal Dollars	$204,521 (5512)	$222,786 (5512)	$246,462 (5512)
Poverty Indicators:			
No Owned House	19.79% (5512)	19.90% (5512)	24.04% (5512)
No Owned Car	12.21% (5512)	11.72% (5512)	12.55% (5512)
Social Network Characteristics:			
Number of Living Siblings	2.74 (5507)	2.76 (5492)	2.93 (5372)
Number of Household Residents	2.71 (5512)	2.86 (5512)	2.47 (5512)
Number of Grandchildren	3.93 (5512)	4.44 (5483)	4.89 (4278)
Social Integration Characteristics:			
Relatives in the Neighborhood	34.67% (5512)	33.19% (5505)	29.47% (4286)
Visits Neighbors	2.43% (5512)	3.16% (5500)	3.10% (4187)
Social Support Characteristics:			
Care for Grandchildren	33.38% (5512)	38.39% (5502)	35.44% (4292)
Help Parents with Basic Needs	4.57% (5512)	5.91% (5497)	7.37% (4288)
Help In-laws with Basic Needs	1.87% (5512)	2.45% (5499)	2.19% (4290)

Finally, the descriptive analyses provide information regarding the social relationship patterns of the respondents. Notably, most had approximately 3 siblings and 3 household residents. The number of grandchildren of these women increased from about 4 to 5 over the course of the four-year data collection. Approximately one-third of women had relatives in the neighborhood and most visited with neighbors several times per year. Over 30% of the women cared for grandchildren at Time 1, nearly 40% did so at Time 2, and about 35% did so at Time 3. Approximately 5% of women help parents with basic needs at Time 1 and this increased to 7% at Time 3. In addition, less than 3% of women help their in-laws with basic needs at any period of time. In sum, Table 3 indicates that social relationships among these women tend to remain somewhat stable over time, with slight modification.

5.2 Results

The following section presents findings from the lagged multivariate and longitudinal growth curve models. The lagged multivariate models tested the effects of individual demographic and social relationship variables on each health domain at three time intervals. These are the one-period lags from Time 1 to Time 2 (1992-1994) and from Time 2 to Time 3 (1994-1996), as well as the two period lag from Time 1 to Time 3 (1992-1996). The dependent variables for the analyses are total number of health conditions, mobility limitations, and depression symptoms.

5.2.1 Lagged Multivariate Models: Main Effects Models

5.2.1.1 Demographic Factors

There are several patterns that emerge from the demographic variables tested in the lagged multivariate models, and these patterns echo the descriptive findings. Across all domains, women experience more health risks as they age. Being separated or divorced, being a high school dropout, having a GED, or not owning a house or car, are associated with poor health at each time interval (Tables 4-10). Conversely, graduation from college is associated with a fewer number of health conditions, mobility limitations, and symptoms of depression (Tables 4-10). Black women consistently reported higher levels of total number of health conditions, while Hispanic women reported more depressive symptoms (Tables 4, 6, 7, 10). The completion of some college is associated with fewer symptoms of depression. However, completion of college is not associated with number of conditions reported by these women (Tables 6 and 10). Women who had reported being widowed reported more mobility limitations as well as more depressive symptoms (Tables 4, 5, 7, 8).

TABLE 4

NUMBER OF CONDITIONS AND SOCIAL NETWORK CHARACTERISTICS

	All Social Time 1-2	Network Time 1-2	All Social Time 2-3	Network Time 2-3	All Social Time 1-3	Network Time 1-3
Intercept	-.341	-.431	-.459	-.661	-.307	-.453
Black	.190***	.125	.205***	.159	.207***	.170
Hispanic	-.084	.232	-.112	.229	-.088	.242
Age	.030***	.032***	.034***	.037***	.032***	.035***
HS Drop	.326***		.352***		.366***	
GED	.181*		.279***		.271**	
S College	-.052		-.039		-.028	
College	-.170***		-.200***		-.174**	
Wealth	-.000***	-.000**	-.000***	-.001***	-.000***	-.000**
Income	-.001**	.000	-.000	.001	-.001**	.001
House	.150***		.134***		.186***	
Car	.180***		.287***		.162**	
Sep or Div	.215***	.241***	.106	.160**	.183***	.221***
Widow	.093	.116	.142*	.189**	.060	.089
Never Mar	.023	.055	-.055	.048	-.052	-.005
Residents	-.027*	-.033	-.025*	-.041*	-.024	-.027
Siblings	-.017**	.003	-.017*	.005	-.014	.011
# Gkids	.015***	.047	.020***	.053***	.016***	.049***
Relatives	.068*		.006		.083*	
Visits	.027		-.016		.012	
Care Gkids	.026		-.006		.018	
Parents	-.067*		-.054		-.093**	
In-laws	.005		-.013		-.008	
Residents * Wealth		.000*		.000		.000
Siblings * Wealth		-.000		-.000		-.000
Grandkids * Wealth		-.000		-.000		-.000
Residents * Income		-.000		-.000		-.001
Siblings * Income		-.000		-.000		-.001*
Grandkids * Income		-.000*		-.000		-.000*
Residents * Black		.055		.057*		.062
Siblings * Black		.016		-.005		.006
Grandkids * Black		-.019*		-.013		-.021*
Residents * Hispanic		-.013		.000		-.010
Siblings * Hispanic		-.008		.021		-.014
Grandkids * Hispanic		-.020		-.020*		-.018
Adj. R2	.117	.097		.098	.117	.095
N	5365	5365		5349	5365	5365

TABLE 5

MOBILITY LIMITATIONS AND SOCIAL NETWORK CHARACTERISTICS

	All Social Time 1-2	Network Time 1-2	All Social Time 2-3	Network Time 2-3	All Social Time 1-3	Network Time 1-3
Intercept	.128	.018	.320	-.023	.385	.233
Black	.059	-.005	.100*	.084	.086	.039
Hispanic	.093	.489	-.044	.424**	-.019	.277
Age	.011***	.013	.011**	.013***	.009*	.011**
HS Drop	.391***		.405***		.403***	
GED	.192**		.262**		.262**	
S College	-.072		-.090		-.085	
College	-.196***		-.247***		-.208***	
Wealth	-.000	-.000	-.000***	-.000**	-.000*	-.000
Income	-.002***	-.002	-.001**	.001	-.002***	-.001
House	.177***		.068		.182***	
Car	.190***		.262***		.166**	
Sep or Div	.213***	.246	.231***	.254***	.245***	.272***
Widow	.087	.116	.191**	.225**	.130	.153*
Never Mar	.022	.084	.139	.237*	.109	.156
Residents	.000	-.019	.000	.002	.003	-.013
Siblings	-.015*	.016	-.022**	.002	-.019**	.008
# Gkids	.015***	.037	.019***	.002***	.016***	.047***
Relatives	.060		.050		.058	
Visits	-.028		-.089**		-.028	
Care Gkids	-.039		-.066**		-.004	
Parents	-.070**		-.062*		-.091**	
In-laws	.010		.016		.002	
Residents * Wealth		.000		.000		.000
Siblings * Wealth		-.000		.000		.000
Grandkids * Wealth		-.000		-.000		-.000
Residents * Income		.000		-.000		-.000
Siblings * Income		-.001		-.000		-.001**
Grandkids * Income		-.000**		-.001***		-.000**
Residents * Black		.026		.025		.043
Siblings * Black		.006		.001		.008
Grandkids * Black		.007		-.004		-.007
Residents * Hispanic		-.016		-.026		.007
Siblings * Hispanic		-.023		-.016		-.011
Grandkids * Hispanic		-.015		-.025**		-.020
Adj. R2	.101	.071		.070		.070
N	5361	5361		5338		5355

TABLE 6

CESD AND SOCIAL NETWORK CHARACTERISTICS

	All Social Time 1-2	Network Time 1-2	All Social Time 2-3	Network Time 2-3	All Social Time 1-3	Network Time 1-3
Intercept	2.19***	2.02***	2.07***	1.78***	2.14***	1.89***
Black	.241**	.249	.050	.140	.053	.295
Hispanic	.961***	1.38***	.489***	.831***	.565***	.908***
Age	.006***	-.014*	-.015**	-.012*	-.015**	-.013*
HS Drop	.834***		.653***		.650***	
GED	.568***		.217		.199	
S College	-.203**		-.326		-.315***	
College	-.513***		-.515		-.483***	
Wealth	-.000	-.001	-.000	-.001**	-.000	-.000
Income	-.002*	-.002	-.002***	.001	-.002**	-.001
House	.472***		.246***		.235**	
Car	.315**		.393***		.305***	
Sep or Div	.320***	.421	.317**	.368***	.316***	.327***
Widow	.436***	.525	.451***	.530***	.332***	.368***
Never Mar	.007	.130	.368*	.480**	.250	.263
Residents	.012	-.012	.003	.011	-.016	.002
Siblings	-.006	.047*	.013	.053**	.015	.066***
# Gkids	-.003	.039**	.004	.036***	-.000	.031*
Relatives	.042		.088		.095	
Visits	-.191***		-.096		-.175***	
Care Gkids	-.009		-.042		.023	
Parents	-.085		-.030		-.055	
In-laws	-.007		.078		.065	
Residents * Wealth		.000		.000**		.000
Siblings * Wealth		.000		-.000		-.000
Grandkids * Wealth		-.000		-.000		-.000
Residents * Income		.000		-.000*		-.000
Siblings * Income		-.001*		-.000		-.000
Grandkids * Income		-.001		-.000**		-.001*
Residents * Black		.035		.009		-.030
Siblings * Black		-.002		-.016		-.019
Grandkids * Black		.012		.008		.007
Residents * Hispanic		-.012		.027		-.002
Siblings * Hispanic		-.008		-.054		-.051
Grandkids * Hispanic		-.000		.013		.030
Adj. R2	.131	.084	.098	.063	.093	.058
N	5340	5362	5327	5349	5365	5365

TABLE 7

NUMBER OF CONDITIONS AND SOCIAL INTEGRATION CHARACTERISTICS

	All Social Time 1-2	Integration Time 1-2	All Social Time 2-3	Integration Time 2-3	All Social Time 1-3	Integration Time 1-3
Intercept	-.341	-.760***	-.459	-.965***	-.307	-.748
Black	.190***	.132	.205***	.213**	.207***	.178*
Hispanic	-.084	.117	-.112	.153	-.088	.123
Age	.030***	.038***	.034***	.044***	.032***	.041***
HS Drop	.326***		.352***		.366***	
GED	.181*		.279***		.271**	
S College	-.052		-.039		-.028	
College	-.170***		-.200***		-.174**	
Wealth	-.000***	-.000	-.000***	-.000***	-.000***	-.000*
Income	-.001**	-.003	-.000	-.001*	-.001**	-.003***
House	.150***		.134***		.186***	
Car	.180***		.287***		.162**	
Sep or Div	.215***	.188***	.106	.184**	.183***	.178
Widow	.093	.263***	.142*	.254***	.060	.243
Never Mar	.023	.023	-.055	-.023	-.052	-.044
Residents	-.027*		-.025*		-.024	
Siblings	-.017**		-.017*		-.014	
# Gkids	.015***		.020***		.016***	
Relatives	.068*	.153**	.006	.082	.083*	.174**
Visits	.027	-.023	-.016	-.061	.012	-.039
Care Gkids	.026		-.006		.018	
Parents	-.067*		-.054		-.093**	
In-laws	.005		-.013		-.008	
Relatives * Wealth		.000		.000		.000
Visits * Wealth		-.000		-.000		-.000
Relatives * Income		-.002*		-.001		-.002
Visits * Income		.001		.000		.001*
Relatives * Black		.159		.090		.128
Visits * Black		.192*		.131		.185*
Relatives * Hispanic		-.080		-.088		-.042
Visits * Hispanic		-.013		-.020		-.010
Adj. R2		.087		.082		.085
N		5386		5371		5386

TABLE 8

MOBILITY LIMITATIONS AND SOCIAL INTEGRATION CHARACTERISTICS

	All Social Time 1-2	Integration Time 1-2	All Social Time 2-3	Integration Time 2-3	All Social Time 1-3	Integration Time 1-3
Intercept	.128	-.144	.320	-.068	.385	.068
Black	.059	.131	.100*	.124	.086	.098
Hispanic	.093	.239	-.044	.188	-.019	.146
Age	.011***	.017	.011**	.018***	.009*	.016***
HS Drop	.391***		.405***		.403***	
GED	.192**		.262**		.262**	
S College	-.072		-.090		-.085	
College	-.196***		-.247***		-.208***	
Wealth	-.000	-.000	.000***	-.001**	-.000*	-.000
Income	-.002***	-.003	-.001**	.000**	-.002***	-.003***
House	.177***		.068		.182***	
Car	.190***		.262***		.166**	
Sep or Div	.213***	.222	.231***	.255***	.245***	.249***
Widow	.087	.229	.191**	.270***	.130	.263***
Never Mar	.022	.044	.139	.148	.109	.120
Residents	.000		.000		.003	
Siblings	-.015*		-.022**		-.019**	
# Gkids	.015***		.019***		.016***	
Relatives	.060	.144	.050	.155**	.058	.143**
Visits	-.028	-.069	-.089**	-.171**	-.028	-.077
Care Gkids	-.039		-.066**		-.004	
Parents	-.070**		-.062*		-.091**	
In-laws	.010		.016		.002	
Relatives * Wealth		.000		.000		-.000
Visits * Wealth		.000		-.000		.000
Relatives * Income		-.002		-.002*		-.001
Visits * Income		-.000		.001		.000
Relatives * Black		.018		.047		.051
Visits * Black		.073		.144		.197*
Relatives * Hispanic		-.097		-.222		-.105
Visits * Hispanic		.257*		.220		.228
Adj. R2		.060		.058		.060
N		5382		5359		5374

TABLE 9

MOBILITY LIMITATIONS AND SOCIAL SUPPORT PROVIDED

	All Social Time 1-2	Provided Time 1-2	All Social Time 2-3	Provided Time 2-3	All Social Time 1-3	Provided Time 1-3
Intercept	.128	.089	.320	.114	.385	.334
Black	.059	.236*	.100*	.360***	.086	.165
Hispanic	.093	.547***	-.044	.198	-.019	.255*
Age	.011***	.014***	.011**	.014***	.009*	.011**
HS Drop	.391***		.405***		.403***	
GED	.192**		.262**		.262**	
S College	-.072		-.090		-.085	
College	-.196***		-.247***		-.208***	
Wealth	-.000	-.000	.000***	-.001***	-.000*	-.000*
Income	-.002***	-.002***	-.001**	-.001	-.002***	-.003**
House	.177***		.068		.182***	
Car	.190***		.262***		.166**	
Sep or Div	.213***	.207***	.231***	.241***	.245***	.245***
Widow	.087	.213***	.191**	.248***	.130	.251***
Never Mar	.022	.038	.139	.138	.109	.152
Residents	.000		.000		.003	
Siblings	-.015*		-.022**		-.019**	
# Gkids	.015***		.019***		.016***	
Relatives	.060		.050		.058	
Visits	-.028		-.089**		-.028	
Care Gkids	-.039	.068*	.066**	.067*	-.004	.121***
Parents	-.070**	-.110*	-.062*	-.106**	-.091**	-.140**
In-laws	.010	-.024	.016	-.070	.002	-.069
Care Gkids * Wealth		-.000		.000		-.000
Parents * Wealth		.000		.000*		.000
In-Laws * Wealth		.000		.000		.000
Care Gkids * Income		-.000		-.001**		-.001
Parents * Income		-.000		-.001		-.000
In-Laws * Income		.001		.001		.001
Care Gkids * Black		-.019		-.086		.055
Parents * Black		-.040		-.070		-.090
In-Laws * Black		-.108		-.020		.035
Care Gkids * Hispanic		-.163*		-.070		-.148
Parents * Hispanic		.023		.044		.130
In-Laws * Hispanic		-.196		.188		.098
Adj. R2		.062		.058		.064
N		5382		5353		5374

TABLE 10

CESD AND SOCIAL SUPPORT PROVIDED

	All Social Time 1-2	Provided Time 1-2	All Social Time 2-3	Provided Time 2-3	All Social Time 1-3	Provided Time 1-3
Intercept	2.19***	2.40***	2.07***	1.99***	2.14***	2.09***
Black	.241**	.270	.050	.195	.053	.180
Hispanic	.961***	1.70***	.489***	.979***	.565***	1.18***
Age	.006***	-.020**	-.015**	-.012*	-.015**	-.015**
HS Drop	.834***		-.653***		.650***	
GED	.568***		.217		.199	
S College	-.203**		-.326		-.315***	
College	-.513***		-.515		-.483***	
Wealth	-.000	-.000	-.000	-.000*	-.000	.000
Income	-.002*	-.005**	-.002***	-.002*	-.002**	-.004**
House	.472***		.246***		.235**	
Car	.315**		.393***		.305***	
Sep or Div	.320***	.452***	.317**	.376***	.316***	.389***
Widow	.436***	.840***	.451***	.577***	.332***	.603***
Never Mar	.007	.139	.368*	.445**	.250	.466**
Residents	.012		.003		-.016	
Siblings	-.006		.013		.015	
# Gkids	-.003		.004		-.000	
Relatives	.042		.088		.095	
Visits	-.191***		-.096		-.175***	
Care Gkids	-.009	.087	-.042	.062	.023	.129*
Parents	-.085	-.040	-.030	.025	-.055	.013
In-laws	-.007	-.102	.078	-.037	.065	.015
Care Gkids * Wealth		-.000		-.000		-.000
Parents * Wealth		.000		.000		-.000
In-Laws * Wealth		.000		.000		.000
Care Gkids * Income		-.000		-.001		-.000
Parents * Income		-.002		-.002*		-.001
In-Laws * Income		.002		.001		.000
Care Gkids * Black		.213*		.125		.179
Parents * Black		-.173		-.160		-.266*
In-Laws * Black		-.040		-.008		-.004
Care Gkids * Hispanic		-.103		.140		-.108
Parents * Hispanic		-.202		-.234		-.165
In-Laws * Hispanic		-.287		-.043		.017
Adj. R2		.087		.056		.059
N		5383		5365		5386

5.2.1.2 Beneficial Effects of Social Relationships on Health

For study respondents, more living siblings at Time 1 or Time 2 was associated with fewer health conditions at Time 2 or Time 3. Also, the number of living siblings reported by respondents is associated with fewer mobility limitations at all three time intervals. These effects are displayed in Tables 4, 5, 7 and 8. Further, the number of household residents reported by respondents at Time 1 or Time 2 was associated with fewer number of health conditions at Time 2 or Time 3 as displayed in Tables 4 And 7.

The reported frequency of visiting with neighbors is strongly related to decreased depression (Table 10). These effects are present at Time 1 on Time 2 depression and are also evident from Time 1 to Time 3 depression (-.191 and -.175, respectively). The reported frequency of visiting with neighbors at Time 2 is also linked to fewer mobility problems at Time 3 (-.171, Table 8). This effect of visiting neighbors on depressive symptoms is the most consistent relationship found of all the social relationship characteristics measured.

Respondents who reported helping their parents with basic needs also reported a fewer total number of health conditions. This relationship was present for all time lags measured in the study. Furthermore, the data indicate that helping one's parents reduced mobility limitations for respondents across all time intervals. These effects are displayed in Tables 4, 5, 7, 8 and 9, and suggest that beneficial effects persist over time for number of health conditions and mobility limitations.

5.2.1.3 Detrimental Effects of Social Relationships on Health

As mentioned previously, a larger number of living siblings was associated with fewer health conditions and mobility limitations (Tables 4, 5, 7, 8). However, a greater number of living siblings was associated with depressive symptoms at all three time intervals (Table 6). In addition, the amount of grandchildren reported by respondents was positively associated with harmful effects upon women's health in the current sample, for all time intervals (Tables 4-9). Finally, respondents who reported that they cared for their grandchildren were more likely to report more mobility limitations over all three time intervals (Table 9) and if women cared for grandchildren at Time 1, they reported more depression symptoms at Time 3 (Table 10).

5.2.2 Lagged Multivariate Models: Interaction Effects Models

The analyses of the significant interaction effects are presented in two sections. Initially, the statistically significant interaction terms between social relationships and race and ethnicity are presented. This is followed by a discussion of statistically significant interaction effects between social relationships and income. In each section those interaction effects that had the largest association with their respective outcome variables were highlighted by a graph and description of the effect. The graphs of interaction effects were created by substituting values (+/- one standard deviation) into each regression equation in order to represent high/low levels of each continuous variable. For dichotomous variables, the values of 0 and 1 were substituted into each regression equation. In addition, for some of the more salient interaction effects, real-world numbers, approximating one standard deviation above and one standard deviation

below the mean, were substituted into the models. This allowed for a calculation of the magnitude of the interaction effects in each model upon the respective outcome variable.

5.2.2.1 Detrimental Social Relationship Effects Unique to Black and Hispanic Women

As displayed in Table 4, a significant interaction was found between Black/non-Black status and number of household residents at Time 2 in predicting health conditions at Time 3. A graph of this significant interaction is displayed in Figure 1. It indicates that for non-Black women the number of household residents at Time 2 is associated with fewer health conditions at Time 3. However, for Black women the number of household residents at Time 2 is associated with more health conditions at Time 3.

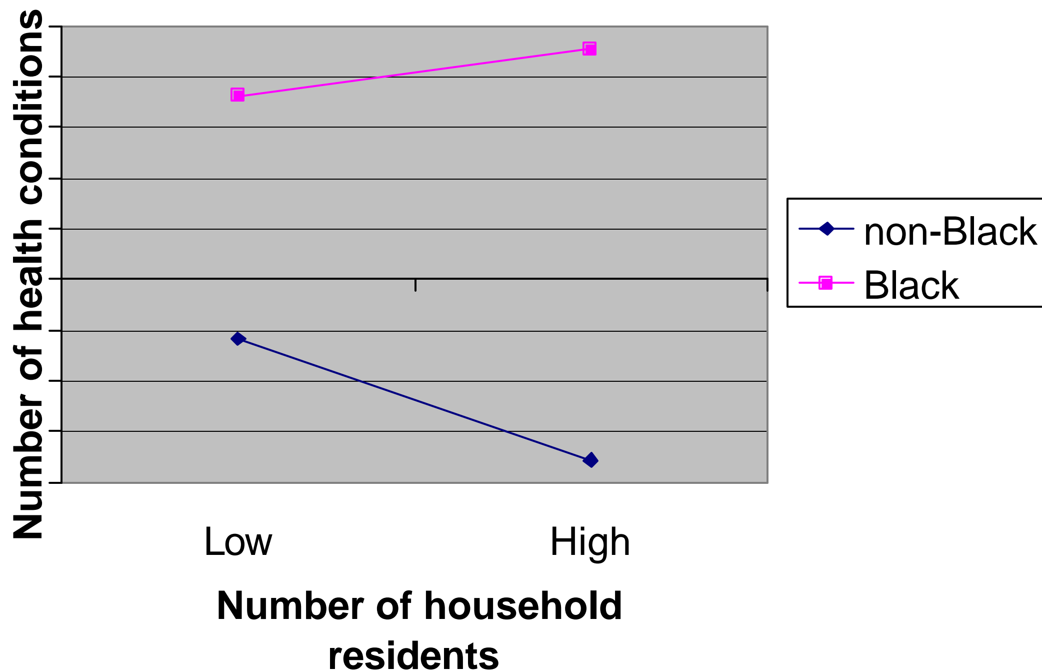

FIGURE 1
Interaction of Number of Household Residents and Black Status from Time 2 to Time 3

As an illustration, for Black women the difference between having 1 and 4 household residents (approximately one standard deviation above and one standard deviation below the mean for household residents) corresponds to an increase of .05 health conditions, or 3.8% of a standard deviation for health conditions. However, for non-Black women, an identical difference corresponds to a decrease of .12 health conditions, or 10.0% of a standard deviation for health conditions.

As displayed in Table 7, the interaction between Black/non-Black status and frequency of visits with neighbors at Time 1 is significantly associated with the total number of health conditions reported at Time 2. A graph of this significant interaction is displayed in Figure 2. For Black women, a greater number of reported visits with

neighbors at Time 1 are associated with a greater number of reported health conditions at Time 2. The same relationship does not hold for non-Black women, as the frequency of visits with neighbors reported at Time 1 is associated with fewer health conditions reported at Time 2.

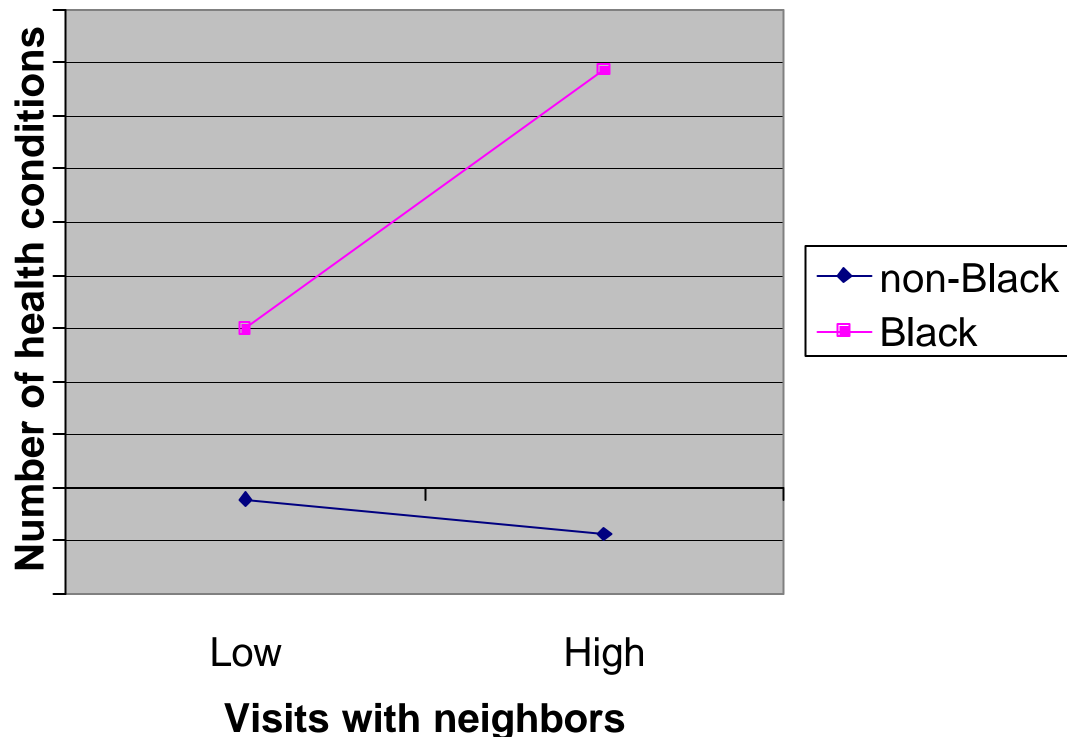

FIGURE 2
Interaction of Visits with Neighbors and Black Status from Time 1 to Time 2

For illustrative purposes, the difference between a rating of 1 and 4 for frequency of visits with neighbors for Black women (approximately one standard deviation above and one standard deviation below the mean for ratings of frequency of visits with neighbors) corresponds to an increase of .51 health conditions, or 38.6% of a standard deviation for health conditions. Alternatively, for non-Black women, a similar increase

corresponds to a decrease of .07 health conditions, or 5.2% of a standard deviation for health conditions.

This detrimental relationship between visits with neighbors and increased total number of health conditions for Black women appears to persist over time. Again, for Black women, the frequency of visits with neighbors reported at Time 1 is associated with increased health conditions reported at Time 3, while for non-Black women; the frequency of visits with neighbors reported at Time 1 is associated with fewer health conditions at reported at Time 3. This interaction effect is displayed in Figure 3.

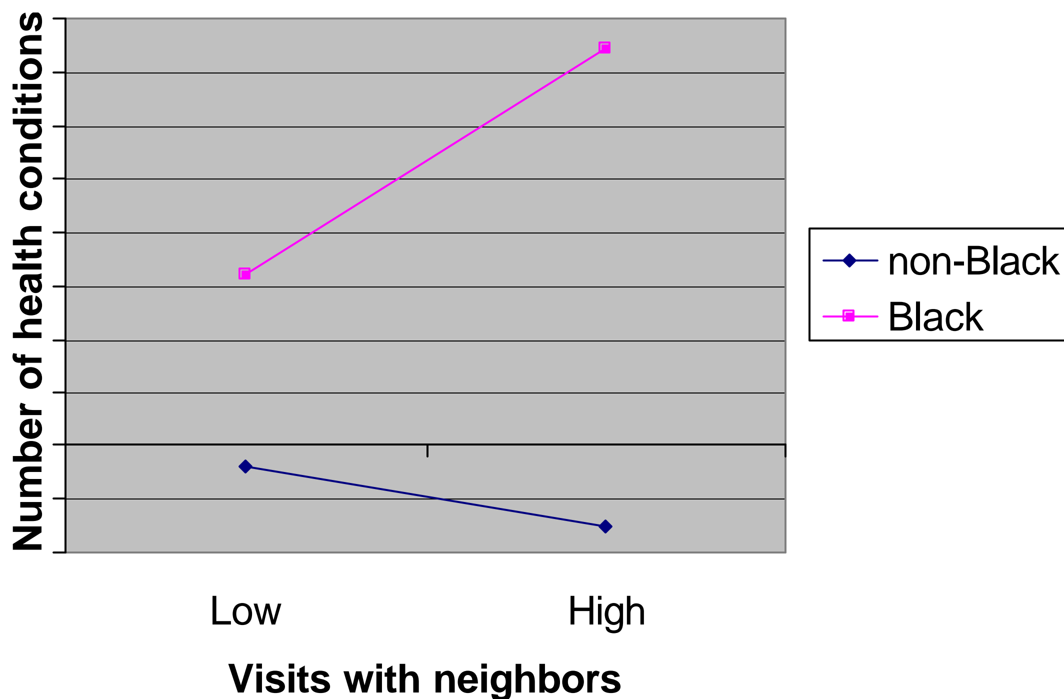

FIGURE 3
Interaction of Visits with Neighbors and Black Status from Time 1 to Time 3

In addition to affecting the total number of health conditions, visiting with neighbors is also associated with increased mobility limitations for Black and Hispanic

women. As displayed in Table 8, the interaction between Black/non-Black status and frequency of visits with neighbors at Time 1 was significantly associated with mobility limitations. A graph of this significant interaction is displayed in Figure 4. It indicates that for Black women, a greater frequency of visits with their neighbors reported at Time 1 was associated with increased mobility limitations reported at Time 3. The opposite appears to be true for non-Black women, as the frequency of visits with neighbors reported at Time 1 was associated with fewer mobility limitations reported at Time 3.

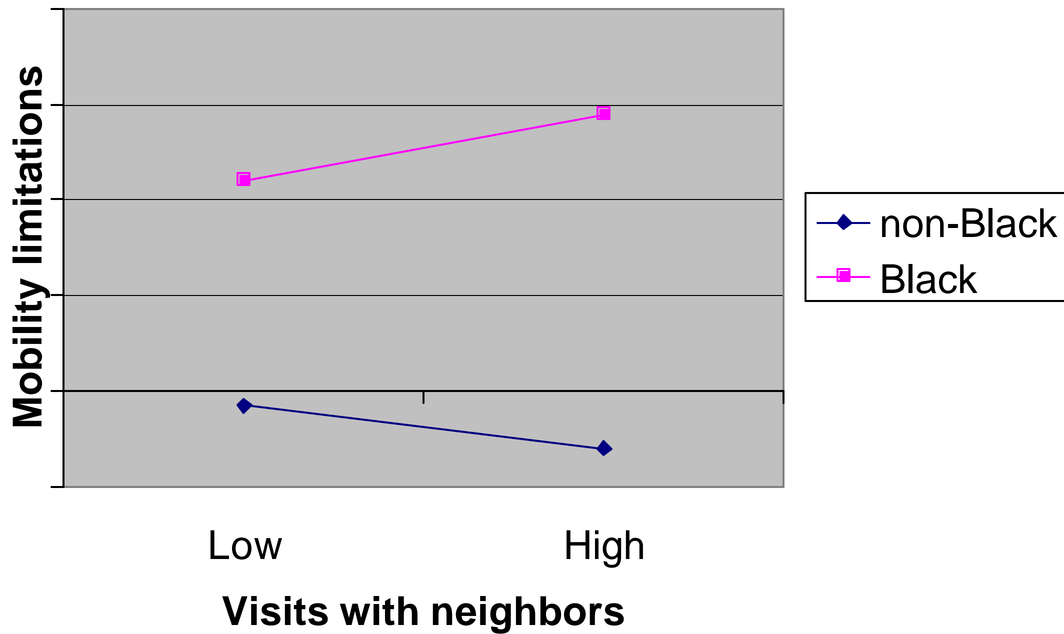

FIGURE 4
Interaction of Visits with Neighbors with Black Status from Time 1 to Time 3

Similarly, Table 8 indicates that there is a significant interaction between Hispanic/non-Hispanic status and frequency of visits with neighbors reported at Time 1 and number of mobility limitations at Time 2. A graph of this significant interaction is displayed in Figure 5. It indicates that for Hispanic women, a greater frequency of visits

with neighbors reported at Time 1 is associated with increased mobility limitations reported at Time 2. This effect is absent for non-Hispanic women as a greater frequency of visits with neighbors reported at Time 1 is associated with fewer mobility limitations reported at Time 2.

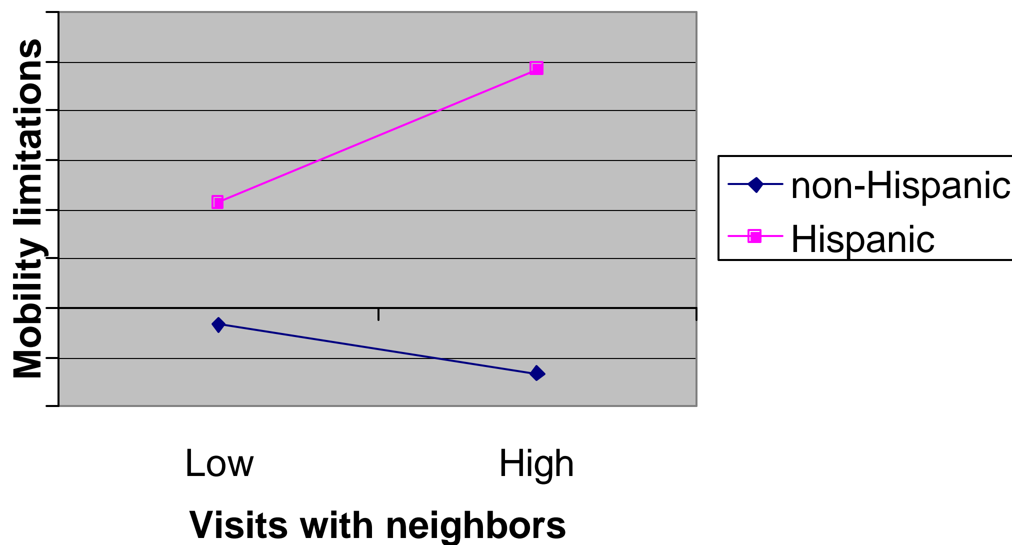

FIGURE 5
Interaction of Visits with Neighbors and Hispanic Status from Time 1 to Time 2

As an illustration, for Hispanic women the difference between a rating of 1 and 4 for frequency of visits with neighbors (approximately one standard deviation above and one standard deviation below the mean for ratings of frequency of visits with neighbors) corresponds to an increase of .56 mobility limitations, or 47.0% of a standard deviation for mobility limitations. However, for non-Hispanic women, a similar increase corresponds to a decrease of .21 mobility limitations, or 17.4% of a standard deviation for mobility limitations.

In addition to an increase in the risk of physical health problems with greater social involvement, Black women may also experience more mental health problems as they find themselves more socially involved. Specifically, Table 10 indicates a significant interaction effect between Black/non-Black status and grandchild care status reported at Time 1 and the number of depressive symptoms reported at Time 2. A graph of this significant interaction is displayed in Figure 6. This graph indicates that non-Black women who report caring for their grandchildren at Time 1 tend to have more depressive symptoms at Time 2 than non-Black women who report that they do not care for their grandchildren. Similarly, Black women who report caring for their grandchildren at Time 1 tend to have more depressive symptoms at Time 2 than those Black women who report that they do not care for their grandchildren. However, Black women who report caring for their grandchildren appear to report a greater number of depressive symptoms as a result of caring for their grandchildren relative to non-Black women.

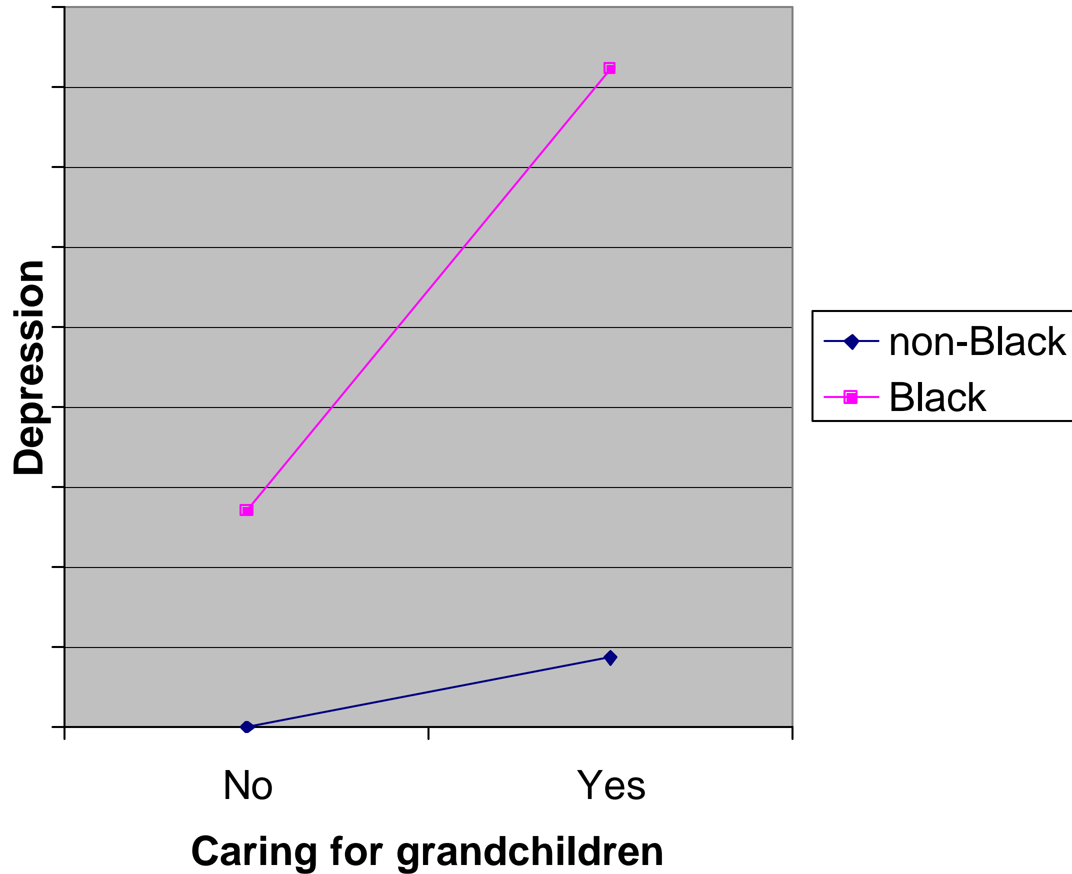

FIGURE 6
Interaction of Caring for Grandchildren and Black Status from Time 1 to Time 2

5.2.2.2 Specific Detrimental Social Relationship Effects for Lower Income Women

In addition to the effects of race and ethnicity, a number of the models provide support for the hypothesis that social relationships have a unique detrimental effect on health, varying by income level. In a number of cases, income appears to modify the effects of social relationships on health outcomes.

As indicated in Table 5, there was a significant interaction between income and number of grandchildren, reported at Time 2, and mobility limitations reported at Time 3. A graph of this significant interaction is displayed in Figure 7. This graph indicates that

for women of higher income the number of grandchildren reported at Time 2 is associated with fewer mobility limitations reported at Time 3. However, for women of lower income, it appears that the opposite relationship applies as the number of grandchildren reported at Time 2 is associated with a greater number of mobility limitations reported at Time 3.

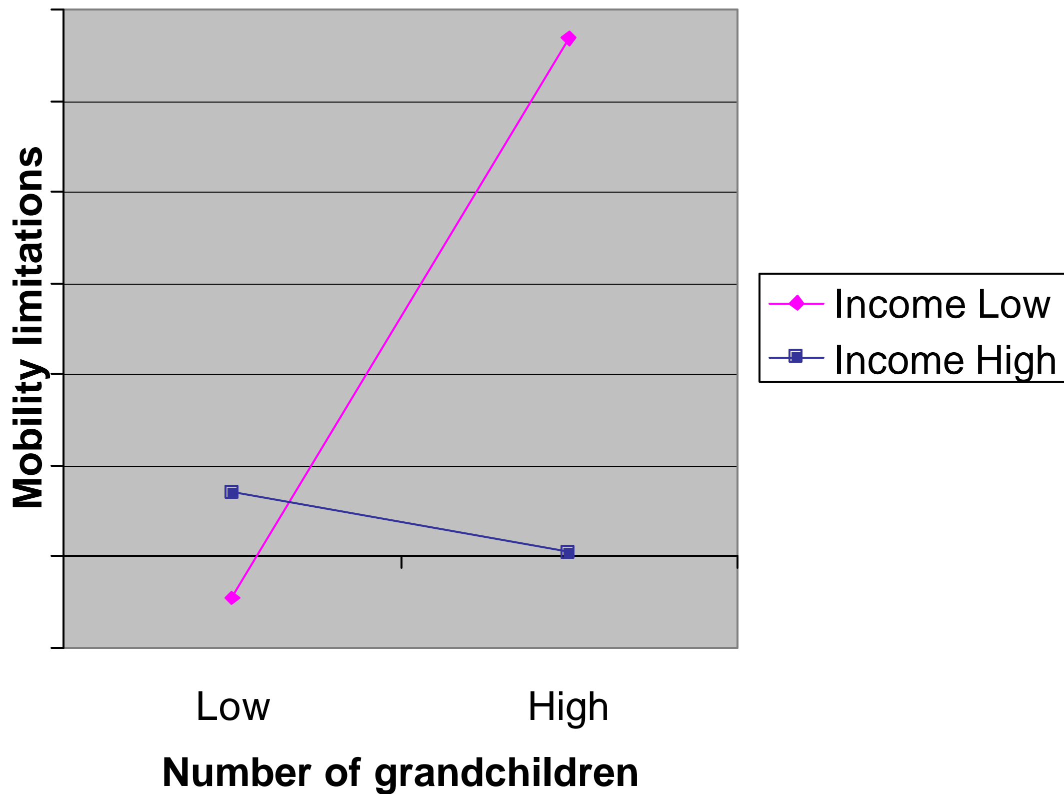

FIGURE 7
Interaction of Number of Grandchildren and Income from Time 2 to Time 3

For illustrative purposes, it appears that for low-income women the difference between having 0 and 8 grandchildren (approximately one standard deviation above and one standard deviation below the mean for number of grandchildren) corresponds to an increase of .50 mobility limitations, or 38.5% of a standard deviation for mobility

limitations. However, for low-income women, a similar increase corresponds to a decrease of .05 mobility limitations, or 4.1% of a standard deviation for mobility limitations.

A similar relationship seems to exist between the number of grandchildren reported and depressive symptoms. Table 6 indicates that a significant interaction effect exists between number of grandchildren and income, reported at Time 2, and depressive symptoms at Time 3. A graph of this significant interaction is displayed in Figure 8. This graph indicates that for women of higher income, the number of grandchildren reported at Time 2 is associated with decreased depressive symptoms at Time 3. Alternatively, for women of lower income, the number of grandchildren reported at Time 2 is associated with a greater number of depressive symptoms reported at Time 3.

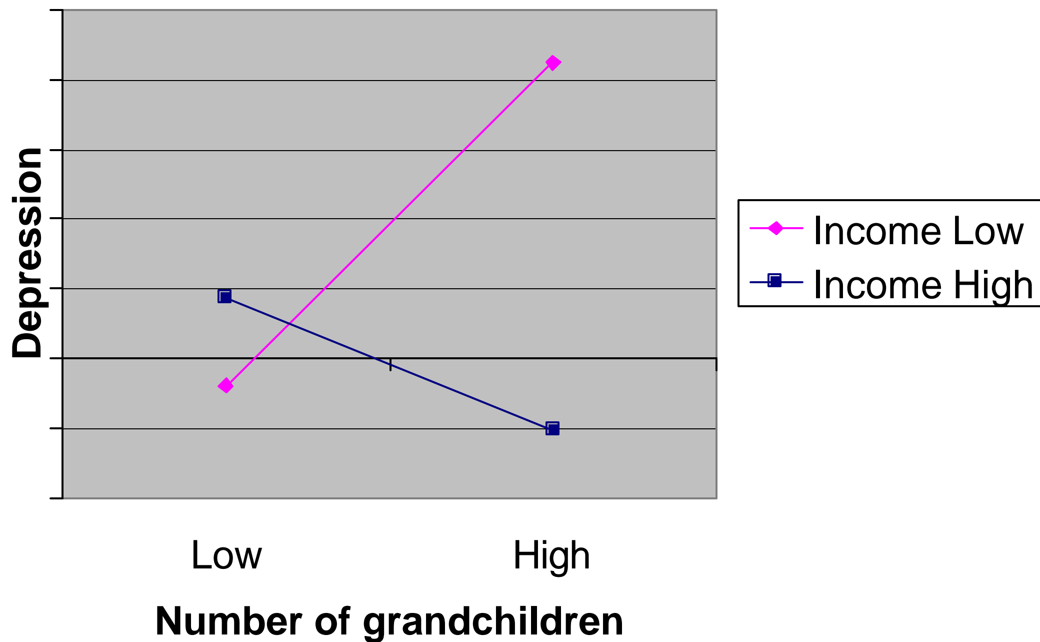

FIGURE 8
Interaction of Number of Grandchildren and Income from Time 2 to Time 3

The association between number of grandchildren and depression for lower income women appears to persist over a larger time period as well. Table 6 indicates a significant interaction effect for number of grandchildren and income, reported at Time 1, and levels of depression reported at Time 3. A graph of this significant interaction is displayed in Figure 9. Specifically, this graph indicates that for women of higher income, number of grandchildren at Time 1 is associated with fewer depressive symptoms reported at Time 3. However, for women of lower income, the number of grandchildren reported at Time 1 is associated with a greater number of depressive symptoms reported at Time 3.

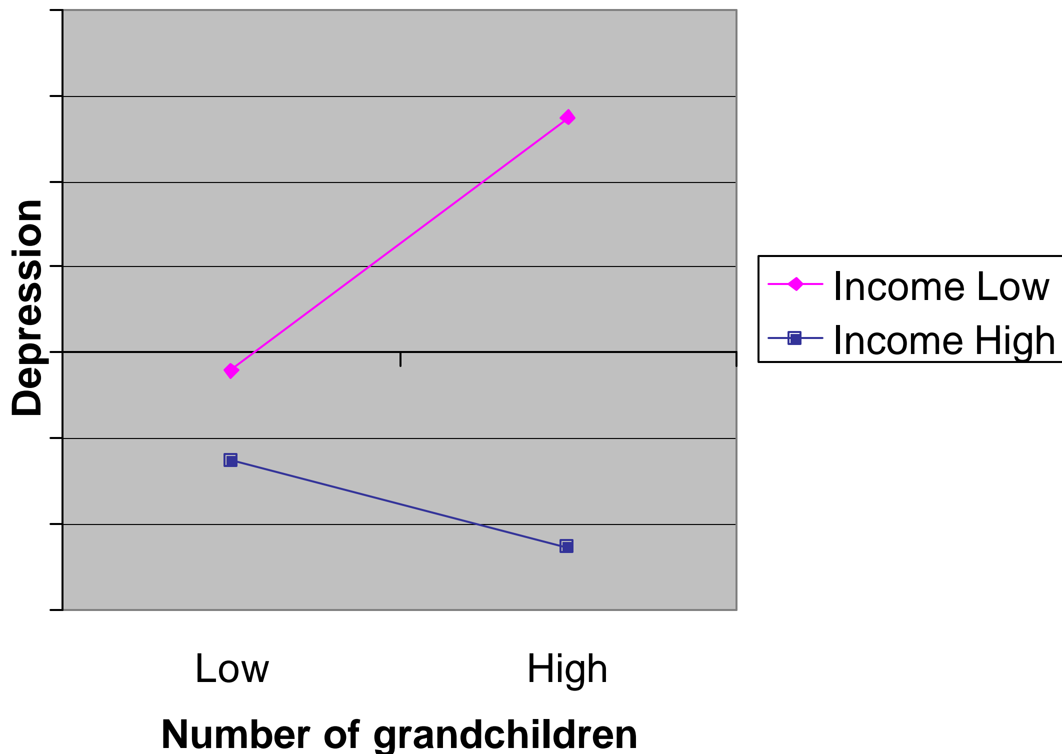

FIGURE 9
Interaction of Number of Grandchildren and Income from Time 1 to Time 3

For illustrative purposes, for low-income women the difference between having 0 and 8 grandchildren (approximately one standard deviation above and one standard deviation below the mean for number of grandchildren) corresponds to an increase of .26 symptoms of depression, or 12.2% of a standard deviation for level of depression. However, for low-income women, a similar increase corresponds to a decrease of .09 symptoms of depression, or 4.2% of a standard deviation level of depression.

In Table 5, a significant interaction effect was found between number of living siblings and income, reported at Time 1, and mobility limitations reported at Time 3. A graph of this significant interaction is displayed in Figure 10. This graph indicates that for women of higher income, a larger number of living siblings reported at Time 1 is associated with fewer mobility limitations reported at Time 3. However, for women of lower income, a larger number of living siblings reported at Time 1 was associated with a greater number of mobility limitations at Time 3.

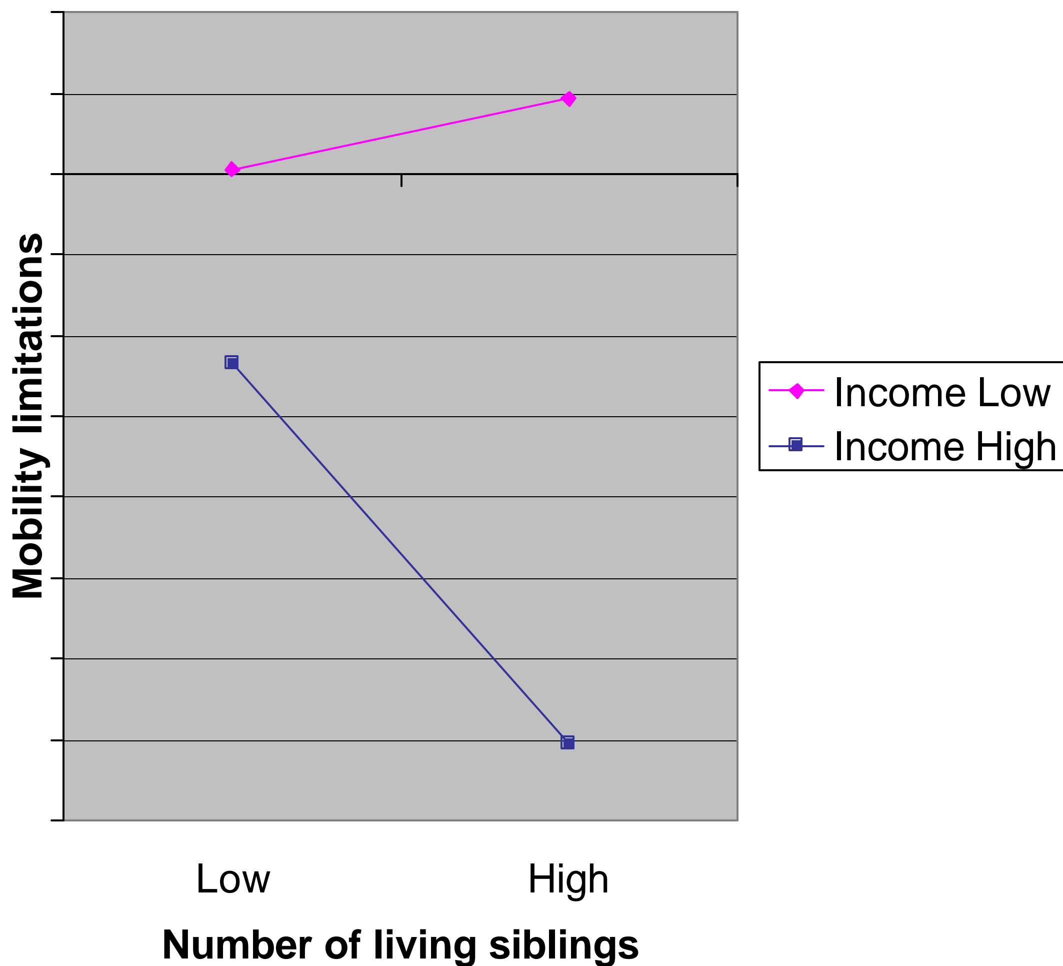

FIGURE 10
Interaction of Number of Living Siblings and Income from Time 1 to Time 3

For illustrative purposes, for low-income women the difference between having 0 and 5 living siblings (approximately one standard deviation above and one standard deviation below the mean for number of living siblings) corresponds to an increase of .04 mobility limitations, or 3.3% of a standard deviation for mobility limitations. However, for low-income women, a similar increase corresponds to a decrease of .23 mobility limitations, or 17.7% of a standard deviation for mobility limitations.

As shown in Table 7, a significant interaction effect exists between whether the respondent had a relative in the neighborhood and income, reported at Time 1, and the number of health conditions reported at Time 2. A graph of this significant interaction is displayed in Figure 11. It indicates that when higher income women report relatives living in the neighborhood at Time 1, this is associated with fewer health conditions reported at Time 2. Figure 11 also indicates that the opposite relationship exists for lower income women, as those women who reported relatives living in the neighborhood at Time 1 reported a greater number of health conditions at Time 2.

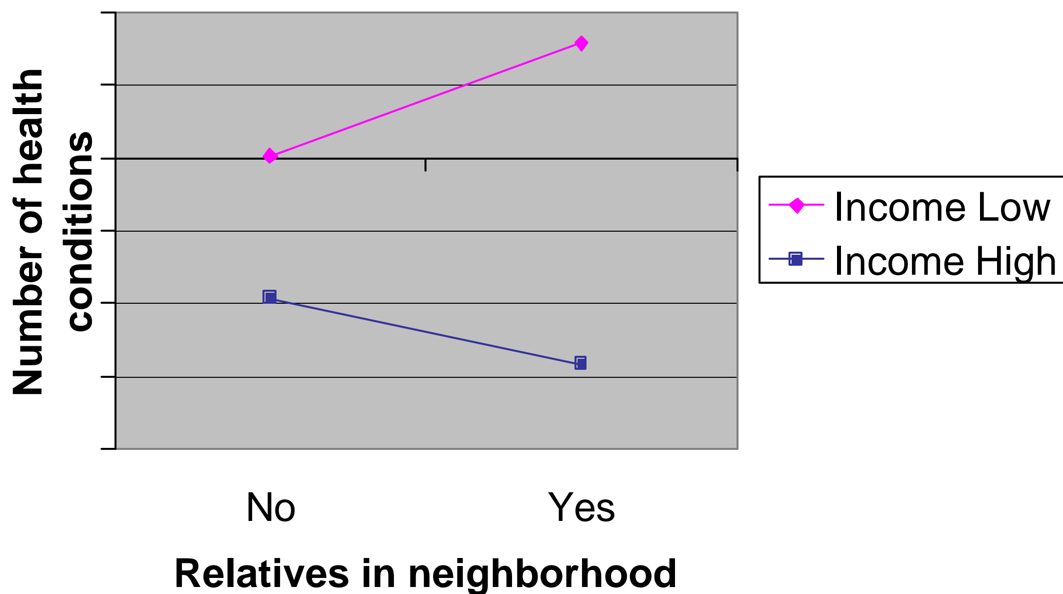

FIGURE 11
Interaction of Presence of Relatives in Neighborhood and Income from Time 1 to Time 2

The interaction effect of relatives living in the neighborhood and income also appears to have an effect upon mobility limitations (Table 8). A graph of this significant interaction is displayed in Figure 12. This graph indicates that for women reporting higher incomes, the presence of relatives in the neighborhood at Time 2 is associated

with fewer mobility limitations at Time 3. Conversely, for women reporting lower incomes, the presence of relatives living in the neighborhood at Time 2 is associated with a greater number of mobility limitations reported at Time 3.

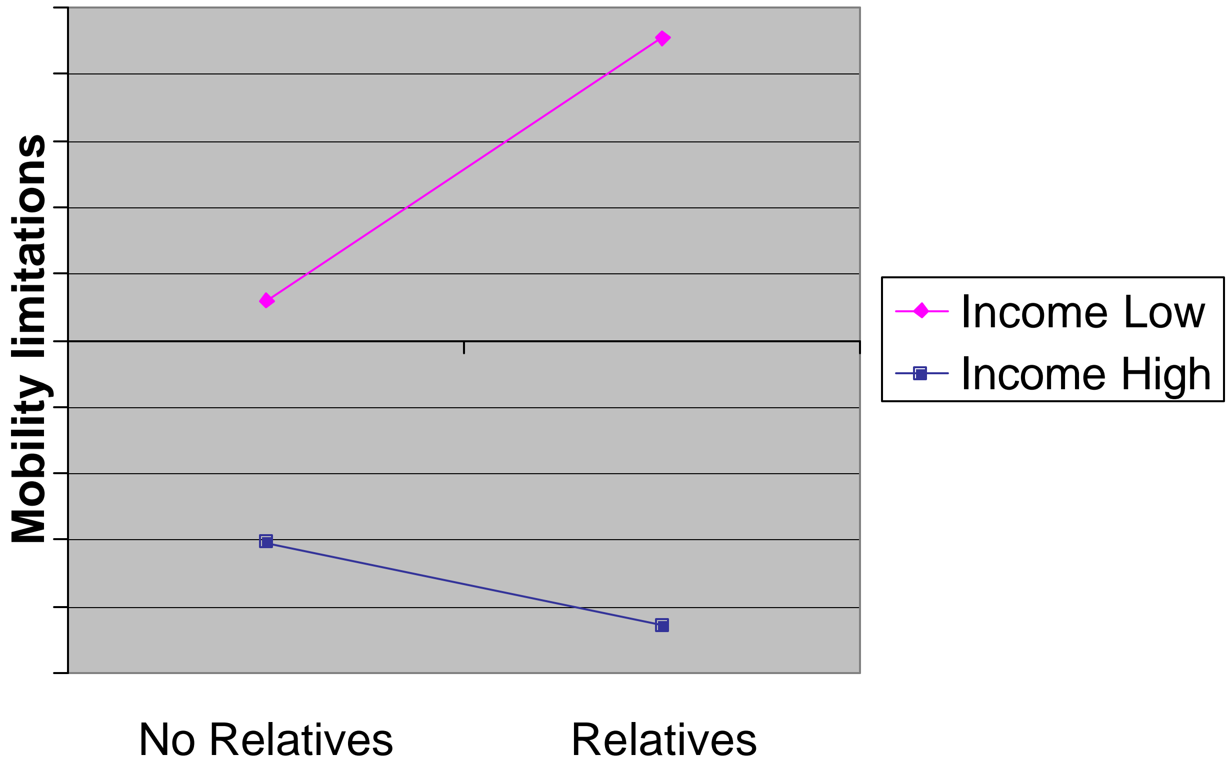

FIGURE 12
Interaction of Presence of Relatives in the Neighborhood and Income from Time 2 to Time 3

As shown in Table 9, a significant interaction effect exists between whether the respondent cared for grandchildren and income, reported at Time 2, and the number of mobility limitations reported at Time 2. A graph of this significant interaction is displayed in Figure 13. Specifically, for higher income women, it appears that caring for grandchildren at Time 2 was associated with fewer reported mobility limitations at Time

3. However, for low income women, caring for grandchildren at Time 2 was associated with a greater number of mobility limitations reported at Time 3.

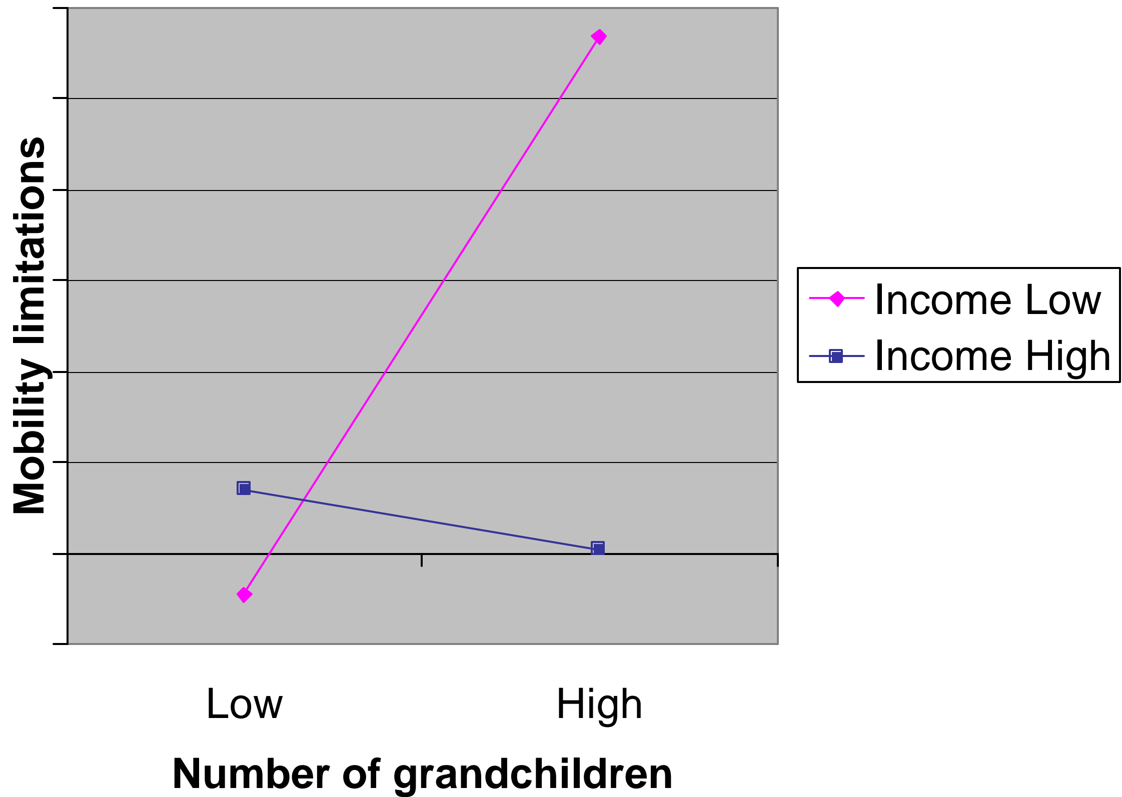

FIGURE 13
Interaction of Number of Grandchildren and Income from Time 2 to Time 3

Finally, as shown in Table 10, a significant interaction exists between helping parents and income, reported at Time 2, and the level of depressive symptoms reported at Time 3. Figure 14 indicates that higher income women who report helping parents with basic needs at Time 2 have fewer reported depressive symptoms at Time 3. However, for women reporting lower income, those reporting that they help parents with basic needs at Time 2, tended to report having more depressive symptoms at Time 3.

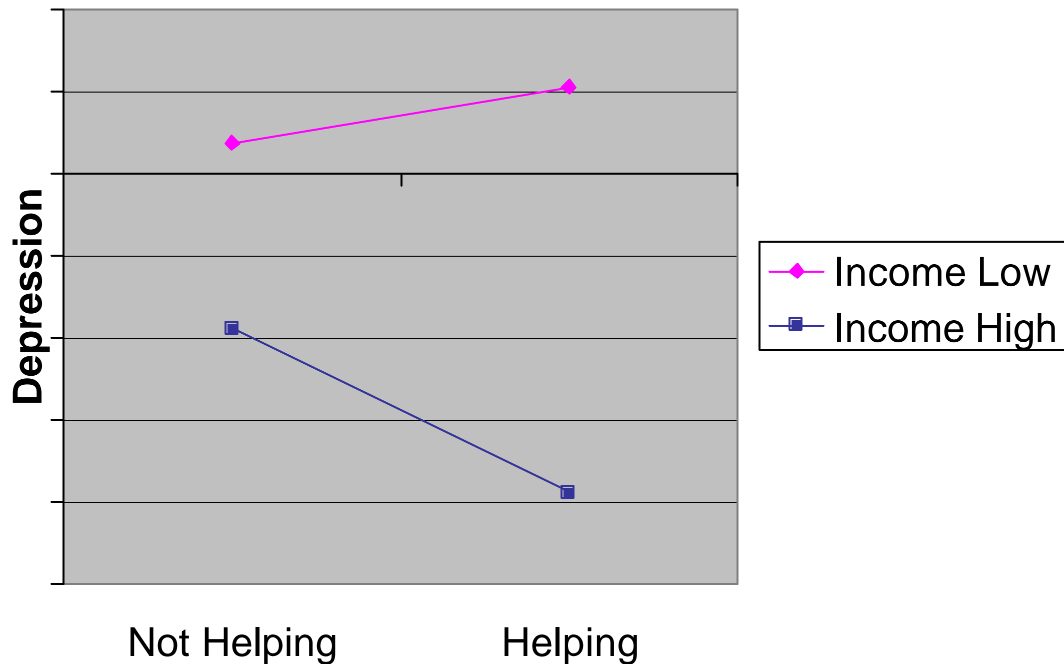

FIGURE 14
Interaction of Helping Parents and Income from Time 2 to Time 3

5.2.3 Summary of Results

While the interaction effects between income and social relationships are modest in size (ranging from -.001 to -.002), these effects clearly point to a significantly differential process that varies by income. Figures 7-14 provide evidence of distinct processes at work for women of different income levels. Further, the fact that effect sizes are small is not surprising, as the main effects between income and health are shown to be modest in the descriptive analyses (ranging from -.125 to -.191).

In regard to the main hypotheses of the study, the results demonstrate support for the first hypothesis, that social relationship characteristics measured by social networks, social integration, and social support provided each have positive effects on health for women in the sample. Specifically, for older women the number of living siblings

reported is associated with better health, as is having more household residents, visiting with neighbors and helping parents with basic needs.

The results of the study also demonstrate support for the second hypothesis, as the data indicate that certain aspects of social relationships, such as social networks, social integration, and providing social support to others, may negatively affect health outcomes for some women. In this study, a larger number of living siblings and grandchildren were associated with negative health outcomes for women in the study, as was providing care for grandchildren.

Finally, support for the third hypothesis was found as it appears that the influence of social relationships on the health of older women is varied, and is modified according to individual characteristics such as income and race. As hypothesized, the detrimental aspects of social relationships distinctively affect women of color and lower income women.

5.2.4 Longitudinal Growth Curve Models

In addition to exploring the effects of socioeconomic status, race-ethnicity and social relationships on health at various time intervals, this research also attempts to better understand how these factors may affect individual health change over time. Prior to examining the nature of individual change in health over time, simple change models that included a baseline measure were tested. These analyses established that prior health affects present health across: overall number of health conditions, number of mobility limitations, and level of depression.

Then, more sophisticated longitudinal growth curve models were applied to determine the presence and nature of individual health change. First, average change in

health on the relevant health domains, over the three time intervals, was examined. Second, the variability in initial individual health status was investigated. Tables 11-19 present these findings.

TABLE 11

ESTIMATES FOR THE RANDOM INTERCEPTS- RANDOM SLOPES MODEL: NUMBER OF CONDITIONS AND SOCIAL SUPPORT CHARACTERISTICS TIME 1 (1992) TO TIME 2 (1994)

Fixed Effect	Coefficient	Std. Error	df	t value	Pr > t
Intercept	-1.11	.064	5510	-6.45	<.0001
Age	.045	.003		14.70	<.0001
Random Effect	Subject ID	Estimate	Std. Error	z value	Pr > z
Intercept		0	.	.	.
Covariance		.011	.003	4.05	<.0001
Slope		.000	.000	.830	.2032
Residual		.000	.002	.010	.4956

TABLE 12

ESTIMATES FOR THE RANDOM INTERCEPTS- RANDOM SLOPES MODEL:

NUMBER OF CONDITIONS AND SOCIAL SUPPORT CHARACTERISTICS

TIME 2 (1994) TO TIME 3 (1996)

Fixed Effect	Coefficient	Std. Error	Df	t value	Pr>t
Intercept	-1.21	.180	5510	-6.75	<.0001
Age	.048	.003		14.96	<.0001
Random Effect	Subject ID	Estimate	Std. Error	z value	Pr> z.
Intercept		.002	2.88	.000	4997
Covariance		.013	.054	.250	.8010
Slope		.000	.001	.040	.4831
Residual		.001	0	.	.

TABLE 13

ESTIMATES FOR THE RANDOM INTERCEPTS- RANDOM SLOPES MODEL:

NUMBER OF CONDITIONS AND SOCIAL SUPPORT CHARACTERISTICS

TIME 1 (1992) TO TIME 3 (1996)

Fixed Effect	Coefficient	Std. Error	Df	t value	Pr>t
Intercept	-1.08	.174	5510	-6.24	<.0001
Age	.048	.003		14.73	<.0001
Random Effect	Subject ID	Estimate	Std. Error	z value	Pr> z
Intercept		.002	.307	.010	.4968
Covariance		.016	.003	5.32	<.0001
Slope		0	.	.	.
Residual		.001	0	.	.

TABLE 14

ESTIMATES FOR THE RANDOM INTERCEPTS- RANDOM SLOPES MODEL:

MOBILITY LIMITATIONS AND SOCIAL SUPPORT CHARACTERISTICS

TIME 1 (1992) TO TIME 2 (1994)

Fixed Effect	Coefficient	Std. Error	Df	t value	Pr>t
Intercept	-.574	.161	5506	-3.56	.0004
Age	.025	.003		8.36	<.0001
Random Effect	**Subject ID**	**Estimate**	**Std. Error**	**z value**	**Pr> z**
Intercept		0	.	.	.
Covariance		.004	.003	1.67	.0945
Slope		.000	.000	3.56	.0002
Residual		.000	.002	.010	.4957

TABLE 15

ESTIMATES FOR THE RANDOM INTERCEPTS- RANDOM SLOPES MODEL:

MOBILITY LIMITATIONS AND SOCIAL SUPPORT CHARACTERISTICS

TIME 2 (1994) TO TIME 3 (1996)

Fixed Effect	Coefficient	Std. Error	Df	t value	Pr>t
Intercept	-.450	.180	5498	-2.49	.0127
Age	.024	.003		7.45	<.0001
Random Effect	**Subject ID**	**Estimate**	**Std. Error**	**z value**	**Pr> z.**
Intercept		7.12	4.71	1.51	.0654
Covariance		-.063	.088	-.720	.4370
Slope		.001	.002	.690	.2468
Residual		.816	0	.	.

TABLE 16

ESTIMATES FOR THE RANDOM INTERCEPTS- RANDOM SLOPES MODEL:

MOBILITY LIMITATIONS AND SOCIAL SUPPORT CHARACTERISTICS

TIME 1 (1992) TO TIME 3 (1996)

Fixed Effect	Coefficient	Std. Error	Df	t value	Pr>t
Intercept	-.408	.174	5498	-2.34	.0193
Age	.024	.003		7.47	<.0001
Random Effect	Subject ID	Estimate	Std. Error	z value	Pr> z
Intercept		.001	1.58	.000	.4996
Covariance		.014	.032	.450	.6496
Slope		.000	.001	.060	.4760
Residual		.001	0	.	.

TABLE 17

ESTIMATES FOR THE RANDOM INTERCEPTS- RANDOM SLOPES MODEL:

DEPRESSION SYMPTOMS AND SOCIAL SUPPORT CHARACTERISTICS

TIME 1 (1992) TO TIME 2 (1994)

Fixed Effect	Coefficient	Std. Error	Df	t value	Pr>t
Intercept	1.42	.298	5507	4.65	<.0001
Age	.001	.005		.230	.8206
Random Effect	Subject ID	Estimate	Std. Error	z value	Pr> z
Intercept		3.42	.964	3.55	.0002
Covariance		-.004	.008	-.440	.6573
Slope		0	.	.	.
Residual		1.88	0	.	.

TABLE 18

ESTIMATES FOR THE RANDOM INTERCEPTS- RANDOM SLOPES MODEL:

DEPRESSION SYMPTOMS AND SOCIAL SUPPORT CHARACTERISTICS

TIME 2 (1994) TO TIME 3 (1996)

Fixed Effect	Coefficient	Std. Error	Df	t value	Pr>t
Intercept	1.35	.294	5510	4.59	<.0001
Age	.001	.005		.260	.7958
Random Effect	Subject ID	Estimate	Std. Error	z value	Pr> z.
Intercept		7.12	4.71	1.51	.0654
Covariance		-.063	.088	-.720	.4370
Slope		.001	.002	.690	.2468
Residual		.816	0	.	.

TABLE 19

ESTIMATES FOR THE RANDOM INTERCEPTS- RANDOM SLOPES MODEL:

DEPRESSION SYMPTOMS AND SOCIAL SUPPORT CHARACTERISTICS

TIME 1 (1992) TO TIME 3 (1996)

Fixed Effect	Coefficient	Std. Error	Df	t value	Pr>t
Intercept	1.37	.284	5510	4.81	<.0001
Age	.001	.005		.200	.8394
Random Effect	Subject ID	Estimate	Std. Error	z value	Pr> z
Intercept		7.45	4.45	1.67	.0471
Covariance		-.071	.086	-.830	.4064
Slope		.001	.002	.790	.2141
Residual		.816	0	.	.

To best describe variability in individual change, change in the dependent variable is first described. Before attempting to account for systematic variance in estimated parameters it must be determined that the significant variance in those parameters exist (Karney and Bradbury 1995). If any parameter does not vary across individuals, then that parameter need not be examined further in the second stage of the analyses, conditional models.

Individual growth curve models analyze change in health by focusing on interindividual differences in intraindividual change. The structure of the mean growth trajectories is described in the fixed effects models. The extent to which individual variation around mean growth occurs is estimated by individual variability in initial status and rate of health decline (McDonough and Bradbury 2003).

In sum, Tables 11, 12, and 13 show both the fixed- and random-effects models. The fixed effects models confirm that average health change occurs, but only for number of health conditions and mobility limitations. This is not the case with depressive symptoms, which show no significant change overall. The random effects models indicate whether there is random variation in the individual growth parameters, or variation in individual intercepts and slopes from mean changes. On all three of the health measures, there was no significant individual variation among respondents in both of these estimates of intercept and slope. Thus, further analyses of socioeconomic, race-ethnicity, or social relationship factors, and their ability to explain individual variation, was not indicated.

Tables 11, 12, and 13 examine mean changes in overall number of conditions, or average changes at each time interval. The fixed effects models demonstrate that, on

average for women in the sample, there is significant variability in initial status. Additionally, on average, the number of conditions increases slightly over time. The random effects models display the nature of change in number of health conditions reported. There is no significant variation in initial status or rate of change at any interval. However, between Time 1 and Time 2 and Time 1 and Time 3, there are significant correlations between initial status and rate of change for number of conditions.

Therefore, if women have more conditions to begin with, they will likely develop additional conditions more quickly over time. It has long been recognized that an initial status and rate of change correlation may be seriously biased due to error in the measure of change (Rogosa et al 1982). However, HLM methods enable us to infer that the correlation between estimated entry status and growth rate is not entirely spurious. A substantial part of the observed correlation is likely attributable to the association of the parameters themselves (Bryk and Raudenbush 1987).

Tables 14, 15, and 16 summarize the fixed effects and unconditional growth curve models of mobility limitations. The fixed effects models demonstrate modest average change in mobility in the sample. The random effects models from Time 1 to Time 2 show evidence of variance in the individual rate of change, or slope. Though it is a very small parameter estimate, there is evidence of variability in the linear rate of change from Time 1 to Time 2. Generally speaking, some women systematically decline faster than others during this time period.

Tables 17, 18, and 19 describe the mean change and nature of individual change in depressive symptoms. The fixed and random effects models indicate no significant change on average over time, the presence of systematic variability on individual initial

depression, and no significant variability in the slopes. Thus, individual starting points of depression vary, but not the rates of change, and there is no significant fixed effect of time demonstrated.

To review, Tables 11-19 display the structure of the average growth trajectories of the health measures in the fixed effects models. Also, these tables show the random effects models that estimate the variability of true individual change curves around the mean curve. That is, the individual growth trajectories from the population mean are shown by variability in initial health status (intercepts) and variability of individual linear rates of change over the survey period (slopes) (Tate and Hokanson 1993). Since both parameters of intercepts and slope do not vary across individuals on any of the health measures, these parameters are not examined further in the second stage of the analyses, the analyses of conditional models.

5.3 Discussion

The results confirmed the major hypotheses of the study, that there are both beneficial and detrimental effects of social relationships on health, and that these effects vary by socioeconomic status and race-ethnicity. The key finding is that women of lower income and women who are either Hispanic or Black are likely at risk for unique health risks due to certain aspects of social involvement. These health risks include: total number of health conditions, depressive symptoms, and mobility limitations.

5.3.1 Beneficial Effects of Social Relationships

In the current study, social relationships had a positive effect upon health for older women in general. This finding replicates numerous studies that have demonstrated the beneficial effects of social support. The types of relationship that were shown to have beneficial effects include: having more siblings and household residents, frequently visiting with neighbors, and helping parents with basic needs. These social connections may reflect present and anticipated sources of support for women that bolster health outcomes. They also may increase women's activity levels and self-esteem, each of which may increase health over time.

5.3.2 Detrimental Effects of Social Relationships

Interestingly, women who reported a greater number of living siblings were found to report more depressive symptoms at later time periods than those women who reported fewer living siblings. This finding runs counter to other results in the current study, specifically those that found a negative association between the number of living siblings reported by women and both health conditions and mobility limitations. It is possible that the presence of more siblings may contribute additional stress for older women that affect mental health in a negative manner but have positive, or less harmful effects upon physical health. It is unclear as to the mechanism by which having more siblings affected the mental health of women in the study in a negative direction but had positive effects upon physical health.

Another finding in the current study that challenges the notion that social support is universally beneficial is the negative effect found for those women reporting a greater

number of grandchildren. On each domain across time, having more grandchildren is negative for the mental and physical health of older women. While explanations for these findings remain unclear, having more grandchildren may somehow create burden or stress for older women, or mask another unmeasured variable such as poverty that impairs health. This finding merits additional research, both replication of the finding but also research that works to identify the mechanism by which having more grandchildren is connected to negative mental and physical health outcomes for older women. It is likely that having more grandchildren is associated with a greater responsibility for caring for them. Similarly, caring for grandchildren was also associated with negative outcomes, such as increased levels of mobility limitations for these women. One possible explanation for these findings is that older women who are responsible for caring for their grandchildren may do so out of a sense of obligation or due to a lack of economic resources on their own part or on the part of their adult children.

5.3.3 Differential Effects of Social Relationships

Perhaps the most important question addressed by the current study is whether social relationships may be uniquely detrimental for minority women or women who experience socioeconomic disadvantage. Indeed, the results indicate that social relationships represent a paradox for older women when race, ethnicity, and socioeconomic status are considered. While social involvement may be helpful, even critical, for these women, certain types of social involvement appear to result in negative health outcomes.

5.3.4 Differential Effects of Race/Ethnicity

Each of the three aspects of social relationships (social networks, social integration, and provision of social support) tested had unique effects across race-ethnicity, with the most health risk borne by Black women. It appears that simply having contact with more people may create more risks for Black women. A greater number of household residents at Time 2 were associated with increased total number of health conditions at Time 3 for Black women. Visiting with neighbors also may be harmful for Black women as reported visits at Time 1 were associated with increased total health conditions at Time 2 and Time 3, and increased mobility limitations at Time 3. Hispanic women also appear to experience similar negative effects as visiting with neighbors at Time 1 was associated with increased mobility limitations at Time 2. Finally, caring for grandchildren at Time 1 has a negative effect on depressive symptoms reported by Black women, increasing symptoms at Time 2. These findings suggest that Black women are uniquely vulnerable to the stresses of certain types of relationships, or that these types of relationships are substantively different than for other women.

5.3.5 Differential Effects across Income

A similar effect was found for women reporting lower levels of income. Results indicate that for low-income women the more siblings and grandchildren reported at Time 1 and Time 2, the higher the risk of mobility limitations and depression at Time 3. Also, if lower-income women report having relatives that live in the neighborhood at Time 1 or Time 2, they experience more total number of health conditions and mobility limitations at Time 2 and Time 3, respectively. Lastly, for low-income women, providing

care for grandchildren and helping parents with basic needs at Time 2 is associated with increased mobility limitations and depressive symptoms at Time 3.

Similar relationships for women reporting higher levels of income are associated with health benefits in most cases, or less negative outcomes in some. These findings may be attributable to the fact that individuals within the social networks of higher income women may have more resources themselves, economic and otherwise. That is, those around them may not require as much care or assistance, but serve more as companions and support for one another. Social relationships may also be more reciprocal in nature within networks in which resources are more plentiful. The nuances of social relationships, influenced by income level, have not yet been tested in the existing research on health and warrant further study.

It has been demonstrated previously that when individuals are socially connected, they do experience more social interactions, feel less lonely, and feel they may have more social support resources to utilize when needed. As social capital theory emphasizes, social relationships may indeed create capital to draw upon for those who participate in them. As theorized, public goods may be produced from social relationships with others. Conversely, it may also be the case that this scenario plays out only for certain, socially advantaged groups. Previous research has often concentrated upon a somewhat simplistic relationship between social support and health outcomes, without consideration of alterations of this relationship by socioeconomic status and race (Bosworth and Schaie 1997, Seeman et al 1999).

The analyses presented replicate the previously demonstrated favorable effects of social relationships upon the health of older women. However, the results also suggest

that the beneficial aspects of social relationships depend on socioeconomic advantages and race-ethnicity for a number of the health outcomes. The results challenge existing notions of how relationships with family and friends affect health as individuals age. There may be additional aspects or types of social relationships that lead to negative consequences that are currently unexplored. Poverty and race-ethnicity may be two of many factors that change the nature of certain types of social affiliations, or make them more stressful.

The findings in this study do not make the case that social ties in disadvantaged communities are inherently problematic. Instead, in social groups where survival rests upon helping one another, social relationships may carry both important benefits and heavy burdens. These burdens may not be present or as significant in the social relationships of other groups. Social capital, as measured by social relationships, may be more difficult to uphold for some group members than others.

Social capital theory has yet to consider what costs there are in sustaining social capital in diverse or disadvantaged communities. The findings of the current study suggest that it may be older women who do much of the work toward maintaining social capital in impoverished or minority communities, and absorb many of the costs. In these communities, the quality of the resources available from others within the network may be poor, while the needs of others great. This may inevitably deteriorate health through exposure to stress over time.

Thus, an examination of the process by which stress is created in disadvantaged social networks is warranted in future research. Extreme feelings of duty and compulsion, possibly stronger in disadvantaged social networks, may result in overly

enmeshed relationships that are more emotionally and physically problematic. These overly-involved social networks may allow less time and energy for those who maintain these networks to meet their own needs. Further, those who maintain social networks may engage in increased behavioral health risks to cope, leading to more unhealthy lifestyles and eventually, premature illness and death.

CHAPTER SIX

CONCLUSION

This dissertation achieves several research objectives. One is the detailed exploration of the influence of social relationships on the health of retirement-age women. Second is the finding that there is variation in the effects of social relationships on health by socioeconomic status and race. This research concludes that the relationship of social support to health may be more complex than previously assumed, and that women of lower socioeconomic status and minority status may be disadvantaged in this regard.

6.1 Limitations

There are a number of limitations to the current study. First, one critical aspect of social relationships is largely untapped: whether older women receive support from those around them, and in what forms they receive such support. This information may help explain the discrepancy in health outcomes demonstrated in this study between those from less-advantaged levels of income, race, and ethnicity and those from more-advantaged groups. The social relationship measures available in the Health and

Retirement Study are extremely limited. Received support is only asked in terms of money received from parents and children, and less than ten percent of the women sampled reported receiving such support. There are no questions to measure if the social support that some women receive is highly valuable, while for others it may be less than satisfactory. This divergence may account for the variation in health yet unexplained.

Another limitation is the effect of selection present in a period of data collection from 1992-1996. While longitudinal data is able to identify time-ordered, antecedent-consequent relationships to a certain extent, there may be discontinuities present. That is, women with better health to begin with still may experience "better" social relationships due to their ability to form and nurture social ties. Selection processes would presume the healthiest women would have the strongest and most rewarding social relationships, in terms of returns on their investments of time and money to others. With the data over a four-year period, such selection bias cannot be completely discounted.

Despite these limitations, the study provides ample evidence that certain aspects of social relationships are not ubiquitously beneficial for all aging women. Thus, a paradox exists. Not surprisingly, certain types of social relationships did have robust positive effects on health for all women. However, it was also discovered in this study that social relationships may be one of the pathways or mechanisms by which socioeconomic status erodes health. In other words, low socioeconomic or minority status seems to limit the effectiveness of social relationships to buffer or reduce some of the health-related effects of aging.

The findings also suggest that there seem to be diminishing returns to social contact for those with already stressful circumstances, particularly those lacking

economic and social resources. The conclusions drawn from this study expose important adjustments that are needed in future theoretical and empirical work on the social influences impacting the health of older individuals.

6.2 Future Studies

The results of this study project call for a modification of social capital theory. Increased specificity is needed about the "goods" produced from social connections, which are often defined as social capital. The findings of this study imply that the "goods" are not always good for health, especially for older women. Unfortunately, current theory has not fully explored exactly how the production of social capital takes place. Increased specificity regarding how social capital is formed and maintained will heighten its effectiveness as a theoretical framework.

Furthermore, there has been little consideration of the differential experiences of social capital in unique social environments, such as those affected by poverty or discrimination. The initiation and effectiveness of social capital resources in these contexts may be costly in terms of health. Social capital may actually create health problems for some individuals and groups. Therefore, conceptualization of social capital, both in terms of health and other domains should include the culture and context of groups. This consideration will lead to a better understanding of the effects of social capital upon various outcomes.

Current empirical work should also be adapted. Early epidemiological studies of social support relationships and health defined them to only encompass love, care, affection, esteem, and mutual obligation (Cobb 1976). In essence, people who had strong

connections with others were found to live longer and healthier lives (Berkman and Syme 1979, House et al 1988). A flood of research has followed since, yet few studies systematically test for effects across group of social support. No studies test if social relationships remain protective for the health of older women who experience economic and social disadvantages. This research represents an initial attempt to explain the relative effects for disadvantaged older women

In order to improve population health and address racial, ethnic and socioeconomic inequalities in health, ongoing research attention is needed. The identification of fundamental social determinants of health must continue in order to address the unmet needs of many aging individuals. How social relationships operate in various geographic, economic, and sociocultural contexts can lead to appropriate interventions and supports created for older women, and others, who face daily challenges in their social networks. On a larger scale, this will involve addressing the failures of educational and health care delivery systems and underlying discriminatory practices that create the burdens that many women carry in their day-to-day lives.

6.3 Implications

The results of this study are relevant to current health and social policy. It is well known that African Americans, Hispanics and individuals with lower levels of income and education have higher rates of chronic illness and death than other subgroups of Americans. This study points to the fact that social relationships may help explain some of these persistent disparities. It is noteworthy that there seem to be unique stress related to the social relationships of the fore-mentioned groups. Certain types of social

relationships may qualify, for the first time, as a health-risk behavior. This should be addressed in future policy decisions, where certain types of family and friends may be considered a health impediment rather than a strict asset for health.

Also, the results of this study indicate that policymakers may want to consider that the health inequalities present in the United States may be partly attributable to difficult and stressful daily experiences that accompany economic disadvantage and racial discrimination. A growing body of research is focusing on the social context of minority women as reflected in their socioeconomic position.

For women of color, social involvement is often shaped by differential access to desirable resources. When resources such as leisure, paid child- and elder-care, and other home-based services are scarce, the result may be high levels of stress and severe constraints on time. At present, we do not fully comprehend how the cultural traditions, belief systems and roles that many minority women occupy lead to high levels of strain. The accumulation of all of these factors undoubtedly contributes to the persistent health disparities.

APPENDIX A

DESCRIPTIVE COMPARISONS OF HEALTH OF WOMEN

IN THE SAMPLE LOST TO FOLLOW UP

Race:	Time 1: 1992 (N)	Time 2: 1994 (N)	Time 3: 1996 (N)
White	59.79% (1039)		
Black	22.45% (1038)		
Hispanic	14.38% (1036)		
Education in 1992			
Dropout	34.46% (1039)		
GED	3.95% (1039)		
High School	34.55% (1039)		
Some College	16.17% (1039)		
College	10.88% (1039)		
Total Family Income: Nominal Dollars	$39,487 (1039)	$40,505 (466)	$48,277 (183)
Total Family Wealth: Nominal Dollars	$184,045 (5512)	$191,518 (466)	$240,577 (183)

APPENDIX B

CORRELATIONS BETWEEN INCOME AND WEALTH MEASURES

	Income 1992	Income 1994	Income 1996	Wealth 1992	Wealth 1994	Wealth 1996	Dropout	GED	HS	Some College
Income										
1992										
1994	.530									
1996	.517	.536								
Wealth										
1992	.506	.399	.450							
1994	.422	.438	.490	.685						
1996	.450	.394	.501	.701	.706					
Education										
Dropout	-.259	-.188	-.216	-.164	-.180	-.168				
GED	-.050	-.046	-.044	-.043	-.050	-.045	-.126			
High School	-.052	-.059	-.061	-.023	-.029	-.020	-.429	-.165		
Some College	.128	.094	.112	.081	.087	.074	-.288	-.111	-.377	
College	.274	.232	.247	.166	.191	.176	-.236	-.091	-.309	-.207

NOTE: All correlations significant at the $p < .0001$ level.

APPENDIX C

Functional Limitations

This set of variables indicates whether the respondent has difficulty doing everyday functional activities such as: walking one or several blocks, climbing one or several flights of stairs, sitting for 2 hours in a chair, getting up from a chair, stooping, kneeling, crouching, lifting and carrying 10 pounds, picking up a dime, extending arms overhead and pushing or pulling large objects.

Raw Recodes

These variables respectively recode the variables as they appear in the raw data except for missing values and accounting for skip patterns.

The Wave 1 questions ask: “We are interested in how much difficulty people have with various activities because of a health or physical problem…Exclude any difficulties that you expect to last less than three months. How difficult is it for you to {…}?. Is it: 1=Not at all difficult, 2=A little difficult, 3=Somewhat difficult, 4=Very difficult, or something that you can’t do at all?” The respondent can also answer, “Don’t do”, but this is later coded as missing.

The Wave 2 the questions ask: “We are interested in how much difficulty people have with various activities because of a health or physical problem. Please tell me how difficult each of the following activities is for you. Exclude any difficulties that you expect to last less than three months. Do you have any difficulty with {…}?” (If yes,) Is that a little difficulty, or a lot of difficulty? In the Wave 2 data the answers to the 2-part question are recoded into 5 categories: 0=No difficulty, 1=Yes, a little difficult, 2=Yes, a lot, 3=Yes, DK/NA how much, 4=Yes, RF how much. There is no “Can’t do” category and the respondent can also answer, “Don’t do”, but this is later coded as missing.

In Wave 3 the follow up question from Wave 2 is dropped, and the question wording and coding responses again change. The Wave 3 questions ask: “We need to understand difficulties people may have with various activities because of health or physical problems. Please tell me whether you have any difficulty doing each of the everyday activities that I read to you. Exclude any difficulties that you expect to last less than three months. Because of a health problem do you have any difficulty with {…}? The answers to difficulty questions are: 0=No, 1=Yes, 2=Can’t do. The respondent can also answer, “Don’t do”, but this is later coded as missing.

The raw recoded variables in all waves recode “don’t do” responses to missing, since the respondent has not revealed whether he/she would have difficulty with the activity if he/she ever did it. In Waves 1 and 2, if a respondent reports no difficulty in jogging a mile, then walking one or several blocks are also set to no difficulty. In all waves, if the respondent reports no difficulty walking several blocks, then walking one block is set to no difficulty.

Some Difficulty Recodes

These variables recode raw data as yes/no dummy variables, where 1 means some difficulty and 0 means not. It attempts to make consistent variables across waves. The variable derivations for some difficulty vary across waves because the question and responses can vary across waves. The differences in question wording, particularly in Wave 1, make for imperfect results, but the closest to consistent coding as determined by examination of the cross-wave data.

In Wave 1, if a respondent answers, "somewhat difficult" or "very difficult/can't do" then the functional limitations variables are set to 1 for some limitation. If the answer is "not at all difficult" or "a little difficult" it is set to 0.

In Wave 2, if a respondent answers "yes" to the first question "Do you have any difficulty with…" the functional limitation variables are set to 1 for some difficulty, regardless of how much difficulty the respondent says he/she has in the follow-up question. From Wave 2 forward, if the respondent answers "no" to the any difficulty question, then the functional limitation variables are set to 0.

In Wave 3, if a respondent answers "yes" or "can't do" to the any difficulty question, the functional limitation variables are set to 1 for some difficulty. If the respondent answers "no" to the any difficulty question, then the functional limitation variables are set to 0.

In all waves, a "don't do" is recoded to a missing value, since the respondent has not revealed whether he/she would have difficulty with the activity if he/she ever did it.

Summary Indices

Several summary measures for functional limitations are included in an attempt to provide some consistency across waves. The large muscle index uses the sitting for 2 hrs, getting up from a chair, stooping, kneeling or crouching, and pushing or pulling large objects activities. The mobility index uses the walking one block, stairs, and climbing several flights of stairs activities. In each wave (w), the “some difficulty” versions of the individual measures are summed to construct these measures.

APPENDIX D

MEAN RESPONSE TO MOBILITY AND DEPRESSION MEASURES

	Time 1: 1992 (N)	Time 2: 1994 (N)	Time 3: 1996 (N)
Mobility Limitations	.582 (5510)	.764 (5508)	.889 (5500)
Depression	.830 (5500)	1.48(5509)	1.42(5512)

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