HOUSING TYPE AND THE SOCIAL CONTACT OF OLDER ADULTS

by

TIMERA SUTHERLAND TEMPLE

(Under the Direction of Anne Sweaney)

ABSTRACT

The literature on the health of older adults supports the importance of socialization toward creating positive outcomes in later life. Housing may have the capacity to encourage or diminish socialization, most directly through visits with neighbors. Additionally, the close proximity of friends and acquaintances may have the power to mitigate negative outcomes from the potential hazards of living alone. Using cross-sectional data from the 2006 Health and Retirement Study (HRS), this study investigates the relationship between housing type and social contact with neighbors. Results demonstrate that within the over 65 population and compared with dwelling in single-family housing, a positive relationship exists between apartment dwelling and the number of social visits per month with neighbors for individuals over age 65.

INDEX WORDS: housing, older adults, social contact, social integration

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TIMERA SUTHERLAND TEMPLE

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TIMERA SUTHERLAND TEMPLE

Major Professor:	Anne Sweaney
Committee:	Anne Glass Robert Nielsen

Electronic Version Approved:

Maureen Grasso
Dean of the Graduate School
The University of Georgia
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DEDICATION

I dedicate this work to my three lovely boys. Without you I may never have been inspired to work so hard.

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CHAPTER 1

INTRODUCTION

The Importance of Housing for Older Adults

Modern American society is facing a caregiving crisis. Understanding how housing can better meet the needs of older adults is a necessary step in preparing for this crisis. As many older adults face age-associated changes in health, housing can either mitigate the negative effects of these changes or make them worse. Social contact and ties between older adults and their neighbors may be related to the type of housing they inhabit. Relationships with neighbors could not only help fulfill an older adult's need for socialization, but relationships with neighbors could also help provide some of the services traditionally provided by family or paid caregivers.

Toward a better understanding of the possibilities for informal caregiving and the best environment for promoting this type of relationship, this study is an investigation into the relationship between housing type and social contact among neighbors for individuals over age 65. The results indicate an association between residing in an apartment, compared with residing in a single-family home, and an increase in the number of social visits with neighbors.

Demographic Changes

The last century has seen dramatic changes in both the built environment and the demographics of the population that inhabits it. The demographic projections for the subpopulation of individuals over age 65 are startling. As the post-World War II generation, known as the Baby Boomers, age, population projections suggest that by 2050 the number of

people over 65 will make up 20.2% of the population of the United States of America, at 88.5 million people (Vincent & Velkoff, 2010). Not only will there be more people of retirement age, but there will also be a massive increase in persons over 85, from approximately 5.7 million in 2010, growing to 19 million by 2050 (Vincent & Velkoff, 2010).

The subpopulation of adults over age 85 is the one that we are most unprepared for as a nation. The past century has seen astounding breakthroughs in the treatment of life-threatening illnesses and increased life expectancy, but society has yet to conquer the many chronic conditions that threaten older adults (e.g., arthritis, Alzheimer's disease, and the disabling effects of heart disease, stroke, and cancer) (Folts & Muir, 2002). Because of recent increases in obesity rates and other lifestyle changes, we are seeing a stagnation in longevity and an increase in the duration of morbidity, or the period of decline before death (Hoyer & Roodin, 2009). Though many adults over 85 are able to live independently, at some point in these later years most individuals have to deal with frailty, mental infirmity, and other health issues that make living independently difficult if not impossible (Folts & Muir, 2002). It is at these later life stages that this subpopulation will need the most care (Folts & Muir, 2002).

Historically, family members have provided most of the necessary care for elders (Cantor, 1979). But as the ratio of working adults to adults over 65 decreases, family-based support becomes a less realistic solution for the provision of this care. Although there is an increase in male caregivers, women continue to provide most of the care for older adults (Hoyer & Roodin, 2009). It is projected that by 2030 the care gap, or the ratio of women of caregiving age, 25-54, to adults over age 65 will be .92 (Vincent & Velkoff, 2010). While this looks like there is still almost one caregiver per person, more and more women are working outside the home (Hoyer & Roodin, 2009). and are unable to fulfill these caregiving duties. Another factor

that may increase the burden for some families is that multiple generations of people are choosing to have children later in life and therefore families are more likely to have children in the home as their parents are approaching old age (Hoyer & Roodin, 2009). Also, higher rates of divorce (Hoyer & Roodin, 2009) are likely to split the resources of adult children trying to care for older parents.

A Brief History of Housing for Older Adults

For much of the twentieth century, the only option available to those who could not care for themselves or did not have family to support them was the institutional model of the nursing home. Since that time, the market for housing for older adults has responded to the perceived needs of older adults with a variety of supportive housing models. Because increasingly older age involves an increased probability of the need for supportive services, those concerned with caring for aging adults reasoned that housing communities could be embedded with differing levels of service. Thus, in this decade there exist an assortment of housing models to choose from available to those who can afford them.

Unfortunately, two realities suppress the widespread use of these supportive housing models. First, the majority of older adults want to age in place. In 2005, 89% of people over 50 wished to stay in their homes (Redfoot, 2010). Second, a growing number of older adults will not be able to afford the more desirable housing options (Redfoot, 2010). Many older adults with trouble completing activities of daily living (ADL) tasks and who are still living in community settings are in poverty (Redfoot, 2010). Redfoot (2010) states "three out of five older persons living in the community with two or more ADL disabilities reported annual incomes of less than $20,000, roughly the individual income eligibility standard for Medicaid

assistance in most states in 2004" (Redfoot, 2010 p. 2). The current poverty measures are under revision because they do not adequately measure the percentage of persons in poverty (Redfoot, 2010). These measures are based on outdated spending data, food consumption trends from 1955, and offer no updates on health care spending. Under the experimental measures used in 2008, at least 20% of adults over 70 were in poverty (Wu, 2010).

There are currently only two government-subsidized programs that support older adults too poor to afford the supportive housing they need. The first is Medicaid, which pays for some in-home supportive services. Only 11% of all community-dwelling residents with disabilities received any publicly funded home or community-based care in 2004 (Redfoot, 2010). This program is currently not structured or funded to support the amount of in-home care needed by US citizens (Redfoot, 2010).

The second government supported program is the Section 202 Housing program. There are currently 300,000 supportive housing units available to low-income residents (Redfoot, 2010). If there is an expected 88.5 million people who will be over 65 and 20% or more of that number will be in poverty, the current housing stock in this program would only support about one percent of that struggling population.

The Importance of Socialization

The World Health Organization, in its 1946 constitution, defined health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (World Health Organization, 1964 p. 100). Social engagement is not only an indicator of health, but is also a crucial piece in promoting the health and well being of older adults

because it is a low-cost way to bring about at least two, and possibly three, positive outcomes. These are introduced below, but will be discussed in more depth in Chapter 2.

The first outcome is a direct physiological benefit to mental and physical health. Higher levels of social integration, through both *structural integration*, or actual social involvement, and *psychological integration*, or perceived social connectedness, have been shown to have positive effects on health, longevity, and psychological well being (Bruce, 2002; Holmén & Furukawa, 2002; Moen, 1995; Moen, Dempster-McClain, & Williams, 1989; Musick, Herzog, & House, 1999; Rowe & Kahn, 1998; Wethington, Moen, Glasgow, & Pillemer, 2000). The second positive outcome is that social contact and proximity can provide incidental caregiving because of the potential for watchfulness among neighbors (Cantor, 1979; Shaw, 2005; Wethington & Kavey, 2000; Wethington et al., 2000). And third, increased social proximity could create opportunities for social relationships that might lead to more active and intentional caregiving roles between neighbors (Cantor, 1979; Shaw, 2005; Wethington & Kavey, 2000; Wethington et al., 2000). These last two outcomes feed back into an individual's health, because social proximity and adequate caregiving have the potential of mediating or deterring negative health outcomes by preventing injuries, overexertion, inadequate nutrition, or delayed medical treatment (Hsia & Shen, 2011).

Purpose of Study

I provide preliminary evidence that a multi-family housing structure, like apartments or duplexes, better provides for the needs of our aging population through its association with increased socialization between neighbors. My literature review provides evidence that a higher number of contacts is beneficial to elders living independently and also provides support for the

association between multi-family housing and increased contact with neighbors. Then, using an analysis of cross-sectional data from the 2006 Health and Retirement Study (HRS) and using the individual as the unit of analysis, this paper displays evidence that for adults over 65 those living in multi-family housing, including apartments and but not duplexes, claim more social visits with neighbors per month than those living in single-family housing.

Because of the complex interrelationship between social contact, social preferences, health status, physical function, and other individual-level characteristics it is important to demonstrate rather than assume the answer to the research question: "Is multi-family home dwelling, relative to single-family home dwelling, associated with a greater number of social contacts with neighbors among individuals over 65?" A cross-sectional investigation of this question is a preliminary step toward an understanding of the relationship between housing and the health of older adults. If the analysis in this study supports the relationship between an individual dwelling in multi-family housing and increased social contact among neighbors, then research should undertake further analysis. Ideally the next project would use multiple years of the HRS to detect changes in social contact when moving between residence types. However, due to the nature of this study as a thesis project, I address the question with the following hypotheses, H_0 being the null hypothesis.

H_0= There is no relationship or a negative relationship between residing in and apartment or duplex and the number of social visits with neighbors per month.

H_1= Residence in an apartment, compared to a single-family dwelling, is associated with an increase in the number of social visits with neighbors per month.

H_2= Residence in a duplex, compared to a single-family dwelling, is associated with an increase in the number of social visits with neighbors per month.

Summary

A more thorough understanding of how environments promote social interactions might bring about solutions to the looming caregiving crisis facing the United States. The literature on the health of older adults supports the importance of socialization toward creating positive outcomes in later life. Housing may have the capacity to encourage or diminish socialization, most directly through visits with neighbors. Additionally, the close proximity of friends and acquaintances may have the power to mitigate negative outcomes from the potential hazards of living alone. Understanding the relationship between housing type and social contact with neighbors is important for three reasons. First, social contact is important toward maintaining the health of older adults. Second, neighbors can serve as social ties who provide incidental caregiving. Third, relationships with neighbors have the potential to fulfill broader and more formal caregiving roles. This study provides evidence that across individuals, dwelling in multi-family housing, in the form of apartments but not duplexes, is associated with a higher number of social visits with neighbors per month than dwelling in single-family homes.

CHAPTER 2

LITERATURE REVIEW

The Fundamental Motivations for Socialization

Socialization is driven by individual, familial, and societal level constraints and pressures (Hoyer & Roodin, 2009), and is also influenced by the constraints of the physical environment (Lawton & Simon, 1968). Older adults may act within a different set of expectations and constraints than younger adults when choosing social behaviors, but it is likely that some of the fundamental motives are the same. The ways in which socialization help us survive occur at two different levels, biological and socio-structural.

Human beings have evolved as a species that utilizes socialization for survival (Adolphs, 2001). This socialization acts at a biological level, through touch, voice, holding, and eye contact, and is crucial in early cognitive development (Adolphs, 2001). Social contact may also be crucial to optimal development or maintenance in older adults especially in regard to cognitive function. Because social interactions have cognitive components and thus promote ongoing cognitive engagement, they may also contribute to better cognitive functioning (Baltes & Baltes, 1990; Rowe & Kahn, 1998).

We have positive feelings we associate with social relationships like a sense of belonging, camaraderie, affection and intimacy, but the value we obtain from our social relationships is far more complicated (Cornwell, 2008) and facilitates our survival on a socio-structural level. Cornwell (2008) cited the following values as derived from the usefulness of social relationships: 1) the cultivation of a stable system of social obligations and

trustworthiness; 2) access to information and resources; 3) the creating of norms and effective sanctions; and 4) opportunities for exchange and power (Coleman, 1988; Cornwell, 2008).

These two levels, the biological and larger socio-structural, at which the individual benefits from socialization, define his or her motivations toward socialization. The individual organism thrives and optimally develops through contact with others, and the individual and its social group survive based on the effective social dynamics of the group. Social contact with neighbors has the potential to provide both of these benefits to older adults.

Social Integration

House and Kahn (1985) define social integration as "the existence or quality of relationships" (p.85). Relationships with neighbors have the potential to create a variety of roles for older adults, and build the individual's levels of social integration. Erickson and Moen (2003) explain the importance of social integration versus isolation in the following passage:

> The greater number of roles a person fills, by definition, the greater the level of social connectedness or integration. Multiple role involvements can be seen as a protective mechanism, like socioeconomic status. This protective mechanism is related, broadly, to a variety of components of health, bolstering a sense of well being over the life course. Conversely, the absence of role involvements and its accompanying social isolation is a significant risk factor for the development of disease and impairment. However, it is not clear whether actually occupying a particular or multiple roles is or simply feeling a subjective sense of integration is more important. (Erickson & Moen, 2003 p. 95)

In terms of fulfilling these multiple role involvements, research has linked social integration to longevity, good-health and psychological well-being (Moen, 1995; Moen et al., 1989; Musick et al., 1999; Rowe & Kahn, 1998; Wethington et al., 2000). Using longitudinal cohort data, Bruce (2002) parsed out some of the effects of actual and psychological integration. He determined increased levels of social interaction buffer the effects of risk factors for depression, like the loss of a spouse. He also found social isolation to be associated with negative outcomes. He determined that lack of social contact was a risk factor for depressive disorders in late life. Other studies have linked the lower quality of the networks, by including a measure of the frequency of interaction, to an increased risk for loneliness and dementia (Fratiglioni, Wang, Ericsson, Maytan, & Winblad, 2000; Holmén & Furukawa, 2002).

An individual's social relationships, even the most informal, may have the capacity to buffer declines in a person's abilities toward self-care. In the case of an emergency, just the proximity of another person could help save a life. In the case of heart attack or stroke, the timeliness of medical care can make a huge difference in outcomes (Hsia & Shen, 2011). During the Chicago heat wave of 1995, many older adults living in multi-family housing within close proximity to neighbors were taken to cool shelters. Those at farther distances from neighbors were not as likely to be saved (Frumkin, Frank, & Jackson, 2002). This case is an extreme example where multiple instances of a phenomenon saved many lives, but illustrates the fact that social support often exists in even the most casual social relationships. Social support is defined as information leading the subject to believe that he is cared for and loved, esteemed, and a member of a network of mutual obligations (Cobb, 1976). This support is active through both the feeling it creates and the actual support rendered.

Neighboring: Social Integration and Social Support

Wethington and Kavey (2000) define neighboring thus: "the characteristics of congeniality, amicability, respect, and availability for help that characterize friendly but not necessarily close or intimate relationships between people who live in the same neighborhood." (p. 190). These relationships could exist through the social visit, providing companionship and intellectual stimulation or information and assistance of various sorts. Neighboring also exists through supportive actions like watering plants or bringing in the mail. In this type of relationship, the proximity of a neighbor could also mitigate a negative outcome, like a fall, overexertion, or stress. An older adult might avoid a dangerous activity if they have the option of asking someone for help. Cantor (1979) suggested that seeking help from neighbors is a type of self-motivated intervention that makes up for gaps in a more intimate or structured support network.

Research from the 1960s and 1970s suggested that support from neighbors was critical to the health of older adults (Barker, 2002; Cantor, 1979; Rosow, 1967). In research including a sample of elder New York City residents, Cantor (1979) found that support from friends and neighbors becomes important when kin, especially adult children, are not available as caregivers. More recent research estimated that 12% of all caregivers in the United States are non-related adults (Pearlin, Mullan, Semple, & Skaff, 1990). Another study is more specific about the care providers being non-kin, *unprofessional,* and *unpaid* and estimates that between 5% and 10% of all community dwelling older adults receive care from these sources (Barker, 2002).

The research community seems to be reluctant in attempting to formalize and incentivize this naturally occurring and extremely complex phenomena and thus interventions using neighboring to promote health have been relatively rare (Ross, 1983). Wethington and Kavey

(2000) contributed this reluctance toward further research to three trends. First, most research on the relationship between social support and health has tended to focus on the support from intimate others because these correlations tend to be much larger than those seen between health and non-intimate others (House, Umberson, & Landis, 1988). Second, there does not appear to be a relationship between network size and well-being (Kahn, Wethington, & Ingersoll-Dayton, 1987). Finally, research finds strong relationships between certain personality factors and reports of social interaction (Cohen, Sherrod, & Clark, 1986). It might be easy to over-simplify these findings to imply that the broader social setting is irrelevant to health.

Accounting for these concerns and considering the promising preliminary results from interventions using neighboring to promote health are, there are still two main concerns associated with the promotion of this sort of activity. First, researchers seem to be reluctant toward intervening in "norms related to the appropriateness of seeking help from others" (Wethington & Kavey, 2002 p. 206). Creating formal mechanisms in this relationship may ruin the informal dynamics that make it functional. The second fear seems to be unspoken in the literature, but immediately comes to mind when thinking about how to incentivize neighboring relationships. The concern is that the types of people who perform neighboring activities without incentives may be best suited and most trustworthy for these types of activities. Offering incentives might draw in individuals who are not as well-suited to providing support because they are not motivated by the benefits of the personal relationship or the knowledge that they are helping someone, but are instead motivated by a more 'selfish' incentive.

Even given these concerns, the availability of social contact is an important characteristic of a neighborhood because neighbors offer two basic mechanisms of support: 1) that which may serve to compensate for a lack of support from more intimate ties when support from these ties is

not readily available, and 2) that which serves a task-specific role (Shaw, 2005). That is, support from neighbors may be beneficial primarily because neighbors may be the network members in the best position to respond to specific types of problems or tasks, such as those requiring geographic proximity (Shaw, 2005).

Shaw (2005) hypothesizes that "although actually experiencing each of these forms of neighborly support and interaction should help to protect against functional decline, simply anticipating access to this type of support from neighbors should also be protective" (p. 507). He argues that the perception that one's safety is being monitored, the availability of actual assistance, and the opportunities for social engagement provide a sense of security. Baltes (1996) contributed to this explanation and posited that this type of security enhances physical functioning by augmenting feelings of personal control. These feelings in turn empower individuals to choose an active and independent lifestyle in select domains (Shaw, 2005).

Wethington and Kavey (2000) undertook an empirical pilot study including a group of older adults (n=95) where they identified five strands of research toward a better understanding of neighboring. One of their main questions involved housing type: "Is neighboring associated with the stability, physical type, socioeconomic status, and propensity for crime in the neighborhood?" (p.193). Their findings support the idea that the right housing and neighborhood characteristics hold the most promise for promoting neighboring relationships. Wethington and Kavey write: "Perhaps the most efficient way to promote neighboring activity is to provide settings where more people who wish to meet others can safely meet new and different people" (p. 206). Housing and the physical spaces we inhabit are likely to hold the most potential for this passive intervention strategy. Erickson and Moen (2003) echo this conclusion in their

preliminary study on social integration in a variety of supportive housing settings for older adults:

> [Our] findings here suggest some strategies for encouraging psychological integration. The importance to psychological integration of seeing neighbors frequently may provide an impetus to design spaces that maximize opportunities for informal visiting. This may be particularly important for those who are otherwise unlikely to join groups or volunteer. These informal social contacts tend to happen more frequently in senior housing where older people are in closer proximity. (Erickson & Moen, 2003 p. 109)

In a study investigating the factors involved in having supportive neighboring relationships, Shaw (2005) found that an individual's assessment of how much support they could count on from their neighbors was strongly and positively associated with the number of contacts they had with them. Therefore, it is reasonable to hope that the passive encouragement of social contacts between neighbors is a reasonable step toward facilitating neighboring roles, which in turn lead to increased well-being in those who experience these types of relationships.

Conceptualizations of the Factors Involved in Social Integration

The factors involved in social integration continue to be of interest to researchers, and they have a variety of theories to explain how an individual constructs this integration. Shaw's (2005) findings support the idea that the availability of this neighborly support is tied to an investment of sorts, through the number of social contacts an individual has with neighbors. The social investment model (Rusbult, 1980) argues that individuals must invest resources to keep relationships going. These resources consist of either *personal resources,* including time and money, or *extraneous resources,* such as shared memories, joint ventures, mutual friends, and

children. The investment in neighboring relationships occurs through visits and perhaps the exchange of other personal and extraneous resources, but what the individual cost of the investment and what the investment is worth across time are informed by a variety of factors on the individual, familial, and societal level. The concept of social capital helps us discuss the value of this social exchange and better understand what other factors apart from individual investment might be related to an individual's social integration.

The concept of *social capital* covers a very broad range of social phenomena and has been independently coined six different times (Putnam, 1995), but it generally refers to the resources available to individuals and groups through investments, either intentional or not, in social connections and relationships with others. In this conceptualization, social capital has historically been a very important factor in the care provided to older adults. Within the last century we have seen a cultural shift where the care formerly provided to older adults through family or community members is now provided through payment and is imbedded in supportive housing (Becker, 1964; Cannuscio, Block & Kawachi, 2003). As the number of older adults in poverty grows (Wu, 2010) and the resources of family members are spread thin through caring for multiple generations and employment demands, we might look to the social resources of the community to provide some of the care older adults need. How these investments translate into returns is dependent on a variety of factors.

The social integration presented by Erickson and Moen (2003) presents a different conceptualization of an individual's social capital. They conceptualize social integration as an indirect measure of the benefits inherent or available to an individual through his or her socialization. They present a framework, based on theories of life course development, which argues that contexts are an important part of dynamics that affect an individual's social

integration, through both actual, or *structural integration,* and perceived, or *psychological integration* (Erickson & Moen, 2003). Erickson and Moen (2003) characterized these dynamic contexts into three areas: 1) residential arrangements- comprising the place of residence, type of residence and duration: 2) family circumstance- made up of factors like marital status, care-giving and contact with children; and 3) individual resources- capturing educational attainment, income, activities of daily living, and other capabilities.

Their framework simplifies the influences of some of the broader social and cultural influences into the direct contexts of the individual. These broader contexts are important in the conceptualization of both social capital and social integration. Coleman (1988) and then later Putnam (1995) pointed out that the levels of existing social capital change not only during life course events, like the loss of friends due to retirement, but can also be tracked as cohort differences, signaling larger socio-cultural contextual shifts. His empirical analysis of trends in civil and social engagement across time reveals a very important theme in human social change; this change involves a process of both individual or *intracohort* change and generational or *intercohort* change (Putnam, 1995). This description provides important insight for researchers trying to understand the behaviors of older adults. The influences of culture during the individual's life course inform the choices he or she makes, but the individual within these broader cultural contexts has the power to influence them. These compounding influences bring about broader intercohort changes that can be tracked in the different behaviors of subsequent generations.

These cohort differences can also be tracked through differences in the surrounding contexts of the generation being studied. As a broad illustration of this type of change, the current generation of older adults will have fewer individuals residing on a farm, higher levels of

education, more women who are working or who have retired from the work force, and better health longer than individuals aging in the early part of the 1900's. While this particular study will not track differences between different cohorts of older adults, these underlying changes work together with the more direct contexts of residential, family, and individual resources.

Many researchers were unable to avoid the reality of the loss of social contacts and connectivity found in the research and tried to describe the individual motivations for this reduction in social contact (Adams, 2004; Carstensen, 1992; Lemon, Bengtson, & Peterson, 1972; Wethington, Moen, Glasgow, & Pillemer, 2000). Carstensen (1992), in her socio-emotional selectivity theory, promotes the idea that these reductions were related to an individual's choice to surround himself with fewer, yet more meaningful, social ties as he becomes more aware of his limited remaining time for living. Adams (2004) promotes a similar theory, but instead of an anxiety or awareness of limited time driving these reductions in social contacts and connectivity, he posits that this choice is driven by maturation and increased wisdom.

The current cohort of older adults does not actually display a loss of social contacts across the variety of social behaviors. Cornwell, Laumann, and Schumm (2008) found that the trends for our current older adults might not be what they were for previous generations, and certainly do not support notions of social isolation. Using cross-sectional data from the National Social Life, Health and Aging Project (NSHAP), part of the Health and Retirement Study (HRS), collected between Autumn 2005 and Spring 2006, they analyzed data from 3,005 older adults. They separated socialization into nine distinct categories and found that while there were age-associated decreases in some social outcomes including network size, the number of primary group members in net, and closeness to network alters, this was certainly not true for all of the

measurements of socialization. The negative relationships they found are logically related to life course factors, the most obvious of which is the death of close friends or a spouse. They found that the number of contacts with close friends begins to decrease with age but then levels off around age 65 and increases again around age 70. This increase could be related to an increased number of visitations surrounding illness and approaching an individual's death. Or these increases could be related to cohort difference. Most relevant to this study, they find that incidences of neighborly socializing increase with age, but less so when controlling for life course factors.

The Environment and Socialization

Environmental Contexts and Socialization

Environmental gerontology (EG) presents as basic behavioral model for us. The perspectives from environmental gerontology assume that the contexts influencing behavior are in interaction with the individual and that together these interacting factors affect an individual's behavior. Or as stated by Golant (1998), these factors are "a set of distinct antecedents, which include personal qualities and behaviors, subjectively interpreted environmental attributes, and psychological processes, both independently and in interaction with each other, are construed as causal influences of a set of individually experienced outcomes'' (p. 36).

Lewin (1951), building on his concept of the ''life space,'' formulated this behavioral model, which argued that behavior (B) is a function of person (P) and environment (E), that is, $B = f(P, E)$. To the extent that 'person' and 'environment' represent an indivisible whole, this model might well be viewed as a transactional perspective (Parmelee, 1998). This becomes especially complicated when we consider the social environment of which an individual is more

directly a part. Lawton, one of the most prolific researchers in EG, was conflicted about how to present the interrelated components of person and environment (Wahl & Weisman, 2003). He tried to formulate a transactional perspective, where Lewin's equation is amended to include a P x E interaction such that $B = f(P, E, PxE)$ (Wahl & Weisman, 2003). While he felt like there was an intellectual justification for this interaction, he ultimately opted for the clarity of the original model, saying "although person and environment form a unified system where what is inside is philosophically inseparable from what is outside, for heuristic purposes, it is necessary to speak of, and attempt to measure, them separately" (Lawton, 1998 p. 1).

Lawton (1980) clarified the issue further, saying:

> Many theorists believe that the interchanges between person and environment are so intricate, so continuously shifting and mutually causal, that it is difficult to view them as separate entities. There is much to be said for this point of view…however…when one must operationalize, measure, and treat variables statistically, the problems become hopeless unless distinctions are made. (p. 11)

In the context of this study, we are concerned specifically with that factors that inform socialization behaviors in later life. The environmental factors, both physical and social, in this case either facilitate or deter an individual's preferred social behaviors. These environmental factors also work at different environmental levels, from the arrangements of cities and towns to the layout and accessibility of neighborhoods and individual homes.

Putnam's (1995) findings illustrate the broad societal influences that the structure of our environment have on individual behavior. He concludes that factors of time and money, which most cite as reasons for lack of an individual's civil and social engagement, do not have nearly the effects as urban sprawl. According to Putnam, the change has occurred because Americans

have been moving to the suburbs of large urban areas, and those residing in expansive urban areas have a "civic sprawl penalty" of roughly 20% on most measures of community involvement. According to Putnam (1995), those who live in these areas do not necessarily prefer less civil engagement, but they have less.

Putnam (1995) cites three fairly common-sense mechanisms that explain this unintentional effect. First, sprawl means more time in the car, usually alone. This reality means less time for a variety of social activities. Second, sprawl has a positive relationship with higher levels of social segregation. Social homogeneity is associated with a decrease, not increase, in civic engagement. Finally, sprawl physically disrupts what Putnam (1995) terms 'community boundedness.' The most civic engagement is found among residents of communities that are well defined and bounded (Putnam, 1995).

These findings are supported by the empirical findings of Leyden (2003) in a study of individual social interactions on households in Galway, Ireland. His survey measured different aspects of social capital of the members of households located in different neighborhood types. Leyden reports that respondents living in walkable neighborhoods are more likely to know their neighbors, to participate politically, trust others, and be socially engaged.

Brueckner and Largey (2008) report that the link between neighborhood density and socialization cannot be supported. They used individual responses from the Social Capital Benchmark Survey regressed on Census tract data and found a negative relationship between both the quantity of friendship oriented social interactions and measures of group involvement and housing density.

Housing Type and Socialization

Multi-family housing typically describes dwellings with more than one unit or family residing within but without an upper limit on the number or units or families within a dwelling. In this thesis, I argue that a multi-family dwelling type, like an apartment or duplex, reduces the individual resources required to maintain and create social contact with neighbors and builds, in a sense, a more 'bound community' than might be available to those living in single-family homes. The mechanisms driving this 'boundedness' are proximity to neighbors, having a larger pool of neighbors with whom one might socialize, and having more shared space, like yards and hallways, between neighbors. Because of suburban expansion, my expectation is that most single-family homes are located in neighborhoods lacking the 'boundedness' described by Putnam (1995), where the distance between neighbors and the smaller pool of them reduces an individual's, especially an older adult's, access to social contact with them. Clarifying these definitions and assumptions should summarize the arguments presented so far in this chapter. The following studies confirm the validity of the theoretical thread presented in this chapter and support increased socialization among those living in multi-family housing among the population at large, but the findings are not specific to older adults.

Glaeser and Sacerdote (2000) studied the relationship between housing and social connectedness using the national Opinion Research Center's General Social Survey, which samples the population of the United States. They cited theoretical mechanisms that would drive the relationship between housing type and social connectedness in opposite directions. First, they hypothesized that homeownership, typically seen in single-family homes, would increase social connectedness between neighbors. They hypothesized that homeownership might create incentives to improve one's neighborhood because of asset ownership and that socialization

between neighbors is a part of this quality. Next, they hypothesized that homeownership might create barriers to residential mobility, which would provide an incentive to invest social capital within that community because one expects to be there longer. Finally, they considered that the effect of having common spaces between single-family homes might increase social interactions with neighbors. They found support for some of these theoretical mechanisms, especially the participation of homeowners in local politics, but not in an increased social interaction with neighbors (Glaeser & Sacerdote, 2000).

Glaeser and Sacerdote (2000) found that for individuals, living in an apartment or multi-family dwelling with five or more units is associated with higher levels of social interaction, measured through the number of social evenings with people in the neighborhood. One weakness that exists in my study of older adults is that the analysis does not account for the possibility that multi-family dwelling is driven by the desire for more social contact among neighbors. Glaeser and Sacerdote (2000) used a two-stage least squares method to reduce the endogeneity of housing choice, and the relationship between multi-family dwelling and higher levels of social integration remains. The instrument they used is the average probability of living in an apartment based on state-city size quartiles. These findings are also robust to individual fixed effects in data on a German population. They also found that residents of multi-family housing are more likely than single-family dwellers to socialize in public spaces within the neighborhood.

Glaeser and Sacerdote (2000) consider several factors about dwelling in multi-family housing that might drive this relationship. One environmental influence might be the lack of space inside smaller residences that drives social interactions out of the unit. Another possibility is that reduced time toward the maintenance of an apartment provides more time and energy for interaction between neighbors. This free-time differential could be especially important for older

adults. They also hypothesize that the use of hallways, entryways, and elevators might augment the relationship between social visits and multi-family dwelling. Yet another potential factor they mention is the cost of transportation. Distance itself seems to be a behavioral cost.

The most well-supported and well-documented mechanism driving this relationship seems to be that physical distance tends to deter interaction (Baldassare, 1978; Festinger, Schachter, & Back, 1950; Glaeser & Sacerdote, 2000; Putnam, 1995), and multi-family dwellers are more proximate to their neighbors. Glaeser and Sacerdote (2000) further support this hypothesis with their evidence that the number of social visits between two individuals has a negative correlation of 64%, meaning the farther apart they are the less likely they are to visit. This relationship between proximity and social contact is also supported by Festinger et al. (1950), who found that those who resided farther apart were less likely to form social connections, and Baldassare (1978), who found that even modest distances between residences decreased residents' social interaction with each other.

Summary

Social contact is beneficial to the health of elders through both direct psychological or physiological means; (Moen, 1995; Moen et al., 1989; Musick et al., 1999; Rowe & Kahn, 1998; Wethington et al., 2000) and through indirect paths made available through informal social support (Barker, 2002; Cantor, 1979; Rosow, 1967). The availability of this support can be described broadly in terms of the availability of social capital (Glaeser, Laibson, & Sacerdote, 2002). The provision or exchange of this type of informal support among people who live near one another is termed neighboring (Cantor, 1979; Wethington & Kavey, 2000). While researchers are reluctant to try to incentivize this type of naturally occurring relationship (Ross,

1983; Wethington & Kavey, 2000), they do recommend more passive methods of encouraging these types of interactions (Erickson & Moen, 2003; Shaw, 2005; Wethington & Kavey, 2000). The most relevant factor in these neighboring relationships seems to be residing in a physical environment conducive to them (Wethington & Kavey, 2000). The larger the number of social contacts with neighbors, the more likely an individual is to feel as though they can rely on support from their neighbors (Shaw, 2005). This feeling of support translates into another set of positive outcomes: 1) the psychological comfort provided knowing that an individual has proximal supportive relationships; and 2) actual care provided by neighbors (Baltes, 1996; Shaw, 2005).

Residing in multi-family housing, like apartments and duplexes, has a positive relationship with the number of social contacts with neighbors among the sampled populations in the United States. The hypothetical mechanisms driving this relationship are varied, but the factor of proximity between neighbors is likely to carry more weight for older adults, especially those who are likely to have diminished physical resources.

CHAPTER 3

METHODOLOGY

Topic Selection Process

The development of this study began with an overview of research on housing for older adults. Starting with a general understanding that the housing situations of older adults are associated with both positive and negative outcomes for health, I wanted to investigate the question of how housing and the social structure inherent in it can be improved to bring about more positive health outcomes. The body of research on the benefits of socialization in older adults large, but I realized that little or no research had investigated if certain housing types encouraged more socialization for older adults still living independently in the community at large.

Data Overview

The data used in the analysis of this study are from the 2006 Health and Retirement Study (HRS). This dataset is appropriate because it focuses on older adults and their households with at least one member over 50. It is designed to enable research and analysis on 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 panel survey, collected every two years, with the earliest cohort beginning in 1992 and subsequent cohorts being added in 1993, 1998, 2004, 2006 and 2008.

It is primarily sponsored by the National Institute of Aging (NIA) and administered by the Institute for Social Research (ISR) at the University of Michigan. HRS data, which was reconstructed for ease of use by the RAND (Research and Design) Center for the Study of Aging, were also used. The RAND data file includes some of the most frequently used demographics and income and wealth information, and was developed at RAND with funding from the National Institute on Aging and the Social Security Administration.

The respondents include: 1) individuals who were age eligible at the time of their first interview; 2) spouses who were not age-eligible at baseline; and 3) spouses who married an age-eligible respondent between survey waves. The data used in the analysis of this study are respondent level data and comes from multiple individuals from single households. The HRS over-samples Hispanics, blacks, and residents of Florida and provides weighting variables to make it representative of the community-based population of older adults in the United States. The RAND data imputations are user-friendlier. This dataset compiles variables from the HRS, such that all HRS respondents are assigned data on wealth and other frequently used variables that might otherwise only be assigned to the individual financial respondent or individual family respondent in each household.

The HRS sample is selected under a multi-stage area probability sample design. The respondents and their households are selected based on characteristics of the household. The most relevant household characteristic is membership of person who was age 51 or older at baseline. They also picked the sample based on other characteristics, like race, that optimize the availability of data on certain groups. This complex sample design requires a more complex analysis than is present in this is study if the results are to be interpreted to extend to the

population of individuals over age 65 in the United States. There are two main issues this complex sample design presents in this study.

The first issue is that individuals sharing households are likely to have strong correlations in a number of variables, and of the most concern, are likely to be more highly correlated in the dependent variables measuring social visitation with neighbors. For example a husband and wife might indicate the same number of visits per month, even though the motives or characteristics of one more than the other were responsible for the visits. This issue, and an attempt to address it without more complex analytical and statistical methods, will be presented further in Chapter 5.

The second issue this creates is that the current analysis, without proper weighting methods, is not properly representative of the population of older adults age 65 and over. Those groups that are over represented may carry more weight in the analysis, and thus bias the results toward statistical significance in areas that carry some correlation with these groupings. Table 1 shows the sizes of the different subsamples used in this study, and respondent level weighting variables are used to demonstrate what the size of the nationally representative samples would look like if we could collect data from every individual in the United States who fits the restriction criteria.

Table 1

Samples Obtained in the Study

Sample Restriction Criteria	Reduction	N	Weighted N* (in millions)
Full HRS Individual Respondents		18,469	75,544
Age restriction to only age 65+ (in any of 2006)	7,272	11,197	37,341
All respondents with extraversion measure	6,572	4,525	15,327
Cross-section of respondents with no missing observations for all variables: Sample 1 (respondents with both zero and a positive number of social visits with neighbors per month)	327	4,198	14,116
Cross-section of respondents with no missing observations for all variables: Sample 2 (respondents with only a positive number of social visits with neighbors per month	1,158**	3040	10,292

* Respondent level weights are applied to each subsample.

** This reduction represents the subsample of respondents in Sample 1 who have zero social visits with neighbors.

I created these samples based on several factors. First, this study only uses individuals over age 65. Cornwell et al. (2008) found that social interactions with neighbors, after declining around age 50, level off and then begin to go back up around age 65. These findings support the need for an age restriction to try to capture a linear relationship in social visits with neighbors. A second restriction that removes a significant number of observations from the sample is the requirement that every individual in the sample have a complete set of extraversion measures and thus an extraversion index. These data are collected through a leave behind psychosocial questionnaire. 2006 psychosocial questionnaires were distributed to HRS respondents if they were selected for the enhanced face-to-face interview as long as they were alive and either they or a proxy completed at least part of the interview in person. Telephone follow-ups were conducted with respondents who had not returned a questionnaire after the second reminder notice. Factoring in the 2006 core response rate of 90%, the HRS estimates that for those assigned to the enhanced face-to-face interview, the overall response rate was about 74%. However, the number of respondents over 65 with a full set of extraversion measures was much lower at 4,569. We lose more observations than the lowest set of observations for each of these questions because of the cross-section of missing responses.

Sample 1 is restricted to the cross-section of respondents who had no missing observations for any of the variables used in the analysis and who have either zero or a positive number of social visits with neighbors. In the last restriction, for Sample 2, I deliberately separated those who have zero or "hardly any" social visits with neighbors, as *non-visitors,* from those who have a positive number, as *visitors*. This separation will further restrict one of the samples used to those respondents who are visitors and will help address the potential of

measurable or unmeasured differences between those two groups. This issue will be discussed further in this chapter.

Theoretical Framework

When considering how to design my study, I used the guiding framework of life-course development, as constructed by Erickson and Moen (2003), to help determine which factors might be relevant in the statistical analysis. I adapted the framework they used in their study of the relationship of individual characteristics and different residential arrangements on an individual's social integration. Erickson and Moen (2003) argue that contexts are an important part of the dynamics that affect an individual's social integration, through both actual, or *structural integration,* and perceived, or *psychological integration.* They categorize these dynamic contexts into three areas: 1) *residential arrangements*- comprising the place of residence and type of residence and duration; 2) *family circumstance*- made up of factors like marital status, care-giving and contact with children; and 3) *individual resources*- capturing educational attainment, income, activities of daily living, and other capabilities. I adapted this behavioral framework to look specifically at the component of structural social integration through social visits with neighbors. Figure 1 illustrates my adaptation of Erickson and Moen's (2003) framework. Their framework and my adaptation, which gives us an idea of the temporal relationship between the three different contexts and the outcome of structural integration specifically, supports a basic behavioral model where the different contexts, *residential arrangements, family circumstance,* and *individual resources*, influence an individual's level of *structural integration.*

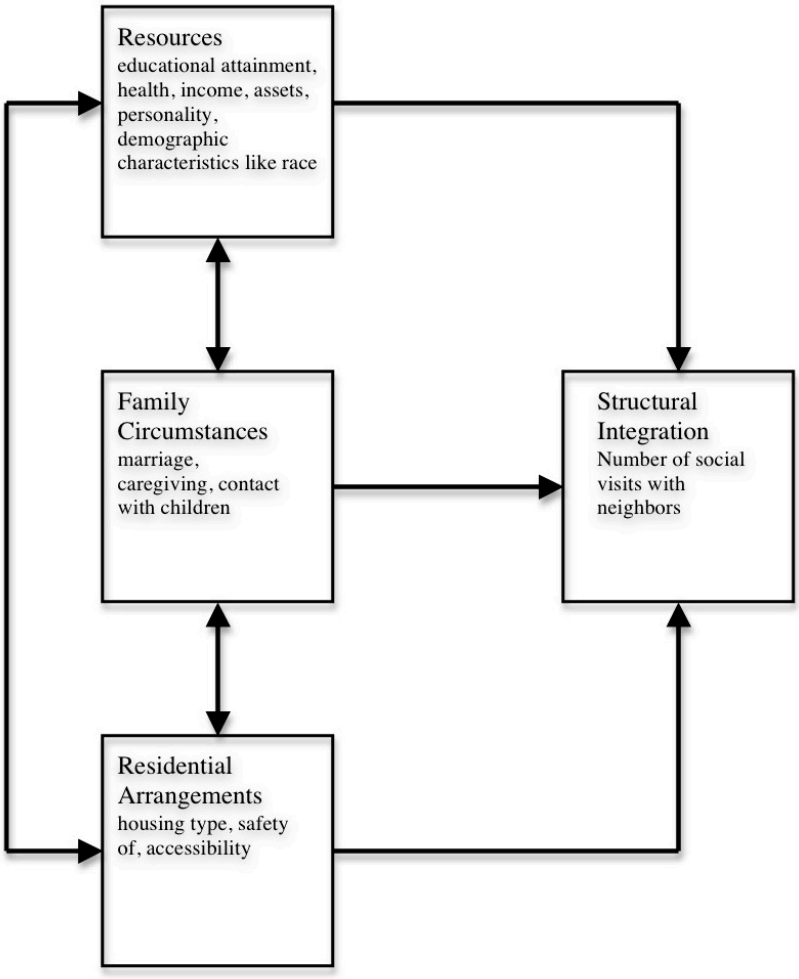

Figure 1. Factors Influencing Structural Integration. Adapted from Erickson and Moen's (2003) Social Integration Framework from the *Pathways to Life Quality* Study, 2003 p. 98)

I initially translated this behavioral model into a linear regression model where the dependent variable measures structural integration, specifically the number of social visits with neighbors, and the independent variables of housing type are part of the broader context of residential arrangements. However, trying to address my research question using a linear regression model on the number of social visits with neighbors is problematic because there is such a large proportion of individuals who have hardly any or zero social visits with neighbors,

approximately 25% of my first sample. Those who have hardly any or zero social visits with neighbors need to be considered as a group with particular and potentially unmeasured characteristics. This group could potentially bias the results of an analysis if they are included in a continuous measure of social contact.

Because there is likely to be some unmeasured difference between those who have zero social visits per month and those who have a positive number, I created two different dependent variables, to be used in two regressions. These different groups should help account for the potential sample selection error and allow us to better understand what factors are related to having zero and a positive number of visits. However, these results are not a main focus of the study. The models presented for the analysis of the research question appear later in this chapter.

Variable Construction

Dependent Variables

Since this research is focused on the relationship between housing type and older adult's development of friends and social networks among neighbors, the dependent variable needs to focus specifically on socialization between the older adult individual and neighbors. The HRS 2006 core questionnaire collected responses from the following question: "How often do you get together with [people in or near the facility/any of your neighbors] just to chat or for a social visit?". I created a variable capturing an approximation of the number of visits per month as an intermediate step in constructing the dependent variables. To create this variable I used KF176, capturing a number of visits, and then either multiplied or divided by KF177, which indicates if the number of responses represent visits per day, week, bi-weekly, month, or year, to approximate the number of social visits in a 30-day period. To use those who responded in visits

per year, I divided the response by 12 and in some cases has to round the decimal to an integer. This transformation put all individuals who had less than .5 visits per month in to the zero visits per month category. Visits per month varied from 0 to 930 social visits per month, but over 99% of the sample had 30 visits or less per month. These higher numbers could bias the results and increase the magnitude of the coefficients on the number of social visits with neighbors per month. In constructing the variables, I treat these observations as outliers and assign them to a numerical value of 30, the maximum number of social visits with neighbors per month.

Table 2 details the construction of these variables. The table lists the variables available in the 2006 HRS and RAND variables created from HRS data in capital letters, including the total number of respondents in each category of response and the total number of observations available in the data. Each HRS or RAND variable is followed by variables constructed for this analysis. Corresponding columns show the distributions for each response and the total number of observations available without any restrictions; subsequent columns show the distributions of the variables used in this study for the two subsamples used in the analysis.

Table 2

Construction of Dependent Variables

Code/name	Question/Measure	Response	N HRS/RAND	N Sample1	N Sample 2
KF176	NUM OF TIMES GET TOGETHER WITH PEOPLE How often do you get together with [people in or near the facility/any of your neighbors] just to chat or for a social visit? If R answers 'almost never' or 'never,' enter 0 at number of times.	0-50	n=17,511		
KF177	NUM OF TIMES GET TOGETHER WITH PEOPLE- PER	1.-Day	2,289		
		2.-Week	6,783		
		3.-Bi-week	556		
		4.-Month	2,441		
		5.-Year	609		
		6. Almost never	4,760		
		7.-Other	7		
			n=17,445		
visitsyear	= KF167/12 if KF177=5 = missing if else	.0833-4.1677	n=609		

Code/name	Question/Measure	Response	N HRS/RAND	N Sample1	N Sample 2
Monthlyvisits	= 0 if KF177=6	0	5,264	1,158	
	= 0 if KF176=0	1-30	12,174	3,040	3,040
	= KF176x30 if KF177=1				
	= KF176x4 if KF177=2				
	= KF176x2 if KF177=3				
	= KF176 if KF177=4				
	= 0 if visitsyear<.5				
	= 1 if visitsyear>=.5 | visitsyear<1.5				
	= 2 if visitsyear>=1.5 | visitsyear<2.5				
	= 3 if visitsyear>=2.5 | visitsyear<3.5				
	= 4 if visitsyear>=3.5 | visitsyear<4.5				
	= 30 if monthlyvisits>=31 & monthlyvisits<=930				
	= missing if else				
			n=17,438	n=4,198	n= 3,040

Code/name	Question/Measure	Response	N HRS/RAND	N Sample1	N Sample 2
visitor	= 1 if monthlyvisits>=1 & monthlyvisits<=30 = 0 if monthlyvisits=0	0= zero visits per month	5,264	1,158	
	= missing if else	1= 1-30 visits per month	12,174	3,040	
			n=17,438	n=4,198	
Visits	= monthly visits if monthyvisits>=1 & monthlyvisits<=30 = missing if else	1-30 (visits per month)	n=12,174	n=3,040	n=3,040

Independent Variables

This study assumes unmeasured factors, like neighbor proximity and the density of neighbors, are linked to the type of housing in which a person dwells. Housing type serves as a measure that captures the group of these other factors and is associated with an individual's number of social visits with neighbors. The 2006 HRS includes a detailed survey on housing and includes the corresponding question, "now I have a few questions about your (house or apartment/house/apartment) in [MAIN RES ADDRESS CITY], [STATE] is it a mobile home, a one family house, a two-family house (duplex), an apartment, townhouse, or what?" From the responses to this question, I constructed five dichotomous variables accounting for the five different types: single-family home, apartment, duplex, mobile home, and other. Other residence type has more respondents than duplex residents and makes the sample more representative.

Because the majority of people reside in a single-family home, I chose to use this as the omitted variable upon which to compare the other group. Table 3 details the construction of these variables. The table lists the variables available in the 2006 HRS and 2006 RAND HRS data in capital letters, including the total number of respondents in each category of response and the total number of observations available in the data. Each HRS or RAND variable is followed by variables constructed for this analysis. Corresponding columns show the distributions for each response and the total number of observations available without any sample restrictions, then shows the distributions for the two samples used in this study

Table 3

Construction of Independent Variables

Code/name	Question/Measure	Response	N HRS RAND	N Sample 1	N Sample 2
KH002	TYPE HOME	1.-Mobile Home	1,072		
	[Now I have a few questions about your (house or apartment/house/apartment) in [MAIN RES ADDRESS CITY], [STATE] a mobile home, a one family house, a two-family house (duplex), an apartment, townhouse, or what?)	2.-One-Family House	13,696		
		3.-Two-family House/ Duplex	514		
	If this is a face-to-face interview, you may confirm residence type.	4.-Apartment/ Townhouse	2,333		
		7.- Other	485		
		9.- Refused	2		
			n=18,102		

Code/name	Question/Measure	Response	N HRS RAND	N Sample 1	N Sample 2
singlefamily	= 1 if KH002=2	0- no	4,404	960	681
	= 0 if KH002=1	1- yes	13,696	3,238	2,359
	= 0 if KH002>=3 & KH002<=7		n=18,100	n=4,198	n=3,040
apartment	= 1 if KH002=4	0- no	15,767	3,683	2,664
	= 0 if KH002<=3	1- yes	2,333	515	376
	= 0 if KH002>=5 & KH002<=7		n=18,100	n=4,198	n=3,040
duplex	= 1 if KH002=3	0- no	17,586	4,084	2,973
	= 0 if KH002<=2	1- yes	514	114	67
	= 0 if KH002>=4 & KH002<=7		n=18,100	n=4,198	n=3,040
mobilehome	= 1 if KH002=1	0- no	17,028	3,987	2,895
		1- yes	1,072	211	145
			n=18,100	n=4,198	n=3,040
otherhome	= 1 if KH002=7	0- no	17,615	4,078	2,947
	= 0 if KH002<=7	1- yes	485	120	93
			n=18,100	n=4,198	n=3,040

Control Variables

I constructed controls from available data within the 2006 HRS and 2006 RAND HRS data based on the contexts constructed by Erickson and Moen (2003). Other residential arrangements include an individual's rating of the safety of the surrounding area, the presence of

home modifications, and the number of people residing in the household, or household size. Neighborhood safety is theoretically relevant to the individual's *choice* to socialize with neighbors; if an individual does not feel safe in his or her neighborhood they might be less likely interact outside of the home and meet fewer people. This measure is captured by a categorical variable that codes 1= poor, 2 = fair, 3 = good, 4 = very good, and 5 = excellent. The presence of home modifications may be relevant to their *ability* to socialize with neighbors. If access in and out of the home is not available, it will be difficult for an individual to interact with neighbors. This variable is coded as a dichotomous variable with 1 = yes and 0 = no for the presence of home modifications.

The number of people living in the house is relevant for a number of reasons. Other people living in the household could increase the number of social visits with neighbors through proxy visits, where the respondent is not actually active in procuring the social visits, but nonetheless participates in or merely counts the visits in the response to the number of social visits with neighbors. It is also possible that the number of people dwelling in the household could decrease the number of social visits with neighbors if household production costs too much time to the respondents, and they then have less time for social interaction with neighbors. The measure of household size could also count as a family circumstance, but as the variable does not capture if the other household residents are family members, it will count as a residential arrangement for the purposes of this study. This variable is taken directly from the RAND variable which is a continuous measure from one to 15.

Family Circumstances included in this study are whether or not a respondent is married and if they have family living near by enough to be considered neighbors. While no studies include either of these particular measures, Erickson and Moen (2003) demonstrated a positive

relationship between the frequency of seeing relatives and an increase in an older adult's non-family roles. These available measures may capture some of that relationship. Marital status strictly captures whether or not an individual is married, with 1 = yes and 0 = no. Family near is also a dichotomous variable with one indicating that the respondent has family living nearby and zero that he or she does not.

Personal resources include a wide range of factors. Age is related to a numerous developmental changes that reduce an individual's physical capacity (Hoyer & Roodin, 2009) and increases the cost of distance in social visiting. Through this indirect pathway, age could affect the quantity of socialization. While age is not associated with diminished physical capacity for individuals, the population of older adults does see an age associated decline in function. Age is captured through a continuous measure with a minimum of 65 and a maximum of 105. This study also includes a self-reported measure attempting to capture if a respondent has difficulty walking several blocks. Possible responses are yes, no, cannot do, and do not do. I tried to capture this ability by coding 1 for difficulty walking several blocks as either yes or cannot do. I coded a zero for those who either said no or that they do not walk several blocks.

Self-reported health is a common measure used in a variety of studies, and self-reports have been found to be consistent with physician assessments and are strong predictors of disease and mortality (Baker, Stabile, & Deri, 2001; Reuben, Siu, & Kimpau, 1992). However, it should be noted that self-reports are prone to response error (Baker et al., 2001). Due to the nature of the HRS as an interview structured survey, response error on most questions is an issue; however, the HRS typically uses survey instruments that have already been tested and hold reasonable margins for response error that have been accepted by the community of researchers using the HRS.

While I found no studies reporting an association between gender and social integration, there are cultural stereotypes supporting the idea that women are more social with neighbors than men. There may also be an issue with the differences between genders in older age that demand the inclusion of this variable. Because men have a lower life expectancy than women (Hoyer & Roodin, 2009), there is a much smaller proportion of them in the population of adults age 65 and over. In this study, the proportions range from 55% to 60% women. The men who live longer may share characteristics like better health. As the research argues, better health and social integration are linked (Baltes & Baltes, 1990; Rowe & Kahn, 1998), thus the men in this sample may be more social on the whole than the women, countering the cultural stereotypes that women are more social than men. Inclusion of gender is also standard in most social science research, which typically accepts the paradigm that gender is a characteristic that influences behavior through both biological and cultural forces, but the most forceful argument for the inclusion of gender is that it may be a marker of other unobserved characteristics related to social behaviors. I created a variable for female, with 1 = yes and 0 = no.

Similarly, though I found no relationship in the literature, the inclusion of race and education is a standard practice used to try to capture the range of unobserved contextual factors that might be associated with behavioral outcomes. Putnam (2005) argues that homogeneity of racial and ethnic groups actually diminishes the social contact between neighbors, but being a minority in a group where there is a strong majority might lead to isolation, especially if there are cultural and language barriers, such as those that may exist for some respondents with Hispanic ethnicity.

Another important aspect of individual resources is income. It is assumed that the resources available at the family level are available to provide for the needs of all the individuals

within the family. As such, I used a measure of family income. This variable was constructed by the RAND Corporation and consists of respondent and spouse earnings, pensions and annuities, Supplemental Security Income (SSI) and Social Security Disability, Social Security Retirement, unemployment and workers compensation, other government transfers, household capital income, and other income.

Individual resources can also be measured through assets. The variable for total family assets was also constructed by RAND and consists of all assets less any liabilities. Assets include primary residence, other real estate (does not include a second home), business assets, IRAs, stocks, bonds, and checking and savings account totals. It is important to include both if these variable to capture the financial resources available to older adults because incomes frequently drop due to retirement or an inability to work and are not representative of the resources available to an individual. For example, an older adult may have access to resources through a home-equity line of credit, which utilizes the equity they have built up in their homes, but does not count as income. Assets also might provide some measure of other personal characteristics and resources that income does not, and the reverse is true for income. But both of these are important measures of the personal resources utilized by older adults. These measures are captured through variables giving the natural logarithm of income and assets. Both of these variables indicate a variance inflation factor of 1.56, where the highest variance inflation factor is on married at 1.76, and are therefore retained in the model. Though they are not used in the analysis, the descriptive statistics display the mean and median for family income and assets, in addition to the means for the natural logarithm of these variables.

Employment status serves as a proxy measure of the time constraints an individual faces and also captures a variety of other potentially unmeasured characteristics. This is not a perfect

measure as there are other categories of employment status that might also take a great deal of time; examples of these are looking for work and homemaker. However, for the purposes of this study it is helpful to distinguish those older adults who are working from those who are retired or not working for other reasons.

The last personal characteristic or resource included in the model is a composite index of the personality characteristic extraversion, which has a demonstrated relationship to socialization measures (Mroczek, Spiro, & Griffin, 2006; Ozer & Benet-Martinez, 2006). Other personality characteristics are also associated with socialization, most notably agreeableness; however, its association with these measures is typically weaker in the literature (Mroczek et al., 2006; Ozer & Benet-Martinez, 2006). My study confirmed that the association between agreeableness and the number of social visits per month is much lower than that for extraversion. While the extraversion scale I created is correlated approximately 11% with the continuous measure on social visits per month with neighbors, the agreeableness scale is only correlated at approximately 5%.

To create the extraversion index I coded for all the variables capturing extraversion as indicated in the HRS psychosocial questionnaire codebook. They are as follows: outgoing, friendly, lively, active and talkative. Respondents ranked themselves not at all, a little, some, or a lot. I gave these a corresponding ranking of 1-4, with the 4 indicating the highest level of each characteristic. I then combined these into an index ranking extraversion from a 5, the lowest, to a 20, the highest. Table 4 details the construction and distributions of these variables. The table lists the variables available in the 2006 HRS and 2006 RAND HRS data in capital letters, including the total number of respondents in each category of response and the total number of observations available in the data. Each HRS or RAND variable is followed by variables

constructed for this analysis. Corresponding columns show the distributions for each response and the total number of observations available without any sample restrictions, then shows the distributions for the two samples used in this study.

Table 4

Construction of Control Variables

Code/name	Question/Measure	Response	N HRS RAND	N Sample 1	N Sample 2
KH150	Perceived Safety of Area	1. –excellent	6,652		
		2. –verygood	5,742		
	Would you say the safety of [your/that] neighborhood is	3. –good	3,868		
	excellent, very good, good, fair or poor?	4. –fair	1,450		
	(created dummy and rate)	5. –poor	348		
		8. don't know	42		
		9. –refused	0		
			n=18,102		
safetyrating	=1 if KH150= 5	1- poor	348	61	36
	=2 if KH150= 4	2- fair	1,450	282	174
	=3 if KH150= 3	3 good	3,868	860	578
	=4 if KH150= 2	4- very good	5,742	1,452	1,068
	=5 if KH150= 1	5- excellent	6,652	1,543	1,184
	= missing if else		n=18,060	n=4,198	n=3,040

Code/name	Question/Measure	Response	N HRS RAND	N Sample 1	N Sample 2
KH139	Home Modifications or Special Features	1. –yes	1,344		
		3. –Already modified	617		
	[Since you moved here in [ ], [ ],/Since you moved here in[ ],/Since [ ], [ ],/In the last two years,] have you modified your (house/apartment) to make it easier or safer for an older person or a disabled person to live there?	5. –no	10,192		
		8. –don't know	3		
		9. -refused	3		
			n=12,159		
hmodify	= 1 if KH139=1 | KH139=3	0- no	10,192	3,538	2,570
		1- yes	1,961	659	470
	= 0 if KH139= 5				
	= missing if else		n=12,153	n=4,198	n=3,040
R8MSTAT	RAND constructed variable from HRS	1- married	11,273		
		2- married, spouse absent	161		
		3- partnered	618		
		4- separated	277		
		5- divorced	1,740		
		6- separated /divorced	8		
		7. Never Married	3,844		
		8. Widowed	546		
			n=18,466		

Code/name	Question/Measure	Response	N HRS RAND	N Sample 1	N Sample 2
spousepres	= 1 if R8MSTAT=1	0- no	7,194	1,551	1,105
	= 0 if R8MSTAT>=2 & R8MSTAT<=8	1- yes	11,272	2,647	1,935
	= missing if else		n=18,466	n=4,198	n=3,040
H8HHRES	Household size	1-15	n=18,469		
	Rand constructed variable capturing the number of people living in the household.				
hhsize	= H8HHRES	1-15	n=18,469	n=4,198	n=3,040
KF174	Relatives near	1. –Yes	4,811		
	Do you have any relatives in or near the facility where you are living?/(Besides the people living here with you,) Do you have any relatives in your neighborhood?	5. –No	12,697		
		8. –Don't Know	2		
		9. Refused	1		
			n=17,511		
familynear	= 1 if KF174=1	0- no	7,058	1,255	930
	= 0 if KF174=5	1- yes	9,186	2,943	2,110
	= missing if else		n=16,244	n=4,198	n=3,040
BIRTHYEAR	RAND constructed	1901-1981	n=18,469		
	year from HRS				
age	= 2006-BIRTHYEAR	65-104	n=18,469	n=4,198	n=3,040
	= missing if else				
GENDER	RAND constructed	1- male	7,587		
	gender from HRS	2- female	10,882		
			n=18,469		

Code/name	Question/Measure	Response	N HRS RAND	N Sample 1	N Sample 2
female	=1 if GENDER=2	0- male	7,587	1,815	1,370
	= 0 if GENDER=1	1- female	10,882	2,383	1,670
	= missing if else		n=18,469	n=4,198	n=3,040
RACE	RAND constructed race	1- white	14,936		
	from HRS	2- black	2,603		
		7- other	930		
		0- not clear	1		
			n=18,468		
white	= 1 if RACE=1	0- no	3,532	585	405
	= 0 if RACE=2 | RACE=7	1-yes	14,936	3,613	2,635
	= missing if else		n=18,468	n=4,198	n=3,040
black	= 1 if RACE=2	0- no	15,865	3,719	2,711
	= 0 if RACE=1 | RACE=7	1-yes	2,603	479	324
	= missing if else		n=18,468	n=4,198	n=3,040
otherrace	= 1 if RACE=7	0- no	17,539	3,092	2,964
	= 0 if RACE=1 | RACE=2	1-yes	929	106	76
	= missing if else		n=18,468	n=3,709	n=3,040
H8ITOT	RAND constructed income from HRS	0 - 25,400,000	n=18,469		
hhincome	= H8ITOT	0 - 25,400,000	n=18,469	n=4,198	n=3,040
	= missing if else			*	**
loghhincome	= ln(hhincome)	-4.61 - 17.05	n=18,469	n=4,198	n=3,040
				***	****

Code/name	Question/Measure	Response	N HRS RAND	N Sample 1	N Sample 2
H8ATOTA	RAND constructed assets from HRS	-2,453,000 - 101,000,000	n=18,469		
totassets	= H8ATOTA	-2453000	n=18,469	n=3,709	n=2,785
	= missing if else	1.01e+08		*****	*****
logtotassets	ln(totassets)	-4.61 - 18.43	n= 18,469	n=4,198	n=3,040
				******	******
KZ216	Educational Attainment	0-17	n=18,233		
	What is the highest grade of school or year of college you completed?	97- don't know	21		
			n=18,254		
yrseducation	= KZ216 if KZ216≠97 = missing if else	0-17	n=18,233	n=3,709	n=2,785
KJ005M1-M5	Current job status	1- working now	5,965		
	Are you working now, temporarily laid off, unemployed and looking for work, disabled and unable to work, retired, a homemaker, or what?	2- unemployed and looking for work	180		
		3- temporarily laid off, on sick leave or other leave	117		
		4-disabled	1,591		
		5- retired	8,465		
		6- homemaker	2,071		
		7- other	63		
		8- don't know	5		
		9- refused	2		
			n=18,459		

Code/name	Question/Measure	Response	N HRS RAND	N Sample 1	N Sample 2
working	=1 if KJ005=1	0- not working 1- working	12,424	3,567	2,601
	=0 if KJ005>=2 & KJ005<=7		5,965	631	439
			n=18,389	n=4,198	n=3,040
KC001	Health- Self-rated health	1- excellent	2,032		
	Would you say your health is excellent, very good, good, fair, or poor?	2- very good	5,261		
		3- good	5,623		
		4- fair	3,872		
		5- poor	1,654		
		8- don't know	23		
		9- refused	1		
			n=18,468		
healthrating	= 1 if KC001=5	1- poor	1,654	308	160
	= 2 if KC001=4	2- fair	3,874	903	625
	= 3 if KC001=3	3- good	5,623	1,343	1,002
	= 4 if KC001=2	4- very good	5,261	1,252	954
	= 5 if KC001=1	5- excellent	2,032	392	299
	= missing if else		n=18,444	n=4,198	n=3,04
KG001	Difficulty walking several blocks	1- yes	5,376		
		5- no	12,268		
	Because of a health problem do you have any difficulty with walking several blocks?	6- can't do	475		
		7- don't do	336		
		8- don't know	4		
		9- refused	3		
			n=18,462		

Code/name	Question/Measure	Response	N HRS RAND	N Sample 1	N Sample 2
diffwalking	=1 if KG001=1 | KG001=6	0- no	12,604	2,798	2,106
		1- yes	5,851	1,400	934
	=0 if KG001=5 | KG001=7		n=18,455	n=4,198	n=3,040
KLB033	Please indicate how well each of the following describes you.				
A	Outgoing	1- alot	2,490		
		2- a little	3,241		
		3- some	1,389		
		4- not at all	370		
		blank	10,979		
			n=7,553		
KLB033 E	Friendly	1- alot	5,184		
		2- a little	2,125		
		3- some	251		
		4- not at all	24		
		blank	10,885		
			n=7,648		
KLB033 I	Lively	1- alot	2,599		
		2- a little	3,389		
		3- some	1,358		
		4- not at all	170		
		blank	10,953		
			n=7,579		
KLB033 S	Active	1- alot	3,037		
		2- a little	3,115		
		3- some	1,152		
		4- not at all	229		
		blank	10,936		
			n=7,595		

Code/name	Question/Measure	Response	N HRS RAND	N Sample 1	N Sample 2
KLB033 W	Talkative	1- alot	2,343		
		2- a little	3,153		
		3- some	1,656		
		4- not at all	394		
		blank	10,923		
			n=7,610		
outgoing	= 1 if KLB033a=4	1- not at all	375	190	100
	= 2 if KLB033a=3	2- a little	1,407	756	496
	= 3 if KLB033a=2	3- some	3,261	1,848	1,362
	= 4 if KLB033a=1	4- alot	2,510	1,404	1,082
	= missing if else		n=7,553	n=4,198	n=3,040
friendly	= 1 if KLB033a=4	1- not at all	24	16	7
	= 2 if KLB033a=3	2- a little	258	130	78
	= 3 if KLB033a=2	3- some	2,137	1,164	779
	= 4 if KLB033a=1	4- alot	5,229	2,888	2,176
	= missing if else		n=7,648	n=4,198	n=3,040
lively	= 1 if KLB033a=4	1- not at all	173	99	55
	= 2 if KLB033a=3	2- a little	1,381	789	507
	= 3 if KLB033a=2	3- some	3,410	1,909	1,430
	= 4 if KLB033a=1	4- alot	2,615	1,401	1,048
	= missing if else		n=7,579	n=4,198	n=3,040

Code/name	Question/Measure	Response	N HRS RAND	N Sample 1	N Sample 2
active	= 1 if KLB033a=4	1- not at all	245	155	81
	= 2 if KLB033a=3	2- a little	1,165	626	397
	= 3 if KLB033a=2	3- some	3,131	1,733	1,264
	= 4 if KLB033a=1	4- alot	3,054	1,684	1,298
	= missing if else		n=7,595	n=4,198	n=3,040
talkative	= 1 if KLB033a=4	1- not at all	402	195	115
	= 2 if KLB033a=3	2- a little	1,666	920	670
	= 3 if KLB033a=2	3- some	3,181	1,791	1,303
	= 4 if KLB033a=1	4- alot	2,361	1,292	925
	= missing if else		n=7,610	n=4,198	n=3,040
extraversion	= outgoing + friendly + lively + active + talkative = missing if else	5-20	n=7,362	n=4,198	n=3,040

Note: * range for hhincome in Sample 1 changed to (0 - 5,039,892)

** range for hhincome in Sample 2 changed to (0 – 1,242,996)

*** range for loghhincome in Sample 1 changed to (-4.60517 - 15.4329)

**** range for loghhincome in Sample 2 changed to (-4.60517 - 14.03304)

***** range for totassets in Sample 1 and Sample 2 changed to (-769,100 - 81,800,000)

****** range for logtotassets in Sample1 and Sample 2 changed to (-4.61 - 18.22)

Table 5 lists all variables used in the analysis and provides sample means for binary, continuous, and categorical variables within the two samples used in the analyses, for weighted and unweighted samples. This table illustrates how the exclusion of non-visitors from Sample 2 changes the means of certain variables in my analysis.

Table 5

Means of Variables Used in Sample 1 and Sample 2

	Sample 1: Visitors & Non-visitors		Sample 2: Visitors Only	
Variables	Unweighted n=4,198	Weighted N=14,116*	Unweighted n=2,785	Weighted N=10,292*
visitor	0.724	0.729	0.724	1.000
visits	10.899	10.909	10.899	10.909
singlefamily	0.771	0.768	0.776	0.772
apartment	0.123	0.125	0.124	0.127
duplex	0.027	0.027	0.022	0.022
mobilehome	0.050	0.050	0.048	0.049
otherhome	0.029	0.029	0.031	0.029
safetyrating	3.985	4.054	4.049	4.108
homemodify	0.157	0.164	0.155	0.158
hhsize	1.969	1.940	1.923	1.901
familynear	.299	.299	.306	3.782
married	0.631	0.618	0.637	0.627
age	74.643	75.118	74.496	74.905
female	0.568	0.569	0.549	0.550
white	0.861	0.911	0.867	0.914
black	0.114	0.066	0.108	0.063
otherrace	0.025	0.023	0.025	0.023
hispan	0.032	0.021	0.026	0.017
working	0.150	0.146	0.144	0.141
yrseducation	12.369	12.571	12.575	12.736
income	50,241	52,051	50,880	53,057
	33,092**	33,632**	34,104**	34,618**

	Sample 1: Visitors & Non-visitors		Sample 2: Visitors Only	
Variables	Unweighted n=4,198	Weighted N=14,116*	Unweighted n=2,785	Weighted N=10,292*
loghhincome	10.391	10.430	10.432	10.474
assets	564,203	619,072	585,782	640,691
	243,250**	264,000**	260,200**	280,000**
logtotassets	11.410	11.629	11.609	11.808
extraversion	15.996	15.945	16.214	16.171
healthrating	3.123	3.150	3.200	3.226
diffwalking	0.333	0.332	0.307	0.303

Notes: * in millions

** connotes a median value

Statistical Analysis

Model 1: Housing Type and Visitor or Non-visitor Status

Having such a high proportion of individuals who had zero social visits per month creates problems in looking at the differences in the number of social visits per month because there may be a qualitative difference between going from zero to one social visit that does not exist for going two to three visits per month; further the individuals who have zero visits may be different than those who visits with neighbors. I investigate if the population of over age 65 *non-visitors*, or those with zero social visits with neighbors, is different than the population over age 65 *visitors*, or those with a positive number of social visits with neighbors, by comparing the means of the two groups. By running a t-test on the two groups of means for each variable, significant differences emerge in the composition of the two groups, based on the sample size of each. Table 6 provides the results from this test.

Table 6

Sample Means and T-tests: Non-visiting and Visiting Individuals Over Age 65

Variables	Non-visitor n / Visitor n	Non-visitor Means	Visitor Means	Difference	t-score
singlefamily	3,216 / 7,595	.743	.751	-.008	-.901
apartment	3,216 / 7,595	.129	.133	-.004	-.545
duplex	3,216 / 7,595	.036	.026	.010**	2.767s
mobilehome	3,216 / 7,595	.064	.058	.006	1.171
otherhome	3,216 / 7,595	.028	.033	-.004	-1.186
safetyrating	3,205 / 7,582	3.785	3.996	-.212***	-9.601
homemodify	3,142 / 7,416	.163	.158	.005	.645
hhsize	3,326 / 7,803	2.136	1.926	.210***	9.145
familynear	3,326/ 7,802	.272	.304	-.032***	-3.415
married	3,318 / 7,792	.536	.591	-.054***	-5.283
age	3,326 / 7,803	75.785	74.742	1.042***	6.382
female	3,326 / 7,803	.618	.553	.065***	6.462
white	3,326 / 7,803	.816	.844	-.028***	-3.597
black	3,326 / 7,803	.148	.126	.022***	3.079
otherrace	3,326 / 7,803	.036	.030	.006	1.622
hispan	3,326 / 7,803	.050	.041	.019***	4.103
working	3,313 / 7,786	.159	.151	.007	.991

Variables	Non-visitor n / Visitor n	Non-visitor Means	Visitor Means	Difference	t-score
yrseducation	3,305 / 7,755	11.536	12.219	-.682***	-9.416
income	3,216 / 7,595	46,179	48,727	-2,546	-.995
loghhincome	3,216 / 7,595	10.156	10.346	-.189***	-7.171
assets	3,216 / 7,595	460,670	573,056	-112,387**	-2.820
logtotassets	3,216 / 7,595	10.190	11.160	-.970***	-9.572
extraversion	1,216 / 3,156	15.379	16.209	-.830***	-9.090
healthrating	3,317 / 7,795	2.774	3.106	-.332***	-14.024
diffwalking	3,322 / 7,801	.448	.341	.107***	10.533

Notes: * $p < .05$, ** $p < .01$, *** $p < .001$, two-tailed test

The distribution of visitors and non-visitors changes slightly for some variable as I am only using the age restriction to look at these two groups. There are many significant differences between the means of two groups, which may illuminate some of the factors associated with the social isolation of the non-visitors. A larger proportion of non- visitors reside in duplexes (1%). This particular result and the association duplex dwellers have with non-visiting will be discussed further in this chapter and in Chapter 5.

Non-visitors have a lower average neighborhood safetyrating (-.212). This particular finding makes sense theoretically; those who feel unsafe are less likely to socialize with neighbors. The average household size is larger for the group of non-visitors (.210). This negative association between household size and social visits exists in all the models and

supports the idea that a larger household may create some sort of time constraint that keeps older adults from interacting with neighbors; however there may be other unmeasured factors also associated with having a larger household that detract from socialization with neighbors. Non-visitors also have lower rates of marriage (-5.4%), a slightly higher age (1.042), and a higher proportion of women (6.5%). Non-visitors are also more likely to choose black as their racial group (2.2%) and identify themselves as Hispanic (1.9%), have lower average years of education (-.682), assets (-$112,387), extraversion index score (-.830), healthrating (-.332), and a higher proportion of individuals who report difficulty walking several blocks (10.7%). These differences present a group of older adults who in many cases may be disadvantaged and socially isolated in situations where they would not chose social isolation. These differences are substantial enough to justify an analysis that separates these two groups. The first regression model, Model 1, is as follows:

Model 1

$$(Pr)Visitor_i = \alpha_0 + \alpha_1 apartment_i + \alpha_2 mobilehome_i + \alpha_3 duplex_i + \alpha_4 otherhome_i\,(X)_i + \varepsilon_1$$

I use a probit linear probability model in which the dependent variable is a dichotomous measure, *visitor,* representing an individual's status of having hardly any or no social visits with neighbors (0) or a positive number of social visits with neighbors (1). The primary independent variables are represented by *apartment, mobilehome, duplex,* and *otherhome*. Their coefficients (α_1 , α_2 , α_3, α_4) are z-scores having associated probabilities, which can be interpreted as increasing the probability of having any visits relative to those in single-family housing. In the results I include the z score, the corresponding probability and the robust standard error. Other

controls are represented by X_i. The hypotheses corresponding to this model, with H_0 as the null or negative hypothesis, are:

H_0= There is no relationship or there is a negative relationship between either apartment or duplex residence and whether a person has any social visits with neighbors per month.

H_1= Residence in an apartment, compared to a single-family dwelling, is associated with an increased probability that a person will have any social visits with neighbors per month.

H_2= Residence in a duplex or two-family home, compared to a single-family dwelling, is associated with an increased probability that a person will have any social visits with neighbors per month.

This analysis uses robust standard errors, or Eiker-Huber-White standard errors. The inclusion of these in an analysis is a standard practice to account for potential heteroskedasticity in the error term, ε_1 , of the model. It is likely that the variance of the error term is not predictable for a given individual and in particular depends on certain of the variables in the model. Using standard errors that account for this unpredictability are helpful in avoiding a type 1 error, where the null hypothesis is rejected when it should not have been. This type of standard error is also helpful in accounting for some, but not all, of the bias resulting from the complex sample design, and the potential bias resulting from clustering on the associations of certain variables. I discuss how this potential bias affects the interpretation of my results in Chapter 5.

Model 2: Housing Type and the Number of Visits

The second model used in the analysis excludes the sample of respondents with non-visitor status. The results of this model correspond to the original research question, which is: "Is residence in a multi-family home, relative to residence in a single-family home, associated with a greater number of social contacts with neighbors among individuals over 65?" The results of this model should now exclude the associations between certain variables and the change from zero to a positive number of social visits per month. Excluding this group should reduce the possible bias in the magnitudes of association between certain variables and the addition of one social visit with neighbors per month. This model will use robust standard errors for the same reasons listed in the discussion on model 1. Model 2 represents a standard linear regression, as follows:

Model 2

$$Visits_i = \beta_0 + \beta_1 apartment_i + \beta_2 mobilehome_i + \beta_3 duplex_i + \beta_4 otherhome_i \ \beta(X)_i + \varepsilon_i$$

The dependent variable for Model 2 is represented by *Visits*, which is a continuous measure of the number of social visits with neighbors per month (1-30), for those with at least one social visit per month. The primary independent variables are represented by *apartment, mobilehome, duplex,* and *otherhome*. Their coefficients (β_1 , β_2 , β_3, β_4) represent the predicted change in social visits per month related to residence in an apartment, mobilehome, duplex, or other housing type relative to a similar person residing in a single-family home. The list of control variables is represented by X_i. The hypotheses associated with this model, with H_0 as the null or negative hypothesis, are:

H_0 = There is no relationship or there is a negative relationship between either apartment or duplex residence and the number of social visits with neighbors per month for individuals with any social visits per month.

H_1= Residence in an apartment or townhome, compared to a single-family dwelling, is associated with an increase in the number of social visits with neighbors per month for individuals with any social visits per month.

H_2 = Residence in a duplex or two-family home, compared to a single-family dwelling, is associated with an increases in the number of social visits with neighbors per month for individuals with any social visits per month.

There is no hypothesis for mobilehome dwelling because these housing types are either situated in rural areas with a great deal of land between each, or they are situated in mobile home parks where they are in close proximity to neighbors. There is also no hypothesis for otherhome because I do not have any information on the different distributions within this housing type. The possibilities listed in the HRS codebook include: co-op, rooming house, recreational vehicle, motor home, van, car, boat, barn, convent, jail/prison, villa, in transition, garage, HUD housing, trailer, motel, and orphanage.

Summary

I used the life-course framework supplied by Erickson and Moen (2003) to guide my variable selection from the 2006 Health and Retirement Study. After looking at the distribution of the dependent variable, it became clear that I could not assume a normal distribution of the number of social visits per month because 25% of my sample had zero social visits with

neighbors per month. In this study I attempt to reduce the sample selection error created by this distribution, and better understand the relationship between housing type and social visiting, by creating two models. There are more advanced statistical techniques for handling this type of sample selection, specifically Heckman's sample selection model (Heckman, 1976). This model uses the same basic technique of separating the analysis into two samples, but adds an instrumental variable to control for the endogeneity of housing type. This type of analysis could be used in any further development of this research that uses cross-sectional data; however, this research attempts to approximate his model.

Analysis on model 1 will help determine the relationship between housing type and the likelihood of visitor status through a probit model. The analysis for model 2 will define the number of social visits per month for those with a positive number of visits and regress the housing type variables and set of controls on this continuous variable. The hypotheses for both models posit a positive relationship between residence in an apartment and duplex dwelling and the dependent variables. That is, residence in multi-family housing should be associated with an increased likelihood of having any visits with neighbors and associated with an increase in the number of visits with neighbors.

CHAPTER 4

RESULTS

Model 1: Visiting vs. Non-visiting Older Adults

The original results from this analysis are in marginal effects taking the form: $\frac{dF(X)}{dX}$. A transformation command allows us to read these marginal effects as changes in probability. The following table, Table 7, shows the marginal effect, α, and the percent change in probability when an individual goes from a 0 in the independent variable to a 1. So, in the case of the independent variables accounting for housing type, the results can be read as an associated change in probability of having any visits when an individual lives in an apartment, mobile home, duplex, or other housing type compared to a similar individual living in a single-family home.

Independent Variables

These findings fail to reject the null hypothesis for the relationship between living in an apartment and having visitor status. While there is an associated change in probability of 2.4% of having any visits when an individual lives in an apartment instead of a similar individual living in a single-family home, this analysis does not support there being a significant relationship between living in an apartment and being more likely to have any visits.

The results also fail to reject the null hypothesis for those living in a duplex compared with similar individuals living in single-family homes. The magnitude on this coefficient is highly significant and negative. The probability estimate shows that duplex dwellers are less

likely, by a difference in probability of 11.4%, to have any visits at all. This sample includes a very small number of duplex residents, n=114, so the relationship between residence in a duplex for the population of this study is still indeterminate; however, this population is a source of potential interest for future studies on the relationship between housing and social contact. Potential factors in this correlation might be residing in an unsafe neighborhood or public housing, and will be discussed further in Chapter 5. Table 7 presents the results from this analysis.

Table 7

Probit Results

Variable	α	*SE*	Probability Change (minimum to maximum)
(single-family omitted)			
apartment	0.074	0.072	0.024
duplex	-0.320***	0.123	-0.114
mobilehome	-0.077	0.096	-0.026
otherhome	0.150	0.131	0.047
safetyrating	0.087***	0.023	0.120
homemodify	-0.003	0.058	-0.001
hhsize	-0.103***	0.025	-0.496
familynear	0.099*	0.047	0.032
married	-0.043	0.056	-0.014
age	-0.007*	0.003	-0.098
female	-0.215***	0.046	-0.070
black	0.045	0.074	0.015
otherrace	0.097	0.139	0.031

Variable	α	*SE*	Probability Change (minimum to maximum)
hispan	-0.114	0.120	-0.039
working	-0.252***	0.063	-0.087
yrseducation	0.024**	0.008	0.139
loghhincome	-0.003	0.024	-0.020
logtotassets	0.012	0.006	0.093
extraversion	0.058***	0.008	0.312
healthrating	0.052*	0.024	0.068
diffwalking	-0.079	0.051	-0.026

Notes: * $p < .05$, ** $p < .05$, *** $p < .001$, n= 3,709

Control Variables

Among the control variables, the analysis revealed several significant relationships that make intuitive or theoretical sense. There is an increased probability of having any visits and a one category increase in the self-reported neighborhood safety rating. An increase of one individual in the household size is associated with a lower probability of having any social visits. Having family near is associated with an increase in the probability of having any social visits with neighbors. An increase in age, being female, and working status are associated with decreased probabilities of having any social visits, while an increase in years of education, extraversion index scores, and self-reported health rating is associated with increased probabilities of having any social visits with neighbors. I will discuss the implications of these findings and their relationship to the findings of model 2 in Chapter 5.

Model 2: The Number of Visits for Older Adults

The original hypothesis driving this research was that residence in multi-family housing could make social contact more accessible to older adults. The level of social integration that residence type is likely to have the most association with is social contact with neighbors. Unfortunately, a continuous measure on the number of social contacts with neighbors including zero visits may inadvertently bias the results for reasons discussed previously. Restricting the dependent variable to 30 visits as the maximum also helped control for upward bias in the coefficients.

The analysis used robust standard errors to further control for any bias that would result in a type 1 error, where the null hypothesis is mistakenly rejected. However, the analysis is still inconclusive for several reasons including the small sample size, the inclusion of individuals from the same household, and the complex sample design of the HRS. These issues, how they affect the implications of these results, and how they might be addressed in future studies, will be discussed further in Chapter 5.

Independent Variables

The linear regression model, using robust standard errors, displays the results for each of the independent variables in a numerical coefficient that translates to the change in the number of social visits with neighbors per month that a person residing in that housing type is expected to have relative to a comparable individual residing in a single-family home. This analysis supports a rejection of the null hypothesis for respondents residing in an apartment, n= 376. The coefficient on apartments is 3.943 with a p-value of 0.000. These results suggest that compared with individuals similar in the variables in this analysis and living in single-family homes,

residing in an apartment is associated with having almost four more social visits with neighbors per month.

The results support a failure to reject the null hypothesis for those residing in a duplex, n=67. The small sample of respondents residing in a duplex makes the presence of a positive association with the number of social visits per month inconclusive. The coefficient is positive, but because of the significant negative association with visitor status in the first model, the results are even more inconclusive. Also, given the results in the first model, it is possible that there are characteristics of duplex dwellers either in the population or just in this sample that make them less likely to socialize with neighbors.

Interestingly, respondents who live in other housing types, and who are clumped together as a group n=93, have an even larger associated difference in social visits with neighbors, than those who live in apartments. The coefficient is 5.571 with a p-value of 0.000. Because I cannot know anything about the distribution of the different housing environments, it is difficult to make any inferences about this group; however, learning more about this group might be an interesting avenue of research on older adults.

The implications of the results on apartment dwellers, given their preliminary nature and concerns about their validity, will be discussed further in Chapter 5. Table 8 displays the β coefficients and robust standard errors from the linear regression results.

Table 8

Linear Regression Results

Independent variable (single-family omitted)	β	*SE*
apartment	3.943***	0.703
duplex	0.553	1.275
mobilehome	1.806	0.930
otherhome	5.571***	1.257
safetyrating	0.498*	0.221
homemodify	1.105*	0.539
hhsize	-0.703**	0.266
familynear	-0.134	0.423
married	-0.257	0.527
age	-0.007	0.030
female	-0.718	0.413
black	0.371	0.696
otherrace	-1.376	1.357
hispan	0.860	1.395
working	-1.710**	0.559
yrseducation	-0.267***	0.076
loghhincome	0.090	0.213
logtotassets	-0.090	0.071
extraversion	0.348***	0.076
healthrating	0.275	0.224
diffwalking	0.344	0.480

Notes: ** $p > .01$, *** $p > .001$, n= 2,785

Control Variables

While it is difficult to compare the outcomes of the probit and linear regression, it is interesting to compare the results because they help illuminate some of the factors associated with social isolation versus the number of social visits. In many cases the same relationships that are associated with social isolation are also associated with having fewer social visits with neighbors. These shared factors are a lower neighborhood safetyrating, increased household size, a positive working status, and a decreased extraversion index score.

Other results are more interesting because they are different than the results on having any social visits. The presence of home modifications is associated with an increase in the number of social visits, adding about one visit per month, but had no significant relationship with having any. Perhaps the cost associated with not having necessary home modifications is not enough to discourage making the effort to socialize with neighbors, but it is enough to decrease the frequency of those interactions.

The results on education are interesting because the direction of the association reverses from the first model. This change might support the idea that education is actually serving as a proxy for other characteristics, like intelligence, the energy invested in employment, or how future oriented an individual is. The ability to complete successive years of education may be associated with abilities and preferences that make a person more likely to be capable of having any social relationships with neighbors; however, more years of education might also be related to more demanding careers that make an individual less likely to have the time or interest to be social with neighbors. Future analysis might use variables capturing educational levels rather than years to get a better idea of the actual relationship between education and social contact with neighbors.

Summary

The analysis in this study supports the original hypothesis for a positive relationship between residence in an apartment and the number of social visits with neighbors per month, with a coefficient of 3.943; however, this relationship is not supported between residence in a duplex and the number of social visits with neighbors per month. More surprising, residing in a duplex is associated a strong decrease in probability (-11%) of having any social visits with neighbors. These preliminary results, while not without the potential for error, are strong and support further investigation.

The results on Model 1 suggest that there may be a negative association between residence in a duplex and having a positive number of social visits with neighbors; however the sample of duplex residents is small, n= 114, and therefore the results are more prone to error. The characteristics of duplex dwellers and potential avenues of future research on this population will be discussed in the next chapter.

Other interesting differences exist between the two models, suggesting that the conditions related to social isolation from neighbors are not the same as those that encourage more visits between neighbors. The presence of home modifications has no significant relationship to the probability of having any social visits, but is associated with an increase in the number of visits by about one visit per month. As previously mentioned, education has opposite associations in the two models. An increase in education by one year is associated with an increase in the probability of having any social visits, but is associated with a decrease in the number of social visits. Being female is associated with a 7% decrease in the probability of having any social visits with neighbors, but has no significant results in the second model. These differences

should be investigated more formally in an attempt to understand how housing type and other characteristics might relate to social isolation versus the quantity of socialization.

CHAPTER 5

DISCUSSION

Review of Findings

The research question for this study asks: "Is residence in a multi-family home, relative to residence in a single-family home, associated with a greater number of social contacts with neighbors among individuals over 65?" The two housing types available in this dataset that fall under the category of multi-family housing are apartments and duplexes. The hypotheses and results of these multivariate analyses are mainly concerned with the results on these two variables; however, some of the other results will be evaluated in the discussion of how to improve upon this study and other future studies. In this section on the review of findings, I will restrict discussion to the results on residence in apartments and duplexes.

The analysis in model 2 supports an association between residence in an apartment and an increase in the number of social visits per month with neighbors, at 3.943, for adults over age 65 who have a positive number of social visits per month with neighbors. The magnitude of these results is highly significant, at p=0.000, and a change of almost four social visits per month is substantial. However, there is no statistically significant relationship in the results for model 1 between residence in an apartment and the probability of having a positive number of social visits per month. These findings, while only intending to address the factors involved in an increase in the number of social visits with neighbors, reveal something about the factors involved in being socially isolated from neighbors. Understanding how to apply these findings

and the implications that more robust findings might have will be discussed in the section on implications.

The results on duplex dwelling also provide evidence toward the research question. The results of model 1 support a failure to reject the null hypothesis, but further, they support a negative association between residence in a duplex and the probability of having any social visits with neighbors. The small number of duplex dwellers in the sample increases the possibility of a bias in the results. Because there is such a small group (n=114) and it has not been randomly selected from the population of duplex dwellers age 65 and over, there is some chance that this group randomly shares some other unmeasured characteristic that is related to both their dwelling in a duplex and their social isolation from neighbors.

The results from model 2, which demonstrate no significant relationship and a positive magnitude on the association of duplex dwelling and the number of social visits, support the inconclusive nature on the findings from model 1. There may be some subgroup of duplex dwellers who share certain characteristics that might make them more prone to social isolation. Or there is a characteristic that all duplex dwellers over age 65 share that makes them less likely to participate in social interactions with neighbors.

I ran a preliminary investigation on the characteristics associated with duplex dwelling with a probit model regressing the list of controls used in this study. Based on these results I identified that being married is associated with a decrease in the probability of duplex dwelling as is an increase in total assets. Those who are older and still working are also more likely to be duplex dwellers. These factors paint a picture of a group of individuals who may be struggling financially in older age and that the time constraints this situation creates may promote social

isolation even when neighbors are in close proximity, as in duplex dwelling. Future studies should investigate the population of duplex dwellers more fully.

Weaknesses of Study

The Issue of Variable Construction

It is important to take note that the variable construction of housing type is not hypothesizing a direct causative relationship in the housing type itself. For this investigation, I made assumptions about characteristics associated with single-family dwellings and multi-family dwellings involving neighbor proximity and density of neighbors. It is impossible to know if these characteristics hold, because even if we evaluated the number of units in the structure, we cannot know how many of those units are occupied. More in-depth variables, including neighbor density, proximity, and the availability of public spaces in which to socialize would all be more precise measures of the mechanisms I think are involved in this relationship.

There may also be issues with the construction and reporting in the main dependent variable of the number of social visits with neighbors. While the HRS asks the individual to enumerate instances of "a social visit or just for a chat," what counts as a social visit is still ambiguous. A greeting may count as a social visit for some, while no less than a shared meal counts for others. The reporting of these subjective assessments may also be biased by an individual's personality and mood. A visit to someone else in the household may count as a personal visit for some but not for others. The issue of counting social visits that are not actually intended for the respondent might be addressed in the future through methods that account for this clustering of responses; however, when we are looking at the spectrum of social visits for the potential they hold, not just for creating friendly and supportive relationships, but to provide a

network of people who know an older adult, the distinction between these types of visits becomes less critical. Household size is negatively associated with both having any visits and the number of visits, but it is still important to address the potential clustering of social visits because it may create a potential bias in the results, especially if many of the respondents share households.

This study initially conceptualized social contact through the number of visits with neighbors and included those with a low number or zero social visits in with the same group as those who have many. While controlling for certain factors does account for these differences, having a quarter of the sample with zero visits skewed the distribution of my dependent variable and violated the assumptions of normality in the regression analysis. Separating the analysis into two parts helped correct for some of this sample selection bias, but makes the relationship between the tow models tenuous. As previously discussed, the use of Heckman's (1976) sample selection model, which adds an instrumental variable into a two-stage estimation technique, would help correct for the issue of sample selection. The instrument in the second stage would help account for endogeneity in the independent variable of housing type. Because people typically choose where they reside, they might choose their housing type based on motives for more social contact. An instrument, or additional variable that captures a relationship with one variable but not the other, would help measure the association between housing type and social visits just for the exogenous or random part of housing type.

The use of a Heckman (1976) sample selection model would optimize the results on a cross-sectional model of the research question, but the most effective methods for researching this question are through a longitudinal analysis. The HRS is a panel study and would provide data on individuals moving between residence types. This method would be helpful because the

analysis would not have to account for differences between individuals; however, it would need to account for differences in an individual across time like age, health, and employment, and changes in familial and other residential circumstances.

Issues of HRS Sample Design

The HRS was designed using randomly selected households, with an over-sampling of black and Hispanic households, as the unit of identification. Older adults within the sample I constructed may be part of the same household; thus, the characteristics associated with the household, including housing type, income, neighborhood safety rating, and the presence of home modifications will all be highly correlated with other individuals, most likely a spouse, living within the home. Researchers have found individual characteristics, such as race, education, and assets to be highly correlated between spouses (Boulier & Rosenzweig, 1984). Even personality characteristics such as extraversion, dominance, quarrelsomeness, and ingenuousness have been correlated among spouses (Buss, 1984). Family arrangements, the presence of a spouse or partner, and having adult children living within ten miles will likely be the same for older adults in my sample living in the same home. If a social visit occurs where multiple members of a household are present, that visit will be counted multiple times by people who are identical in many categories, most importantly in their housing type. This extra weight may create a bias in the results on housing type. A further development of this study should use more advanced statistical techniques to account for the specific design of the HRS that creates this potential bias when using members of the same household.

Another issue with these results might be omitted variable bias. Some contextual factors were considered theoretically relevant to the research such as the years an individual has resided

in a home and the years an individual has resided in the area, but were omitted because of low levels of correlation with the dependent variable of social visits per month and because they had a low level of respondents in the sample. Access to more responses from these questions might be available in previous panels of the HRS and might be compiled to provide more representational correlations.

Another set of factors I considered theoretically relevant but did not include were measures of whether or not an individual resided in an urban or rural setting. This might help provide some indication of housing density and proximity to neighbors. These data were not available in the HRS, but might be tied in through census information or other datasets in future studies.

Implications

It is important to note that being socially isolated from neighbors is not conclusively a negative outcome. It could merely suggest that an older adult is not particularly socially integrated in his or her neighborhood. He or she may be benefitting from familial and other resources, but isolation from neighbors may decrease the availability of resources from that group of individuals in closest proximity.

This paper argues that for the population of older adults, social contact with neighbors is beneficial. If these results on apartment dwellers from this sample could be extended to the population of adults age 65 and over in the United States, then the implications for future housing policy, development, and individual choices about housing could be quite dramatic. It is important to emphasize future housing choices here, because most older adults wish to age in place (Redfoot, 2010) and most currently reside in single-family housing.

The addition of four social visits per month might be enough to satisfy both the biological and socio-structural motives toward socialization. An additional four social visits could promote health through increasing cognitive function (Baltes & Baltes, 1990; Rowe & Kahn, 1998). If these visitations involve walking or other physical activities, they would provide an added benefit toward an individual's optimal aging by maintaining physical activities.

An additional four visits per month might even be enough social contact to supply the values described by Cornwell (2008) as derived from the usefulness of social relationships: 1) the cultivation of a stable system of social obligations and trustworthiness; 2) access to information and resources; 3) the creating of norms and effective sanctions; and 4) opportunities for exchange and power (Coleman, 1988; Cornwell, 2008). These additional four visits per month are certainly enough to support the idea that older adults who reside in apartments have higher levels of social capital and are more socially integrated with their neighbors than those who reside in single-family homes.

Additionally, if these results are confirmed, they will support the association between residence in apartment and higher levels of socialization with neighbors, already supported by Glaeser and Sacerdote (2000) for the general population, to the population of adults age 65 and over. As previously stated, these findings could be particularly valuable for those concerned with the development of housing for older adults or with encouraging certain trends in how older adults choose their housing. As the literature review in this paper suggests, neighboring relationships, through filling holes in support networks, may have the power to forestall the need for more expensive support options. Some of these more expensive supports are: in-home care through health insurance, paying for in-home support out of pocket, moving to a new residence closer to family, moving to supportive housing, or requiring family members or other supports to

move closer to the older adult in need. Residence in apartment type housing might be a better option for older adults who are downsizing or for individuals who are choosing housing in which they hope to age in place. These results demonstrate that residential arrangements, especially through the type of residence, are a crucial factor in the structural integration, in terms of social contact, of adults over age 65.

Summary

In an economy dependent on the creation of financial resources, it may be easy for individuals to forget that many of our most vital resources are created in the relationships we build with one another. The housing environment holds a great deal of power in its ability to facilitate or deter social interaction and to build both passive and active support systems. In this study, I investigated the question of what type of housing best facilitates this contact. The literature review provided evidence that a higher number of contacts is beneficial to elders living independently, an argument for the benefits of neighboring, a framework toward the construction of this research, and support for the association between multi-family housing and increased contact with neighbors. Results from an analysis of cross-sectional data from the 2006 Health and Retirement Study (HRS) support the hypothesis that residence in apartments, but not duplexes, is associated with an increase in an older adult's socialization with neighbors. The magnitude and significance of this relationship, even given the variety of weaknesses in this study, justify further analysis of this research question.

References

Adams, K. B. (2004). Changing investment in activities and interests in elders' lives: Theory and measurement. *The International Journal of Aging and Human Development, 58*(2), 87-108.

Adolphs, R. (2001). The neurobiology of social cognition. *Current opinion in neurobiology, 11*(2), 231-239.

Baker, M., Stabile, M., & Deri, C. (2001). "What do self-reported, objective measures of health measure?". *Journal of Human Resources*, *39*(4), 1067-1093

Baldassare, M. (1978). Human spatial behavior. *Annual Reviews in Sociology, 4*(1), 29-56.

Baltes, M. M. (1996). *The many faces of dependency in old age*. Cambridge, U.K.: Cambridge University Press.

Baltes, P., & Baltes, M. (1990). Psychological perspectives on successful aging: The model of selective optimization with compensation. In Baltes, P., & Baltes, M. (Eds.), *Successful aging: Perspectives from the behavioral sciences* (pp. 1-34). Cambridge, U.K.: Cambridge University Press.

Barker, J. C. (2002). Neighbors, friends, and other non-kin caregivers of community-living dependent elders. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 57*(3), S158.

Becker, G. S. (1964). *Human capital*. New York, NY: Columbia University Press (for the National Bureau of Economic Research).

Boulier, B. L., & Rosenzweig, M. R. (1984). Schooling, search, and spouse selection: Testing economic theories of marriage and household behavior. *The Journal of Political Economy*, 712-732.

Bruce, M. L. (2002). Psychosocial risk factors for depressive disorders in late life. *Biological Psychiatry, 52*(3), 175-184.

Brueckner, J. K., & Largey, A. G. (2008). Social interaction and urban sprawl. *Journal of Urban Economics, 64*(1), 18-34.

Buss, D. M. (1984). Toward a psychology of person-environment correlation: The role of spouse selection. *Journal of Personality and Social Psychology, 47*(2), 361-377.

Cannuscio, C., Block, J., & Kawachi, I. (2003). Social capital and succesful aging: The role of senior housing. *Annals of Internal Medicine, 139* (5 (Part 2)), 395-399.

Cantor, M. H. (1979). Neighbors and friends. *Research on Aging, 1*(4), 434-448.

Carstensen, L. L. (1992). Social and emotional patterns in adulthood: Support for socioemotional selectivity theory. *Psychology and Aging, 7*, 331-331.

Cobb, S. (1976). Presidential Address -1976: Social support as a moderator of life stress. *Psychosomatic medicine, 38*(5), 300.

Cohen, S., Sherrod, D., & Clark, M. (1986). Social skills and the stress protective function of social support. *Journal of Personality and Social Psychology, 50*, 963-973.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 95-120.

Cornwell, B. (2008). *Physical function and social action: Implications for social connectedness.* Retrieved from ProQuest Digital Dissertations (AAT 3272997)
Chicago, IL: The University of Chicago.

Cornwell, B., Laumann, E. O., & Schumm, L. P. (2008). The social connectedness of older adults: A national profile. *American Sociological Review, 73*(2), 185-203.

Erickson, M. A., & Moen, P. (2003). Social participation and integration. In E. Wethington, P. Moen, N. Glasgow & K. Pillemer (Eds.), *Residential choices and experiences of older adults: Pathways to life quality* (pp. 93-113). New York, NY: Springer Publishing Co.

Festinger, L., Schachter, S., & Back, K. (1950). *Social pressures in informal groups*. Stanford, CA: Stanford Univ. Press Stanford, Calif.

Folts, W. E., & Muir, K. B. (2002). Housing for older adults: New lessons from the past. *Research on Aging, 24*(1), 10-28.

Fratiglioni, L., Wang, H. X., Ericsson, K., Maytan, M., & Winblad, B. (2000). Influence of social network on occurrence of dementia: A community-based longitudinal study. *The Lancet, 355*(9212), 1315-1319.

Frumkin, H., Frank, L. D., & Jackson, R. (2002). Urban sprawl and public health. *Public Health Reports, 117*(3), 201-218.

Glaeser, E. L., Laibson, D., & Sacerdote, B. (2002). An economic approach to social capital. *The Economic Journal, 112*(483), 437-458.

Glaeser, E. L., & Sacerdote, B. (2000). The social consequences of housing. *Journal of Housing Economics, 9*(1-2), 1-23.

Golant, S. M. (1998). Changing an older person's shelter and care setting: A model to explain personal and environmental outcomes. In P. G. Windley & R. J. Scheidt (Eds.), *Environment and aging theory: A focus on housing* (pp. 34–60). Santa Barbara, CA: Greenwood Press.

Heckman, J. J. (1976). The common structure of statistical models of truncation, sample selection and limited dependent variables, and a simple estimator for such models. Retrieved March 26, 2011 from http://www.nber.org/chapters/c10491.pdf

Holmén, K., & Furukawa, H. (2002). Loneliness, health, and social network among elderly people: A follow-up study. *Archives of Gerontology and Geriatrics, 35*(3), 261-274.

House, J. S. & Kahn, R. L. (1985) Measures and concepts of social support. In Cohen S. and Syme, S. L. (Eds.), *Social support and health* (pp. 83-108). San Diego, CA, US: Academic Press.

House, J. S., Umberson, D., & Landis, K. R. (1988). Structures and processes of social support. *Annual Review of Sociology, 14*, 293-318.

Hoyer, William J. & Roodin, P. (2009). *Adult development and aging* (6th ed.). New York, NY: McGraw Hill.

Hsia, R., & Shen, Y. C. (2011). Possible geographical barriers to trauma center access for vulnerable patients in the United States: An analysis of urban and rural communities. *Archives of Surgery, 146*(1), 46.

Kahn, R. L., Wethington, E., & Ingersoll-Dayton, B. (1987). Social support and social networks: Determinants, effects, and interactions. In R. P. Abeles (Ed.), *Life-span perspectives and social psychology* (pp. 139-165). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Lawton, M. P. (1980). *Environment and aging*. Belmont, CA: Brooks-Cole.

Lawton, M. P. (1998). Environment and aging: Theory revisited. In R. J. Scheidt & P. G. Windley (Eds.), *Environment and aging theory: A focus on housing* (pp. 1–31). Santa Barbara, CA: Greenwood Press.

Lawton, M. P., & Simon, B. (1968). The ecology of social relationships in housing for the elderly. *Gerontologist, 8*(2), 108-115.

Lemon, B. W., Bengtson, V. L., & Peterson, J. A. (1972). An exploration of the activity theory of aging: Activity types and life satisfaction among in-movers to a retirement community. *Journal of Gerontology, 27*(4), 511.

Lewin, K. (1951). *Field theory in social science*. New York, NY: Harper.

Leyden, K. M. (2003). Social capital and the built environment: the importance of walkable neighborhoods. *American Journal of Public Health, 93*(9), 1546.

Moen, P. (1995). A life course approach to postretirement roles and well-being. In I. A. Bond, S. J. Cutler & A. Grams (Eds.), *Promoting successful and productive aging*, (pp. 230-257). Thousand Oaks, CA; Sage.

Moen, P., Dempster-McClain, D., & Williams, R. M. (1989). Social integration and longevity: An event history analysis of women's roles and resilience. *American Sociological Review, 54*(4), 635-647.

Mroczek, D. K., Spiro III, A., & Griffin, P. W. (2006). Personality and Aging. In J. E. Birren & K. W. Schaire (Eds.), *Handbook of the psychology of aging* (6 ed., pp. 363-377). Amsterdam, Netherlands: Elsevier.

Musick, M. A., Herzog, A. R., & House, J. S. (1999). Volunteering and mortality among older adults: Findings from a national sample. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 54*(3), 173-180.

Ozer, D. J., & Benet-Martinez, V. (2006). Personality and the prediction of consequential outcomes. *Annual Review of Psychology., 57*, 401-421.

Parmelee, P. (1998). Theory and research on housing for the elderly: The legacy of Kurt Lewin. In R. Scheidt & P. Windley (Eds.), *Environment and aging theory: A focus on housing* (pp. 161–185). Santa Barbara, CA: Greenwood Press.

Pearlin, L. I., Mullan, J. T., Semple, S. J., & Skaff, M. M. (1990). Caregiving and the stress process: An overview of concepts and their measures. *The Gerontologist, 30*(5), 583.

Putnam, R. D. (1995). Bowling alone: America's declining social capital. *Journal of Democracy, 6*, 65-65.

Redfoot, D. (2010). Trends in disability, community living, and caregiving: Analysis of data from the national long-term care survey. Retrieved March 26, 2011 from http://www.aarp.org/relationships/caregiving/info-09-2010/0927-ltc-health.html

Reuben, D. B., Siu, A. L., & Kimpau, S. (1992). The predictive validity of self-report and performance-based measures of function and health. *Journal of Gerontology, 47*(4), M106.

Rosow, I. (1967). *Social integration of the aged*. New York, NY: Free Press.

Ross, H. K. (1983). The neighborhood family: Community mental health for the elderly. *The Gerontologist, 23*(3), 243-247.

Rowe, J. W., & Kahn, R. L. (1998). *Successful aging*. New York, NY: Dell.

Rusbult, C. E. (1980). Commitment and satisfaction in romantic associations: A test of the investment model. *Journal of Experimental Social Psychology, 16*(2), 172-186.

Shaw, B. A. (2005). Anticipated support from neighbors and physical functioning during later life. *Research on Aging, 27*(5), 503.

Vincent, G. K. & Velkoff, V. A. (2010). The next four decades: The older population in the United States: 2010-2050. *Population Estimates and Projections:* U. S. Bureau of the Census. Retrieved March 26, 2011 from: http://www.census.gov/prod/2010pubs/p25-1138.pdf

Wahl, H. W., & Weisman, G. D. (2003). Environmental gerontology at the beginning of the new millennium: Reflections on its historical, empirical, and theoretical development. *The Gerontologist, 43*(5), 616.

Wethington, E., & Kavey, A. (2000). Neighboring as a form of social integration and support. In E. Wethington, P. Moen, N. Glasgow & K. Pillemer (Eds.), *Social integration in the second half of life* (pp. 191-210). Baltimore, MD: The Johns Hopkins University Press.

Wethington, E., Moen, P., Glasgow, N., & Pillemer, K. (2000). Multiple roles, social integration, and health. In E. Wethington, P. Moen, N. Glasgow & K. Pillemer (Eds.), *Social integration in the second half of life* (pp. 48-71). Baltimore, MD: The Johns Hopkins University Press.

World Health Organization (1946). Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference. *Official Records of the World Health Organization*. 100

Wu, K. (2010). Impact of modernizing the American poverty measure on the poverty status of older persons. Retrieved March 24, 2011 from http://assets.aarp.org/rgcenter/ppi/econ-sec/fs205-economic2.pdf