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Disabled and Out? Social Interaction Barriers and Mental Health among Older Adults with Physical Disabilities

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DISABLED AND OUT? SOCIAL INTERACTION BARRIERS AND MENTAL HEALTH AMONG OLDER ADULTS WITH PHYSICAL DISABILITIES

by

Raeda K. Anderson

A DISSERTATION

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DISABLED AND OUT? SOCIAL INTERACTION BARRIERS AND MENTAL
HEALTH AMONG OLDER ADULTS WITH PHYSICAL DISABILITIES

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University of Nebraska, 2018

Advisors: Regina Werum and Julia McQuillan

Over one-third of older adults in the U.S. are physically disabled. Having a
disability is a chronic stressor for older adults, and this chronic stress significantly
compromises mental health. Because disablement likely restricts older adults' ability to
engage in interpersonal interactions, the link between physical disability and mental
health may reflect consequences of such unmet social needs. Social interactions are
associated with better mental health, yet prior work on social context of disablement
focuses on the quality of social relations or perceptions of support, not on actual access to
social interactions. There remains a need to understand how and why physical disability
affects individuals' desire for and ability to engage in interactions. Improving scientific
understanding of factors shaping social interactions patterns is important because a lack
of social interactions is associated with poor mental health, lower self-rated health,
greater healthcare utilization and expenditures, and increased mortality risks.

The main objective of this dissertation is to advance scientific understanding of
how barriers to social interactions shape mental health among older adults with physical
disabilities. Specific objectives aimed at exploring the effects of unique interpersonal and
environmental barriers to social interactions experienced by disabled older adults were
examined with longitudinal data from a nationally representative survey of older adults
(National Social Life, Health and Aging Project), complemented by 60 semi-structured interviews with older adults living with physical disabilities.

Specifically, I use quantitative and qualitative data to analyze the differential effects of the social environment and of the physical environment for people with disabilities’ mental health. Drawing on social psychology research, this project also employs interviews to examine the effect internal dialogue by people with disabilities has on their social life and their mental health outcomes. Finally, integrating theoretical frameworks used in sociology and gerontology, this project analyzes the relationship between physical disability, social interactions, and mental health outcomes by gender. Results highlight that having a physical disability is associated with less frequent social interactions, feelings about social interactions, and alters locations of social interactions. The relationship between physical disability and social interactions in turn relates to an inverse relationship with mental health.
DEDICATION

“The thing y’all need to understand is disability affects more than just my body.”

- Momma Rose

I dedicate this dissertation to my mother who is a paraplegic and sparked my dissertation with just one sentence.
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RAMPS study because without their willingness to share their experiences this study would not have been possible. I firmly believe that to understand a person with disabilities experience, you need to listen to people with disabilities’ experiences.

I earned degrees from Valdosta State University prior to coming to the University of Nebraska-Lincoln. The knowledge and intellectual growth fostered within their applied sociology program shaped my desire to pursue a career within social science research. Dr. Kathleen Lowney continues to be my mentor and without her support I would not be a Sociologist. Dr. Lowney was the first person in my academic career who challenged me to be a producer rather than solely a consumer of knowledge.

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CHAPTER 1: INTRODUCTION

More than one-third of U.S. adults over the age of 65 have functional or mobility-related limitations (Brault 2012) that can become a significant chronic stressor. Older adults with physical limitations report worse mental health on a wide range of indicators, including depressive symptoms (Bierman and Statland 2010; Fifield et. al 1998), self-esteem (Reitzes and Mutran 2006), positive affect (Caputo and Simon 2013), and loneliness (Warner and Adams 2016). Because functional limitations also potentially restrict the ability of older adults to engage in desired social roles (Verbrugge and Jette 1994), the association between physical disability and mental health may reflect unmet social needs. Indeed, prior work has firmly established that social interactions are associated with better mental health (Ozbay et al. 2007; Umberson and Montez 2010).

Yet, prior research on the social context of disablement has largely focused on the quality of social relations or perceptions of social support (Warner and Kelley-Moore 2012), rather than on the ability and desire of older adults with physical disabilities to engage in the types of social interactions that are prerequisites for the development and maintenance of high quality interpersonal ties, such as visits with friends and neighbors, participation in organized activities, volunteering. Thus, it remains unknown how and why physical disability is associated with the frequency of face-to-face social interactions. The ability and desire for social interactions inherently may depend on the perceptions older adults with physical disabilities about the ease with which they can navigate the built environment (Riddell and Watson 2014) and how others view them (Cohen 2000; Deal 2003). The built environment includes both the natural environment, e.g. green spaces as well as weather like snow, and the constructed environment, e.g. sidewalks, stairs, and ramps. Alternatively, it may be the social environment that is the
Understanding the social psychological factors that influence social interactions among persons with physical disability is important because social isolation is not only associated with worse mental health, but also lower self-rated health, greater healthcare utilization and expenditures (Hughes et al. 2004), and even mortality (Holt-Lunstad et al. 2015).

Thus, the overarching goal of this dissertation is to advance scientific understanding of the role of barriers to social interactions for shaping mental health among older adults with physical disabilities. Figure 1:1 above shows the conceptual model of this dissertation and outlines how social interactions might mediate the relationship between disability and mental health, with an additional focus on the physical environment and self-perception barriers related to social interactions. Within this overarching goal, this dissertation addresses four specific objectives, outlined below. I have achieved these objectives with a mixed-methods design that involves analysis of
existing longitudinal data from the National Social Life, Health, and Aging Project (NSHAP) as well as primary data collection (60 interviews) on a sample of persons with a range of physical disabilities.

Objective 1: Establish the association between physical disability, social interactions, and mental health.

Declines in functional ability may require changes in the structure and quality of social relations. Extant research has focused primarily on changes in the quality of social relations rather than on the frequency of social interactions, which in and of themselves may be a prerequisite for maintaining social support. The relationship between social interactions and social support is cyclical as social interactions generate social support and social support generates social interactions (Mendes, Glass, and Berkman 2002). Thus, measurement of social interaction is a mechanism to measure both social interaction and social support. Such studies generally find that older adults with physical disabilities report lower social support than able-bodied persons do (e.g., Taylor and Lynch 2004; Yang 2006). Thompson and Heller (1990), in a study of older women, found functional limitations were associated with perceptions of isolation from family and friends, suggesting that people with disabilities experience lower levels of interactions than they desire. In a recent study, Warner and Adams (2016) established that, despite an overall lack of decline in social relations over time among older adults with functional limitations, this apparent non-effect resulted from the fact that improvements in social relations were about equally as likely to occur as deteriorations. Thus, for at least some older adults with physical disabilities it appears that social
relationships change in ways that may put them at risk for adverse mental health outcomes. Though, again, this raises the question whether changes in the quality of social relations results from changes in the frequency of interactions or levels of contact, a factor typically overlooked in prior studies.

Establishing whether older adults with physical disabilities experience lower quality or fewer social interactions is important for understanding the mechanisms behind the well-established association between functional limitations and mental health outcomes. Many of these prior studies have focused exclusively on depressive symptoms as an indicator of mental health. These studies overwhelmingly show that older adults with low levels of social interactions experience higher levels of depression (e.g., Bookwala and Franks 2005; Pagán-Rodríguez and Pérez 2012; Yang 2006). Further, persons with larger social networks, which are associated with higher levels of social interactions, have reported fewer depressive symptoms (Allen, Ciambrone and Welch 2000).

Objective 2: Explore how the anticipation of the physical environment shapes the desire for social interactions.

Just as only a limited number of studies exists that examine the frequency and quality of social interactions among older adults with physical disabilities, studies on actual and perceived barriers to social interactions are equally rare (see Clarke et al. 2008). The limited research attention to actual barriers may reflect the fact that compliance with the 1990 American with Disabilities Act has been slow. Not surprisingly, though, the prior work that does exist finds that people with disabilities
identify the built environment as one of the single most important barriers to navigation (Gray, Gould and Bickenbach 2003). For example, compared to when a street is in good condition, if a street is in fair or poor condition (e.g., presence of potholes) people with disabilities are four times more likely to report they have severe mobility issues (Clarke et al. 2008). Additionally, people with disabilities report low use of public fitness and recreation facilities (Rimmer et al. 2004) due to the lack of accessibility and safety concerns (Cooper et al. 1999; Rimmer 2005). In contrast, among persons with severe functional limitations, such as persons with spinal cord injuries, the natural environment is one of the two largest environmental barriers (Whiteneck et al. 2004). When people with disabilities address their barriers, e.g., home modifications (Wahl et al. 2009), they describe greater ability to function within the built environment.

Among older adults, the built environment also presents a potential barrier for persons with physical disabilities, even though we might expect less variation fewer differences due to general safety concerns in this subpopulation, which experiences a rising prevalence of falls (Graafmans et al. 1996) and might expect access-related difficulties (Boerner 2004). In fact, older adults with functional impairments do report more actual barriers in the built environment than do those without functional limitations (Shumway-Cook et al. 2003). Natural environmental factors, such as snow and ice, are also major concerns for older adults with functional limitations (Wennberg, Ståhl and Hydén 2009). In addition, perceived barriers to mobility in the outdoor environment actually precedes the mobility decline among older adults who live in their own homes (Balfour and Kaplan 2002; Rantakokko et al. 2012; Schootman et al. 2006).
Objective 3: Investigate how self-perception of others’ willingness to interact affects the desire for social interactions.

In addition to concerns about the physical environment, concerns about how others will react to them may lead older adults with physical disabilities to seek fewer social interactions, or experience a decline in the quality of said interactions. That is, people with physical disabilities may avoid social settings in anticipation of negative interactions. There is some evidence to suggest that such concerns are not misplaced, as Deal (2003) argues that anticipated consequences of relationships with people with disabilities can often cause able-bodied people, as well as people with less severe disabilities, to avoid people with a disability. Able-bodied people may fear being associated with someone who has a disability due to the stigma attached to physical disability (Deal 2003; Martin, Leary and Rejeski 2000). Lack of knowledge about how to navigate conversations and actions surrounding differences in physical ability may make interactions between able-bodied persons and those with physical disabilities especially challenging (Schieman and Turner 1998). Given these challenges, both able-bodied individuals and people with disabilities share the fear that social interactions will not be successful (Cohen 2000).

Because of social interaction challenges, persons with disabilities may avoid social interactions. Fear of rejection and may lead to anticipation of problems and therefore become a perceived interpersonal barrier. There is limited evidence among younger adults of such interpersonal barriers, as persons with physical disabilities struggle to maintain relationships—especially friendships (Correa-Torres 2008). Friendships may be particularly vulnerable for older adults because they are voluntary
and primarily based on shared activities and emotional exchange (Blieszner and Adams 1992; Carr and Moorman 2011). Interactions with peripheral members of one’s social network or with strangers may thus become limited, because persons with disabilities anticipate that others will react negatively to them (Cohen 2000) or perhaps because they do not know how to overcome such interpersonal barriers to address the challenges to interacting with able-bodied persons. In fact, there is some limited evidence that anticipated consequences of social interactions for people with disabilities reduces interactions or even eliminates the interactions altogether (Deal 2003). Moreover, after a poor interaction occurs people generally avoid future interactions (Lenney and Sercombe 2002). Given the limited prior research, though, it is important to understand how older adults with physical disabilities perceive others’ willingness to interact and their anticipated competency doing so. It is also important to understand how physical disabilities shape the older adults’ desire for social interactions across a wide a variety of settings.

Objective 4: Examine how the physical environment and self-perception of others influence the frequency of social interactions and mental health.

We should expect that these perceptions outlined above will alter the frequencies of interactions involving older adults with physical disabilities. The ways in which perceived barriers affect the frequency of social interactions may vary from individual to individual, however. There are at least three potential responses. In the most severe instance, the environmental and interpersonal barriers are prohibitive and the older adult thus completely withdraws from social interactions. In the best-case scenario, the older
adult develops successful adaptive strategies to overcome the environmental and interpersonal barriers, accommodating the situational demands, and therefore frequently engages in social interactions. In between these two, the third and likely most common response is that the older adult develops adaptive strategies, but the barriers nevertheless partially remain and lead to reduced social interactions. For example, prior research suggests that one adaptive strategy people with disabilities may pursue involves downplaying their disability during interactions. Such a strategy would involve using humor, being overly kind, and joyful. Another strategy may be to expect the need to accommodate easily to changes in plans or circumstances (Boerner 2004). Pursuing strategies to overcome anticipated environmental and/or interpersonal barriers for every interaction, however, would be a stressful undertaking (Taub, McLorg and Fanflik 2004) and may change the frequency and/or quality of social relations. Indeed, this may help to explain why prior research finds that physical disability is associated with lower quality social relations, including reduced reports of social support and increases in social strain (e.g., Taylor and Lynch 2004; Warner and Adams 2012). Any decline in social interactions would be problematic given its importance for mental health.

In the following section, I contextualize the four dissertation objectives described above in the broader empirically and theoretically based social science literatures that address issues related to aging, disability, and mental health.

LITERATURE REVIEW: AGING AND DISABILITY

The prevalence of physical disability increases sharply with age (Brault 2012). Mobility limitations are the most common type of disability for older adults (He and
Larsen 2014) and more than one-third of U.S. adults over the age of 65 have mobility limitations (Brault 2012). Along with mobility limitations, around 20% of older adults have each of vision impairment, hearing impairment, and incontinence (Koroukian et al. 2016)—all conditions that may make social interactions more difficult. As it potentially restricts the ability of older adults to engage in desires social roles (Verbrugge and Jette 1994), disablement is a significant stressor for older adults. Within the framework of Stress Process Theory (Pearlin et al. 1981; Pearlin and Bierman 2013), physical disability can lead to a deterioration in social interactions due to the perception of barriers in the physical environment and self-regulation by people with disabilities related to their perception of others’ willingness to interact. Although few studies have explicitly examined changes in the frequency of social interactions, prior research finds that physical disability associated with reductions in the quality of social relations suggesting that such reductions in interactions may be occurring given that older adults largely rely on their social interactions with others for support (Aneshensel and Mitchell 2014; Antonucci and Akiyama 1987). Indeed, older adults with disabilities report having lower levels of social support than able-bodied older adults (Taylor and Lynch 2004).

Social interactions are key for the preservation mental health (Ozbay et al. 2007; Umberson and Montez 2010) and, thus, it should not be surprising that prior studies find that physical disability is associated with a number of adverse mental health outcomes among older adults. Older adults with physical disabilities report more depressive symptoms (Bierman and Statland 2010; Bol et al. 2010), greater anxiety (da Silva et al. 2011; Jones et al. 2014), lower self-esteem (Reitzes and Mutran 2006), lower positive affect (Caputo and Simon 2013), and greater loneliness (Warner and Adams 2016).
Overall, research shows the compromised mental health of persons with physical disabilities across severity of impairment, age, underlying biomedical condition, and sub-populations. Prior studies also find that people with disabilities who report lower levels of social support report worse mental health (Choi and Marks 2008; Hawkley et al. 2008; Umberson et al. 1996). Thus, as functional limitations potentially constrain the ability of older adults to engage in desired social roles (Peek et al. 2003), the association between physical disability and mental health may reflect unmet social needs.

THEORY: STRESS PROCESS AND BIOPSYCHOSOCIAL EXPLANATIONS

The link between reduced social interactions and compromised mental health among older adults with physical disabilities is fully consistent with the Stress Process Theory framing of physical disability as a constant stressor: a chronic hardship that over time leads to other, secondary stressors—such as reduced social interactions—that in turn lead to declines in mental health (Pearlin et al. 1981; Pearlin et al. 2005). Although Stress Process Theory recognizes that individual exposed to the same stressor do not necessarily suffer the same adverse health consequences—due, for example, to differences in social support, social interactions, self-concepts, and coping strategies (Pearlin 2010), there has been less attention to the fact that any one individual may experience the same condition as more or less stressful depending on the situation at hand.

By contrast, the biopsychosocial framework of disability, where the medical condition and social processes interact to affect mental health (Engel 1989; Schneidert et al. 2003), provides such recognition. That is, the factors causing stress, or stressors, vary not only across individuals but also by situational context (Kelly and Ismail 2015; Thoits
This situational dependence reflects the fact that stress occurs when specific environmental factors exceed an individual’s capacity to deal with a chronic medical condition like physical disability (Aneshensel and Mitchell 2014; Keller et al. 2012). Of particular relevance is that the biopsychosocial model frames disability as a fluid status that has the capacity to change based on situational barriers such as accessibility to buildings and healthcare (McDermott and Turk 2011).

Moreover, the situational context affects the likelihood or frequency that a person with disabilities will engage in social interactions, as well as the quality of those interactions with other people (Altman 2014). This suggests that the stress-inducing effects of physical disability depend on the real and perceived situational barriers that older adults encounter that vary across contexts. Thus, rather than a persistent stressor, physical disability may be thought of more as an intermittent stressor—one which when perceived environmental and interpersonal barriers are low may have only limited mental health effects, but when such barriers are perceived to be great has significant detrimental mental health effects.

Prior research has not yet fully considered how the situational contexts in which physical disability is experienced render it an intermittent stressor and, thus, it remains unknown how and why physical disability is associated with the frequency of face-to-face social interactions. Specifically, prior research has provided only scant attention to understanding the ways in which the ability and desire for social interactions depend on the perceptions of older adults with physical disabilities about the ease with which they can navigate the built environment (Riddell and Watson 2014) and how others view them (Cohen 2000; Deal 2003). These factors together lead to the conceptual model displayed
in Figure 1, where perceived barriers to social interactions should moderate the effect of physical disability on social interactions. The overarching goal of the dissertation, therefore, is to advance our understanding of how older adults with physical disabilities approach social interactions, in particular, the perceived environmental and self-perception (interpersonal) barriers to interactions, and how this is associated with mental health.

To summarize, this dissertation seeks to provide more than just a case study of how disability affects the lives and quality of life among older Americans. In its broadest terms, the project contributes value to both social science at large, and to the general public. I frequently refer to these contributions as intellectual merit and broader impact, described below.

INTELLECTUAL MERIT

Drawing on two methodologies (quantitative and qualitative) and two theoretical frameworks, the biopsychosocial model of disability (Thoits 2010) and Stress Process Theory (Pearlin et al. 1981), this dissertation will contribute to several social science fields including social psychology, medical sociology, and disability studies. This body of research will add knowledge to the field by examining how older adults with physical disabilities perceive the physical environment and interpersonal barriers to social interactions. Additionally, this project advances extant research by employing a mixed methods approach (Guetterman et. al 2017) that relies on analogous survey questions, along with semi-structured in-depth interviews, to allow for comparison across samples and data collection modes.
Specifically, this dissertation employs explanatory mixed methods analysis (Creswell 2013; Creswell and Poth 2018). Explanatory mixed method analysis uses quantitative analysis to shape the design and analysis of qualitative data (Creswell et al. 2007). For the quantitative analysis I use the National Social, Health, and Aging Project (NSHAP) data to estimate the relationships between physical disability, social interactions, and poor mental health (Chapter 3). The findings from the quantitative analysis shaped the questions and focus in the qualitative analysis of barriers to social interactions (Chapter 4) and mental health outcomes (Chapter 5) through the semi-structured interviews I conducted to create the Redefining and Maintaining Positive Social Interactions (RAMPS) data.

Prior research has established that social interactions are important for a wide range of mental health outcomes, but extant research tends to focus on rehabilitative physical functioning outcomes for older adults with physical disabilities. Persons with disabilities report lower quality social relations and compromised mental health, but it is unclear why these patterns exist. Specifically, do perceptions about the ease of engaging in social activities within the physical environment or perceptions about the willingness and motivation of others to interact affect the frequency of social interactions? Finding the reasons for these patterns is crucial, as access and engagement in social activities is a necessary precondition for supportive relations.

In this dissertation I also modified Stress Process Theory (Pearlin et al. 1981) by conceptualizing physical disability as an intermittent stressor: one which may elicit a stronger or weaker stress response depending on (perceptions about) the situation. Bringing together stress process and biopsychosocial frameworks and modifying stress
process for people with disabilities highlights the importance of and barriers to social interactions; therefore the theoretical and empirical dimensions of this dissertation advance knowledge in the area of sociology of health. Hypotheses grounded in extant empirical and theoretical literature lead me to anticipate that we will better understand the compromised mental health of older adults with physical disabilities by listening to their experiences involving social and physical barriers to social interactions. To date, there is sparse research among older adults examining the mental health outcomes for people with disabilities as a direct result of physical environment and interpersonal barriers to social interactions. Yet evidence that social interactions should matter for mental health suggest the need for such research.

The current project provides several innovations. Longitudinal analysis of physical disability, social interactions, and mental health provides the time order necessary for stronger casual inferences. The project’s empirical innovation lies in the unpacking of quantitative findings with qualitative interview data, allowing for an understanding of the relationships beyond correlations and statistical significance. The quantitative survey data using population data provides a way to determine if the relationships among physical disability, social interactions, and mental health are generalizable beyond the survey sample. The qualitative interview data generates an understanding of the nuances related to why the relationship exists between physical disability, social interactions, and mental health from the perspectives of people with disabilities. Another strength of this project is the overlap in the question on the national and convenience samples, thus allowing insight regarding how common the in depth interview insights can likely reach. The overlapping questions in the two data sources
facilitates comparisons of the targeted and general populations and maximizes the potential to extrapolate appropriate conclusions from each study.

BROADER IMPACT

This research project provides new knowledge about the social consequences of disability, and the implications for older adults’ mental health. The project creates a unique data set comprised of qualitative interviews from older adults with physical disabilities. Pairing analyses of this newly-created dataset with analyses of a nationally representative sample of older adults (from NSHAP) provides an unprecedented level of detail on the environmental and interpersonal barriers older adults with physical disabilities confront and the ways in which such barriers may compromise mental health. The findings from this project have utility for stakeholders from at least five different, and at times disconnected arenas.

First, and most notably, the project achieves a nuanced understanding of the mental health consequences of the perceived/experienced barriers to social interactions experienced by older adults with physical disabilities. In turn, this information can inform the targeted, tailored intervention strategies of rehabilitation hospitals. Although many rehabilitation hospitals focus on physical rehabilitation and mastery of the tasks of daily living (e.g., work skills, cooking, driving, writing, handling finances, etc.), the current study demonstrates that the recovery process and the continued well-being of older adults with physical disabilities is contingent on not just individual functional capabilities and skill mastery, but also on the adequacy of social environments. Rehabilitation facilities
that value a holistic understanding of recovery and well-being will therefore consider patient’s wants, needs, and preferences, or patient-centered care.

Second, identifying the interpersonal challenges confronting disabled older adults and understanding their coping strategies (and the potential consequences of such strategies) can help families provide their loved ones with a supportive environment, one which fosters recovery and well-being.

Third, the project’s findings can be of use to health insurers. Identifying and understanding the barriers (particularly environmental) to social interactions as a potential “point of intervention” will allow insurers to target their resources early and effectively in order to circumvent subsequent mental health declines (and their concurring financial costs). Findings from the current research can also facilitate patient-centered collaboration between rehabilitation hospitals and insurance providers.

Fourth, findings regarding the role of the environmental barriers can inform those professionals who design the built environment (e.g., urban planners, architects). The findings from this dissertation can inform strategies to optimize implementation of the ADA, and can also help design professionals begin to view the ADA as positive, rather than as punitive and legalistic (Sherman and Sherman 2012).

Fifth, the findings from this project contributes to the scientific study of physical disability by the dissemination of findings through publications and presentations at national conferences for sociologists and interdisciplinary scholars and policymakers focused on physical disability.
OVERVIEW OF PROCEEDING CHAPTERS

This dissertation examines the relationship between physical disability, social interactions, and mental health for older adults. Chapter 2 reviews relevant research and theoretical ideologies of stress process theory and biopsychosocial framework that shape the analysis. Chapter 3 establishes the empirical relationship between physical disability, social interactions, and mental health, using data from three waves of NSHAP (Objective 1). Chapter 4 utilizes data from semi-structured interviews with the sample of older adults with functional limitations explores how the anticipation of the physical environment (Objective 2) and self-perception of others’ willingness to interact (Objective 3) shapes the desire for social interactions. Following the identification and categorization of themes under the prior objectives, Chapter 5 also uses data from semi-structured interviews to examine the themes in relation to the frequency of social interactions focusing on mental health (Objective 4). Lastly, Chapter 6 (Conclusion) considers the broader impacts of the findings from this study and outlines future research directions.
CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Over one billion people in the world currently have a disability (Iezzoni and Long-Belil 2012). This staggering figure includes the one in five Americans that experience a long-lasting disability in their lifetime, as well as nearly eighty percent of the elderly population who experience disability (Census 2014). Research has found that people with physical disabilities experience higher levels of poor mental health (Warner and Kelly-Moore 2012) and have fewer social interactions as well as lower-quality social interactions. People who report high levels of social interactions, in turn, report better mental health. Few studies examine the relationship between physical disability, social interactions, and mental health. My goal is to examine the determinants of mental health outcomes among older people with disabilities using a biopsychosocial framework of disablement with a theoretical grounding in stress process theory (see Chapters 3, 4, and 5). Below I outline an explanation of the biopsychosocial framework and stress process theory followed by an examination of existing literature related to each research objective.

STRESS PROCESS THEORY AND BIOPSYCHOSOCIAL FRAMEWORK

Stress Process Theory

When the effects of environmental factors exceed an individual’s capacity to deal with an issue stress occurs (Aneshensel and Mitchell 2014; Keller et al. 2011). The factors causing stress, or stressors, vary based on individuals and situations (Kelly and Ismail 2015; Thoits 2010). Constant stressors, such as physical disability, exist over long periods of time negatively affect mental health (Pearlin, Schieman, and Meersman 2005). People who have these long-term stressors have more drastically declining physical and
mental health outcomes than people without long-term stressors (Pearlin, Schieman, and Meersman 2005; Steptoe and Kivimaki 2013; Thoits 2010). These factors have such a strong effect on health that stress is highly related to degenerative conditions and premature death (Keller 2012). The relationship is reciprocal where stress causes health issues and health issues cause stress (Aneshensel and Mitchell 2014; Steptoe and Kivimaki 2013). To that end, psychosocial interventions are to help treat mental health issues, specifically depression (Steptoe and Kivimaki 2013).

Older adults largely rely on their social interactions with others for support (Aneshensel and Mitchell 2014; Antonucci and Akiyama 1987). Within the framework of the stress process theory (Pearlin and Bieman 2013; Pearlin et al. 1981), physical disability can reduce the amount of desired social interactions due to barriers in the physical environment and self-regulation by people with disabilities related to their self-perception. The stress deterioration hypothesis supports the idea that physical disability limits desired social interactions and thus causes a shift in social interactions, reducing the safeguarding of mental health through social interactions. Additionally, within the stress buffering hypothesis, a low quality and low levels of social interactions can reduce the buffer generated by quality social interactions on the negative effect of disability on mental health (Cohen 2004). People with disabilities who report higher levels of social support report higher levels of mental health (Choi and Marks 2008; Hawkley et al. 2008; Umberson et al. 1996). However, people with disabilities report having lower levels of social support than able-bodied people (Taylor and Lynch 2004).
Biopsychosocial Framework

The biopsychosocial framework is a structure that allows for an analysis of disability to include factors beyond just a physical health status. Within this framework, disability has three conceptual components; medical, functional, and social (Schneidert 2003). The three components combine to affect how people experience disability as a medical and social status (Engel 1977). At the most basic level, the biopsychosocial framework is an integration of the medical model and social model of disability (Engel 1977). The medical model of disability focuses on biological factors such as diagnosis and progression outlined by medical doctors. In contrast, the social model of disability defines disability as a limitation or inability to complete a task due to environmental barriers (Altman 2013; Madans, Loeb, and Altman 2010). The biopsychosocial framework integrates the medical and social models commonly used for disability research. Within this model, disability is a “consequence of biological, personal, and social forces” and the interactions between these factors result in disablement (Jette 2005: 727). The combination of the medical model and social model into the biopsychosocial framework focuses attention on ways that medical diagnosis, social interactions, and physical environments can shape mental health outcomes for people with disabilities.

RELATIONSHIP BETWEEN PHYSICAL DISABILITY, SOCIAL INTERACTIONS, AND MENTAL HEALTH

Physical Disability and Social Interactions

Most research has focused on changes in the quality of social relations rather than the frequency of contact, even as social interactions may be a prerequisite for maintaining
social support (Taylor and Lynch 2004; Yang 2006; Warner and Adams 2016). Such studies generally find that older adults with physical disabilities report lower social support than able-bodied persons do (e.g., Taylor and Lynch 2004; Yang 2006).

Thompson and Heller (1990), in a study of older women, found functional limitations were associated with perceptions of isolation from family and friends suggesting that people with disabilities experience lower levels of interactions than they desire. In a recent study, Warner and Adams (2016) found that although there was no evidence of a decline in social relations over time for older adults with functional limitations, this is because improvements in social relations were about equally as likely to occur as deteriorations. Thus, for at least some older adults with physical disabilities there is evidence that social relationships change in ways that may put them at risk for adverse mental health outcomes though, again, whether changes in the quality of social relations is a result in changes in the frequency of interactions is unknown as prior studies have not explicitly examined levels of contact.

I examine the relationship between people’s physical disability and their social interaction levels in multiple sections of this dissertation. Analysis within Chapter 3 examines the relationship between physical disability, social interaction, and mental health. Chapter 4 provides an analysis of the barriers that people with physical disabilities experience in their social interactions. Lastly, Chapter 6, the conclusion, pulls together the overall findings about how a person’s physical disability affects their social interactions.
Social Interactions and Mental Health

Whether older adults with physical disabilities experience lower social interactions is important for understanding the well-established association between functional limitations and lower mental health. Many prior studies focus exclusively on depressive symptoms as an indicator or as the measure of mental health. These studies overwhelmingly show that older adults with low levels of social interactions experience higher levels of depression (e.g., Bookwala and Franks 2005; Pagán-Rodríguez and Pérez 2012; Yang 2006). Further, persons with larger social networks, which are associated with higher levels of social interactions, have fewer depressive symptoms (Allen, Ciambrone and Welch 2000). As reviewed above, there are similar patterns for other measures of mental health including self-esteem (Reitzes and Mutran 2006), positive affect (Caputo and Simon 2013), and loneliness (Warner and Adams 2016).

Several studies show that there are mental health consequences for people living with a physical disability. Living with a physical disability is associated with higher stress levels compared to not living with a disability (Gayman, Brown, and Cui 2011; Lenze et al. 2001, Thoits 2010). In addition, people with physical disabilities have higher levels of depression than able-bodied individuals (Alexopoulos et al. 2011, Brown and Turner 2010, Feinstein 2011, Gayman, Brown, and Cui 2011, Rodgers and Pilgram 2014). Similarly, people with physical disabilities experience higher levels of anxiety than able-bodied individuals experience (Brenes et al. 2004; Louw 2011; Jones et al. 2014, Sareen et al. 2006). The mental health consequences of living with a physical disability goes beyond higher levels of depression, to include decreased perceived social support and psychological resources (Yang 2006). Compared to able-bodied individuals,
people with physical disabilities experience higher levels of loneliness (Russell 2009, Warner and Adams 2012, Warner and Adams 2015, Warner and Kelley-Moore 2012). Among people with disabilities, those who have more social connections (e.g. high numbers of friends, family members, and colleagues) have lower levels of depression (Allen, Ciambrone, and Welch 2000) than those with fewer social connections.

I examine the relationship between social interaction and mental health throughout this dissertation. In Chapter 3, NSHAP - Determinants of Social Interaction Patterns and Mental Health Outcomes, I complete a quantitative analysis of nationally representative survey data of social interactions and a scale make from multiple mental health measures. Chapter 5, RAMPS- qualitative analysis of social interaction and mental health patterns, includes a qualitative analysis of the mental health manifestations as a result of social interactions for people with disabilities. Additionally, Chapter 6, the conclusion, pulls together the findings from Chapters 3 and 5 related to social interactions and mental health.

Anticipation of the Physical Environment and Desire for Social Interactions

Alternatively, anticipated negative consequences of relationships with people with disabilities may also cause people to avoid social interactions with others, regardless of their own experience with disabilities (Deal 2003). People who do not have a disability often fear being associated with someone who has a disability, because association with someone who has a disability may cause social stigma for the person who does not have a disability. This fear of backlash or stigma can put limitations on social and sexual interactions those without a disability are willing to have with those who do have
disabilities (Deal 2003). I examine the anticipation of how the physical environment shaping the desire for social interaction in Chapter 4, RAMPS - Qualitative Analysis of Barriers to Social Interaction, using narrative analysis of semi-structured interviews from 60 participants.

Self-Perception of Others’ Willingness to Interact and Desire for Social Interactions

Most cultures designate disability as not only indicating difference but also less than; and in U.S. society this often means that people with disabilities are stigmatized (Lenney and Sercombe 2002). Taub, McLorg, and Fanflick (2004) explain how social norms based on this meaning of disability can cause able-bodied individuals to feel uncomfortable, judgmental, and even threatened by people with disabilities. Feelings of being uncomfortable or threatened often cause mixed emotions, attitudes, and actions like lashing out towards people with disabilities (Deal 2003; Stone and Colella 1996; Taub et al. 2004). Therefore I provide an analysis of responses of people with disabilities about their self-perception of others’ willingness to interact and their desire for social interactions in Chapter 4, RAMPS - Qualitative Analysis of Barriers to Social Interaction.

Interactions between Able-Bodied People & People with Disabilities

As discussed above, assumptions and stereotypes are often the basis for interactions between people with disabilities and able-bodied individuals. While we do not always verbalize our assumptions during these interactions, they can come into play in both social and professional settings (Schieman and Turner 1998). Able-bodied
individuals interpret these interactions differently than people with disabilities, based on the influence of socialization, social norms, and lifestyles.

Social interactions can involve frightening encounters for able-bodied individuals and people with disabilities and alike. Most people, regardless of disability status, do not like failed social interactions. Specifically for people with disabilities, Correa-Torres (2008) focuses on the point that people with disabilities often struggle with keeping relationships, especially those based on social networks like friendships. Both able-bodied people and people with disabilities bring their own unique assumptions and attitudes toward the other group. These interactions are often the most stressful for young adults with disabilities because the majority of new interactions occur in places such as clubs or bars where other young adults who are overwhelmingly at the peak of their able-bodied lives surround them (Schieman and Turner 1998). Interactions quite often will either not occur or be limited because people are concerned with being rude or not knowing how to negotiate barriers and they will avoid contact in fear of failure or rejection (Lenney and Sercombe 2002).

Lenney and Sercombe (2002) observe that the opposite may also be true. They find that able-bodied people, because of their religion and compassion to communicate with people who have disabilities, will cause able-bodied individuals to seek out interactions with people who have disabilities. Florey and Harrison (2000) take this a step further by explaining how people often assume those with disabilities are socially inept and therefore feel obligated to include people with disabilities. Titchkocky (2000) argues that these findings are only true in certain situations with specific disabilities. Able-bodied individuals will generally avoid all interactions with people who are blind because
they rely on the human emotion and expression interpreted through the eyes. Stone and Colella (1996) agree with Titchkocky (2000) in the idea that others treat people with disabilities largely based on personal characteristics of each individual and specific disability. Stone and Colella (1996) identify factors such as the setting and other social connections which play a large and often unrecognized role in interactions.

Able-bodied individuals and people with disabilities share one major fear during interactions: that the interactions will not be successful (Cohen 2000). “If a person’s difference is to be understood, then it seems plausible that people need to start communicating with each other in an open fashion and not fear people because of their difference” (Lenney and Sercombe 2002:13). Not letting fear rule your interactions is often quite difficult. If each party involved understands that there are different languages, subcultures, and social experiences for each individual, the majority of the stress of an unsuccessful interaction would be relieved (Cardona 2008). Titchkosky (2000) and Cardona (2008) agree that neither individual has to give up his or her identity; both just have to be willing to accept the other individual, which often occurs in reference to religion, ethnicity or political views. Cohen (2000) sums the majority of these tips up in the idea that a person can have successful interactions if they are willing to employ the simple practice of trying to understand another’s perspective rather than trying to judge.

Generally, people with disabilities will attempt to downplay their disability in interactions; the biggest motivation for which is their fear of rejection (Deal 2003). These individuals will often downplay a disability through humor, being overly kind, or joyful. This also helps to break down stereotypes about people with disabilities as being rude, curt, and socially inept. Quite often, people with disabilities find that overcoming the
obstacle of their disability is the most stressful and challenging aspect of interactions, especially those in social settings (Taub et. al 2004).

In Chapter 4, RAMPS - Qualitative Analysis of Barriers to Social Interaction, I analyze the complexities in social interactions for people with disabilities when they interact with others.

Interpretation of Interactions and Attitudes

Interaction interpretations are wide-ranging simply because people are involved. With that said, this section will attempt to briefly cover the most common misinterpretations and assumptions between able-bodied and people with disabilities. The social construction surrounding the perception of staring is a common misinterpretation by both people with disabilities and able-bodied individuals. Some research supports the idea that all staring is rude, which is a value able-bodied individuals tend to agree on (Cohen 2000). Some disabled persons feel that staring is not rude, especially if the stare is accompanied by a smile because with a smile a stare is seen as friendly eye contact. One study by Lennney and Sercombe (2002) even found that if the person was who was staring is attractive, the person with a disability welcomed it, smile or not. In an effort not to appear rude or discriminatory against people with disabilities, able-bodied individuals will often be nice to people who have disabilities, even though they feel that people with disabilities are a burden (Longoria and Marini 2006).

The able-bodied hierarchy, measured through social distance scales, is a ranking of physical disabilities from the most (type 1 diabetes) to least desirable (blind). Looking at this hierarchy from the perspective of a person with a disability, the inference is that
people with disabilities are defined through how able-bodied individuals define and stigmatize what it is to have a specific disability (Lenney and Sercombe 2002). People with disabilities who appear able-bodied physically (Deal 2003, Lenney and Sercombe 2002) and have a high mental capacity (Watson 2002) have the highest number and quality social interactions.

How Environment and Perception of Others Influence the Frequency of Social Interactions and Mental Health

Perceptions surrounding mental health are important not only for the general public but also for health care providers and for management of mental health issues (Winnick, Werum, and Pavalko 2001) and thus have implications for our understanding how interactions can shape mental health outcomes for people with disabilities. People who have disabilities report higher levels of depression than people without disabilities (Wallsten et al 1999). Anxiety and depression levels are higher for people who have physical disabilities (Jones et al 2014). Women with disabilities report lower levels of self-esteem and mastery compared men with disabilities (Brown 2014).

Social integration (i.e. more social interactions) is associated with better mental health. In addition to the frequency of social interactions, higher quality of social interactions is also associated with lower levels of depression, anxiety, stress, and loneliness (Allen et al 2000). Mental health is also associated with whether or not people have others that they can interact with regularly and rely on (Yang 2006). Compared to those who are satisfied with their level of social interaction, wanting more social interaction is also associated with higher levels of depression (Cornwell and Waite 2009).
Studies of negative interactions (strained or hostile) show an association with higher levels of depression, anxiety, stress, and loneliness (Umberson et al 1996). Longitudinal research shows that declines in social interactions are associated with increases in poor mental health (Dave, Rashad, and Spasojevic 2006).
CHAPTER 3:
NSHAP – DETERMINANTS OF SOCIAL INTERACTION PATTERNS AND MENTAL HEALTH OUTCOMES

Objective 1: Establish the association between physical disability, social interactions, and mental health.

SYNOPSIS

This study examines whether social interactions, an objective assessment of social context, mediates the association between physical disability status and global mental health over time. This study uses the three longitudinal waves of the National Social Life, Health and Aging Project (NSHAP) data. NSHAP data consists of interviews with adults 57 to 85 years old who currently live in their own homes (Analytic N = 3005). Researchers collected Wave 1 data in 2005-2006, Wave 2 in 2010-2011, and Wave 3 in 2015-2016.

I employed structural equation modeling (SEM) to examine disability status as it relates to social interactions and mental health as latent constructs, holding the effect of demographic characteristics constant. Findings suggest that the frequency of social interactions partially mediates how older adults with physical disabilities experience poorer mental health.

Longitudinal SEM results reveal that those with physical disabilities experience lower levels of future social interactions and poorer mental health outcomes. Future social interactions partially mediate the effect of physical disabilities on future poor mental health. Findings overall suggest that efforts to identify the determinants and mechanisms of poor mental health outcomes among the elderly benefit from consideration of how the impact of how physical disabilities are related to social
interactions. This analysis establishes the relationship between physical disability, social interactions levels, and mental health outcomes (Objective 1).

Additionally, cross-sectional SEM models show that for each wave of data, people with physical disabilities report poorer mental health compared to people without physical disabilities. People with disabilities also have lower amounts of social interactions. Low levels of social interactions are associated with poor mental health.

These longitudinal and cross-sectional findings align with the Stress Process Theory where stressors, in this case, a physical disability, are associated with poor mental health. These findings also support Stress Process Theory that if people have social interactions the effect of the stressor, physical disability, will have less of an effect on mental health. Additionally, these findings support the biopsychosocial framework of disability as each of the paths between physical disability (biological), mental health (psychological), and social interaction (social) are all substantive and statistically significant.

The findings from this study also have relevance for practitioners and policymakers working with older adults who have physical disabilities. For practitioners, if a patient currently has a physical disability, they also will likely experience social and emotional ramifications. Therefore it is important for social workers and mental health professionals to consider social interactions and mental health considerations among people with disabilities. Considering social and emotional, not just physical, dimensions of disability will help practitioners to develop intervention strategies to seek out and maintain social interactions as well as to monitor the mental health of older adults with physical disabilities. Additionally, policymakers should be cognizant of the importance of
social interactions for older adults with physical disabilities. For example, designing community spaces, handling weather emergencies, and implementing transportation plans should include designs that facilitate inclusion of people with walkers, wheel-chairs, scooters, canes, and other assistive devices. Knowing the relationship between physical disability, social interactions, and mental health should increase the importance of allocations of public service money and effort into programs that foster social interactions among older adults such as community centers with programs focused on the social life of older adults.

INTRODUCTION

I examined the relationship between physical disability, social interactions, and mental health through four interrelated research questions. (1) What is the relationship between physical disability and mental health? (2) How are physical disability and social interactions levels related? (3) Is the relationship between social interactions and mental health significant? (4) Does physical disability have a relationship with future social interactions and mental health?

Researchers have examined questions 1, 2, and 3 are examined in isolation in previous research. This study pulls together these ideas tested individually in prior research to examine the relationship that exists between physical disability, social interactions, and mental health grounded in a biopsychosocial framework (Schneidert 2003) and Stress Process Theory (Pearlin, Schieman, and Meersman 2005). The biopsychosocial framework contains a biological, a psychological, and social understanding of disability. This model includes each component of this relationship with
the biological as physical disability status, the psychological through mental health measures of depression, stress, anxiety, and loneliness, and the social through the frequency of social interactions. The Stress Process Theory shaped the model with social interactions as the buffer between physical disability, the stressor, and mental health.

DATA AND METHODS

National Social Life, Health, and Aging Project

Data used for this analysis comes from the National, Social, Health, and Aging Project (NSHAP) Waves 1, 2, and 3 data. The National Social Life, Health, and Aging Project is a nationally-representative panel (N=3005) of community-dwelling persons ages 57 to 85 (born between 1920 and 1948 at Wave 1) in the contiguous United States (Waite et al. 2014). For NSHAP operationalization of community-dwelling means, participants are non-institutionalized and thus must live in their own homes rather than in an assisted facility such as a nursing home or hospice center. NSHAP collected data on a variety of domains related to health and social relations during in-home interviews that lasted on average for two hours that began with a short self-administered questionnaire and asked to complete a leave behind survey. Interview questions included a range of topics but largely focus on respondent’s physical health, mental health, social networks, sexuality, and demographic information. NSHAP uses panel data (Waite 2017). Panel data exists by re-interviewing the same participants over time (Hecker and Gibbons 2006) and explained in greater detail in a subsequent section titled Longitudinal Panel Data.
Wave-Specific NSHAP Panel Data

Interviews of participants first occur for Wave 1 in 2005-2006, re-interviewed for Wave 2 in 2010-2011, and re-interviewed again for Wave 3 in 2015-2016. 3005 participants were included in Wave 1. For Wave 1, the weighted response rate was 75.5%. Males, oldest old adults (76-85), African-Americans, and Latinos were oversampled. 3,377 participants were in the Wave 2 sample. To be included in Wave 2, participants had to be included in the sampling frame for Wave 1 or were currently married to or a cohabitating romantic partner of a respondent. The weighted response rate for Wave 2 was 74%. 4,777 participants are included in Wave 3. Wave 3 re-interviewed participants from Wave 2 as well as added a new cohort of adults born between 1948-1965 along with their spouses or cohabitating romantic partner. Of the 4,777 participants in Wave 3, 49.6% (n=2,368) were added with the new cohort. The release of some information about Wave 3, including response rates is not complete as researchers at NSHAP are completing quality control checks as well as data coding/cleaning. NSHAP nor this analysis uses weighted data (Waite 2017).

The current study examines the relationship between disability, social interactions, and mental health over time. Participants who were not present for two waves of data had no longitudinal data and thus were not relevant for this project. NSHAP followed 3005 participants consistently over the three waves. However, exclusion of participants who were not present at Waves 2 and 3 from this analysis generated a final sample size of 2,491 participants.¹

¹ If a respondent only missed one wave (i.e. they were in Wave 1 and 3 or in Wave 1 and 2) were not dropped as longitudinal analysis could be completed.
Longitudinal NSHAP Panel Data

The use of longitudinal panel data is key “for establishing temporal order, measuring change, and making stronger causal interpretations” (Menard 1: 2002). This prospective panel design allows for researchers to examine how relationships between variables unfold over time (Wall and Williams 1970).

Longitudinal panel data has notable advantages when compared to cross-sectional data with more statistical power, each person serves as their own control, and researchers can tease out individual change over time (Hedecker and Gibbons 2006). Relationships between variables are significant with smaller sample sizes because longitudinal panel data has more statistical power. Each person serves as their own control for studies that examine social behavior in an experimental design. Lastly, re-surveyed participants allow researchers are able to examine not only change that occurs over time within groups but also change that occurs over time for individuals (Hedecker and Gibbons 2006, Menard 2002).

While longitudinal panel data provides a unique opportunity for examining change over time it is not without limitations (Menard 2002). Longitudinal panel data requires an extended period of time, has attrition (Hedecker and Gibbons 2006), and retesting effects can be an issue with longitudinal data (Menard 2002; Selig and Little 2012). Panel models are especially useful for looking at relationships between similar variables over time (Selig and Little 2012), in this case, disability, social interactions, and mental health. Longitudinal panel data is collected over several time points with the same sample. Because of the time between waves of data collection, longitudinal panel data takes a longer amount of time to collect than cross-sectional data. Attrition is when
participants drop out of a study between data collection waves (Hedecker and Gibbons 2006). Attrition occurs because participants choose to no longer participate in a study, researchers are not able to contact them, and similar situations. Data collection that study population is older adults, such as NSHAP, also has attrition due to death of participants².

Priming effects are a greater concern in longitudinal data than cross-sectional data. Priming occurs when participants’ answers are biased due to a stimulus. The previous waves of data collection can cause a priming effect for participants as they are asked the same questions across different waves of data (Menard 2002).

The ability to analyze the same variables over time for the same person was the deciding factor to use the NSHAP longitudinal panel data for this study. An examination of changes in physical disability, social interactions, and mental health over time allowed for analysis not only of the relationships at a single time point but also the delayed effects of physical disability on social interactions and mental health between time points. Additionally, the large sample size and the variety of measures on key dependent and independent variables is a notable strength of NSHAP. Specifically, physical disability measures through Activities of Daily Living, social interactions frequency, as well as tested mental health measures make NSHAP uniquely suited for this study. Measures of relevance for the proposed project, as depicted in Figure 3:1, are as follows.

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² Between Wave 1 and Wave 2 430 respondents died. NSHAP researchers have not released this data for deaths between Waves 2 and 3.
Disability: Participants were asked to assess the degree of difficulty (no difficulty = 0 to unable to do = 3) they had with six Activities of Daily Living (ADL) expected to last at least three months: walking across a room, dressing, eating, bathing or showering, getting in and out of bed, and using the toilet\(^3\). An in-person interviewer asked these questions. The interviewer reads the following statement to each participant “we are interested in what activities are easy or difficult for you. Please look at the answer categories on the hand AA card and tell me how much difficulty you have with each difficulty. Exclude any difficulties that you expect to last less than three months.” The

\(^3\) Other measures of health within NSHAP include self-rated health, information on medications, and biomarker data. I use ADL measures as they are a measure of disability across diagnosis and used within the medical community for practitioners as measures of physical disability (Spector et al 1987). Since one of the broader impacts of this paper is to help practitioners working with older adults with disabilities these measures are used in the study.
hand card listed the options of 0= “no difficulty”, 1= “some difficulty”, 2= “much difficulty” and 3= “unable to do”. Following the prompt and being given the hand card, participants were read the following ADL measures (1) Walking across a room?, (2) Dressing, including putting on shoes and socks?, (3) Bathing or showering?, (4) Eating, such as cutting up your food?, (5) Getting in or out of bed?, and (6) Using the toilet, including getting up and down?. The interviewer recorded responses for each question.

Prior analyses with these data, given that participants were community-dwelling at first interview, suggests that dichotomizing each indicator to reflect any difficulty is appropriate⁴ (Warner and Kelley-Moore 2012; Warner and Adams 2016). I measured physical disability as a dichotomous variable for this study.⁵ If participants identified that they had difficulty completing any Activity of Daily Living (ADL) measure, I coded as having a physical disability (Spector et al. 1987). I used participants who did not have a physical disability as the reference group, or 0, for the physical disability measure.

Social Interactions: Participants were asked three separate social interactions questions about how often in the past 12 months they (a) did “volunteer work for religious, charitable, political, health-related, or other organizations”; (b) attended “meetings of any organized group”; and (c) got “together socially with friends or relatives”. Responses for items ranged from 0= “never”, 1= “less than once a year”, 2=...
“About once or twice a year”, 3= “Several times a year”, 4= “About once a month”, 5= “Every week”, to 6= “Several times a week.”

These social interactions measures were selected to examine social interactions that unfold both within an organization, volunteering and attending meetings of an organized group, as well outside of an organization, such as getting together socially with friends or relatives. I used three indicators of social interactions to generate a latent variable of social interactions. A higher score for the latent variable indicates higher frequency of social interactions. Social interactions measures were included in a leave behind survey. The response rate for the leave behind survey was 84% for Wave 1 and 87% for Wave 2. NSHAP researchers have not yet released response rates for Wave 3 (National Social Life, Health, and Aging Project 2018). Social interactions indicators are through total disaggregation, which is the use of individual variables rather than summated scales. The use of total disaggregation allows for an examination of how each individual measure directly relates to the latent variable (Williams, Vangenberg, and Edwards 2009).

Mental Health: NSHAP included four validated mental health scales, including for the Center for Epidemiological Studies Depression scale [CESD] (Radloff 1977),

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6 Analysis was also completed looking at the number of alters given for network data. I used frequency of social interactions to measure social interactions. Analysis of ego networks would measure the number of people a respondent was actively engaging with rather than the frequency interactions was occurring.

7 I correlate volunteering and attending group events errors within each wave. As both of these measures exist within formal groups the correlation falls under the meaningfulness rule. SEM experts outline that the meaningfulness rule is when errors are correlated due to their logical relationship to each other (Kenny 2011).
UCLA Short Loneliness scale (Hughes et al. 2004), the Hospital Anxiety Scale [HADS] (Bjelland et al. 2002), and the Perceived Stress Scale [PSS] (Sheldon, Kamarck and Mermelstein 1983). Health research widely uses each of the aforementioned scales in health research across disciplines and tested for people with disabilities. Higher scores on each of these scales indicate poorer mental health.

The Center for Epidemiological Studies Depression scale [CESD] short form is a widely used and validated scale measuring depression (Eaton et al. 2004). CESD has been tested to be reliable and valid for people with different types of disability including spinal cord injuries (Miller, Anton, and Townson 2008), stroke (Weimar et al. 2002), and arthritis (Vali and Walkup 1998). The UCLA Loneliness Scale is valid and reliable short scale to measure loneliness (Russell, Peplau, and Curtona 1980). The UCLA Loneliness Scale has been used in studies examining mental health outcomes of people with disabilities (Alpass and Neville 2003; Duvdevany and Efrat 2004). The Hospital Anxiety and Depression Scale is a reliable instrument to assess levels of anxiety (Allen and Oshagan 1995). Researchers have validated the HADS Scale in medical settings, such as hospitals and at primary care facilities, as well as in the community (Snaith 2003). Studies examining various types of disabilities such as Parkinson's (Muslimović et al. 2008), multiple sclerosis (Janssens et al. 2003), and arthritis (Dickens et al. 2002) have all used the HADS Scale. The Perceived Stress scale is the most commonly used psychological measure of stress (Cohen, Kamarck, and Mermelstein 1994). Additionally,

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8 There are two additional questions directly relating to overall mental health (1) self-rated mental health and a (2) happiness question. This study only uses the validated mental health scales that are for specific mental health outcomes to examine distinct psychological experiences.
PSS is widely used in research as the measure for stress in studies about people with disabilities (Bédard et al. 2009; Deldago 2007; McAuley et al.2006).

I used these four scales to generate a latent variable of mental health. A higher score for the latent variable indicates poorer mental health. I asked questions for the CESD (depression) scale, HADS (anxiety) scale, and PSS (stress) scale I during the in-person interview. I told participants “Now let’s talk about thoughts and feelings you may have had during this past week. I will read a series of statements. Tell me how often during this past week you felt like this; rarely or none of the time, some of the time, occasionally, or most of the time? Don’t take too long over your replies; your immediate reaction to each item will probably be more accurate than a long thought out response.” I gave participants hand card FF with the following response options (1) rarely or none of the time, (2) some of the time, (3) occasionally, and (4) most of the time. Statements for the CESD (depression) scale included (1) I did not feel like eating; my appetite was poor, (2) I felt depressed, (3) I felt that everything I did was an effort, (4) My sleep was restless, (5) I was happy, (6) I felt lonely, (7) People were unfriendly, (8) I enjoyed life, (9) I felt sad, (10) I felt that people disliked me, and (11) I could not get “going”. I recoded statements (5) I was happy and (8) I enjoyed life so that higher scores indicated higher levels of depression. I then added each respondent’s answers for statements related to the CESD together. A higher score is associated with higher levels of depression.

Questions for the PSS (stress) scale included (1) I was unable to control important things in my life, (2) I felt confident about my ability to handle personal problems, (3) I felt that things are going my way, and (4) I felt difficulties were piling up so high that I could not overcome them. Statement (3) I felt that things are going my way was reverse
coded so that higher scores indicated a higher level of stress. After recoding, all stress indicators were added together to construct the PSS scale with lower scores indicating a lower level of stress.

Questions for the HADS (anxiety) scale included (1) I felt tense or “wound up”, (2) I got a frightened feeling as if something awful was about to happen, (3) Worrying thoughts went through my mind, (4) I could sit at ease and feel relaxed, (5) I got a frightened feeling like butterflies in my stomach, (6) I felt restless as if I had to be on the move, and (7) I had a sudden feeling of panic. For the HADS measures, I reverse coded (4) I could sit at ease and feel relaxed so higher scores would reflect higher anxiety. I added all eight indicators together for the HADS (anxiety) scale.

Questions for the UCLA (loneliness) scale were included in a leave behind questionnaire. These are the only mental health questions that I did not ask during the in-person interview. Questions for the UCLA (loneliness) scale included (1) How often did you feel that you lack companionship?, (2) How often do you feel left out?, and (3) How often do you feel isolated from others?. Response options for each of these questions ranged from 1= “Never”, 2 = “Hardly even”, 3 = “Some of the time”, to 4= “Often”. I added together question responses for respondent loneliness so that higher scores would indicate a respondent is lonelier.

The mental health indicators are partially disaggregated for the SEM. Partial disaggregation is the use of scales as indicators for latent variables rather than individual variables (Williams, Vangenberg, and Edwards 2009). Even though this type of disaggregation does not allow for analysis of each individual variable, this study the uses
well-established scale measures of mental health because of their wide use and high quality throughout the social sciences.

**Control Variables:** The full model includes control variables for sex, age, education, race, and marital status. Sex is measured as a dichotomous variable with female as 1 and male as 0. Sex was included as a control variable because patterns of social interactions are different for men and women (Walen and Lachman 2000). To adjust for age, I included age at Wave 1. To make the constant more meaningful I centered age by subtracting the lowest age (57) from each respondent’s age. Thus the constant indicates the average value of the dependent variable (e.g. social interaction or poor mental health) for those at age 57. Because I subtracted a constant, the coefficients still indicate the increase or decrease in the dependent variables for a one year increase in age. Increases in age are associated with changes in social interactions amounts and mental health (Musick and Wilson 2003), therefore age is an important control variable. Education is a good indicator of social class for older adults (Grundy and Holt 2001) and has a strong association with health (Mirowsky and Ross 2003). I control for level of education with an indicator variable for having more than high school education (=1) compared to high school education or less (=0). For this analysis division of education into more than high school education and high school education or less to examine the effect of higher education. Race is included in the model as a dichotomous variable with minority racial identity as 0 and white as 1. Research has found that older people who are racial minorities have a smaller number of connections within their social network but a higher frequency of social interactions (Ajrouch, Antonucci, and Janevic 2001). Thus, a
control for race was included as there is evidence supporting that social interactions unfold differently between whites and racial minorities. Lastly, marital status is included as a dichotomous variable with 0 being not currently married (widowed, divorced, etc.) and 1 as currently married. Marital status was included because the social connections that a person’s spouse has often has a carryover effect into their own life and people who are not married have higher social interactions levels with others (Utz et al. 2002).

Analytical Approach

Structural Equation Modeling. While multiple regression or Ordinary Least Squares (OLS) is often used to examine relationships between multiple factors with a mental health outcome, that approach limits how we can assess the way particular variables influence outcomes of interest. Specifically, OLS regression assumes a linear relationship and largely minimizes the indirect pathways between non-physical factors as they relate to health measures (Raina et al. 2004). Due to these limitations, I employ Structural Equation Modeling (SEM) for this analysis. SEM allows measures not only the relationship between variables but also indirect and direct pathways, allows for variables to be grouped into a latent construct, as well as test advanced empirical hypothesis through goodness of fit statistics (Anderson and Gerbing 1988). Additionally, SEM “allows researchers to simultaneously implement two key aspects of the research process, linking latent variables associated with concepts of theory to indicators used to represent these concepts and estimating relationships among latent variables as proposed by theory” (Williams, Vangenberg, and Edwards 588: 2009). This study uses Structural Equation Modeling to test the relationships, both direct and indirect, of mediating effects
of social interactions levels between an individual’s physical disability status and their mental health shown in Figure 3:2 below.

Structural equation models should be theoretically driven and based on previous research (Bollen 1989, Overton 1998; Williams, Vandenberg, and Edwards 2009). This SEM analysis examines the relationship between physical disability, social interactions, and mental health. Structural equation models are uniquely suited to test the direct and indirect relationships between physical disability, social interactions, and mental health, through latent variables of social interactions and mental health, outlined in the theory
and literature review sections above. This allows modeling to be less circumscribed to linear relationships, such as with regression modeling.

I tested measurement and structural models within the SEM analysis. Measurement models are the statistical testing of how well indicators load onto latent variables (Bollen 1989). I addressed measurement models in this study with two general equations. \( Y = L_\eta \eta + \varepsilon \) is the measurement model for endogenous latent variables, social interactions and mental health, in this study with \( Y \) is the vector of these dependent variable measurements collected from NSHAP Waves 1, 2, and 3, \( L_\eta \) contains the loading scores on \( \eta \), and \( \varepsilon \) is a measure of error within the model. Specifically, I used two measurement models for each latent variable. I measured disability status, the exogenous variable, as a dummy variable. If participants identified having difficulty with any activity of daily living (walking across a room, dressing self, bathing self, getting in and out of bed, using the toilet, or eating) they were coded as having a disability. I measured social interactions, an endogenous variables \( Y_{\text{Social Interaction}} = L_{\text{Social Interaction}} \eta + \varepsilon \). I measured mental health, an endogenous variable, as \( Y_{\text{Mental Health}} = L_{\text{Mental Health}} \eta + \varepsilon \). For each wave of data these procedures were followed thus there is one exogenous variables (disability status at Wave 1) and 8 endogenous latent variables (disability at Wave 2 and 3, social interactions at Wave 1, 2, and 3, as well as mental health at Wave 1, 2, and 3).

Structural models encompass the causal relationship hypothesized between the endogenous and exogenous variables (Lai 2010). The structural equation model within this analysis follows a traditional model of \( \eta = B_\eta + I \xi + \zeta \). \( B \) is the matrix of the effects of the regression coefficients of endogenous variables on other endogenous
variables. For this study, social interactions on mental health $I$ is the matrix from effects of the regression coefficients from the exogenous variable on endogenous variables, functional limitations on social interactions and mental health respectively. Lastly, $\zeta$ is the vector of residuals from the SEM. Bentler Comparative Fit Index (CFI) (Bentler 1990), Steigler-Lind Root Mean Square Error of Approximation (RMSEA) (Steiger 1990), and Tucker Lewis Index (TLI) (Tucker and Lewis 1973) were used as measurements for fit of the model as they are the industry standard for sample sizes above 400 (Kenny 2012; Kline 2016). RMSEA values less than 0.05, ideally closer to 0 (Browne and Cudeck 1993), CFI values greater than 0.90, and TLI values greater than 0.90 (Hu and Bettler 1998) indicate a good model fit.\(^9\)

**Time-Invariant Variables and Time-Variant.** The control variables within this analysis are either time-invariant or time-variant. Time-invariant variables are factors measured within longitudinal data that will not change over time. Time-variant variables are factors that may, but do not necessarily, change over time. Time-Invariant variables within this study are age at Wave 1, race at Wave 1, education at Wave 1, and sex at Wave 1. The model uses the value that participants report at Wave 1. For older adults, marital status changes over time largely due to divorce, marriage, and widowhood (Huntley-Hall 2017; Smith, Zick, and Duncan 1991). Marital status relates to social

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\(^9\) There is ongoing debate if reporting CFI and TLI values is redundant as they are closely related. Additionally, there is debate as to what the cut off values should be for CFI and TLI as over 0.80 up to over 0.95 (Fan and Sivo 2005; Hu and Bentler 1999). Each model in this study having good model fit with a CFI and TLI of 0.80 or higher.
interactions levels as well as mental health (Cornwell, Laumann, and Schumm 2008; Ferraro 1984). Thus, the only control variable that is time-variant is marital status.

**Maximum Likelihood.** Maximum likelihood is a common tool used for estimation and fitting method for structural equation modeling (Kline 2016). Maximum likelihood provides estimations that maximize the likelihood that the data were from the population (Bollen 1989; Kline 2016). Maximum likelihood has three notable properties; the properties are asymptotic, the maximum likelihood estimator is consistent, and they are not biased across variables used for estimation (Bollen 1989). Since the properties are asymptotic, they work especially well with larger sample sizes, such as with this study. As maximum likelihood is the default estimation and test for local fit\(^{10}\) (Kline 2016), I used maximum likelihood for this analysis.

**Correlated Errors.** Correlated errors should only be included within structural equation models when they are logically driven rather than to increase model fit (Kline 2016). By correlating the errors associated with each of the variables the model adjusts for the overlap that may exist for these indicators (Kline 2016). For social interactions, of the three variables used for analysis\(^{11}\) two, volunteering and attending group events, exist within formal group settings. I correlated these variables’ errors to note that volunteering and attending group events very well may occur within the same setting. The correlated

\(^{10}\) Other options for model fit are unweighted least squares and generalized least squares.

\(^{11}\) Social interactions variables are frequency of (1) volunteering, (2) attending group events, and (3) time spent with friends and family.
errors are included for volunteering and attending group events at Wave 1, Wave 2, and Wave 3. Similarly, of the mental health measures\textsuperscript{12}, depression, anxiety, and stress are interrelated as many people who experience depression have anxiety and high levels of stress (Cohen et al. 1983). Thus correlation of errors is included for depression and anxiety, depression and stress, as well as anxiety with stress. The correlated errors are included for depression, anxiety, and stress at Wave 1, Wave 2, and Wave 3.

Correlations of errors are included when researchers use the same indicators across multiple data collection points (Kline 2016). When researchers correlate the errors it allows maximum likelihood to adjust for the relationship that exists between the same measures over time. As this model uses the same measures across each wave, such as the three social interactions measures of frequency volunteering, attending group events, and time spent with friends and family, the errors for identical variables the researcher should controlled these across waves. Thus, I correlated the errors for variables\textsuperscript{13} measured across Waves 1, 2, and 3.

RESULTS
Descriptive Statistics across Three Waves

Descriptive statistics of all study variables are contained in Table 3:1. For the 2,491 participants, 36% had at least one disability at Wave 1 which increased to 52% at Wave 2.

\textsuperscript{12} Mental Health Measures are (1) Depression (CESD), (2) Loneliness (UCLA), (3) Stress (PSS), and (4) Anxiety (HADS)

\textsuperscript{13} The same variables used across all three waves include the physical disability measure (disability as dichotomous variable), social interactions measures (frequency of volunteering, attending group events, and time spent with friends and family), mental health scales (CESD, HADS, PSS, UCLA), and marital status (married as a dichotomous variable).
and 69% at Wave 3. This pattern is common as people age they are more likely to develop physical limitations and thus are more likely to have a disability.

| Table 3.1. Descriptive Statistics for the Variables Included in the Multivariate Analysis |
|---------------------------------------------|----------------|----------------|----------------|----------------|
|                               | Wave 1 | Wave 2 | Wave 3 |
|                               | Mean   | Dev.  | Range | Mean   | Dev.  | Range | Mean   | Dev.  | Range |
| Disability                    | 0.36   | 0-1   | 0.52  | 0-1   | 0.69  | 0-1   |
| (Dummy)                       |        |       |       |        |       |       |
| Has Disability                |        |       |       |        |       |       |
| Social Interactions           |        |       |       |        |       |       |
| Volunteering                  | 2.14   | 2.08  | 0-6   | 2.15   | 2.14  | 0-6   | 2.16   | 2.19  | 0-6   |
| Attend Group Activities       | 2.58   | 2.15  | 0-6   | 2.64   | 2.18  | 0-6   | 2.66   | 2.24  | 0-6   |
| Time with Friends & Family    | 4.32   | 1.30  | 0-6   | 4.27   | 1.37  | 0-6   | 4.48   | 1.31  | 0-6   |
| Mental Health                 |        |       |       |        |       |       |
| Loneliness (UCLA)             | 4.04   | 1.41  | 0-9   | 3.20   | 2.31  | 0-9   | 2.98   | 2.27  | 0-9   |
| Anxiety (HADS)                | 10.57  | 3.46  | 7-28  | 11.66  | 3.67  | 6-27  | 11.42  | 3.42  | 6-25  |
| Depression (CESD)             | 16.56  | 5.19  | 11-43 | 16.11  | 4.90  | 10-41 | 16.25  | 5.05  | 11-40 |
| Stress (PSS)                  | 5.79   | 2.28  | 4-16  | 7.17   | 2.67  | 2-16  | 6.73   | 2.52  | 2-16  |
| Controls                      |        |       |       |        |       |       |
| Age ^                         | 69.30  | 7.85  | 57-85 |        |       |       |
| Degree (Education)^           | 2.49   | 1.07  | 1-4   |        |       |       |
| White (Race) ^                | 0.76   | 0.1   | 0-1   |        |       |       |
| Married                       | 0.60   | 0-1   | 0.57  | 0-1   | 0.56  | 0-1   |

^ Included as time invariant variables using Wave 1 values.

Data: NSHAP

Social Interactions is relatively consistent over three waves using indicators of volunteering\(^{14}\) (2.14 at Wave 1, 2.15 at Wave 2, and 2.16 at Wave 3) and attending group events\(^{15}\) (2.58 at Wave 1, 2.64 at Wave 2, and 2.66 at Wave 3). However, there are

\(^{14}\) ANOVA Output for volunteering= F (2,7470) = 0.05, p=0.95

\(^{15}\) ANOVA Output for attending group events= F (2,7470) = 0.90, p=0.94
notable differences between waves when examining the time spent with friends and family\textsuperscript{16} (4.32 at Wave 1, 4.27 at Wave 2, and 4.48 at Wave 3).

Loneliness changes over time, decreasing between each wave\textsuperscript{17} (4.04 at Wave 1, 3.20 at Wave 2, and 2.98 at Wave 3). Anxiety changes over time, increasing between Waves 1 and 2 then decreasing between Waves 2 and 3\textsuperscript{18} (10.57 at Wave 1, 11.66 at Wave 2, and 11.42 at Wave 3). Depression decreases between Waves 1 and 2 but is stable between all other waves\textsuperscript{19} (16.56 at Wave 1, 16.11 at Wave 2, and 16.25 at Wave 3). Stress changes over time with an increase between Waves 1 and 2 and a decrease between Waves 2 and 3\textsuperscript{20} (5.79 at Wave 1, 7.17 at Wave 2, and 6.13 at Wave 3).

\textsuperscript{16} ANOVA output for time with friends and family = F (2,7470) = 17.02, p<0.001. Change between Waves 1 and 2 is not significant (p= 0.38) with a decrease of 0.05. Change between Waves 1 and 3 is significant (p <0.01) with an increase of 0.08. Change between Waves 2 and 3 is significant (p <0.01) with an increase of 0.12.

\textsuperscript{17} ANOVA output for loneliness = F (2,7470) = 187.43, p<0.001. Change between Waves 1 and 2 is not significant (p=0.38) with a decrease of 0.05. Change between Waves 1 and 3 is significant (p<0.01) with an increase of 0.16. Change between Waves 2 and 3 is significant (p<0.01) with an increase of 0.12.

\textsuperscript{18} ANOVA output for anxiety = F (2,7470) = 817.13, p<0.001. Change between Waves 1 and 2 is significant (p<0.001) with an increase of 1.09. Change between Waves 1 and 3 is significant (p<0.001) with an increase of 0.85. Change between Waves 2 to 3 is significant (p=.04) with a decrease of 0.24.

\textsuperscript{19} ANOVA output for depression = F (2,7470) = 132.11, p=0.01. Change between Waves 1 and 2 is significant (p=0.005) with a decrease of -0.45. Change between Waves 1 and 3 is not significant (p=0.08) with a decrease of 0.31. Change between Waves 2 and 3 is not significant (p=0.59) with an increase of 0.14.

\textsuperscript{20} ANOVA output for stress = F (2,7470) = 1237.86, p<0.001. Change between Waves 1 and 2 is significant (p<0.001) with an increase of 1.21. Change between Waves 1 and 3 is significant (p<0.001) with an increase of 0.94. Change between Waves 2 and 3 is significant (p<0.001)
Half of the participants were female (51.6%). Their average age was 64.9 years old at Wave 1, ranging from 57 to 85 years old. Over two-thirds of participants (76.0%) were white. Half of the participants’ highest degree of education was high school or less than high school and half of the participants’ highest degree of education was some college or more. At Wave 1 60% of participants were married compared to 57% at Wave 2 and 56% at Wave 3. Overall, the averages for social interactions, mental health, age, education, and race remain relatively stable over time with some minor fluctuations in social interactions and mental health. Over time there is an increase in the percent of people with disabilities and a slight decrease in the percent of people who are married.

Disability, Social Interactions, and Mental Health over Time

This chapter examines the complex relationship between disability, mental health, and social interactions at a given time point, as well as the effect of disability over time on social interactions and mental health. For each wave, the relationship between disability and poor mental health was a positive moderate relationship for each wave at .46 (Wave 1), .44 (Wave 2), and .38 (Wave 3). Additionally, the relationship between disability and social interactions remained moderately negative for each wave with correlations of -.40 (Wave 1), -.31 (Wave 2), and -.47 (Wave 3). Social interactions have a weak negative relationship with poor mental health with -.10 at Wave 1, -.16 at Wave 2, and -.16 at Wave 3. These findings, shown in Figure 3:3 below, support the Stress Process Theory that people with disabilities have better mental health outcomes when they have social interaction to mediate the effects of disability on mental health.
There is a negative relationship between social interactions and disability status over time (-.26 from Wave 1 to Wave 2 and -.48 from Wave 2 to Wave 3). This finding supports the notion that physical disability not only affects social current interactions but also in the future in a negative manner so people with disabilities not only have lower levels of social interactions currently but this carries over into their future levels of social interactions. There is also an association of disability status with poor mental health over time. The association is weak and positive between Wave 1 disability status and Wave 2 poor mental health (.27), and moderate and positive (.42) between and Wave 2 disability status and 3 poor mental health. Therefore, currently having a disability is not only associated with poor current mental health but also future poor mental health.

The three-wave structural equation models all produced goodness of fit statistics within the ranges considered acceptable that I described above (i.e. RMSEA of 0.04, CFI
of 0.92, and TLI of 0.89). All indicators for the measurement model of disability, social interactions, and mental health loaded significantly to their respective latent constructs.

Table 3:2. Control Variable Significance For Three Wave Structural Equation Model of Physical Disability, Social Interactions, and Poor Mental Health

<table>
<thead>
<tr>
<th>Time Invariant</th>
<th>Model 1 Dis -&gt; SI</th>
<th>Model 2 Dis -&gt; SI -&gt; PMH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female (vs. Male) (Sex)</td>
<td>0.21 ***</td>
<td>0.05</td>
</tr>
<tr>
<td>Age</td>
<td>0.01 **</td>
<td>-0.01 **</td>
</tr>
<tr>
<td>H.S. + (vs. LT HS) (Education)</td>
<td>0.17 ***</td>
<td>-0.70 ***</td>
</tr>
<tr>
<td>White (vs. Non-white) (Race)</td>
<td>-0.04</td>
<td>-0.70 *</td>
</tr>
<tr>
<td>Time Variant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married at Wave 1 (vs. non-married) (Marital Status)</td>
<td>0.05</td>
<td>-0.32 ***</td>
</tr>
<tr>
<td>Married at Wave 2 (vs. non-married) (Marital Status)</td>
<td>0.01</td>
<td>-0.44 ***</td>
</tr>
<tr>
<td>Married at Wave 3 (vs. non-married) (Marital Status)</td>
<td>0.06</td>
<td>-0.42 ***</td>
</tr>
</tbody>
</table>

For the Time Invariant Variables: Model 1 coefficients are for the associations of the control variable with Social Interaction (W1_SI) in the model with Wave 1 Disability (W1_Dis) as a predictor. Model 2 coefficients are for the associations of the control variables with Wave 1 Poor Mental Health (W1_PMH) in the model with Disability (W1_Dis) and Social Interaction (W1_SI) as predictors.

For the Time Variant Variables (Married): Model 1 coefficients are for the associations of the control variable with Social Interaction (SI) in the model with Disability (Dis) as a predictor. Each line relates to a specific wave of data. Model 2 coefficients are for the associations of the control variables with Poor Mental Health (PMH) in the model with Disability (Dis) and Social Interaction (SI) as predictors. Wave 1 is on the first line, Wave 2 on the second line, and Wave 3 on the third line.

Dis= Disability, SI= Social Interaction, PMH= Poor Mental Health
H.S.+ = High School or more of education
LT HS = Less than High School education

Data: NSHAP Waves 1, 2, and 3
* p < .05; ** p < .01; *** p < .001

As seen in Table 3:2 above the results indicate that women, those who are older, and those who have higher levels of education have higher, and whites have lower, levels of
social interactions compared to those in the reference groups. Women, however, do not have worse poor mental health than men. Those who are older, more educated, and white have lower levels of poor mental health compared to those in the reference groups. Marital status in prior waves is not associated with social interactions, but within waves those who are married have lower poor mental health than those who are not married. Therefore, even though marital status is not associated with social interactions levels among older adults, it is associated with better mental health at each wave.

Direct, Indirect, and Total Effects

Effects are a measurement of the influence of a variable, or set of variables, on an outcome (Bollen 1987). Examination of effects allows the researcher to tease out the effect variables within a structural equation model (Cohen et al. 2003). Researchers report effects as direct effects, indirect effects, and total effects (Bollen 1987; Cohen et al. 2003). Measurement of direct effects is the coefficient between two variables (Bollen 1987; Cohen et al. 2003). Direct effects for this study are the coefficients from the relationship between physical disability and poor mental health. Indirect effects include all pathways to a single variable mediated or moderated by one or more variables (Bollen 1987; Cohen et al. 2003). Calculation of indirect effects for this study is by multiplying the unstandardized coefficients of physical disability status with social interactions and social interactions to poor mental health. Total effect is the measurement of both the direct and indirect effects within a model (Bollen 1987; Cohen et al. 2003). Table 3:3 contains total effects calculations for the outcomes of social interaction and poor mental health using summation of the direct effect and indirect effect for each outcome.
For this longitudinal model, there are a total of 5 paths. Each wave has a path accounting for 3 of the paths. Across waves of data, there are two additional paths. Then from Wave 1 to Wave 2 accounts for a path. Lastly from Wave 2 to Wave 3 accounts for a path.

The direct path from disability status in Wave 1 to poor mental health is 0.46. The indirect path from disability to social interactions to poor mental health is 0.04. The total association from disability status to poor mental health for Wave 1 is 0.50. Therefore in Wave 1 a portion of the association from disability status to poor mental health is through social interactions. The direct path from disability status to poor mental health in Wave 2 is moderate and positive (0.44). The indirect path from disability to social interactions to poor mental health is 0.05. The total path for Wave 2 is 0.49. Thus there is a similar level of mediation through social interaction among older adults about five years after the first wave. The direct association from disability to poor mental health in Wave 3 is smaller than in the prior two waves, 0.38. The indirect path from disability to social interactions

<table>
<thead>
<tr>
<th>Wave 1 (Dis₁ → SI₁ → PMH₁)</th>
<th>Direct Effect</th>
<th>Indirect Effect</th>
<th>Total Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.46</td>
<td>0.04</td>
<td>0.50</td>
<td></td>
</tr>
<tr>
<td>Wave 2 (Dis₂ → SI₂ → PMH₂)</td>
<td>0.44</td>
<td>0.05</td>
<td>0.49</td>
</tr>
<tr>
<td>Wave 3 (Dis₃ → SI₃ → PMH₃)</td>
<td>0.38</td>
<td>0.08</td>
<td>0.46</td>
</tr>
<tr>
<td>Wave 1 to Wave 2 (Dis₁ → SI₁₂ → PMH₁₂)</td>
<td>0.27</td>
<td>0.04</td>
<td>0.35</td>
</tr>
<tr>
<td>Wave 2 to Wave 3 (Dis₂ → SI₂₃ → PMH₂₃)</td>
<td>0.42</td>
<td>0.08</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Dis₁= Physical Disability at Wave 1, SI₁= Social Interactions at Wave 1, PMH₁= Poor Mental Health at Wave 1
Dis₂= Physical Disability at Wave 2, SI₂= Social Interactions at Wave 2, PMH₂= Poor Mental Health at Wave 2
Dis₃= Physical Disability at Wave 3, SI₃= Social Interactions at Wave 3, PMH₃= Poor Mental Health at Wave 3

Data: NSHAP Waves 1, 2, and 3
to poor mental health is larger in Wave 3, 0.08. The total path for Wave 3, however, is similar to the prior waves, 0.46. Thus more of the total effect from disability status to poor mental health is through social interactions in Wave 3 (.08) than in the prior waves. The associations are similar across waves (with the exception of the indirect effect in wave 3), suggesting that disability status and level of social interactions are relevant for mental health from the mid-fifties to the late nineties.

There are two paths that cross two time points: the relationship between physical disability at Wave 1 to social interactions and poor mental health at wave 2, and the relationship between physical disability at wave 2 to social interactions and poor mental health at Wave 3. Wave 1’s direct path from physical disability to wave 2 poor mental health is 0.27. The indirect path from wave 1 disability to wave 2 social interactions to wave 2 poor mental health is 0.04. The total path is 0.35. Wave 2’s direct path from physical disability to wave 3 poor mental health is 0.42. The indirect path from wave 2 disability to wave 3 social interactions to wave 3 poor mental health is 0.08. The total path is 0.50. The paths between each wave of data are similar to each other, showing that the effects of the relationship between physical disability and poor mental health partially accounted for by an inclusion of social interactions over time spans of about 5 years.

Supplementary Analysis: Disability, Social Interactions, and Mental Health at One Time Point

I also analyze each wave of NSHAP separately to see if inclusion of multiple waves of data changes the patterns of relationships between physical disability status, social interaction, and poor mental health. Completing a supplementary analysis of each
wave as a check of the full model. My findings for each wave matched closely with the three wave model.

For Wave 1, there is a good model fit with RMSEA (0.04), CFI (0.91), and TLI (0.89) all within acceptable parameters. As seen in Figure 3:4, all indicators for the measurement model of social interactions and mental health loaded significantly to their respective latent constructs. For Wave 1 (seen in Figure 3:4), there is a moderate positive (.43) relationship between disability status and poor mental health, a moderate negative (-.40) relationship between disability status and social interactions, and a weak negative (-.19) relationship between social interactions and poor mental health over time. To that end, older adults with disabilities have poorer mental health and lower social interactions, and those with higher social interactions have lower poor mental health. Social interactions partially mediate the relationship between disability status and poor mental health.

![Figure 3:4](image-url)

**Figure 3:4. Structural Equation Model for Disability and Social Interaction Predicting Poor Mental Health Wave 1**

Note: Controlled for sex, age, education, race, and mental status at Wave 1. CFI = 0.91, TLI = 0.89, RMSEA = 0.04

Data: NSHAP Waves 1, 2, and 3
As seen in Table 3:4, of the control variables sex, age, and education were significant in the relationship between disability status and social interactions. Women have higher levels of social interactions compared to men. With each year of age, there is a small but significant increase in the frequency of social interactions. People with higher levels of education indicate higher levels of social interactions. Similar to Wave 1, older adults with physical disabilities have poorer mental health and lower social interactions, and those with higher social interactions have lower poor mental health. Women have higher levels of poor mental health than men. People with higher levels of education as well as people who are married have lower levels of poor mental health than those in the reference groups.

Table 3:4. Control Variable Significance For Wave 1 Structural Equation Model of Physical Disability, Social Interactions, and Poor Mental Health

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>W1_Dis -&gt; W1_SI</td>
<td>W1_Dis -&gt; W1_SI -&gt; W1_PMH</td>
</tr>
<tr>
<td>Female (vs. Male) (Sex)</td>
<td>0.43 ***</td>
<td>0.14 ***</td>
</tr>
<tr>
<td>Age</td>
<td>0.01 **</td>
<td>0.00</td>
</tr>
<tr>
<td>H.S. + (vs. LT HS) (Education)</td>
<td>0.42 ***</td>
<td>-0.04 *</td>
</tr>
<tr>
<td>White (vs. Non-white) (Race) (Race)</td>
<td>0.13</td>
<td>-0.03</td>
</tr>
<tr>
<td>Married (vs. non-married) (Marital Status)</td>
<td>0.03</td>
<td>-0.21 ***</td>
</tr>
</tbody>
</table>

Model 1 coefficients are for the associations of the control variable with Wave 1 Social Interaction (W1_SI) in the model with Wave 1 Disability (W1_Dis) as a predictor. Model 2 coefficients are for the associations of the control variables with Wave 1 Poor Mental Health (W1_PMH) in the model with Disability (W1_Dis) and Social Interaction (W1_SI) as predictors.

Dis= Disability, SI= Social Interaction, PMH= Poor Mental Health
H.S.+ = High School or more of education
LT HS = Less than High School education

Data: NSHAP Waves 1, 2, and 3
* p < .05; ** p < .01; *** p < .001
My analysis of Wave 2 has good model fit, the RMSEA (0.05), CFI (0.93), and TFI (0.88) which are all within acceptable parameters. As seen in Figure 3:5, all indicators for Wave 2’s measurement model of social interactions and mental health loaded significantly to their respective latent constructs.

Also seen in Figure 3:5, Wave 2 data follows a similar pattern to Wave 1. There is a moderate positive relationship (.51) between disability and poor mental health, disability is moderately negatively (-.34) associated with social interactions, and social interactions is weakly negatively (-.28) associated with poor mental health. Therefore, compared to not having one, having at least one disability is associated with poorer mental health and lower levels of social interactions, and low levels of social interactions associated with higher poor mental health.

**Figure 3.5.** Structural Equation Model for Disability and Social Interaction Predicting Poor Mental Health: Wave 2
Note: Controlled for sex, age, education, and race at Wave 1. Controlled for marital status at Wave 2. CFI = 0.93 TLI = 0.88 RMSEA = 0.05

Data: NHAP Waves 1, 2, and 3
As seen in Table 3:5, for the relationship between disability status and social interactions, sex, education level, and race were significant. Women had higher levels of social interactions than men. Higher levels of social interactions were associated with higher levels of social interactions. Participants who identified as white had higher amounts of social interactions than people who identified as racial minorities. For the relationship between disability status, social interactions, and mental health, women have higher levels of poor mental health and people who are married have lower levels of poor mental health.

<table>
<thead>
<tr>
<th>Table 3:5. Control Variable Significance For Wave 2 Structural Equation Model of Physical Disability, Social Interactions, and Poor Mental Health</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model 1</strong></td>
</tr>
<tr>
<td>W2_Dis -&gt; W2_SI</td>
</tr>
<tr>
<td>Female (vs. Male) (Sex)</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>H.S. + (vs. LT HS) (Education)</td>
</tr>
<tr>
<td>White (vs. Non-white) (Race)</td>
</tr>
<tr>
<td>Married (vs. non-married) (Marital Status)</td>
</tr>
</tbody>
</table>

Model 1 coefficients are for the associations of the control variable with Wave 2 Social Interaction (W2_SI) in the model with Wave 2 Disability (W2_Dis) as a predictor. Model 2 coefficients are for the associations of the control variables with Wave 2 Poor Mental Health (W2_PMH) in the model with Disability (W2_Dis) and Social Interaction (W2_SI) as predictors.

Data: NSHAP Waves 1, 2, and 3

* p < .05; ** p < .01; *** p < .001

Wave 3’s model fit statistics, in Figure 3:6 below, were the strongest out of the three waves of data with an RMSEA of 0.03, CFI of 0.96, and TLI of 0.93. All indicators
for the measurement model of social interactions and mental health loaded significantly to their respective latent constructs.

Wave 3, depicted in Figure 3:6, follows a similar pattern to Waves 1 and 2. Disability has a moderate positive (.41) with poor mental health. However, there is a strong negative (-.67) relationship between disability and social interactions, stronger than measured in the two previous waves. Additionally, the relationship between social interactions and poor mental health is also stronger as a moderate negative (-.37) relationship. To that end, the overall relationships are the same. The strengths of those relationships, however, are higher compared to the previous waves of analysis. Beyond stronger relationships between the variables, the model fit statistics are better for Wave 3.

**Figure 3.6. Structural Equation Model for Disability and Social Interaction Predicting Poor Mental Health Wave 3**

Note: Controlled for sex, age, education, and race at Wave 1. Controlled for marital status at Wave 3. CFI= 0.96 TLI= 0.93

RMSEA = 0.03

Data: NSHAP Waves 1, 2, and 3
As seen in Table 3:6, control variables of sex and education were significant for the relationship between disability status and social interactions. Women reported having higher levels of social interactions than men. People with higher levels of education have higher frequency of social interactions. Upon examination of the relationship between disability status, social interactions, and mental health the control variables of sex, education, and marital status were significant. Women have higher levels of poor mental health. People with higher levels of education and people who are married have lower levels of poor mental health.

Table 3:6. Control Variable Significance For Wave 2 Structural Equation Model of Physical Disability, Social Interactions, and Poor Mental Health

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3_Dis -&gt; W3_SI</td>
<td>W3_Dis -&gt; W3_SI -&gt; W3_PMH</td>
</tr>
<tr>
<td>Female (vs. Male) (Sex)</td>
<td>0.47 ***</td>
</tr>
<tr>
<td>Age</td>
<td>0.00</td>
</tr>
<tr>
<td>H.S. + (vs. LT HS) (Education)</td>
<td>0.44 ***</td>
</tr>
<tr>
<td>White (vs. Non-white) (Race)</td>
<td>0.15</td>
</tr>
<tr>
<td>Married (vs. non-married) (Marital Status)</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Model 1 coefficients are for the associations of the control variable with Wave 3 Social Interaction (W3_SI) in the model with Wave 3 Disability (W3_D) as a predictor.

Model 2 coefficients are for the associations of the control variables with Wave 3 Poor Mental Health (W3_PMH) in the model with Disability (W3_D) and Social Interaction (W3_SI) as predictors.

Dis= Disability, SI= Social Interaction, PMH= Poor Mental Health
H.S.+ = High School or more of education
LT HS = Less than High School education

Data: NSHAP waves 1, 2, and 3
*p < .05; **p < .01; ***p < .001
Sensitivity Analysis

Social interactions and mental health are examined within this study as latent constructs. I completed a sensitivity analysis on the factor loading for social interactions and mental health. Confirmatory factor loading analysis show that the social interactions variables loaded onto a single factor with an eigenvalue of 2.38 and uniqueness of 0.20 for volunteering, 0.17 for attending group events, and 0.24 for time spent with friends and family. For mental health, one notable factor emerged with a weak second factor. The factor with an eigenvalue 1.47 and uniqueness of 0.68 for the UCLA loneliness scale, 0.54 for the HADS anxiety scale, 0.87 for the PSS stress scale, and 0.43 for the CESD depression scale.\(^2\)

Completion of additional sensitivity analysis examined if each variable used to generate latent constructs. This analysis examined if each construct within a given factor gave a similar model output. To complete the sensitivity analysis, I replaced the latent constructs with each of their indicators and re-ran the structural equation model to see if the model found different results with a single indicator rather than the latent variable.

To that end, for social interactions the model was rerun using volunteering, attending group events, and time spent with friends and family individually. Each social interactions variable (volunteering, attending group events, and time spent with friends and family) generates a similar model to the latent construct of social interactions. Having a disability is associated with lower levels of each social interactions variable and inferior mental health. Each mental health scale (UCLA loneliness scale, the HADS

\(^2\)Reported Eigenvalues and factor uniqueness values are for Wave 1. Factor analysis across waves followed the same pattern.
anxiety scale, the PSS stress scale, and the CESD depression scale) generates a similar model to the latent construct of mental health. Having a physical disability is associated with having higher levels of loneliness, anxiety, stress, and depression. The analysis also show that having more social interactions are associated with lower levels of loneliness, anxiety, stress, and depression. These findings all align with the findings using the comprehensive latent constructs of social interactions and poor mental health. To that end, the sensitivity analyses show that the main conclusions (i.e. the direction and strength of the associations) are robust to various measurement strategies and specifications.

DISCUSSION AND CONCLUSION

Social interactions partially mediate the negative association between functional limitations and mental health among older adults. There is a moderate negative association between functional limitations and mental health, a strong negative association between functional limitations and social interactions, and a weak positive association between social interactions and mental health.

The findings lend support to the call to consider how functional limitations unfold in a social context and that context is necessary for understanding the psychosocial consequences of disablement (Warner and Kelley-Moore 2012). Importantly, when considered with prior research, the results indicate that objective and subjective measures of social connectedness operate differently (Cornwell and Waite 2009) as objective measures of social interactions mediate the lower psychosocial mental health of persons
with functional impairments but their subjective appraisals of how well that interaction meets their needs may moderate these deleterious effects.

**Limitations.** Limitations of this study are rooted in the data and assumptions within the model. NSHAP, while nationally representative and well respected, only includes adults who are community dwelling. Older adults with high levels of disability are largely institutionalized within nursing homes, skilled care facilities, and hospices. Older adults within institutions will have different levels of social interactions and mental health and thus this study is not generalizable to all older adults. Assumptions within the model are within the latent constructs of physical disability, social interactions, and mental health. Activity of Daily Living measures are widely used and verified as measures of physical disability, thus they are of less concern as a study limitation. Social interactions were generated under the assumption that people’s social involvement with friends, family, and community organizations is a strong conceptualization of social interactions. It is likely that there are some individuals within this age group who solely interact with one group (i.e. just friends, just family, just church) and have very high and satisfying levels of social interactions. Lastly, mental health is generally not used as a holistic measure in most studies; therefore, results should be interpreted with minor caution.

**Future Research Directions.** Researchers beyond this dissertation needed to examine various measures of social interactions, subjective measures of social support, and barriers to social interactions. Analysis of objective measures of social interactions
and subjective measures of social support will provide a more robust assessment of the social context in which older persons experience functional limitations. Research should unpack the barriers to social interactions for people with disabilities based on their physical and social environment. In conjunction with longitudinal data to examine the causal order of physical disability, social interactions, and mental health would allow researchers and medical practitioners to develop best practices to prevent excess deterioration of social interactions and mental health for people with physical disabilities.

To summarize, this chapter establishes the relationship between physical disability, social interactions, and mental health for older adults. However, it remains unclear why this association exists for older people with disabilities. To examine the nature of this relationship, I also conducted semi-structured interviews asking older adults with physical disabilities about their social interactions and mental health in Chapter 4. Through the collection of stories and insights of people’s lived experiences, the readers will glean a better understanding of the social and mental health outcomes for people with disabilities is analyzed.
CHAPTER 4: RAMPS - QUALITATIVE ANALYSIS OF BARRIERS TO SOCIAL INTERACTION

Objective 2: Explore how the anticipation of the physical environment shapes the desire for social interactions.

Objective 3: Investigate how self-perception of others’ willingness to interact affects the desire for social interactions.

SYNOPSIS

This chapter examines the barriers to social interaction for older people with disabilities. I examined two distinct barriers: (1) physical environment barriers and (2) self-perception barriers. This part of the dissertation study uses Redefining and Maintaining Positive Social Interactions (RAMPS) data, originally collected with support from the National Science Foundation (Grant No. 1702959). RAMPS data involve semi-structured interviews and surveys of adults 55-85 years old who are currently living in their own home (N=60). Recruitment occurred from July of 2017-February of 2018 and interviews completed in January and February of 2018. Participants lived in two states. All participants are white.

I used narrative research to examine how physical disabilities shape social interaction. Findings suggest that people with disabilities experience social interaction barriers related to the physical environment (e.g. stairs without railings) as well as self-perception barriers (e.g. perceptions of other’s willingness to interact). Most importantly, participants talked about changes in their lives, specifically social interactions, when their disability developed or worsened to the point that it affected their ability to socialize with others.
The findings from this study have relevance for sociological theories of living with disabilities, city planners, for people with disabilities, as well as people who interact with people who have disabilities. Even decades after the Americans with Disabilities Act, there is evidence for the need for more actions. If the goal is inclusion, city planners should take direct action to ensure that public locations are accessible for people with disabilities. This includes things such as ramps into public buildings, removal of ice and snow from sidewalks, as well as regulations for locations frequented by the general public such as restaurants, shopping centers, public parks, and businesses. There is also evidence of potential benefits from efforts to education people with disabilities how to maneuver tough social interactions as well as working around barriers within the physical environment. Lastly, people without disabilities could do more to effectively interact with people who have disabilities in ways that support positive social integration. Chapter 5, in turn, examines the implications of changes in social interactions on mental health for people with disabilities.

INTRODUCTION

I use a narrative research approach (Franzosi 1998) to analyze interviews, grounding the open-ended interview questions in insights from biopsychosocial (Engel 1989) and Stress Process theories (Pearlin et al.1981). I use interview questions to explore participants’ experiences with their social and physical environments, as well as the implications of the social and physical environment for social interactions.

This chapter builds on the quantitative findings presented in Chapter 3. The SEM models based on data from the National Social, Health, and Aging Project (NSHAP) used
in Chapter 3 showed that there are direct and indirect relationships between physical
disability, social interactions, and mental health. However, the quantitative panel data did
not contain information on the specific mechanisms related to physical disability (the
“why”) and social interactions, the actual and perceived barriers to social interactions,
and the interpretation or meaning of social interactions for people with disabilities. To
address these shortcomings, I conducted 60 semi-structured interviews and surveys as
part of the RAMPS data collection effort. The mixed-method approach enables me to
complement the strengths of NSHAP data with a parallel qualitative study mirroring key
variables\textsuperscript{22} used in the original NSHAP items, for the purpose of comparing NSHAP and
RAMPS sample properties. Furthermore, the RAMPS data collection facilitated asking
additional, innovative interview questions designed to elicit narratives about experiences
with social interactions from older people with disabilities. The richness of qualitative
data within interviews moves beyond correlations and path diagrams to understand the
dynamics in which people with disabilities’ lives unfold. I performed all data analysis
using a combination of STATA, for statistical analysis of survey data, and Excel, to sort
the semi-structured interview data.

DATA AND MEASURES

\textbf{Researcher Positionality.} A basic tenant of qualitative research is that a
researcher’s role must be examined prior to and throughout the duration of the study
(Roller and Lavarkas 2015). Because I conducted the interviews in person, my role in the

\textsuperscript{22} Duplication of the disability, social interaction, mental health scales, and control
variables used in NSHAP are used with the RAMPS data collection.
research is important to the data collection process. Therefore I describe my position and reflexivity in this study. The population for this study was older adults with disabilities. I am younger than all of the study participants by 25 years and do not currently have a visible disability. I recognized that my positionality as a young researcher without physical disabilities could potentially shape how participants respond to my questions. I made efforts to be aware of these differences and made deliberate choices in data collection in an attempt to reduce interviewer effects. I worked to build rapport by discussing the study purpose and other topics of common interest during recruitment as well as before the interview and during an explanation of the study and related paperwork. Rapport building between respondent and researcher is the “cornerstone” for interviews as this is the most personal of all the qualitative research design methods (Roller and Lavrakas 2015).

**Research Ethics.** University of Nebraska-Lincoln’s Institutional Review Board, as well as the review board for the spinal cord rehabilitation center in the Midwest that allowed me to advertise to their patients, approved this study. All study instruments were approved by both of the review boards before any recruitment or collection was completed. All participants completed an informed consent with original signatures of the respondent and researcher. Additionally, participants were allowed to skip all questions that they would prefer not to answer, ask for clarity on anything that was unclear, and take breaks as desired by the respondent. I gave participants the contact information for several locations that provided mental health services at free or sliding scale costs to follow up with if they desired to speak with a professional following their interview.
Sampling and Recruitment Procedure

To optimize comparability with the NSHAP population, recruitment of participants for the semi-structured interview/survey component of this study are from a population of adults between the ages of 55 and 85 who had a disability and lived in their own homes. The parameters for inclusion closely mirror those of the National Social, Health and Aging Project (NSHAP) of being between the ages of 57 and 85\textsuperscript{23} and living in their own home. The goal was to facilitate a mixed methods analysis comparing the nationally representative longitudinal surveys with data from NSHAP with the semi-structured interviews and surveys from RAMPS. The recruitment materials introduced the study by the name Redefining and Maintaining Positive Social Interactions, subsequently referred to as RAMPS\textsuperscript{24} in communication with participants, a spinal cord rehabilitation center, and the National Science Foundation.\textsuperscript{25}

My recruitment strategy for this study involved a combination of respondent driven sampling and convenience sampling from a dissemination of a flyer, both printed and electronic. The flyer includes information with the study name, qualifications to

\textsuperscript{23} Due to an error on my part respondents for the RAMPS study (interviews used in this chapter) are 55-85 years old but the NSHAP study (surveys used in the preceding chapter) are 57-85 years old. This was unintentional and a slight misalignment with the two data sets.

\textsuperscript{24} The name Redefining and Maintaining Positive Social Interactions, RAMPS, is for recruitment purposes. Many people with disabilities do not identify as disabled (Deal 2003) and thus using the dissertation title “Disabled and Out? Social Interactions and Mental Health among Older Adults with Physical Disabilities” would deter respondents from feeling that they qualify for the study.

\textsuperscript{25} The National Science Foundation is the funding agency for RAMPS.
participate in the study, that the interview will take about an hour, there will be a $20
cash incentive, that all information will remain confidential, as well as my contact
information. A copy of the flyer is included as Appendix A. I posted printed flyers posted
at a spinal cord rehabilitation center in the Midwest, at senior centers, at medical supply
direct sale locations, and grocery stores. I disseminated electronic flyers through posts on
social media forums, to occupational and physical therapists who shared the flyers
through social media and craigslist solicitations.

I collected a total of 60 in-person interviews between January and February of 2018. The respondent and I set up a time and location for the interview. I recorded all
interviews on a digital voice recorder that ranged from 24 minutes to 64 minutes with an
average around 45 minutes\textsuperscript{26}. Most of the interview participants lived in rural areas (53 or
88.3%), followed by suburban areas (4 or 6.7%), and urban areas (3 or 5.0%). People
who completed the study recruited 27 additional participants, or 45%, through word of
mouth.

I sent the recordings to the Bureau of Sociological Research at the University of
Nebraska-Lincoln to for completion of transcriptions by trained transcriptionists. After
transcription was completed I manually coded each interview. I took each coded quote
and generated an excel file with respondent information, the quote code, and quote from
the interview. I conducted the narrative analysis based upon the quotes coded from each
interview.

\textsuperscript{26} This time does not include going through the informed consent and related paperwork. From the beginning of paperwork through the end of the interview averaged between 50 and 60 minutes per respondent.
Data Collection Environment

If able, I set up a physical space that worked well for each respondent’s physical status. I made sure the area for the interview was not a far distance to walk from the main entrance to a building and parking areas. To make the space easier to navigate for people with disabilities I moved furniture and potential obstacles. Prior to the arrival of a respondent in a wheelchair, I moved all chairs except mine out of the area. Additionally, for the respondent, I selected a chair that with a high back, sturdy armrests, and average to tall height so it was easier for participants to sit down and stand up.

I conducted all interviews in semi-private or private areas including respondent homes, a private room at a medical center, study rooms at a public library, or similar accessible location. I requested that each respondent choose where the interview location to help them feel more comfortable. Some participants requested to meet in a public space because of concerns about how far I would need to drive to meet them in their home, the lack of privacy due to other people being around in their own homes, their pets were not friendly to strangers, and embarrassment related to their homes.

Data Collection

I decided to conduct in-person interviews and surveys for this study, because in-person interviews allow for participants and researchers connect more easily (Bruner 1985; Merriam & Tisdell 2016) and help participants feel more comfortable in answering questions (Baxter and Eyles 1999). I recruited, completed, and analyzed all surveys and semi-structured interviews. Prior to each interview, I would screen participants to make sure they met the requirements to participate in the study of age, disability, and living at
home. This study’s data collection process is complex. The data collection proceeded through the following process.

At the beginning of data collection, a brief conversation occurred to help build/maintain rapport. We went over the informed consent form (Appendix C) together, and both the research respondent and I signed the informed consent. Participants understood they could stop the interview at any time without damaging their relationship with the researcher, University of Nebraska-Lincoln, or the spinal cord rehabilitation center/recruitment entity. All participants answered every question asked. All participants chose to complete the interview.

Following the informed consent, participants completed a Respondent Consent Capacity Evaluation (Appendix D). This five question screener evaluated if the respondent retained the most important information from the informed consent. Two people failed\textsuperscript{27} the Respondent Consent Capacity Evaluation and no longer eligible for the study.

Following the Respondent Consent Capacity Evaluation, each respondent received $20 cash in appreciation for their time and inconvenience for participating in the study. Participants and I filled out a Research Respondent Disclosure Form (Appendix E) that identified the $20 received as well as their name, address, and signature to account for the incentive money dispersed throughout the study. Participants received the incentive money prior to the interview to ensure that they felt free to skip any questions or stop the study at any point at their discretion.

\textsuperscript{27} Both respondents who failed the Respondent Consent Capacity Evaluation missed one of the five questions. They did not receive the $20 incentive for participation.
Recording began and continued for the duration of the data collection process. All participants were briefly pre-screened prior to setting up an interview. Verification of the information asked on the Pre-Consent Respondent Screener (Appendix F) occurred at this time. Information on the Pre-Consent Respondent Screener included general questions such as name, birth date, medical conditions that resulted in mobility limitations, and if the respondent had been diagnosed with a serious memory impairment. At the time of the interview, I re-asked the study criteria questions, titled Pre-Consent Respondent Screener to ensure each respondent qualified for the study.

Following the Pre-Consent Respondent Screener, participants completed a self-administered survey (Appendix G). Questions on the self-administered survey are from NSHAP about social relationships and activities (e.g. volunteering), loneliness, and general demographics (e.g. education, marital status, and number of children). I asked participants if they would rather me read the questions or if they wanted to fill out the survey themselves. I offered to read the survey to participants for two reasons. First, several participants had a hard time reading due to physical conditions like macular degeneration. Second, participants answered the survey questions not only by selecting a closed-ended response but also explained their response choice with experiences from their lives related to each question. For example, when asking how much time a respondent spent with friends and family in the last year, I sought to obtain both a closed-ended response (survey) and information via an open-ended question (interview) about those times as they decided which response option to choose.

28 In NSHAP the interviewer asks the questions for depression, anxiety, and stress directly to the research respondent. I followed this same model and questions are in the interviewer-administered survey.
The semi-structured interview (Appendix H) followed the survey. The first questions of the semi-structured interview was Rapport Building/General Questions including questions about how a respondent’s general life as well as questions about their disability as Activity of Daily Living, ADLs, measures of ability to walk a block, walk across a room, dressing, bathing, eating, getting in and out of bed, and using a toilet. For the ADLs measures, I showed participants a card with the exact questions and response categories (Show Card A, Appendix J) to help participants with the cognitive burden of large amounts of sensitive questions.

Subsequently, participants explained how the physical environment is limiting with their current physical disabilities. The physical environment includes buildings, sidewalks, green spaces, as well as weather-related conditions. In the next interview section, participants completed questions about social interactions, especially concerning friends and family, and the degree to which barriers in their living and social spaces shaped plans to interact with friends and family. During this part of the interview, participants had the opportunity to explain the degree to which they experienced limitations in social life with friends, family, and people in the community.

Finally, a series of interview questions addressed the extent to which physical barriers shaped participants’ desired levels of interactions with friends, family, and the community. The RAMPS data collection also contained several widely used mental health measures that were also in the NSHAP data analyzed in Chapter 3: Center for Epidemiologic Study Depression Scale, Perceived Stress Scale, and Hospital Anxiety and Depression Scale (anxiety measures). For the mental health measures, I showed participants a card with the exact questions and response categories (Show Card B,
Appendix K) to help participants with the cognitive burden of large amounts of sensitive questions. Following recommendations from Creswell, Hanson, Clark, Morales (2007) and Roller and Lavrakas (2015), I both read questions and provided a card to participants with the questions and response categories. Participants answered questions after reflection and asked questions if they were not sure what a question meant. The interview concluded with an open-ended question in which participants had the chance to share what advice they would give to another person in a similar situation, as well as any questions about the respondent has about the study.

Participants completed each area of the semi-structured interviews. Consistent with qualitative research practices, I allowed the interviews to proceed as conversations. Therefore, unlike standard survey practice, I asked questions in the protocol when participants raised issues. Therefore, although all participants answered all questions, the order of the questions and answers were not always the same. My conversational approach is consistent with suggestions by Roller and Lavrakas (2015) who recommend a research strategy of modifying the questions or each interview based on respondent answers. As mentioned above, some participants elaborated when asked survey questions, others expanded in one section addressing another, and some interviews skipped questions inapplicable to the respondent. Participants, therefore, could have a conversational experience during the interview and I was able to gather all of the information in my protocol. Because question ordering can influence responses in more structured surveys (Dillman, Smyth, and Christian 2014) it is possible that my choice to privilege the participants experience over question ordering could influence the
responses. I did not see evidence that question ordering mattered, however, for the sixty interviews in this study.

I also used additional techniques to facilitate participants telling about their experiences and their stories. For example, I used narrative inquiry (Franzosi 1998 and Polkinghorne 2006) and active listening techniques such as paraphrasing and nodding (Roller and Lavrakas 2015). The questions raised painful emotions for many participants. Several participants cried or expressed anger when they described how their lives had changed as a result of their disability. The expression of emotions, willingness to answer all questions, and appreciation participants expressed for the opportunity to talk about their situation, suggest that the interview techniques that I used were successful in reducing satisficing and acquiescence (Berg and Lune 2012 and Dickson-Swift et al. 2006).

I included existing questions to measure the perceptions, actions, and effects of social interactions for people with disabilities using in-person semi-structured interviews and a survey. As described above, I covered all of the same general topics with each respondent, yet the amount of follow up varied based on responses to the initial questions.

Survey Measures. Participants for this study completed both a survey as well as a semi-structured interview. The purposes of completing the survey were to get general demographic, mental health, and social interactions information as well as to mirror questions from NSHAP and RAMPS. Questions outlined below are for participants within the survey portion of the data collection process for RAMPS.
Functional Limitations: Mirroring NSHAP, I asked participants the degree of difficulty (no difficulty = 0 to unable to do = 3) they had with seven Activities of Daily Living (ADLs) expected to last at least three months: walking one block, walking across a room, dressing, eating, bathing or showering, getting in and out of bed, and using the toilet. Consistent with practices from prior studies with the ADLs questions, I dichotomized each indicator into any or no difficulty (Warner and Kelley-Moore 2012; Warner and Adams 2016).

Social Interactions: Also the same as NSHAP, I asked four questions about how often in the past 12 months they (a) did “volunteer work for religious, charitable, political, health-related, or other organizations”; (b) attended “meetings of any organized group”; (c) got “together socially with friends or relatives”; and (d) got “get together with any... neighbors just to chat or for a social visit?” Responses for items a-c ranged from 0= “never” to 6= “several times a week.” Responses for item d ranged from 0= “hardly ever” to 4= “daily or almost every day.”

Mental Health: Also for comparison to NSHAP, I gave participants the same validated mental health scales, including for the Center for Epidemiological Studies Depression scale [CESD] (Radloff 1977), UCLA Short Loneliness scale (Hughes et al. 2004), the Hospital Anxiety Scale [HADS] (Bjelland et al. 2002), and the Perceived Stress Scale [PSS] (Sheldon, Kamarck and Mermelstein 1983). I provide the results of more in-depth analysis of the mental health items in chapter 5.

Finally, even with a small sample, it is useful to include measures of social location. Therefore I asked about gender, race/ethnicity, marital status, education, and number of children (Warner and Adams 2016).
Research Objectives

The following objectives guided each question asked to participants both in the survey and semi-structured interview to understand social interactions as related to other people’s willingness to interact, anticipation of the social environment, desire for social interactions, and other people’s impressions and actions.

Objective 2: Explore how the anticipation of the physical environment shapes the desire for social interactions.

Objective 3: Investigate how self-perception of others’ willingness to interact affects the desire for social interactions.

Data Coding and Analysis Process

The Bureau of Sociological Research (BOSR) at the University of Nebraska-Lincoln transcribed and de-identified interviews. Rather than completing all interviews first and then having all of them transcribed, I completed 10-15 interviews myself, built in checks for accuracy of transcription (complemented by field notes I had taken during the interviews), and started noting initial emerging themes. The following 45-50 interviews were completed while keeping emerging themes identified in the first 10-15 interviews in mind.

I removed all of identifying information on the surveys. De-identifying the interviews included removing respondent names, other people’s names, as well as locations. My goal was to protect the confidentiality of participants. I provided each respondent with a pseudonym to protect confidentiality and thus any names given in the
study are not those of the respondent. I generated pseudonyms by taking the 50 most popular names by gender in the decade a respondent was born and randomly selecting their pseudonyms without duplicates. This was done as a small reminder to help keep in mind the age of participants in the study.

I did the coding used narrative theory coding practices. I developed the initial codes based on field notes (Charmaz 2014). My goal was to identify desire for social interactions levels and ways that the physical environment limited or did not limit access to social interactions. After the initial coding of a cluster of interviews, additional themes emerged and I added them, including actions and impressions of other people during social interactions. Therefore the final codes developed from initial codes and from the themes that emerged throughout the narratives of how specific events occurred as well as descriptions of internal dialogues and feelings surrounding events.

Narrative Research

Narrative research is a qualitative analytical approach where participants to share their lived experiences, largely through stories, with the researcher (Creswell and Poth 2018; Loh 2013; Polkinghorne 2006). Narrative research developed in literature, history, anthropology, sociology, and education (Creswell et al. 2007). The stories shared by research participants to researchers not only explain the step-by-step experiences that a person has but also their emotions and perceptions surrounding their experiences (Creswell and Poth 2018). The experiences are through many mediums including interviews, observation of people or groups, and photographs. Participants telling their experiences and stories are not limited to a specific time-frame and often talk about
things that have occurred in the past, current experiences, as well as perceptions of future events (Czarniawska 2004; Riessman 2008). The interactions in narrative research can take multiple forms. The most common forms are: a) the researcher is there to ask questions and listen, or b) the data collection process is largely a conversation (Creswell and Poth 2018).

Narrative research has been widely used for disability research as it allows for people with disabilities to share their experiences and life stories (Block and Weatherford 2013). Narrative research is a unique method that focuses on gathering stories about how people have shared different experiences with their disability and how those experiences influence their lives (Walmsley 2001).

Nonetheless, narrative research is not without challenges (Loh 2013). A strong understanding of the study population is important. Researchers “need to collect extensive information about the respondent and need to have a clear understanding of the context of the individual’s life” (Creswell and Poth 2018:73). Additional information for analysis to understand the context in which a person’s life unfolds outside of and in relation to the topics studied is necessary within narrative research.

Narrative research involves encouraging participants to share their experiences and perceptions surrounding their experiences in a storytelling manner. Participants were asked to describe situations and daily life from their perspective not only with how it faculty occurred but also their feelings and perceptions about the experience. The social interactions that I engaged in during the RAMPS narrative research involved asking questions and listening more than an unfolding conversation. I used the questioning and
listening form of narrative research to reduce bias that could come from interjecting my thoughts and experiences in the interview process.

RAMPS Respondent Characteristics

I completed interviews with 60 older adults between the ages of 55 and 85 years old who live independently in their own homes. Research participants lived in urban, suburban, and rural areas. As seen in Table 4:1, the data collection for this study involved a 2x2 purposive sampling design based on the categories of age and sex. Men and women experience disability, social interactions, and mental health differently. Additionally, as people age they are more likely to experience disabilities. Sex and age differences in disability experience were the reasons for a purposive sampling design.

<table>
<thead>
<tr>
<th>Age</th>
<th>Sex</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>55-70</td>
<td>Male</td>
<td>53.6% (15)</td>
<td></td>
<td>55.0% (33)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>56.3% (18)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>71-85</td>
<td>Male</td>
<td>46.4% (13)</td>
<td></td>
<td>45.0% (27)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>43.7% (14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100.0% (28)</td>
<td>100.0% (32)</td>
<td>100.0% (60)</td>
<td></td>
</tr>
</tbody>
</table>

Data: RAMPS

29 I conducted these 60 interviews with support from the National Science Foundation’s Sociology Program- Doctoral Dissertation Research Improvement Grant, and supplemented by funding from UNL’s Sociology Department. A total of 64 respondents were interested. 2 were not eligible after failing a capacity exam. 2 recordings were lost and new interviews with other respondents were completed.

30 88.3% (53) lived in rural area, 6.7% (4) lived in a suburban area, and 5.0% (3) lived in urban areas.
The average age of participants is 71.3 years old (71.8 for men and 70.8 for women). I used targeted recruitment of younger males (ages 55-70) to help ensure saturation for all groups (Robson 2011) because this was a group that was hard to find (Creswell and Poth 2018). Saturation occurs when no new themes emerge from additional interviews (Fusch and Ness 2015). For this study no new information emerged after about 40 interviews. I still completed the remaining 20 interviews to complete the 2X2 purposive sampling frame.

RAMPS SURVEY RESULTS

Table 4:2 contains summarized demographic information. Educational attainment varied for participants and included 5% (3 participants) less than high school, 46.7% (28) completed high school, 21.7% (13) attended college, 8.3% (5) associate degree, 8.3% (5), bachelor’s degree, and 10% (6) a master’s degree. All participants were white. Half of the participants (30) were retired with 16.7% (10) working full time and 16.7% (10 working part-time. The remaining ten participants were disabled and unable to work (8), unemployed and looking for work (1), or were a homemaker (1).

Marital status varied with over half 63.3% or 38 participants married, 1.7% (1) lived with their romantic partner, 5% (3) were divorced, 26.7% (16) widowed, and 3.3% (2) were never married. Men reported being married nearly 20% more than women. Women reported their marital status as widowed about 20% more than men. Women are more likely than men to be a widow and women are more likely to be a widow longer than men because women on average live longer than men and are younger than men when they get married (Umberson, Wortman, and Kessler 1992).
<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Male (N=27)</th>
<th>Female (N=33)</th>
<th>Total (N=60)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>71.8</td>
<td>70.8</td>
<td>71.3</td>
</tr>
<tr>
<td>Range</td>
<td>55-85</td>
<td>55-85</td>
<td>55-85</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>1 (3.7%)</td>
<td>2 (6.1%)</td>
<td>3 (5.0%)</td>
</tr>
<tr>
<td>High School Diploma/GED</td>
<td>14 (51.9%)</td>
<td>14 (42.4%)</td>
<td>28 (46.7%)</td>
</tr>
<tr>
<td>Some College</td>
<td>5 (18.5%)</td>
<td>8 (24.2%)</td>
<td>13 (21.7%)</td>
</tr>
<tr>
<td>Associate’s (2-year)</td>
<td>2 (7.4%)</td>
<td>3 (9.1%)</td>
<td>5 (8.3%)</td>
</tr>
<tr>
<td>Bachelor’s (4-year)</td>
<td>3 (11.1%)</td>
<td>2 (6.1%)</td>
<td>5 (8.3%)</td>
</tr>
<tr>
<td>Master’s Degree/MBA</td>
<td>2 (7.4%)</td>
<td>4 (12.1%)</td>
<td>6 (10.0%)</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>27 (100.0%)</td>
<td>33 (100.0%)</td>
<td>60 (100.0%)</td>
</tr>
<tr>
<td><strong>Work Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currently working full</td>
<td>6 (22.2%)</td>
<td>4 (12.1%)</td>
<td>10 (16.7%)</td>
</tr>
<tr>
<td>time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currently working part</td>
<td>6 (22.2%)</td>
<td>4 (12.1%)</td>
<td>10 (16.7%)</td>
</tr>
<tr>
<td>time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retired</td>
<td>11 (40.7%)</td>
<td>19 (57.6%)</td>
<td>30 (50.0%)</td>
</tr>
<tr>
<td>Disabled and unable to</td>
<td>3 (11.1%)</td>
<td>5 (15.2%)</td>
<td>8 (13.3%)</td>
</tr>
<tr>
<td>work</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed (looking for</td>
<td>1 (3.7%)</td>
<td>0 (0.0%)</td>
<td>1 (1.7%)</td>
</tr>
<tr>
<td>job)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A homemaker</td>
<td>0 (0.0%)</td>
<td>1 (3.0%)</td>
<td>1 (1.7%)</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>20 (74.1%)</td>
<td>18 (54.5%)</td>
<td>38 (63.3%)</td>
</tr>
<tr>
<td>Living with a partner</td>
<td>1 (3.7%)</td>
<td>0 (0.0%)</td>
<td>1 (1.7%)</td>
</tr>
<tr>
<td>Divorced</td>
<td>1 (3.7%)</td>
<td>2 (6.1%)</td>
<td>3 (5.0%)</td>
</tr>
<tr>
<td>Widowed</td>
<td>4 (14.8%)</td>
<td>12 (36.4%)</td>
<td>16 (26.7%)</td>
</tr>
<tr>
<td>Never married</td>
<td>1 (3.7%)</td>
<td>1 (3.0%)</td>
<td>2 (3.3%)</td>
</tr>
<tr>
<td><strong>Number of children</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>3 (11.1%)</td>
<td>4 (12.1%)</td>
<td>7 (11.7%)</td>
</tr>
<tr>
<td>1</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>9 (33.3%)</td>
<td>14 (42.4%)</td>
<td>23 (38.3%)</td>
</tr>
<tr>
<td>3</td>
<td>6 (22.2%)</td>
<td>6 (18.2%)</td>
<td>12 (20.0%)</td>
</tr>
<tr>
<td>4</td>
<td>8 (29.6%)</td>
<td>2 (6.1%)</td>
<td>10 (16.7%)</td>
</tr>
<tr>
<td>5</td>
<td>0 (0.0%)</td>
<td>3 (9.1%)</td>
<td>3 (5.0%)</td>
</tr>
<tr>
<td>6 or more</td>
<td>1 (3.7%)</td>
<td>4 (12.1%)</td>
<td>5 (8.3%)</td>
</tr>
<tr>
<td><strong>Has a Paid caretaker</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>25 (92.6%)</td>
<td>31 (93.9%)</td>
<td>56 (93.3%)</td>
</tr>
<tr>
<td>Yes</td>
<td>2 (7.4%)</td>
<td>2 (6.1%)</td>
<td>4 (6.7%)</td>
</tr>
<tr>
<td><strong>State of Residence</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State 1</td>
<td>4 (14.8%)</td>
<td>3 (9.1%)</td>
<td>7 (11.7%)</td>
</tr>
<tr>
<td>State 2</td>
<td>23 (85.2%)</td>
<td>30 (90.9%)</td>
<td>53 (88.3%)</td>
</tr>
</tbody>
</table>

Data: RAMPS
Each respondent reported their total number of living children. 38.3% (23) of participants identified having two children, 20% (12) had three children, 16.7% (10) four children, 5% (3) five children, 8.3% (5) had six or more children, and 11.7% (7) had no children. Only a handful of participants, 4 or 6.7%, had paid medical caretakers. Of those with caretakers, 2 had caregivers coming in each day and the other two participants had a medical caretaker one day a week and the other two days a week.

Table 4:3. Number and Percentage of Participants With a Disability in Each Activity of Daily Living and Total Number of Disabilities for Males, Females, and Total

<table>
<thead>
<tr>
<th>Disability Indicator</th>
<th>Male (N=27)</th>
<th>Female (N=33)</th>
<th>Total (N=60)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulty Walking a City Block</td>
<td>20 74.1 %</td>
<td>28 84.8 %</td>
<td>48 80.0 %</td>
</tr>
<tr>
<td>Difficulty Walking Across a Room</td>
<td>12 44.4 %</td>
<td>13 39.4 %</td>
<td>25 41.7 %</td>
</tr>
<tr>
<td>Difficulty Dressing</td>
<td>17 63.0 %</td>
<td>19 57.6 %</td>
<td>36 60.0 %</td>
</tr>
<tr>
<td>Difficulty Bathing or Showering</td>
<td>7 25.9 %</td>
<td>20 60.6 %</td>
<td>20 33.3 %</td>
</tr>
<tr>
<td>Difficulty Eating</td>
<td>2  7.4 %</td>
<td>5 15.2 %</td>
<td>7 11.7 %</td>
</tr>
<tr>
<td>Difficulty Getting in/out of bed</td>
<td>7  25.9 %</td>
<td>15 45.5 %</td>
<td>22 36.7 %</td>
</tr>
<tr>
<td>Difficulty Using the Toilet</td>
<td>4 14.8 %</td>
<td>9 27.3 %</td>
<td>13 21.7 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Disabilities</th>
<th>Male (N=27)</th>
<th>Female (N=33)</th>
<th>Total (N=60)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicated 0 disabilities^</td>
<td>2 7.4 %</td>
<td>0 0.0 %</td>
<td>2 3.3 %</td>
</tr>
<tr>
<td>Indicated 1 disability</td>
<td>4 14.8 %</td>
<td>7 21.2 %</td>
<td>11 18.3 %</td>
</tr>
<tr>
<td>Indicated 2 disabilities</td>
<td>8 29.6 %</td>
<td>9 27.3 %</td>
<td>17 28.3 %</td>
</tr>
<tr>
<td>Indicated 3 disabilities</td>
<td>6 22.2 %</td>
<td>5 15.2 %</td>
<td>11 18.3 %</td>
</tr>
<tr>
<td>Indicated 4 disabilities</td>
<td>4 14.8 %</td>
<td>5 15.2 %</td>
<td>9 15.0 %</td>
</tr>
<tr>
<td>Indicated 5 disabilities</td>
<td>3 11.1 %</td>
<td>3 9.1 %</td>
<td>6 10.0 %</td>
</tr>
<tr>
<td>Indicated 6 disabilities</td>
<td>0 0.0 %</td>
<td>3 9.1 %</td>
<td>3 5.0 %</td>
</tr>
<tr>
<td>Indicated 7 disabilities</td>
<td>1 3.7 %</td>
<td>2 6.1 %</td>
<td>3 5.0 %</td>
</tr>
</tbody>
</table>

Note: Percentages indicate the percentage of participants within each group (males, females, and the total sample) who indicated difficulty with each activity of daily living (e.g. 74.1% of the males, 84.8% of the females, and 80% of the total sample had difficulty walking a city block).

^ 2 participants self-identified as having a disability but did not experience any of the disability measures

Data: RAMPS
To qualify to participate in the study all participants had to identify as having a mobility limitation. Self-identified mobility limitations are one of the inclusion requirements in the study. I also measured disability using the measures found in NSHAP – the Activities of Daily Living scale (ADLs). The ADLs measure asks about difficulty walking a city block, walking across a room, dressing, bathing or showering, eating, getting in/out of bed, and using the toilet. The vast majority of participants (80.0%) had difficulty walking a city block (see Table 4:3). Few participants experienced difficulty eating (N=7, 11.7%).

I report the total number of disabilities, calculated by the number of ADLs a participant experienced, in Table 4:3. 2 participants, both male, self-identified as being disabled but reported no ADL measures, and thus are marked as having 0 disabilities. 4 males and 7 females reported having one disability. 17 participants, 8 males and 9 females, identified having 2 disabilities. 11 participants, 6 males and 5 females, reported having 3 disabilities. 4 males and 5 females reported having 4 disabilities. 6 participants, half males (3) and half females (3) identified as having 5 disabilities. 3 females reported having 6 disabilities. 2 females and 1 male reported having all 7 measures of disability. Thus, participants were most likely to report having 2 disabilities and least likely to report having 0 disabilities.

To provide a sense of all of the individual participants and as a reference for the quotes in the descriptions below, I provide a list of each respondent with pseudonyms, sex, education, work status, age, marital status, whether or not they have a paid medical caretaker and number of disabilities (Table 4:4). When I used a respondent’s quote in the results section, it includes reported anonymized information from this table.
### Table 4.4. Participant Information

<table>
<thead>
<tr>
<th>Name</th>
<th>Sex</th>
<th>Education</th>
<th>Work Status</th>
<th>Age</th>
<th>Marital Status</th>
<th>Caretaker</th>
<th># of Disabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robert</td>
<td>Male</td>
<td>High School</td>
<td>Retired</td>
<td>80</td>
<td>Widow</td>
<td>No</td>
<td>5</td>
</tr>
<tr>
<td>Betty</td>
<td>Female</td>
<td>High School</td>
<td>Retired</td>
<td>80</td>
<td>Widow</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>Barbara</td>
<td>Female</td>
<td>High School</td>
<td>Retired</td>
<td>83</td>
<td>Widow</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>David</td>
<td>Male</td>
<td>High School</td>
<td>Current Full-Time</td>
<td>55</td>
<td>Married</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>Shirley</td>
<td>Female</td>
<td>High School</td>
<td>Retired</td>
<td>83</td>
<td>Widow</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>Thomas</td>
<td>Male</td>
<td>High School</td>
<td>Current Part-Time</td>
<td>68</td>
<td>Married</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>Patricia</td>
<td>Female</td>
<td>Less than High School</td>
<td>Retired</td>
<td>86</td>
<td>Widow</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>Dorothy</td>
<td>Female</td>
<td>Some College</td>
<td>Retired</td>
<td>77</td>
<td>Married</td>
<td>No</td>
<td>4</td>
</tr>
<tr>
<td>Linda</td>
<td>Female</td>
<td>High School</td>
<td>Homemaker</td>
<td>70</td>
<td>Married</td>
<td>No</td>
<td>3</td>
</tr>
<tr>
<td>John</td>
<td>Male</td>
<td>High School</td>
<td>Disabled</td>
<td>85</td>
<td>Widow</td>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td>Joan</td>
<td>Female</td>
<td>Associates</td>
<td>Retired</td>
<td>79</td>
<td>Widow</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>Margaret</td>
<td>Female</td>
<td>Masters</td>
<td>Retired</td>
<td>84</td>
<td>Widow</td>
<td>No</td>
<td>4</td>
</tr>
<tr>
<td>William</td>
<td>Male</td>
<td>Less than High School</td>
<td>Retired</td>
<td>79</td>
<td>Married</td>
<td>No</td>
<td>4</td>
</tr>
<tr>
<td>Sandra</td>
<td>Female</td>
<td>Some College</td>
<td>Current Part-Time</td>
<td>70</td>
<td>Married</td>
<td>No</td>
<td>4</td>
</tr>
<tr>
<td>Sharon</td>
<td>Female</td>
<td>Some College</td>
<td>Retired</td>
<td>66</td>
<td>Divorced</td>
<td>No</td>
<td>7</td>
</tr>
<tr>
<td>Ronald</td>
<td>Male</td>
<td>Bachelors</td>
<td>Retired</td>
<td>65</td>
<td>Widow</td>
<td>Yes</td>
<td>5</td>
</tr>
<tr>
<td>Judith</td>
<td>Female</td>
<td>High School</td>
<td>Disabled</td>
<td>70</td>
<td>Married</td>
<td>No</td>
<td>7</td>
</tr>
<tr>
<td>Joseph</td>
<td>Male</td>
<td>High School</td>
<td>Current Part-Time</td>
<td>69</td>
<td>Married</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>Nancy</td>
<td>Female</td>
<td>High School</td>
<td>Retired</td>
<td>81</td>
<td>Widow</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>Susan</td>
<td>Female</td>
<td>High School</td>
<td>Retired</td>
<td>71</td>
<td>Widow</td>
<td>No</td>
<td>5</td>
</tr>
<tr>
<td>Karen</td>
<td>Female</td>
<td>Associates</td>
<td>Current Full-Time</td>
<td>64</td>
<td>Married</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>Betty</td>
<td>Female</td>
<td>Some College</td>
<td>Retired</td>
<td>72</td>
<td>Married</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>Cynthia</td>
<td>Female</td>
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<td>No</td>
<td>3</td>
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<tr>
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<td>No</td>
<td>6</td>
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<tr>
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<td>Bachelors</td>
<td>Current Part-Time</td>
<td>61</td>
<td>Married</td>
<td>No</td>
<td>6</td>
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<td>Widow</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>Donna</td>
<td>Female</td>
<td>Masters</td>
<td>Retired</td>
<td>68</td>
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<tr>
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<td>Masters</td>
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<td>Some College</td>
<td>Retired</td>
<td>72</td>
<td>Married</td>
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<tr>
<td>Janet</td>
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<td>4</td>
</tr>
<tr>
<td>Paul</td>
<td>Male</td>
<td>High School</td>
<td>Disabled</td>
<td>73</td>
<td>Married</td>
<td>No</td>
<td>3</td>
</tr>
<tr>
<td>Janet</td>
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<td>High School</td>
<td>Retired</td>
<td>69</td>
<td>Widow</td>
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<td>3</td>
</tr>
<tr>
<td>Elizabeth</td>
<td>Female</td>
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<td>Current Full-Time</td>
<td>55</td>
<td>Married</td>
<td>No</td>
<td>3</td>
</tr>
<tr>
<td>Paul</td>
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<td>Retired</td>
<td>64</td>
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<td>1</td>
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<tr>
<td>Kenneth</td>
<td>Male</td>
<td>Masters</td>
<td>Current Part-Time</td>
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<td>Married</td>
<td>No</td>
<td>4</td>
</tr>
<tr>
<td>Diane</td>
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<td>Some College</td>
<td>Retired</td>
<td>72</td>
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<td>No</td>
<td>1</td>
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<td>Frank</td>
<td>Male</td>
<td>High School</td>
<td>Retired</td>
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<td>Never Married</td>
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<td>Retired</td>
<td>56</td>
<td>Married</td>
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<tr>
<td>Raymond</td>
<td>Male</td>
<td>Bachelors</td>
<td>Currently Part-Time</td>
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<td>2</td>
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<tr>
<td>Jack</td>
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<td>Bachelors</td>
<td>Currently Full-Time</td>
<td>72</td>
<td>Married</td>
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<td>1</td>
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</tbody>
</table>

^2 participants self-identified as having a disability but did not experience any of the disability measures

Data: RAMPs
Table 4.5. Frequency of Interview Themes Identified by Participants for Males, Females, and Overall

<table>
<thead>
<tr>
<th></th>
<th>Male (N=27)</th>
<th>Female (N=33)</th>
<th>Overall (N=60)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social Environment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Interactions</td>
<td>2.38</td>
<td>8.05%</td>
<td>6.07 14.26% 4.14 11.82%</td>
</tr>
<tr>
<td>Self-perception of Others’ Willingness to Interact</td>
<td>0.46</td>
<td>1.56%</td>
<td>0.93 2.18% 0.68 1.94%</td>
</tr>
<tr>
<td>Anticipation of the Social Environment</td>
<td>0.15</td>
<td>0.52%</td>
<td>0.71 1.68% 0.43 1.22%</td>
</tr>
<tr>
<td>Desire for Social Interactions</td>
<td>1.00</td>
<td>3.38%</td>
<td>1.14 2.68% 1.04 2.96%</td>
</tr>
<tr>
<td>Other People’s Impressions and Actions</td>
<td>4.38</td>
<td>14.80%</td>
<td>6.93 16.28% 5.50 15.70%</td>
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<tr>
<td><strong>Physical Environment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environment Limits Access</td>
<td>1.54</td>
<td>5.19%</td>
<td>3.43 8.05% 2.43 6.93%</td>
</tr>
<tr>
<td>Ways to Work Around Physical Environment</td>
<td>1.54</td>
<td>5.19%</td>
<td>3.36 7.89% 2.39 6.83%</td>
</tr>
<tr>
<td>Anticipation of Physical Environment</td>
<td>1.92</td>
<td>6.49%</td>
<td>2.36 5.54% 2.07 5.91%</td>
</tr>
<tr>
<td><strong>Social Interactions and Physical Environment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Environment Influencing Social Interactions</td>
<td>0.62</td>
<td>2.08%</td>
<td>0.14 0.34% 0.36 1.02%</td>
</tr>
<tr>
<td>Anticipation of the Physical Environment Shapes Desire for Social Interactions</td>
<td>0.46</td>
<td>1.56%</td>
<td>0.50 1.17% 0.46 1.33%</td>
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<tr>
<td>Feelings Related to Social Events and Physical Environment</td>
<td>0.38</td>
<td>1.30%</td>
<td>0.71 1.68% 0.54 1.53%</td>
</tr>
<tr>
<td>Change in Social Plans (Location) due to Physical Environment</td>
<td>1.23</td>
<td>4.16%</td>
<td>1.36 3.19% 1.25 3.57%</td>
</tr>
<tr>
<td>Perceptions about Overcoming/Dealing With Mental Health</td>
<td>3.15</td>
<td>10.65%</td>
<td>3.71 8.73% 3.32 9.48%</td>
</tr>
<tr>
<td>Perceptions about Overcoming/Dealing With Physical Health</td>
<td>2.77</td>
<td>9.35%</td>
<td>4.64 10.91% 3.61 10.29%</td>
</tr>
<tr>
<td><strong>Ability</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lowered Physical Ability Alters Lifestyle</td>
<td>5.54</td>
<td>18.70%</td>
<td>4.64 10.91% 4.89 13.96%</td>
</tr>
<tr>
<td>Emotions about Lowered Physical Ability Altering Lifestyle</td>
<td>2.08</td>
<td>7.01%</td>
<td>1.93 4.53% 1.93 5.50%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>29.6</td>
<td>100.0%</td>
<td>42.6 100.0% 35.0 100.0%</td>
</tr>
</tbody>
</table>

Note: Percentages indicate the percentage of participants within each group (males, females, and the total sample) who indicated social interactions (e.g. 8.05% of the coded quotes for males, 14.26% of the coded quotes for males, and 11.82% of the coded quotes for males).

Data: RAMPS
The interviews generated more discussion about some themes than others. To provide an overview of how responsive participants were to various topics I provide summary information about how often themes came up in the interviews (See Table 4:5). Lincoln and Guba (1981) argue that the frequency of various themes can be used as the criterion for the relative importance of themes to participants. The total number of quotes highlighted by the group in the respective column is the basis for the calculated percentages. For example, per interview the average mention of social interactions was 2.38 times for men, or 8.05% of quotes for all of the quotes pulled from male interviews. As I discuss each theme I summarize how common the theme was in interviews by referring to the data in Table 4:5 on the previous page.

COMPARISON OF NSHAP AND RAMPS SURVEY RESULTS FOR SOCIAL INTERACTION AND MENTAL HEALTH

RAMPS survey questions mirror NSHAP questions on physical disability, social interactions, and mental health scales. The information in Chapter 4: Table 10 below provides an analysis comparing the Wave 1 participants within NSHAP without physical disabilities (referred to as NSHAP: No Disability), NSHAP participants with a disability (referred to as NSHAP: Disability), and RAMPS participants, all of which have disabilities (referred to as RAMPS). I completed ANOVAs, analyses of variance, to compare all three groups on each indicator of social interaction and each mental health scale. I found that all social interaction measures (volunteering, attending group events, and time spent with friends and family) as well as all mental health scales (CESD, HADS, UCLA, and PSS) are different across the three groups. Then I completed a post-
hoc Tukey test to examine the two groups of participants with physical disabilities which are NSHAP participants with disabilities and RAMPS participants. I found that all social interaction measures (volunteering, attending group events, and time spent with friends and family) as well as all mental health scales (CESD, HADS, UCLA, and PSS) are different for NSHAP: Disability and RAMPS participants. NSHAP and RAMPS participants are different in various ways and thus I had no expectation that the measures of social interactions and mental health would directly overlap. The main differences between the nationally representative samples of NSHAP and the convenience sample in RAMPS is RAMPS is all white, mostly rural, and not representative.

<table>
<thead>
<tr>
<th>Table 4:6: Mean, Standard Deviation, and ANOVA of Participants for NSHAP: No Disability, NSHAP: Disability, and RAMPS: Disability on Social Interaction and Mental Health Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NSHAP: No Disability</strong></td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>Social Interactions</td>
</tr>
<tr>
<td>Volunteering</td>
</tr>
<tr>
<td>Attend Group Events</td>
</tr>
<tr>
<td>Time with Friends and Family</td>
</tr>
<tr>
<td>Mental Health</td>
</tr>
<tr>
<td>CESD (Depression)</td>
</tr>
<tr>
<td>HADS (Anxiety)</td>
</tr>
<tr>
<td>UCLA (Loneliness)</td>
</tr>
<tr>
<td>PSS (Stress)</td>
</tr>
<tr>
<td>N=1480</td>
</tr>
</tbody>
</table>

^ One-way between groups ANOVA
^^ Post-hoc Tukey HSD comparing the two groups of people with disabilities from NSHAP Wave 1 and RAMPS

Note: Data from RAMPS is a convenience sample. Reporting of statistical significance as a reference not generalizability of findings.

Data: NSHAP Wave 1 and RAMPS

† p<.10, * p<.05, ** p<.01, *** p<.001
RAMPS INTERVIEW RESULTS: NARRATIVE THEMES

I use RAMPS interviews to address three of the four research objectives of this dissertation: Objective 2: Explore how the anticipation of the physical environment shapes the desire for social interactions, Objective 3: Investigate how self-perception of others’ willingness to interact affects the desire for social interactions, and Objective 4: Examine how the physical environment and self-perception of others influence the frequency of social interactions and mental health.

Four major thematic areas emerged in the narrative research: (1) Social Environment, (2) Physical Environment, (3) Social Interactions and Physical Environment, and (4) Ability, with subthemes under each area. For (1) social environment the subareas are social interactions, self-perception of other’s willingness to interact, anticipation of the social environment, desire for social interactions, and other people’s impressions and actions. For (2) physical environment the subareas examine how environment limits access, ways to work around the physical environment, and anticipation of the physical environment. This is followed by (3) social interactions and physical environment which includes physical environment influencing social interactions, anticipation of the physical environment shapes desire for social interactions, feelings related to social events and physical environment, change in social plans (location) due to physical environment, perceptions about overcoming/dealing with mental health, and perceptions about overcoming/dealing with physical health. I focus on the first three themes in this chapter and the fourth theme in the next chapter.
Social Environment

Social Interactions. Participants explained their current social interactions through formal groups such as volunteering and church attendance as well as informal social groups of friends. 11.82% (4.14 average per interview) of all coded quotes were about social interactions. Women talked about social interactions on average 6.07 times per interview compared to only 2.38 times per interview for men.

In contrast to the emphasis on lack of social interactions in prior research, the interviews suggested mostly positive social interactions, largely occurring in small groups, and largely center around spending informal time with others accompanied by coffee or meals. For example, Betty (80 years old, widowed, with 2 disabilities) “love[s] to visit” regardless of formal and informal setting as long as friends are involved. While Jack, (72 years old, married, with 1 disability) finds his social interactions are less formal as “we have, oh we go, to you know, different people’s houses for dinner and stuff like that.” Compared to Richard (84 years old, married, with 3 disabilities) whose social life “depends on the day. If, If I’m not doing nothing else we meet outside usually and talk a little bit and then go on down the street and, and if I find them over in the store somewhere and you visit with them over there.”

Some social interactions are in a more structured setting as outlined by David (55 years old, married, with 1 disability) explained one of his consistent social interactions. “Well it’s just the 55 and older church members and we get together have dinner and encourage each other, and socialize, and just pretty much you encouraging each other to hang in there.” Even though descriptions of the social interactions described differences, in group size, location, and frequency, most are framed in a positive light, and overall
participants were happy and excited to talk about the times spent interacting with others. Therefore the interviews reinforce a key idea of this project – that social interactions have the potential to be important for the lives of people with disabilities.

**Others during Social Interactions: Interactions and Perceptions.** The positive descriptions of social interactions from the prior section also help explain why problems with social interactions could lead to negative self-perceptions of others’ willingness to interact (1.94% of all quotes averaging 0.98 times per interview for women and 0.46 times per interview for men) and other people’s impressions and actions (15.7% of all quotes averaging 6.93 times per interview for women and 4.38 times per interview for men).

Reports of negative self-perceptions and issues regarding others’ willingness to interact occurred mostly to participants with visible disabilities. For example, Thomas a 68-year-old married male with 2 disabilities, shared a similar sentiment with many participants that “younger people, they don’t really have time for old people anymore.” Participants with visible markers of disability such as using a walker, having a notable limb, an oxygen tank there was a large desire to be treated the same as other older adults. Janet, a 57-year-old married female with 4 disabilities, said “I don’t like being treated different just because I have the oxygen on.” Therefore research on the implications of disabilities for social interaction should ask not only about the ability to do activities, but also how easy it is for others to see that one has a disability.

The influence of other people was not limited to internal dialogues but also to interactions with others. A notable number of participants mentioned on other people’s
comments and actions directly related to their physical disability status. Paul (64, married, 1 disability) explains his situation with humor saying that “Everybody tells me what I should and shouldn’t do. It’s amazing, I didn’t know there was that, you know that many mothers in the world, they’re there.” Cynthia, a 64 year old divorced woman with 5 disabilities, has a more isolated impression as she states “I guess I feel much more alone and that people don’t really understand what’s going on with my situation because when they see me I’m full dressed, I’ve had my shower and I’m walking around now with a cane and they always say, “Oh, you look really good.” Dennis (56, married, 0 disabilities\(^{31}\)) is similar to Cynthia and has negative emotions surrounding the actions of others in relation to his physical disability. Dennis is “fearful that they think that I can’t do it”. While many participants identified having a small number of negative self-perceptions of others’ willingness to interact and actions related to their physical disability only one respondent found a workaround to largely eliminate this issue. Mark is a 56-year-old male living with 3 disabilities who lives with his partner, created a space that allowed him and his friends to have the types of social life he desired. Mark’s workaround, to him, was simple, “that’s why I got this shop, this is basically my toy shop and people just come over after work and we have a beer and hang out.”

The stories among the RAMPS participants are similar to the pattern of associations in chapter 2 of this dissertation, physical disability is associated with lower

\(^{31}\) Dennis self-identified as having a disability due to his drastic change in lifestyle and work because of his physical health declines in mobility. Dennis was not identified as having any disabilities with the measures of disability used, activities of daily living measures. Respondents self-identifying as disabled but not meeting the criteria using activities happened twice- Dennis mentioned in this footnote and Frank (married 66 year old male).
levels of social interactions. However, the relationship is much more complex than indicated by the NSHAP data. As anticipated by the biopsychosocial theoretical framework, people with disabilities have additional factors that alter their social interactions that include perceptions and actions of others in relation to their physical status. These perceptions and actions not only shape a social interaction as it is unfolding immediately but also the anticipation of social interactions in the future.

**Anticipation of the Social Environment.** Some participants specifically make social plans in anticipation of potential barriers in the social environment. Anticipation of the social environment in this study spans the space a person has, the density of people at a location, and engaging in social interactions. For people like Margaret (84, widow, 4 disabilities), social environment space has paramount importance. Margaret makes plans related to the amount of space she and her mobility equipment take up in a social setting as shown by her statement of “I would prepare, I would rather use a cane than I would a walker because it doesn’t take up the room, it doesn’t bother people and it’s not as hard to get up over the door thing.”. While others anticipate the actions and number of people who will be attending an event and identify as “being out in a crowd really stresses me out because I can’t concentrate on what I’m doing; it takes a lot of concentration to walk around if I don’t have that by the crowds and stuff it’s a lot more difficult.” (Sandra, 70, married, 3 disabilities).

In addition to anticipation surrounding social environment space and density of people, the actual social interactions is daunting for many participants. Judith, a 70 year old who is married with 7 disabilities, finds it difficult to think about not only her
physical needs in a social interactions but also the social interactions itself as she finds “If I get to talking to somebody then I can handle it, but just starting on my own it’s a little hard.” The combination of all aforementioned anticipations averaged for males 1.92 times per interview, 2.36 times per interview for females, and 2.07 times on average per interview. For some people, the anticipation of a new social environment is not worth the effort and several participants, like Shirley (83, widowed, with 2 disabilities) stated that she just “don’t think I’d go”.

Information from responses to questions about anticipation of the social environment speaks to the biopsychosocial model’s social aspect. Physical disability social factors unfold within social contexts that have factors influencing the social interaction. People with disabilities described perceptions of their social environment that mattered to them about the physical space that they need to navigate for social events, the number of people in a location, and engagement in social interactions. People described what limits their social interactions that directly related to their physical disability.

**Desire for Social Interactions.** About 1 time per interview (1 for men, 1.14 for women, with 1.04 overall) participants discussed their desires or lack of desire for higher levels of social interactions. Of those who expressed a desire nearly 1/5 (5 or 18.5%) talked about wanting to have the physical stamina to participate in sports and physical activities like hiking and hunting. Edward (68, married, 4 disabilities) said “I played every sport there was…ya know, and all that’s gone. And that’s not easy to deal with since I don’t feel like it was anything but yesterday. [laugh] You know, it doesn’t feel like it was that long.” The vast majority of women (94%) who expressed a desire for
social interactions specifically mentioned spending time with people during passive activities such as Betty (80, widow, with 2 disabilities) who would “like to have more company for meals”.

The desire for more social interactions did not exist for all participants. Some participants felt that a lower level of social interactions was normative for older adults and that did not bother them. This was most clearly identified by Frank when he was asked if he had a desire for more social interactions and he responded “Oh, not really. Just seems like the older you get the less you want to go out and do a lot of things.” The finding that some people did not desire more social interaction or accepted their situation suggests that future research might ask not only about the quality and quantity of social interaction, but the fit between what people have and what they want, particularly in studies of coping and/or mental health.

Physical Environment

Environment Limits Access. Several participants described how the physical environment affects their social interactions. Two themes emerged in comments about how environments can limit access: (1) weather and (2) the physical obstacles that people have to work around such as curbs, stairs, grass, and hills. Men expressed an average of 1.54 examples of the physical environment limiting social interactions compared to 3.43 for women.

When participants brought up weather, every example was in relation to winter conditions such as snow, ice, wind, and cold temperatures. Many participants find themselves to largely be homebound during the winter months due to concerns or
inability to navigate with a disability on ice and snow in the cold. Nancy’s (81, widowed, with 1 disability) perception of the snow and ice was precautionary shown in her statement that “I don’t go out now because of the snow and I don’t want to ask for trouble.” Other participants, like Robert, an 80-year-old widower with 5 disabilities, are not being precautionary but rather cannot physically leave their homes because “when it snows too hard and the wind blows and I can’t get out of the garage”.

Aside from the weather, stairs and railings largely shape environmental access to social interactions. These feelings range from an outright dislike for any amount of stairs. “Stairs are the worst.” was Joseph’s (69, married, 2 disabilities) explanation. This inability to work around locations without railings with stairs as explained by Janet “if they didn’t have that railing where the steps are, I couldn’t get in”. Some participants found that once arriving at a location, their physical environment limited their ability for social interactions as was the case for Cheryl (61, married, with 6 disabilities) when she explained a lunch at a relative’s home: “We went to her place, she invited us for lunch and everything. We went one time, but we are not going back because she had all these stairs going up to her house, and …there wasn’t a railin’ … I try to avoid if there’s no railing and if there’s a lot of stairs.”

My analysis shows that the physical environment is relevant both to Stress Process Theory as well as the biopsychosocial framework of disability. For Stress Process Theory the physical environment can generate stressors for people with disabilities in relation to both physical barriers in terms of winter related conditions such as ice as well as physical barriers to social interaction where locations are not accessible. The biopsychosocial framework of disability specifically outlines that disability either
reduced or increased by the locations that social interactions occur. Participants’ explained how having to navigate physical environments was a way that their disability shaped their social lives. Several participants described how they were not able to get to the locations in which social interactions unfold support this ideology. Participants addressed some of the physical environment limitations with ways to work around and overcome the physical environment outlined in the next section.

Ways to Work around/Overcome Physical Environment. Some participants said that the physical environment limits their social interactions, but they also identified ways to work around the physical environment. Larry, a 56-year-old divorced male with 2 disabilities, found his physical limitations very frustrating at first then made a point to figure out “workarounds around most everything.” These ‘workarounds’ ranged from new methods to accomplish daily tasks to planning special trips. One large theme discussed were completing tasks needed for a household to run. Steven, a 60-year-old married man with 1 disability, had a wood burning stove to heat his home. To get into his home there were several steps at each entrance. Due to his physical disability status he was no longer able to carry weight while climbing stairs, so Steven and his son altered the home by “cut[ting] a hole inside of the screen where I can put the wood up, bring it over from the shed all the way over I can just fill that up. Then I go around the steps like I can’t come up with weight in my arms, so I put it up there first and then bring it over.”

Getting groceries can be a feat with physical disabilities as the combination of walking long distances around the store, retrieving items from the shelves, walking around with the groceries, and loading them into a vehicle is a long and often physically
demanding process. A common emergent theme was summarized well by Karen (64, married, with 1 disability) as she “just made sure I got a hold of the cart as soon as I got there and I kind of used the cart as my walker.” Rather than using a walker or cane in addition to a shopping cart people with disabilities go between cars and objects (e.g. railings, other people, building) on the way to a shopping cart for balance and stability.

Many of the ‘workarounds’ were developed out of trial and error. As people experienced their physical disability over a longer period of time they had more developed processes to accomplish their goals more independently. Not surprisingly, people who had developed more of these ‘workarounds’ felt less limited by their physical environment and vocalized that they were able to accomplish the same goals (e.g. moving wood, household chores, getting groceries) in a different manner. This pattern was unexpected, as it seems logical the longer someone has a physical disability the more it would alter their daily life. Yet the interviews revealed that rather than time with a disability, the number of ‘workarounds’ mattered for managing environments. While these ‘workarounds’ became very commonplace in people’s lives they always had an element of thinking ahead and anticipating the factors within the physical environment that would cause obstacles within a person’s life. These findings lend support to the idea that people with disabilities are able to reduce their stressors when the physical environment is accessible, either by design or through workaround developed to overcome issues within the physical environment.

Anticipation of the Physical Environment. Similar to the manner in which participants anticipated the social environment they anticipate the physical environment
(5.91% of total quotes with an average of 1.92 times per male interview and 2.36 times per female interview). People make a point to be cautious of the physical barriers that exist especially weather-related conditions and their ability to get around a location. In terms of weather-related conditions, the anticipation causes people to consider where to go. Helen, a 78-year-old widow with 1 disability, attends to two different churches based on the weather conditions explaining that it “depends on the roads. I go to a [Church1] over by [City1] and if the roads are gonna be okay; otherwise I'll go to the [Church2].” The concerns for the weather are not limited to road hazards as Dennis (56-year-old married male with 0 disabilities) explains “I gotta be careful on ice and stuff because if I slip, [my knee will] pop out and pop back”. For other people, the anticipation of the physical environment was the deciding factor if they will attend social events. Responses like “when it’s wet and snowy like this, I am not gonna go anywhere” from Joan (79-year-old widow with 2 disabilities) were common where some people largely become shut in’s during the winter months due to concerns about falling or not being able to drive in poor weather.

The results from analysis of the anticipation of the physical environment are important for cities to be cognizant of with winter related conditions of ice and snow. They also support the emphasis in the biopsychosocial model that disability status reflects the person and the situation, not just the person. These findings illuminate the fact that even if a location is accessible through the built environment, such as having curb cuts, it is no longer accessible for people with disabilities if altered by winter related conditions of snow and ice.
Social Interactions and Physical Environment

Physical Environment Influences the Frequency of Social Interactions. About half of participants noted a change in lifestyle following their development or worsening of their physical disability status. Due to their changes in physical disability status, 21 participants mentioned how the physical environment influenced their frequency of social interactions. This emergent theme was more common for men than women and noted in both hobbies as well as work patterns. William, a 79-year-old married male with 4 disabilities, found it frustrating that “bout all I do is sit and watch TV cause I can’t do nothing else. But, if I was still without the Parkinson’s, I would, probably wouldn’t have, still have my horses and I’d still have my shop and stuff.” Paul (married, 73-year-old, with 3 disabilities) had to leave his manual labor job as he was no longer able to get into job locations and perform his work-related duties after developing his physical disabilities. He found the toughest part aside from the reduction in income being “I’m not used to being at home, I’m used to getting up and going to work”. At a lower rate than men, women mentioned how the physical environment influences their frequency of social interactions. For example, Elizabeth (married, 55-year-old, with 3 disabilities) enjoyed swimming for years as a hobby and exercise but now she does not go to “the swimming pool, I don’t go anymore because my final destination is too far and would be very painful to get there.”

Over a third of participants identified that their physical environment influences their frequency of social interaction and the theme was more common among men than women. The effects of the physical environment range from lifestyle changes (William), employment (Paul), as well as exercise (Elizabeth), illuminating the need for accessible
physical environments for people with disabilities to live their lives beyond the confines of their home. The effects of the physical environment often require people with disabilities to anticipate how the physical environment will affect their future social interactions, and sometimes prevent people from having social interactions.

Anticipation of the physical environment shapes the desire for social interactions. Physical environment not only influenced the frequency of social interactions for many people with disabilities it also shaped the desire for social interactions. Dorothy, a married 77-year-old with 4 disabilities, found her desire to attend an annual gala limited by the physical environment barriers that could exist. She explains that “they’d have those galas, I never even attempted to go to those because for one I can’t dance anymore and number two… you don’t know when you walk in the door or before you walk in the door, where you can sit, where you can be comfortable, how close you can be to a bathroom”. Her experience was not an isolated event as Karen (married, 64-year-old, with 1 disability) describes that “I didn’t go to my class reunion this year because I was on that scooter, and I thought man, not going to my class reunion on my scooter, because it was a hassle, it was out at the golf course which is not accessible, and we’d either have to go up a steep ramp or go clear around and the scooter was so un-handly, and I knew people would be drinking, and I thought, I’m just not gonna undo anything, that I’ve done, so yeah I just didn’t go and I would have, would have gone any other time.”

Descriptions of concerns about the physical terrain were common. Specific examples including being able to navigate outdoor spaces, specifically uneven ground. Ronald, a widowed 65-year-old with 5 disabilities, explains how his desire has receded into
acceptance that he is no longer able to do things that he desires. He said “I know I’m left out of a few things because, strictly because I can’t go, I can’t do things, you know and I guess you know it but it don’t really bother me much anymore. It used to. I used to think about it more often than I do now. You know when your friends are doing one thing and they’re doing things and like back in high school you know they’re going but then you think about it but I guess you really don’t, I don’t dwell on it.”

Some participants described how concerns about physical locations reduced their desire to participate in social interactions. Participants’ identified that they overwhelmingly want to participate in social interactions but are concerned about their ability to get to a location and be comfortable in the location once they have arrived. Thus findings from Chapter 3 that how that compared to those without disabilities, those with any disabilities have lower levels of social interaction could reflect challenges navigating physical environmental barriers. The interviews provide concrete examples of the ways that physical disability status can inhibit social interaction. In the next section I describe how some participants in RAMPS altered their social interaction locations due to concerns about accessibility.

Change in social plans (different event, location, etc.) because of access. Participants also described changing social plans due to accessibility concerns was voiced by participants (1.25 times on average per interview). Participants described changing social plans because of concerns about steps or long periods of sitting or standing. Raymond (widowed, 74-year-old, with 2 disabilities), a lifelong football fan, now “wouldn’t go to a stadium where I have to climb the steps.” Similarly, Sandra, a 70-year-
old married woman with 4 disabilities, finds steps a daunting task where the dangers outweigh the rewards. Sandra explains that the issue is “stairs. I’m really bad on stairs anywhere that has a lot of stairs I don’t--I avoid cause it--I’m scared of falling and then I have a fear of falling cause with the hips, I’ve dislocated on of ‘em and it’s cracked and I really have a fear of falling on the ice and stuff like that so if it--if it’s really bad out I panic going someplace, like if I got to the store and there’s a big parking lot, if I can’t park close to the store, I just don’t go.” Carol (married, 79-year-old, with 1 disability) shared a similar sentiment with Sandra in relation to concerns about falling at social interactions to the point where “I just say, "I'm not gonna do it." [laugh] It's not worth it. I'll say, "It's not worth it." Because, you know, an being out 'n away from home an' you don't wanna have a fall.”

Beyond concerns about stairs, some participants noted that they were no longer able to do non-physical activities such as going to a science fair due to the amount of standing or going to the movies because of how long they would be expected to sit continuously. Donna (never married 68-year-old with 2 disabilities) found these changes to be especially life-altering as she felt that “it’s put me further behind in the ability to do things socially like sitting for a long time at a symphony, or an opera, or some kind of concert is really difficult because after that time that I’ve been seated the arthritis in my feet and ankles are usually so bad.”

The changes in social plans emerged in two themes of (1) physical barriers of getting to and around in the event and (2) the socially normative expectations around physical movement such as sitting or standing for extended periods of time. I expected to
find that physical barriers would be an issue for people but did not expect physically
normative actions to emerge in the interviews.

The idea that not only are there physical barriers to an interaction but also
internalized social barriers rooted in social norms supports the biopsychosocial
framework that people with disabilities experience barriers not solely occur based on
biological factors but is also because of social factors. People internalize social norms
and have dialogs that shape feelings of not being able to complete normative social
expectations. Similar to Mead’s (1934) idea of “taking the role of the other”, participants
described how they imagined that others would judge them for not being in situations in
“normal” ways, and therefore avoided some spaces to avoid the judgement.

CONCLUSION

This study set out to examine two main objectives to have a deeper understanding of the
relationship between disability status and social interactions. Below I outline and discuss
each objective.

Objective 2: Explore how the anticipation of the physical environment shapes the
desire for social interactions.

Main Findings

Participants who have concerns about the physical environment have lower levels
of desire for social interactions. A common perception common among participants was
that when there are a large number of a barriers in the physical environment there is a
lower desire to participate in social events. These concerns were mostly in two areas of
(1) the built environment and (2) winter weather-related conditions. For the built
environment issues regarding uneven surfaces, such as grassy areas without a paved sidewalk, as well as stairs with and without railings were of the largest concern. Some older adults with physical disabilities found a small number of stairs, such as that typical to get into someone’s home, manageable with a railing. Without a railing, many would avoid the social interactions altogether out of concern of falling for both safety and embarrassment concerns.

Objective 3: Investigate how self-perception of others’ willingness to interact affects the desire for social interactions.

Main Findings

When older adults with disabilities have both the perception that others are willing to interact – based upon their impressions of others and others actions - there are higher levels of social interactions. People told stories about how others responded to them and based their desires for future interactions based on their perceptions of how the interactions unfolded. Most of the older adults with disabilities in this study felt that they are treated similarly to other older adults unless they had a visible physical disability, such as a severe limp, or some visible marker of having a physical disability, such as an oxygen tank. With minimal exceptions, participants identified that they enjoy social interactions with others that they are able to complete with their physical health status. These activities are largely social in nature and involve little more than conversation while meeting up for coffee or shared meals. Future researchers may need to revise their research from “people with disabilities” may need to be revised to “people with visible disabilities” for studies of social interaction.
Limitations

Nearly all limitations in this study relate to the sample and measures used in the study. This study used a 60 person convenience sample. As people self-selected into the study, there is likely an amount of selection effect. For example, people who want more social interaction may respond to a request for a conversation. Alternatively, people who are already more comfortable with social interaction may be more willing to participate in research that involves a conversation. Findings are not generalizable as the study participants are not randomly from the population. People who have low levels of social interactions would likely not want to engage in social interactions to complete the study, so participants who participated are likely to be more social and enjoy social interactions at higher levels. As this study measures personal factors during an in-person interview about personal aspects of social interactions and mental health there may be some issues with satisficing. People who are embarrassed by their disability or the impact it has on their life might not be as forth coming as those who were more comfortable with their situation.

Additionally, people with poorer mental health may not feel comfortable disclosing struggles they may be having with mental health. Asking self-assessments of mental health using participants’ recollection of their mental health condition during the previous week whether in the form of scales or as open-ended questions can be problematic, if participants had an abnormal week. Specifically, one respondent noted that he was concerned about responding to the questions about the previous week, because that is when he found out that his son had cancer. Even though the respondent completed the mental health questions for the previous week rather than a typical week,
similar fuzziness associated with other participants’ experiences and recollections may lead outliers to have a disproportionate impact on the themes discussed by participants and illustrated here. For instance, it is likely that this respondent was not the only person with this experience, but he is the only one who self-identified as having worse mental health than what is typical.

I also noticed possible issues with the measure of disabilities. There was a small number of participants, 2, who self-identified as having a disability but with the disability measures used did not have a disability. The two participants who self-identified as having a disability but did not register on the physical disability measurement are included in the data and analysis. The study requirement was a self-identification of disability status however the measure used to examine disabilities was not sensitive enough to pick up their physical disability.

Future Directions

After completion of these interviews there are several areas that I would have liked to include in analysis but did not. For example, I wish that I had asked information about ego networks (i.e. friends), the frequency of social interactions that did not unfold in-person (e.g. on the web), and what changes to public spaces participants think would most facilitate social interaction. For ego networks, it would have been helpful to inquire about how the people they are closest with interact with each other and perceptions about their feelings of social support. Participants identified other people’s support shaped their desire for social interactions. With the rise of online social interactions and frequency of social interactions over the phone additional questions, I wish I had probed more about
digital and other contexts of interaction. While I did not ask for specifically in person only interactions, very few participants talked about any social interactions aside from in-person interactions. Lastly, participants have potentially valuable insights about what changes in the physical environment would help with social interactions. These three facets together would allow a more in-depth analysis of the biopsychosocial framework’s social context of disablement through examining attributes of social interactions directly though ego networks, specifically addressing social interactions beyond face-to-face interactions, and people with disability’s ideas about how public spaces would be more welcoming to social interactions.

The SEM analysis of the nationally representative NSHAP data and the in-depth interviews with people both establish the importance of social interaction for people with disabilities. In the next chapter I further explore the patterns identified in the nationally representative NSHAP data showing that physical disability status and level of social interactions are associated with poor mental health by describing the experiences of older people with disabilities in the RAMPS data. In the RAMPS interview data I analyze mental health through standardized measures of mental health and self-perception of mental health. Participants’ responses to the standard measures of mental health revealed differences for males and females in mental health as well as how social interactions can generate improved or worse mental health.
CHAPTER 5: RAMPS - QUALITATIVE ANALYSIS OF SOCIAL INTERACTION AND MENTAL HEALTH PATTERNS

Objective 4: Examine how the physical environment and self-perception of others influence the frequency of social interactions and mental health outcomes.

SYNOPSIS

This chapter examines experiences among how older people with disabilities are associated with perceptions of level of mental health. Like Chapter 4, this chapter is based on the Redefining and Maintaining Positive Social Interactions (RAMPS) interview data. RAMPS data are semi-structured interviews and surveys of adults 55-85 years old who have at least one disability, defined as a problem with an activity of daily living, who are currently dwelling in their own home (N=60). I conducted the interviews in January and February of 2018 (see chapter 4 for more details).

I employed a narrative analytic approach to identify themes related to perceptions and internalized dialogues about social interaction and mental health brought up by participants in the RAMPS study. I completed a comparison of NSHAP and RAMPS on each social interaction and mental health scale finding differences between the samples for each study. Participants responded to open-ended questions designed to complement survey-based scales about standardized mental health scales. These follow-up questions delved into their perceptions about their own mental health that emerged during the RAMPS interviews. RAMPS participants volunteered for the study, lived in two states, and nearly all were from rural areas.
Because the NSHAP data is a nationally representative probability sample I can generalize the significant associations to the population of community dwelling adults ages 57 to 85. The RAMPS participants volunteered and come mostly from two communities in two states - I therefore cannot generalize from this convenience sample to a broader population. The RAMPS data, however, provides insights from the perspective of those living with disabilities in their own words. Unlike the NSHAP data (24% racial minorities), all of the RAMPS participants are white. Chapter 3, NSHAP- Determinants of Social Interaction Patterns and Mental Health Outcomes, however, there were no significant differences between whites and racial minorities. I used the explanatory analysis mixed methods research approach (Creswell 2013). Therefore the quantitative analysis of the NSHAP data shaped the qualitative analysis of RAMPS. In this chapter I focus on mental health. My analysis of NSHAP found that there are different mental health outcomes for males and females thus, I also complete additional analysis examining the differences for males and females within the RAMPS data for mental health.

Similar to the approach in chapter 4 in which I used some of the standardized measures from the NSHAP survey in the RAMPS project, I had RAMPS participants complete the standardized scales for depression (Center for Epidemiological Studies Depression Scale), anxiety (Hospital Anxiety and Depression Scale), stress (Perceived Stress Scale), and loneliness (UCLA Loneliness scale). These are the same scales from NSHAP and therefore provide a way to see how much overlap there is in the two studies on these scales. In addition I could see what the questions meant to the participants – how they interpreted them and what additional thoughts and feelings emerged as they
answered questions. Therefore the mental health scales in RAMPS intentionally align with NSHAP, the longitudinal data used in Chapter 3. I was able to learn how participants think about the standard survey questions because I was with them as they answered the questions. I was able to observe if participants delay, became emotional, or change their response option. Additionally, many participants choose to freely explain their rationale for choosing a specific response option without any sort of prompt or follow up question.

During the interview I took notes on participants’ body language, emotions, assistive devices present, and the manner in which they described their life experiences as a person with a disability. Therefore the RAMPS data includes observations, probing questions, and reactions by participants that are not included in the NSHAP data using the same mental health scales.

Findings from this part of the dissertation have implications for health practitioners and those who specifically work with older adults with disabilities. Health practitioners may easily recognize that being having a physical disability is physically hard on a person. It can be harder for health care practitioners to recognize if living with a disability is mentally taxing, isolating, depressing, anxiety-filled, stressful, and lonely. Even though the biopsychosocial model and stress process theories suggest that living with a disability could have mental health consequences for people, training of practitioners focuses overwhelmingly on the biological and less on the psychological and social dimensions of living with a disability (Engel 1977). In this chapter I provide insights for Sociologists, Gerontologists, and for health care practitioners to understand the perceptions of people living with disabilities about their own mental health, plus my
observations about their emotions and stories related to their ability to navigate their lives.

INTRODUCTION

Sociological research finds that experiencing physical disabilities is associated with worse mental health (Bierman and Statland 2010; Caputo and Simon 2013; Reitzes and Mutran 2006). The portion of older adults within the U.S. population with physical disabilities has grown and will continue to grow (Brault 2012). If the mental health consequences of living with disabilities is in part the result of preventable environmental and interpersonal issues, then there is a need to understand not only the social interaction dimensions of disability described in Chapter 4, as well as perceptions of mental health issues. Therefore in this chapter I report on participants descriptions of their mental health and my observations of their reactions to questions about mental health in the RAMPS survey. I complete this analysis with narrative research within a biopsychosocial framework and rooted in Stress Process Theory. Building on Chapters 3 and 4, the current analysis of narrative themes moves beyond the findings that social interaction mediates the relationship between physical disability and poor mental health (Chapter 3) and that the social interactions for people with disabilities are shaped by the social and physical environment to examine mental health experiences and perceptions. Using mixed methods of survey data analysis and narrative analysis of semi-structured interviews, I examine how mental health outcomes relate to physical disability both through standardized measures as well as through experiences and emotions shared by participants. This chapter completes the analysis of the overall conceptual model
examining how social interactions mediate the relationship between physical disability and poor mental health. Due to the gendered differences found in Chapter 3, NSHAP - Determinants of Social Interaction Patterns and Mental Health Outcomes, this chapter examines mental health outcomes overall and includes separate analysis for men and women on standardized mental health scales.

DATA AND METHODS

Please see Chapter 4 (Data and Methods section) for a detailed description of the data and methods for this study, because I used the same RAMPS data for both chapters.

RESULTS

Mental Health Outcome Measures

To examine mental health, I asked standardized mental health outcomes measures for depression, anxiety, stress, and loneliness from each participant within RAMPS (see Appendix G: Self-Administered Survey and Appendix I: Interview Administered Survey for measures). As seen in Table 5:1 below, basic information of average mental health measures was calculated for males, females, and overall for study participants across three distinct mental health scales.

In Chapter 3 I emphasized the comparison between those with no and those with any disabilities. In Chapters 4 and 5 I emphasize comparisons of men and women; everyone in the sample has at least one disability. Because the RAMPS data consists of a convenience sample the t-tests comparing men and women is more of a heuristic
indicating a large difference than a true test of the generalizability of the difference from the sample to the population.
As seen in Table 5:1 above, I analyzed participant responses from standardized mental health measures for depression, anxiety, loneliness, and stress for males, females, and overall. Males and females differ on depression, measured by the Center for Epidemiological Studies Depression Scale (p<.001). Females report significantly higher levels of depression averaging 16.06 with a range of 9-30, compared to 13.96 for males on a scale from 9-37, and an overall average of 15.12 and range of 9-30 for females.

Anxiety, measured by the measures for anxiety by the Hospital Anxiety and Depression Scale has an overall average of 11.05 and range of 7-21 is not significantly different for males (11.30) and females (10.85). Similar to anxiety, loneliness was not statistically significantly different for males and females. Loneliness, measured through the UCLA Short Loneliness Scale and has an overall average of 4.70 and range of 3-9 is not significantly different for males (5.89) and females (7.36).

The effects of social interactions, physical environment, and the interplay of social interactions with the physical environment emerged in emotional responses to questions and the short survey responses. Overwhelmingly, the emotions participants showed were either sad or angry. About a third of participants cried when talking about how their lives had negatively changed in relation to their physical disability. Crying ranged from a short period while talking about a specific event to crying throughout the majority of the interview. A distinct and smaller group, around 5 participants, expressed their anger about the changes in their lives. These participants voiced and gestured their experiences differently as through raising their voices, cussing, and throwing their hands into the air out of frustration when explaining life changes. I focus on describing the participants who had more negative reactions, but also want to point out that over half of
the participants did not have strong negative emotional reactions to their disability. A lack of emotion about physical disability, social interactions, and poor mental health does not mean that participants do not have emotions about the aforementioned topics. Participants may have felt sadness or anger but chose to minimize those emotions during the interview due to the fact that they did not know me and may have not been comfortable enough to show their emotions related to their disability status affecting their social interactions and mental health.

In Chapter 4 I summarized the insights from the first three thematic areas of the interview protocol; access to environment, altering of social interactions, and barriers to interaction. In this chapter I focus on the last area in the interview guide, the section on how lowered physical ability alters lifestyle and how emotions about lowered physical ability alter lifestyle. Below I summarize responses to questions about how participants experienced emotions and perceived their mental health relative to their disability.

Thoughts/Emotions about Life Now

Participants discussed their emotions about lowered physical ability altering lifestyle (seen in Chapter 4: Table 11) on average 1.93 times per interview accounting for 5.5% of all quotes with 2.08 on average for males and 1.93 times on average for females. Participants expressed negative emotions of frustration and disappointment when there was a lack of alignment between expectations and reality about life in relation to work, retirement, and overall feelings about their health. For example Pamela (married 63-year-old with 2 disabilities) developed knee problems that greatly affected her ability to work
her manual labor job. Recalling the changes that occurred in her life she was largely upset and frustrated. She said:

A year ago, reflecting back was in the last week at home looking in the mirror when you're brushing your teeth or putting makeup on and just going, "If you would've told me a year ago, that I was gonna miss six months of work," I'd a said “bullshit”, but I made it through the last year and I'll make it through the next year.”

Frustration was not limited to work but also to anticipating the joys of retirement. Like many participants, Joyce (married 72-year-old with 3 disabilities) and her husband looked forward to their retirement plans. Her physical disabilities and the challenges that has generated for her and her husband to travel have put those plans on hold. In relation to retirement, she expressed “it’s very disappointing and it’s kind of frustrating because we always thought when we retired, we would travel and now that’s not happening”.

Feelings of frustration and disappointment were common for participants who experienced disabilities that resulted in pain or fatigue. Daniel, a married 58-year-old with 2 disabilities, specifically brought up this point by saying “it’s frustrating, you know, ‘cause you just like to feel good all the time, but I guess one way to look at it too is like when you do feel good you appreciate it more. [Laugh]”. These feelings were not isolated to a single event, time period, or level of physical disability but often were a general feeling about how life had changed due to their physical disability levels. This sub-section of analysis fits within the larger research model (Figure 1). The RAMPS participants stories reveal that physical disability often is a chronic stressor with implications for mental health.
Mental Health Related To the Social Events and Physical Environments

The balance between not wanting to ask other people for help and the need of help to accomplish daily activities and maintain positive mental health illuminated the effects of physical disability and social interactions on mental health. A small amount of quotes from participants, 1.53% or an average of 0.54 per interview, were about feelings related to social events and physical environments with males’ average number of mentions being 0.38 and females’ averaging 0.71 times per interview (seen in Chapter 4: Table 11). While this theme is small within the interviews, it is powerful to note the topics discussed by participants about their mental health in relation to social events and physical environment. Specifically, some people find it hard to reach out to others for help. George (married 78 year old with 2 disabilities) finds that while he often needs assistance in completing day to day activities he finds that “it’s hard for me to ask for help. It always has been.” Roy (never married, 59 year-old with 4 disabilities) shared similar views and felt that “you know, it [physical disabilities] kinda psychologically works on you.” While Teresa (a 63-year-old widow with 3 disabilities) has found that it was best for her to ask for help as her physical disabilities made it difficult for her to leave her home alone. She found that it was more mentally taxing to stay at home alone than to ask for help as the “four walls will close in on you if you don’t get out once in a while.”

Participants identified that some social interactions, specifically reaching out to others for help, has negative implications for mental health and often is stressful. The finding that social interaction can be a stressor is of key importance as the Stress Process
Theory outlined by Pearlin (1989) identifies that social interactions minimize the negative effect of disability, the stressor, on mental health outcomes. However, in this study some participants noted that the opposite is true that social interaction, specifically asking for help, is a stressful process that diminishes good mental health rather than increases good mental health. The identification of social interactions as a possible stressor supports a notion that Stress Process Theory should be further analyzed to examine what other social interactions act as a stressor rather than a buffer for mental health outcomes.

Perceptions about Overcoming/Dealing with Mental Health

Overcoming and dealing with mental health concerns related to physical disabilities and social interactions was largely discussed and elaborated on by participants being brought up an average of 3.32 times per interview overall, with women averaging 3.71 times and men averaging 3.15 times per interview. Participant’s perceptions around mental health are largely about feeling that they were a burden to others, that they were in the way, and that they were not contributing to their households. When asked about how he felt about the changes in his social life due to his physical disabilities Ronald (married 73 year old with 3 disabilities) said “Well I’m depressed when I can’t really get out and do what I really wanna do ya know, it’s just, sittin in the chair you know, and I gotta be doin something.” Kenneth spoke more generally about how he feels his mental health is currently as “just horrible.”

Like many participants with disabilities, Diane (married, 72-year-old, with 1 disability) feels self-inflicted guilt. When asked why she felt guilty she explained that
“well I feel guilty bec--, if I’m not getting, like I need to run the sweeper, or I need to do this, and I’ll feel guilty” in relation to her ability to complete housework. Negative emotions are a double negative as people (1) were upset that they have a disability and (2) then felt bad about being upset that they had a disability. These ranged from feeling bad about being ‘too emotional’ or having a poor outlook. Karen (a 72-year-old widow with 2 disabilities) had a common perspective where she finds that “I get mad at myself for my attitude” where not only having negative mental health related to their physical disability and social interactions but also with the fact that they were having negative mental health. These feelings would spiral into large manifestations of feelings of burden, poor mental health, and negative internal dialogues. Across interviews, these perspectives were similar to personal tornadoes, a combination of factors related to self-perception, other’s actions, and situational factors, which would spiral out of control tearing through many people’s personal lives destroying ideas about social support and social interactions.

Rather than asking participants how they deal with any mental health struggles they may have related to their physical disability and social interactions levels, I asked them to tell me what advice they would give to others. Most people, like Gary (married, 61-year-old, with 3 disabilities) gave vague advice of “do what you need to do [for yourself]”. A small portion of participants suggested turning to religion in some form when struggling with mental health as “praying…helps that’s for sure cause that’s the only way I know that I think I got through what I did.” (Steven, a married 60-year-old with 1 disability) or “the first thing would be to rely on God” (Robert, a widowed 80-
year-old with 5 disabilities), and “I talk to God about it” (Dorothy, a married 77-year-old with 4 disabilities).

Of note, when asked what advice they would give others in dealing with a physical disability similar to their own, most participants gave very clear advice such as “follow your doctor’s orders” (Helen, a 78-year-old widow with 1 disability), have “patience, perseverance” (Pamela, a married 63 year old with 2 disabilities), and “make sure you get a good doctor and a good physical therapist” (Jack, a married 72-year-old with 1 disability). This finding was surprising, as all participants were willing and able to give specific advice about their physical disability status related to their social interactions and mental health but very few had advice on personal management of mental health issues compared to dealing with physical health issues.

It is imperative for Sociologists, Gerontologists, and health practitioners to understand the long reach of disability beyond a person’s physical body as disability can have serious manifestations within mental health. The state and process that participants identified in relation to their mental health directly mirrors the biopsychosocial model of disablement. Disability is not simply a physical state but rather is biological with the physical body limitations, psychological as disability manifests within a person’s internal dialogue and self-perception, and social as people with disabilities alter their social interactions largely due to these biological and psychological facets of disability.

CONCLUSION

In this chapter I examined how perceptions of the physical environment and self-perception of others influence the frequency of social interactions and thus mental health
(Objective 4). I measured manifestations of poor mental health directly through standard mental health measures as well as through observing reactions, stories, and comments (e.g. was depressing” or “I was sad”). Working within an explanatory mixed methodological framework the quantitative findings from NSHAP (Chapter 3) outlined the need to complete analysis in this chapter on mental health examining not only the overall mental health for participants but also the mental health of male participants compared to female participants. To that end, standardized measures of depression, anxiety, stress, and loneliness indicated that men and women had similar levels of anxiety and loneliness. Women had higher levels of depression and anxiety than men in the study. Both men and women identified throughout their interview that their changes in social interactions had negative effects on their mental health with higher levels of depression and loneliness.

Participants often talked about social interaction in terms of a lack of social interaction or stressful social interaction. Feelings of isolation from others as well as the perception that the walls were closing in were two markers of social interactions. On the other hand, some participants identified that having social interaction negatively affected their mental health. Participants social interactions related to asking others for help are stressful. According to Stress Process Theory, social interactions decrease poor mental health outcomes. Participants’ identification of stress related to asking for assistance does not support the Stress Process Theory and calls for additional analysis beyond this dissertation of social interactions being both a potential stressor and buffer for mental health.
Apart from the analysis of standardized mental health measures, a strong theme came through in the interviews: participants described feeling caught in a cycle of being upset about how their physical disability negatively altered their social life and mental health. They experienced what I termed a ‘double-negative emotion.’ This double negative would come about from them being upset about the situation, as well as being upset about the fact that they were upset. They felt guilty for being upset, sometimes blaming themselves, making them feel even more depressed, alone, and isolated. Of the 60 participants, more than one-third of participants described feeling caught in this cycle or out-of-control downward spiral. These negative self-evaluations initiated a process that began to ripple manifest and begin ripping through their social interactions and personal lives, leaving little behind in terms of perceived social ties and support. This cycle made it very difficult for participants to bring themselves out of this mental state alone. Highlighting once again, just how important a support system is for those with mental and physical health problems. These findings advance sociological understanding of how disability manifests for mental health directly as well as through social interactions.

RAMPS data provided important insights about the mental health experiences of people with disabilities. A substantial minority of participants described sadness and anger, several tied to challenges living their lives in ways that they had enjoyed before their disability. Others found workarounds or saw their situation as part of aging, and therefore had less negative mental health consequences. Some people experienced more than just sadness or anger from the implications of their disability – they also felt bad for feeling bad – a double negative. A few even experienced what sounded like “personal tornados” in which the disability contributed to difficulties with relationships and
negative emotions, which led to more difficulties coping, and their lives spiraled in multiple negative ways. Listening to the experiences of participants in the RAMPS study added insights to the paths in the structural equation model from disability to social interaction and poor mental health (Chapter 1: Figure 1). The use of mixed methods to examine mental health outcomes for people with disabilities allows for both establishment of a relationship between physical disability and mental health for older adults as well as an in-depth insight into why these manifestations of mental health exist for older adults with disabilities. I establish the relationship between physical disability and mental health in Chapter 3 and then the rich understanding of the contexts in which older adults with disability experience mental health is in this chapter where I utilize semi-structured interviews examining the experiences and explanations of mental health for people with disabilities.
CHAPTER 6: CONCLUSION

This dissertation set out to examine the relationship between physical disability, social interactions, and mental health. I pose 4 research objectives that I answer sequentially and successfully with a mixed methods approach that involves panel data from the National Social, Health, and Aging Project (NSHAP), as well as original qualitative data from 60 interviews and referred throughout this study as Redefining and Maintaining Positive Social Interactions (RAMPS).

The explanatory mixed methods approach facilitated using quantitative measurements of physical disability, social interaction, and mental health identical for NSHAP and RAMPS data. Explanatory mixed methods starts with quantitative and moves into qualitative data allows for the generalizability of statistical analysis from a nationally representative study (NSHAP) as well as the richness of responses gathered through interviews about people’s lived experiences with disabilities (RAMPS). This dissertation examines four specific objectives. Summaries of each of findings related to the objectives and broader implications below followed by future research directions.

This dissertation advances sociological research on the lived experiences of people with disabilities and the role of social interaction for mental health. The explanations from people with disabilities about their experiences of negative feelings about being disabled and internal negative dialog could not come from the NSHAP data and had not emerged in prior research that came out before RAMPS. Central insights also include ways that minimal social and built environment interventions could greatly enhance the lives of older people with disabilities, a group that will continue to increase for the US Society in coming decades. More specifically, this dissertation examines four
objectives. Summaries of findings relate to these objectives and their broader implications follow below. I conclude by outlining directions for future research.

**Objective 1: Establish the association between physical disability, social interactions, and mental health.**

People in their 50s through 80s with physical disabilities have poorer mental health than people who do not have disabilities. Structural Equation Models (SEM) revealed that the frequency of social interactions partially mediates the direct relationship between physical disability and mental health. Additionally, SEM analysis show that disability has a long reach over time on social interaction and mental health. SEM analyses also show that physical disability status is associated with future social interaction and future mental health. Having a physical disability currently predicts lower levels of social interaction in the future. Having a physical disability currently predicts poorer mental health in the future.

These quantitative findings using longitudinal as well as cross-sectional data situate the dissertation within the biopsychosocial framework, broadly conceived. Findings reported here support the notion that disability unfolds within three interrelated spheres of biological (physical), psychological (mental health), and social (social interactions) contexts. Additionally, these findings align with previous research that disability is associated with lower levels of social interaction and poorer mental health (Bookwala and Franks 2005; Pagán-Rodríguez and Pérez 2012; Yang 2006).

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32 Examined with NSHAP data.
These quantitative findings advance sociological understanding of the relationship between physical disability and mental health. Previous studies have examined the relationship between physical disability and specific mental health outcomes such as depressive symptoms (Bierman and Statland 2010; Fifield et. al 1998), self-esteem (Reitzes and Mutran 2006), positive affect (Caputo and Simon 2013), and loneliness (Warner and Adams 2016). This dissertation builds on these studies by operationalizing using a holistic measure of mental health that includes depression (CESD), anxiety (HADS), loneliness (UCLA), and stress (PSS). Using this holistic mental health measure enables us to assess a person’s overall mental health, thus generating a more valid overall analysis. I propose that a holistic operationalization of mental health is an improvement over using a one-dimensional measure of mental health.

Additionally, new knowledge in this study in addition to emphasizing the role of social interaction in shaping the mental health consequences of disablement among older adults, the results have implications for clinicians and patient-centered collaboration between rehabilitation hospitals and insurance providers. Findings from this study emphasize the role of social interactions in shaping mental health consequences among older adults with physical disabilities. These results have implications for clinicians. If clinicians have a greater awareness of the potential long term effects of disability on social interactions and mental health, then they can include such considerations in more holistic approaches to patient centered care beyond a physical diagnosis of a disability.

Analysis also establishes that there is a significant relationship between physical disability, social interaction, and mental health for older adults. As this is a mixed methods dissertation using explanatory mixed methods I use the quantitative findings
from NSHAP to inform the development and analysis of qualitative data from RAMPS. The remaining objectives focus on examining why physical disability results in lower amounts of social interaction and poorer mental health for older adults.

**Objective 2: Explore how the anticipation of the physical environment shapes the desire for social interactions.**

Most RAMPS participants consistently noted that their anticipation of the physical environment shapes their desire for social interactions. Participants often mentioned that they would plan ahead and make workarounds in relation to the physical environment that they anticipated for their social interactions. For example, bringing a smaller walker so that they would take up less physical space or bringing a walker with a seat when they may need to sit when there was limited seating. When participants could not come up with a work around that they were comfortable with, they forgo social opportunities (e.g. the reunion). When participants express concerns about being able to navigate a physical space they link it to lower desire for social interaction. This is a major innovation that ties to RAMPS data. Essentially, RAMPS interviews and surveys reveal an inverse relationship between physical barriers and desire for social interaction. Inability to get around a location due to stairs, especially stairs without railings, walking far distances to get to a social event, uneven ground, and winter weather conditions emerged as common physical barriers to social interaction.

Findings also support the biopsychosocial framework, broadly conceived. Results from RAMPS data demonstrate that disability can have context-specific implications from the locations of social interactions. Thus, people who are disabled in one situation
may not be considered disabled in another situation (Kelly and Ismail 2015; Thoits 2010). This perspective became evident whenever participants discussed their efforts (successful and otherwise) to maneuver or work around their physical environment. The degree to which the physical environment limited social interaction and the desire for social interaction varied based on respondent’s ability levels. Some participants felt comfortable walking up to a city block while others were unable to walk across a room. Participants described altering their desire for social interaction based upon their perceived ability to access and navigate the location social interactions unfolded.

While some older adults with physical disabilities do recognize that they now have to put more effort into making social interaction work than they had to before, but often they are able to make it work. There are still instances in which even with careful planning and thought the effort is not worth the pay off or there is no good solution, but many people indicated resilience and agency.

This study examines in detail how when people with disabilities cope with physical barriers, (for example via home modifications). Qualitative data indicates that removal of physical barriers enable people with disabilities to function better within the built environment. These findings align with limited existing research (Wahl et al. 2009). City planners and community center organizers can use these findings to improve the lives of aging people with disabilities. Hearing specific examples of how physical environments shape desires for social interactions for people with disabilities, with recognition of a growing population of older Americans with Disabilities, cities can build physical environments that facilitate more inclusive social interaction. City planners can use this information to better plan layouts of buildings and public spaces to be accessible
which is important for people with disabilities to navigate their communities (Cooper et al. 1999; Gray, Gould and Bickenbach 2003). The findings from this dissertation can inform strategies to optimize implementation of the ADA, and can also help design professionals begin to view the ADA as positive, rather than as punitive and legalistic (Sherman and Sherman 2012).

City planners and community organizers can use these findings to benefit the lives of people with disabilities. For example, community center organizers should plan events that encourage social interactions that older adults across physical disability status are able to attend and engage in activities. This could be things as simple as having a senior lunch indoors in a space that is easy to maneuver rather than at a park with uneven ground.

**Objective 3: Investigate how self-perception of others’ willingness to interact affects the desire for social interactions.**

Analysis of RAMPS data also shows that, when people with disabilities perceive that others are willing to interact, people with disabilities have more desire to have social interactions. Participants stressed in open-ended questions that they frequently feel they needed to interpret other people’s perceptions surrounding social interactions. Overall, people with disabilities feel that they were the same as other older adults, unless they have a visible marker of disability such as an oxygen tank or wheelchair. When other people show they are willing to interact with a respondent, people with disabilities have higher levels of interactions. Respondent’s interpreted willingness to interact based on
previous successful social interactions as well as people showing desire to interact through being kind and invitations for interactions.

These findings call in to question the general Stress Process Theory that social interactions reduce the effect of a stressor, in this case a disability, on mental health outcomes. People with disabilities identified that social interactions themselves can be stressors, specifically the perception of others’ willingness to interact. Thus Stress Process theory should be adapted to understand that social interactions act both as a buffer between a physical disabilities (stressor) and reduced mental health as well as a stressor causing reduced mental health. The notion that social interactions are both a buffer (as found in Objective 1- Chapter 3) and as a stressor (as found in Objective 3-Chapter 4) is of paramount importance for scholars to study older adults with physical disabilities.

Objective 4: Examine how the physical environment and self-perception of others influence the frequency of social interactions and mental health outcomes.

Quantitative (survey) and qualitative (narrative) analysis of RAMPS data also shows that, for people with disabilities, physical environment and social interactions affect mental health. I used both standardized measures of mental health from population surveys, as well as narrative research methods and found that participants experience several contexts in which social barriers and physical barriers shape social interactions, with implications for mental health. In this section I focused on gender, because prior research suggests that women have higher levels of social interaction and worse mental health than men. My analyses of NSHAP and RAMPS shows similar patterns to prior
research and adds the finding that levels of social interaction do mediate some of the
effects of disability on mental health. For both NSHAP and RAMPS, standardized
measures of depression, anxiety, stress, and loneliness are used and RAMPS analysis
show that men and women report similar levels of anxiety and loneliness, even though
women also report significantly higher levels of depression and anxiety than men in the
study. Males and females in the RAMPS study both identified that their social
interactions affected their mental health. Several people described feeling like a burden to
others and concerns about being more of a burden because of their accessibility needs.
There were few examples of actual indication of being a burden to others because
participants rarely identified an actual occurrence in which someone said that the
disability was a problem.

Fundamental social psychological concepts, such as Meads (1934) idea of “taking
the role of the other”, help explain why participants might worry about how others see
them. Listening to stories, however, suggests that people with disabilities may have more
concerns than their lived experience suggests they need to have. Rehabilitation centers
have the potential to inform people that, based on the RAMPS studies, few older people
with disabilities actually encounter others who see their disability in a negative light.
Taking risks to maintain interactions with others – perhaps with creative workarounds –
could be worthwhile for quality of life and mental health. Health care professionals and
rehabilitation centers have opportunities to use the insights from the RAMPS participants
to develop tailored interventions for people with disabilities to maintain social
interactions. Currently, intervention strategies largely focus on an individual’s physical
needs through physical therapy and their ability to accomplish tasks through occupational
therapy. Finding that maintaining social interactions can also require additional efforts and is worthwhile for positive mental health could guide efforts to facilitate better interventions for people with disabilities holistically in relation to their lives in a biological, psychological, and social manner.

FUTURE RESEARCH

This dissertation, while answering all four research objectives, also generates a set of new research questions. There is a need for further examination of how social interactions unfold differently for older adults living in nursing homes compared to those who are living in the community. Nursing homes generally plan social events each day and attempt to engage older adults in social interactions. Older adults living in their own homes are likely to have social interaction but in a less structured and less frequent manner. Yet, it is worth an examination of how social interaction opportunities align with social interaction desires and participation for people with disabilities.

Additionally, it would be useful for future studies to specifically recruit older adults with different kinds of disabilities. The biopsychosocial framework provided a useful guide for the current focus on community dwelling adults with functional limitations. Therefore people in this study likely experienced lower levels of disability than those living in facilities with more levels of care. Similar to NSHAP data, RAMPS data also focused on people who could self-manage or manage with assistance from others. People with higher levels of disability will likely have different experiences in social interactions, therefore future research should specifically assess similarities and differences in a study that expands to include all people with physical disabilities. A
broader pool of people with disabilities will allow researchers, health and mental health care professionals, and family members to have a better understanding of the lived experiences of older adults with physical disabilities.

Overall we now know that social interaction partially mediates the relationship between physical disability and poor mental health. Additionally, physical barriers and social barriers limit the social interactions that people with disabilities experience which in turn affects their mental health. My analysis of the RAMPS data illuminated that to really understand a person with disabilities experience, you need to listen to people with disabilities’ experiences. Thus, future research should make sure to purposively maximize on variation of physical disability and mental health outcomes.

As outlined in the empirical chapters above, findings from this project support both the biopsychosocial framework as well as stress process theory. In particular, the quantitative analysis bolsters the biopsychosocial framework and the qualitative analysis provides insights into the Stress Process theory which posits that physical disability is a chronic stressors.

The quantitative findings support both the biopsychosocial framework and Stress Process Theory. The qualitative findings identify additional mechanisms in which the social aspect of the biopsychosocial framework unfolds with physical environment barriers and social environment barriers as primary drivers of successful social interactions. Additionally, the qualitative analysis challenges Stress Process Theory, because social interactions for people with disabilities can be both a buffer (as outlined in the original theory) as well as a stressor. After analysis, I conclude that social interactions have the potential to buffer the effect of physical disability on mental health outcomes if
the interactions are successful. In contrast, social interactions have the potential to become a stressor if they are not successful. People in my study generally describe the people with whom they interact successfully to be able to empathize with a person who has a disability without letting the disability define the person. Future research should focus on parallels experiences of people with disabilities and people with chronic illnesses that do not result in physical disabilities.
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APPENDICES
APPENDIX A: Recruitment Flyer
Are you an adult with a mobility limitation?

The University of Nebraska-Lincoln is conducting a research project about social life and adults with mobility limitations.

If you are 55-85 years of age and you have a mobility limitation, you might be eligible to participate.

This study involves an hour long interview.

In appreciation of your time, you will receive $20 cash.

All information will remain confidential.

For more information or to volunteer for this study please contact Raeda Anderson at raeda.anderson@huskers.unl.edu or 402.405.5312 and leave a message with your name and telephone number.

Note: Removal of the spinal cord rehabilitation center information per their request on all presentation of findings.
APPENDIX B: Pre-Consent Participant Screener
RAMPs
Redefining
And Maintaining
Positive Social Interactions

Pre-Consent Participant Screener

I am going to ask you a quick list of questions that will let us know if you are a good fit for the research study.

1. What is your first and last name? *(If already provided through voicemail or email, confirm)*

   1a. **Respondent is:**
       - [ ] Male
       - [ ] Female

2. Do you have a diagnosed medical condition that has resulted in a functional limitation?
   - [ ] Yes *(If yes, ask questions 2a, 2b, and 2c)*
   - [ ] No

   2a. If so, has it lasted or expected to last longer than three months?
       - [ ] Yes
       - [ ] No

   2b. What is the medical condition?

   2c. Does this cause a mobility impairment?
       - [ ] Yes
       - [ ] No

3. Has a doctor ever told you that you have Alzheimer’s, dementia, senility or any other serious memory impairment?
   - [ ] Yes
   - [ ] No

   2a. If so, what is the diagnosis?

4. What year were you born?
   - [ ] Insert Year Born (YYYY)
   - *Respondents must be born in 1962-1932*

<table>
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<tr>
<th>Respondent Eligibility Status</th>
<th>Scheduling of Interview</th>
</tr>
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<td>[ ] Spinal Cord Injury</td>
<td>Date:</td>
</tr>
<tr>
<td>[ ] Other Physical Disability</td>
<td>Day of the week:</td>
</tr>
<tr>
<td>[ ] Not Eligible</td>
<td>Time:</td>
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</tbody>
</table>
APPENDIX C: Participant Informed Consent Form
**Participant Informed Consent Form**

**Title:** Redefining and Maintaining Positive Social Interactions, "RAMPS"

**Purpose:**
This research project will examine social interaction among older adults with mobility limitations, expected to last at least three months, which are the result of a spinal cord injury or other serious physical health condition. You are invited to participate in this study because you are an older adult between the ages of 55 and 85 with mobility limitations that are the result of a spinal cord injury and/or other serious physical health condition.

**Procedures:**
You will be asked to complete a short self-administered survey followed by an interview. The short survey asks questions about your social life and basic demographics. The interview focuses on your health, your relationships (such as with family and friends), and your experiences getting around inside and outside of your home. The interview will be audio recorded. The survey and the interview combined will last about an hour and will be conducted at a location agreed upon by the researcher and participant.

**Benefits:**
There are no direct benefits to you as a research participant.

**Risks and/or Discomforts:**
No physical risks are anticipated. While the interview questions are not invasive, there might be questions that cause minimal psychological risk insofar as you might talk about difficult experiences. In order to minimize this risk, you do not have to answer any question with which you are uncomfortable. Additionally, at the end of the interview you will be provided with a handout that includes information on three affordable or free counseling and therapy services if you would like to speak with a professional.

**Confidentiality:**
Any information obtained during this study that could identify you will be kept strictly confidential. Your name will not be associated with the interview data. The de-identified and transcribed data from the audio-recording will be stored in a locked cabinet in the co-principal investigator’s office and on a secure server. Only the principal investigator and co-principal investigator will have access to these data. The information obtained in this study may be published in scientific journals or presented at scientific meetings but will be reported as aggregated data.

**Compensation:**
You will receive $20.00 in cash for participating in this project. You will complete a receipt acknowledging that you received this compensation for the interviewer’s records.
Opportunity to Ask Questions:
You may ask any questions concerning this research and have those questions answered before agreeing to participate in or during the study or you may contact the investigators at the phone numbers below. Please contact the University of Nebraska–Lincoln Institutional Review Board at (402) 472-6965 to voice concerns about the research or if you have any questions about your rights as a participant.

Freedom to Withdraw:
Participation in this study is voluntary. You can refuse to participate or withdraw at any time without harming your relationship with the researchers or the University of Nebraska–Lincoln or Madonna Rehabilitation Hospital, or in any other way receive a penalty or loss of benefits to which you are otherwise entitled.

Consent, Right to Receive a Copy:
You are voluntarily making a decision whether or not to participate in this research study. Your signature certifies that you have decided to participate having read and understood the information presented. You will be given a copy of this consent form to keep.

Participant Feedback Survey:
The University of Nebraska–Lincoln wants to know about your research experience. This 14 question, multiple-choice survey is anonymous; however, you can provide your contact information if you want someone to follow-up with you. This survey should be completed after your participation in this research. Please complete this optional online survey at: https://esp.qualtrics.com/SE/?SID=SV_aVvIvNCiU1vse5n.

Signature of Participant:

_____________________________  _________________________
Signature of Research Participant  Date

Name and Phone number of investigator(s)

David F. Warner, Ph.D., Principal Investigator
Office: (402) 472-3421  Email: dwarner3@unl.edu

Raeda K. Anderson, M.S., Co-Principal Investigator
Office: (402) 472-3631  Email: raeda.anderson@huskers.unl.edu
APPENDIX D: Participant Consent Capacity Evaluation
I am going to ask you some questions about the information we just went over together. While some of the questions may seem obvious, I have to ask you each one.

[Allow respondent to provide open-ended response and then indicate whether they understood that aspect of the informed consent process]

1. Is there a direct benefit to your medical condition by participating in this study? This does not include the money you will be given for your time.
   - No
   - Yes

2. Do you have to answer questions that make you uncomfortable or you do not want to answer?
   - No
   - Yes

3. Are you able to stop the interview at any time with no penalty?
   - Yes
   - No

4. Are there any serious risks associated with your participation in this study?
   - No
   - No

5. How much money will you receive for your participation in this study?
   - $20
   - Any amount other than $20

Total number of questions correct: /5
** Correct responses are on the left side **

To be completed by interviewer: Respondents must get 5 out of 5 questions correct to participate in the study. Did the respondent correctly answer all questions?

- Yes → If Yes, proceed with interview.
- No → if No, complete compensation process and thank respondent for their time. Do NOT conduct interview.
APPENDIX E: Research Respondent Disclosure Form
RESEARCH PARTICIPANT DISCLOSURE FORM

Principal Investigator: __________________________
Protocol Number: ________

I, the undersigned, acknowledge receipt of compensation in the amount of $ _________ for my time and inconvenience as a participant in the above research study. I also acknowledge that the information provided below will be shared with the central business office of the University of Nebraska - Lincoln.

Name: _______________________________________
Address: _______________________________________
_____________________________________
_____________________________________

Participant’s Signature ______________________ Date ________

Researcher’s Signature ______________________ Date ________
APPENDIX F: Counseling and Therapy Services
Counseling and Therapy Services

While you did not face any serious risks from this research, topics we talked about may be upsetting. Specifically, recalling events could cause discomfort or you may have found this process uncomfortable overall. If after the interview you would like to talk with a counselor the following places have counseling for free or low cost.

**CenterPointe: Harvest**

Physical Location: 2633 P Street Lincoln, Nebraska 68503

Phone Number: 402.475.8717

Community support specifically for adults 55 and over. Provided in collaboration with Lincoln/Lancaster Aging Partners.

**University of Nebraska-Lincoln Psychological Consultation Center**

Physical Location: 325 Burnett Hall, UNL Lincoln, Nebraska 68588

Phone Number: 402.472.2351

Counseling for men, women and children on a sliding fee scale. Held on Monday and Wednesday evenings beginning at 4:30 p.m. Clinical Psychology doctoral students provide assessment and therapy.

**Catholic Social Services**

Physical Location: 221 O Street Lincoln, Nebraska 68510

Phone Number: 402.489.1834

Individual, child, family and grief counseling on sliding fee scale. In 1995, Catholic Social Services began a community-based mental health service delivery system implemented throughout the Diocese of Lincoln.
APPENDIX G: Self-Administered Survey
Social Relationships and Activities

1. In the past 12 months, how often did you do volunteer work for religious, charitable, political, health-related, or other organizations?
   - 1. Several times a week
   - 2. Every week
   - 3. About once a month
   - 4. Several times a year
   - 5. About once or twice a year
   - 6. Less than once a year
   - 7. Never

2. In the past 12 months, how often did you attend meetings of any organized group? (Examples include: a choir, a committee or board, a support group, a sports or exercise group, a hobby group, or a professional society.)
   - 1. Several times a week
   - 2. Every week
   - 3. About once a month
   - 4. Several times a year
   - 5. About once or twice a year
   - 6. Less than once a year
   - 7. Never

3. In the past 12 months, how often did you get together socially with friends or relatives?
   - 1. Several times a week
   - 2. Every week
   - 3. About once a month
   - 4. Several times a year
   - 5. About once or twice a year
   - 6. Less than once a year
   - 7. Never

4. Among your nearby neighbors, how many of the adults would you know by name if you met them on the street? (By nearby neighbors, we mean the ten to fifteen families living closest to you.)
   - 1. None of them
   - 2. Some of them
   - 3. Most of them
   - 4. All of them

5. How often do you get together with any of these neighbors just to chat or for a social visit?
   - 1. Daily or almost daily
   - 2. Several times a week
   - 3. Several times a month
   - 4. Several times a year
   - 5. Hardly ever
6. How often do you feel that you lack companionship?
- Hardly ever (or never)
- Some of the time
- Often

7. How often do you feel left out?
- Hardly ever (or never)
- Some of the time
- Often

8. How often do you feel isolated from others?
- Hardly every (or never)
- Some of the time
- Often

9. What is your sex?
- Male
- Female

10. What is the highest degree or level of school you have completed?
- None
- High school diploma/GED
- Some college
- Associate’s (2-year) degree
- Bachelor's (4-year) degree
- Master’s Degree/MBA
- Law or MD
- PhD

11. What is your race? Check all that apply.
- White
- Black/African American
- American Indian or Alaska Native
- Asian or Pacific Islander
- Other (specify):

12. What is your current work status?
- Currently working full time
- Currently working part time
- Retired
- Disabled and unable to work
- Unemployed and looking for work
- A homemaker
- Other (specify):

13. In what year were you born?
Year Born (YYYY)

14. What is your current marital status?
- Married
- Living with a partner
- Separated
- Divorced
- Widowed
- Never married

15. How many children do you have?
- 1
- 2
- 3
- 4
- 5
- 6 or more
- I do not have any children

16. Do you have a paid caretaker?
- No
- Yes

17. If yes, how many days per week do you have a paid caretaker?
- 1 (1 day per week)
- 2
- 3
- 4
- 5
- 6
- 7 (every day)
- Less than once a week
APPENDIX H: Semi-Structured Interview
SEMI-STRUCTURED INTERVIEW

This semi-structured interview schedule will be used as a general guide for each interview. While each section will be covered with every respondent, not all questions in each section will be posed to each respondent. This is used as a general guide to cover the different sections listed below.

Just as a reminder, you are able to stop the interview at any time. If there are any questions you are not comfortable answering or would prefer to not answer, feel free to decline answering.

RAPPORT BUILDING/GENERAL QUESTIONS:

In this first set of questions, I would like to learn a little bit about who you are and your health.

Would you tell me a little about yourself?
  Probe if needed: family [spouse, children, extended family], work [current and retirement], community [church attendance, volunteering], social [friends, community groups, country club]
  Probe if needed: If you met someone new, how would you explain who you are?
  Hobbies.

Will you tell me about what brought you to [reddish patch]?
  Probe if needed: Injury [acute injury or chronic condition], length of injury, mobility ability [needs medical devices to walk, low stamina]

In this next set of questions we are interested in your health status. Specifically, we are interested in what activities are easy or difficult for you. Please listen at the answer categories and tell me how much difficulty you have with each activity. Some of these answers may seem obvious, but I need to ask you each of these questions.

Excluding any difficulties that you expect to last less than three months, how much difficulty do you have with _________________?

[HAND SHOWCARD A with no difficulty, some difficulty, much difficulty, and unable to do] [Record answers on Interview Administered Survey]
  1. Walking one block
  2. Walking across a room
  3. Dressing, including putting on shoes and socks?
  4. Bathing or showering?
  5. Eating, such as cutting up your food?
  6. Getting in or out of bed?
  7. Using the toilet, including getting up and down?]
Can you tell me how your life has changed personally since your [medical event]?
   Probe if needed: Can you tell me how your social life has changed your [medical event]?

SECTION 1: FUNCTIONAL LIMITATIONS AND PHYSICAL ENVIRONMENT: ACCESS TO ENVIRONMENT

Can you tell me about your experiences in getting around different locations?
   Probe if needed: This includes all physical locations such as your home, buildings, sidewalks, and parks.

Have you made any changes to your home related to your [medical event]?
   Probe if needed: What alterations to your home have you completed after your [medical event]?
   Probe if needed: What changes to your home would you like to do?
   Probe if needed: Why have you not made these changes yet?

What issues, if any, have you experienced with getting around in public?
   Probe if needed: What about any specific buildings, transportation, or public spaces?

Would you tell me about your experiences with going shopping? Probe if needed: Groceries and clothing

Do you go to see people more or do people come see you more?
   Probe if needed: Is that new or is that a result of your [medical condition]?

What effect, if any, is there on amount of a social life because of issues with getting into or around a location?
   Probe if needed: Buildings, restaurants, other people’s homes, public places, and private events.

I want you to think about when you are planning on going to a place you have never been to before. Before going what types of things do you think about in relation to your [medical condition] and the location?
   Probe if needed: Accessibility into location, space in location for medical equipment, traveling to/from location, feelings of other people with you (embarrassment, burden, excitement), interactions with employees (welcoming, ignoring of person with disability) interactions with other patrons (stares, questions), and comfortability.

How about your experiences with waiters? With others? Has anything changed there?
Probe if needed: People asking another person with you what you would like to drink at a restaurant, not being acknowledged by strangers, people asking questions about you to others when you are present

Now I want you to think about if you are planning on traveling and staying at a hotel you have never been to before. Before going what types of things do you think about in relation to your medical condition and the hotel?
  Probe if needed: Accessibility into hotel, accommodations, space in restaurant for medical equipment, traveling to/from hotel, feelings of other people with you (embarrassment, burden, excitement), interactions with employees (welcoming, ignoring of person with disability)

SECTION 2: FUNCTIONAL LIMITATIONS AND PHYSICAL ENVIRONMENT: ALTERING OF SOCIAL INTERACTIONS

I would like to hear about your experience of changing plans with friends and family because of accessibility barriers.

When making plans to meet up with other people, how much does being able to get into and around a location affect your choice?
  Probe if needed: Have you ever had to change plans once you’ve arrived at a location due to your inability to…Enter, Have enough space for you [if applicable medical/assistive equipment], Use the restroom

Has there been a time when you were not able to attend an event due to accessibility issues?  Probe if needed: Did you attempt any ‘work arounds”? Can you tell me more about it?

Has there been a time when you decided to not attend an event because you thought there would be accessibility issues?
  Probe if needed: This can include physical activities that you were able to do prior to your [medical event] such as sports.

I would like to hear more about your experiences with [specific event mentioned, family dinners, getting together with friends].

SECTION 3: PHYSICAL LIMITATIONS AND SOCIAL INTERACTIONS: BARRIERS TO INTERACTIONS

In this section I would like to hear about your experiences of your social life with friends, family, and people in the community.

Thinking of before your [medical event] and now, have you noticed any changes in social interactions with friends?
  Family?
How is that in compared work colleagues?
What about strangers?
Neighbors?
How about with your spouse?

Why do you think these changes have occurred?
   Probe if necessary: physical changes, other factors, combination of these?
   Do you think it is because you’re in a wheelchair? Is it because people grow apart? Or something else?

Have you ever felt like your [medical condition] makes things difficult?
   Probe if necessary: Makes things difficult on you, your friends, and your family. How have these factors affected your life? Interactions with others, low excess money, happiness

SECTION 4: PHYSICAL LIMITATIONS AND SOCIAL INTERACTIONS: DESIRED LEVELS OF INTERACTIONS

In this section I would like to hear about how much social interactions you’re having.

Has your social life increased, decreased, or stayed about the same since your [medical event]?

Do you have more, less, or about the same amount of a social life as you would like?
   Probe if needed: Why do you have [more or less] interactions that you would like? Perception of social awkwardness (Do you feel uncomfortable? Do you think others feel uncomfortable?), medical embarrassment (i.e. inability to feed self or use of drainage bag)

Have you ever felt left out or cut off because of consequences of your [medical event]?
   Probe if necessary: Feeling like or being treated as a burden (having to get a ride, needing help eating)

Now let’s talk about thoughts and feelings you may have had during the past week. I will read a series of statements. Tell me how often during the past week you felt like this; rarely or none of the time, some of the time, occasionally, or most of the time? Don’t take too long over your replies; your immediate reaction to each item will probably be more accurate than a long thought out response.

[HAND SHOWCARD B with rarely or none of the time, some of the time, occasionally, and most of the time]
[Record answers on Interview Administered Survey]

During the past week…
   1. I did not feel like eating
2. I felt depressed
3. I felt that everything I did was an effort
4. My sleep was restless
5. I was happy
6. I felt lonely
7. People were unfriendly
8. I enjoyed life
9. I felt sad
10. I felt that people disliked me
11. I could not get “going”

During the past week…
1. I felt tense or wound up
2. I got a frightened feeling as if something awful was about to happen
3. Worrying thoughts went through my mind
4. I could sit at ease and feel relaxed
5. I got a frightened feeling like butterflies in my stomach
6. I felt restless as if I had to be on the move
7. I had a sudden feeling of panic

During the past week …
1. I was unable to control important things in my life.
2. I felt confident about my ability to handle personal problems.
3. I felt that things are going my way.
4. I felt difficulties were piling up so high that I could not overcome them.

SECTION 5: CONCLUSION

This section I would like to hear about advice you would give others and things you wish you would have known. This is the last section.

If you were to give advice to other people with [your medical event] what would you tell them? Probe if needed: What advice would you give other people with your medical condition to work around your accessibility issues?

Is there anything you wish you would have known about how [your medical event] would change your relationships?

Is there anything you wish you would have known about how to get around and overcome accessibility issues?

After this interview, do you have any questions about this project?
APPENDIX I: Interview Administered Survey
**Interview Administered Survey**

[Asks in Rapport Building/General Questions Section Semi-Structured Interview]

Excluding any difficulties that you expect to last less than three months, how much difficulty do you have with:

<table>
<thead>
<tr>
<th>Item</th>
<th>Degree of Difficulty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Walking one block</td>
<td>□ No Difficulty  □ Some Difficulty  □ Much Difficulty  □ Unable to do  □ DK  □ RF</td>
</tr>
<tr>
<td>2. Walking across a room</td>
<td>□ No Difficulty  □ Some Difficulty  □ Much Difficulty  □ Unable to do  □ DK  □ RF</td>
</tr>
<tr>
<td>3. Dressing, including putting on shoes and socks?</td>
<td>□ No Difficulty  □ Some Difficulty  □ Much Difficulty  □ Unable to do  □ DK  □ RF</td>
</tr>
<tr>
<td>4. Bathing or showering?</td>
<td>□ No Difficulty  □ Some Difficulty  □ Much Difficulty  □ Unable to do  □ DK  □ RF</td>
</tr>
<tr>
<td>5. Eating, such as cutting up your food?</td>
<td>□ No Difficulty  □ Some Difficulty  □ Much Difficulty  □ Unable to do  □ DK  □ RF</td>
</tr>
<tr>
<td>6. Getting in or out of bed?</td>
<td>□ No Difficulty  □ Some Difficulty  □ Much Difficulty  □ Unable to do  □ DK  □ RF</td>
</tr>
<tr>
<td>7. Using the toilet, including getting up and down?</td>
<td>□ No Difficulty  □ Some Difficulty  □ Much Difficulty  □ Unable to do  □ DK  □ RF</td>
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[Asks in Section 4 of the Semi-Structured Interview]

During the past week...

<table>
<thead>
<tr>
<th>Item</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>1. I did not feel like eating</td>
<td>□ Rarely/ none of the time □ Some of the time □ Occasion-ally □ Most of the time □ DK □ RF</td>
</tr>
<tr>
<td>2. I felt depressed</td>
<td>□ Rarely/ none of the time □ Some of the time □ Occasion-ally □ Most of the time □ DK □ RF</td>
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<tr>
<td>3. I felt that everything I did was an effort</td>
<td>□ Rarely/ none of the time □ Some of the time □ Occasion-ally □ Most of the time □ DK □ RF</td>
</tr>
<tr>
<td>4. My sleep was restless</td>
<td>□ Rarely/ none of the time □ Some of the time □ Occasion-ally □ Most of the time □ DK □ RF</td>
</tr>
<tr>
<td>5. I was happy</td>
<td>□ Rarely/ none of the time □ Some of the time □ Occasion-ally □ Most of the time □ DK □ RF</td>
</tr>
<tr>
<td>6. I felt lonely</td>
<td>□ Rarely/ none of the time □ Some of the time □ Occasion-ally □ Most of the time □ DK □ RF</td>
</tr>
<tr>
<td>7. People were unfriendly</td>
<td>□ Rarely/ none of the time □ Some of the time □ Occasion-ally □ Most of the time □ DK □ RF</td>
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<tr>
<td>8. I enjoyed life</td>
<td>□ Rarely/ none of the time □ Some of the time □ Occasion-ally □ Most of the time □ DK □ RF</td>
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<tr>
<td>9. I felt sad</td>
<td>□ Rarely/ none of the time □ Some of the time □ Occasion-ally □ Most of the time □ DK □ RF</td>
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### During the past week...

<table>
<thead>
<tr>
<th>Item</th>
<th>Frequency</th>
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<td>1. I felt tense or wound up</td>
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<td></td>
<td>Some of the time</td>
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<td>2. I got a frightened feeling as if something awful was about to happen</td>
<td>Rarely/none of the time</td>
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<td>Some of the time</td>
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<td>3. Worrying thoughts went through my mind</td>
<td>Rarely/none of the time</td>
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<td>Some of the time</td>
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<td>DK</td>
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<td>RF</td>
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<td>4. I could sit at ease and feel relaxed</td>
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<td>5. I got a frightened feeling like butterflies in my stomach</td>
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<td>6. I felt restless as if I had to be on the move</td>
<td>Rarely/none of the time</td>
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<td>7. I had a sudden feeling of panic</td>
<td>Rarely/none of the time</td>
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<td>1. I was unable to control important things in my life</td>
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<td>4. I felt difficulties were piling up so high that I could not overcome them</td>
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<td>RF</td>
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</table>
APPENDIX J: Show Card A
Show Card: A

1. No difficulty

2. Some difficulty

3. Much difficulty

4. Unable to do
APPENDIX K: Show Card B
Show Card: B

1. Rarely or none of the time
2. Some of the time
3. Occasionally
4. Most of the time