

SOCIAL INTEGRATION AMONG OLDER ADULTS: A FOCUS ON
SOCIO-DEMOGRAPHIC AND HEALTH CHARACTERISTICS

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ABSTRACT

Social integration is a multi-dimensional construct that is instrumental to healthy aging. The current study explores variation in older adults' social integration based on socio-demographic variation (age, gender, education, marital status, and rurality) and health status (as measured by number of chronic illness and Activities of Daily Living). Participants included 416 older adults (aged 60+) from a small Midwestern metropolitan area. Results from two-stage hierarchical multiple regressions revealed associations between age, education, marital status and rurality and social integration, whereas gender was not associated with overall social integration. Instrumental ADLs were more consistently associated with social integration as compared to chronic health conditions. These findings highlight the multi-faceted nature of social integration in late-life. Implications and future directions are discussed.

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Keywords: social integration, aging, health.

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CHAPTER 1. INTRODUCTION

The United States Census Bureau (2010) projects that the number of older adults will increase dramatically in the next few decades. With the Baby Boomers entering into older adulthood, the population of older adults is projected to double by 2030, representing nearly twenty percent of the total U.S. population (Olshansky, Goldman, Yuhui, & Rowe, 2009). This staggering demographic shift will have major implications on the quality of life of older adults. While, much of the research on the implication of this population shift has focused on health care, housing and financial needs, less emphasis has been placed on understanding the social needs of older adults (Wiener & Tilly, 2002). With the rapid increase in the older population, there is a great need for better understanding how to enhance the quality of life of older adults (Broughton & Beggs, 2007). The current study seeks to expand the research on older adults' social needs by investigating what aspects of social integration are salient and whether socio-demographics and health factors are associated with the social integration of older adults.

Social integration is increasingly recognized as an important part of healthy aging (Bennett, 2005; Cornwell, Laumann, & Schumm, 2008). Over the past few decades, numerous studies have demonstrated that various aspects of social integration including social support quality, social network composition, and social participation/engagement influence physical and mental health of older adults (Arcury et al., 2012; Ertel, Glymour, & Berkman, 2009; Fothergill et al., 2011; Thomas, 2011a, 2011b; Zunzunegui, Alvarado, Del Ser, & Otero, 2003). However, within the literature there is substantial variability in the way social integration is assessed in older adults. A great deal of research has examined social integration in older adults in terms of the frequency of network contact and/or level of perceived social support (Mezuk & Rebok, 2008; Sherman et al., 2006; Warren-Findlow, Laditka, Laditka, & Thompson, 2011). Most of

these studies center around the influence of social relationships on physiological and psychological health outcomes (Amieva et al., 2010; Bath & Deeg, 2005; Crooks, Lubben, Petitti, Little, & Chiu, 2008; Ertel et al., 2009; McLaughlin, Vagenas, Pachana, Begum, & Dobson, 2010; Warren-Findlow et al., 2011). While these studies address the importance of social integration for health and well-being, they do not take into account the full breadth of social integration that occurs beyond close interpersonal relationships (e.g. family). Furthermore, many studies on social integration tend to ignore periphery relationships that are an important part of late-life, such as neighbors, co-workers, and people at social organizations (e.g. senior centers, clubs, etc.). Thus, it is important to examine the social lives of older adults as a broader concept which includes multiple contexts of social integration in late-life.

Social integration is a context specific phenomenon. Previous research suggests that various aspects of social integration (e.g. social support quality, social network composition, and social participation/engagement) vary based on one's age, gender, socio-economic status, marital status, and geographic location (Ajrouch, Blandon, & Antonucci, 2005; Cornwell et al., 2008; Mair & Thivierge-Rikard, 2010). Studies have robustly shown that as people get older they tend to have smaller social networks, less frequent contact with network members, and lower community involvement (Ajrouch et al., 2005; Cornwell, 2011a; Luong, Charles, & Fingerma, 2011). In addition to age differences in social relationships, gender differences in social network size, composition, and quality of support have also been frequently reported (Ajrouch et al., 2005; Fiori, Smith, & Antonucci, 2007). Studies have demonstrated that the social interests of older women vary greatly compared to men in terms of the types of people they associate with and the types of social activities they participate in (Gurung, Taylor, & Seeman, 2003; McLaughlin et al., 2010). Furthermore, studies also suggest that married individuals tend to have

larger social networks and are more socially engaged compared to individuals who are not married (Ertel et al., 2009) . Socio-economic status also influences social networks in late-life. For instance, some studies suggest that higher education levels are linked to more diverse and less family centered social networks (Ajrouch et al., 2005; Gray, 2009). In addition to socio-economic status, population density and opportunities which differ based on rurality also have a significant influence on social integration (Mair & Thivierge-Rikard, 2010) Although, not many studies have focused solely on regional differences in social integration of older adults, in general people living in rural areas have strong social ties with friends and neighbors (Mair & Thivierge-Rikard, 2010). Regional differences in social integration also vary based on socioeconomic status and local culture.

In addition to demographic variation, levels of physical activity and the presence of chronic health conditions in late-life also influence one's level of integration in society (Ertel et al., 2009; Garcia, Banegas, Perez-Regadera, Cabrera, & Rodriguez-Artalejo, 2005). Physical activity has been regarded as a key facet of successful aging (Montross et al., 2006). Staying active in later life is critical for social integration as it allows older adults to stay connected with society (Gray, 2009).

The current study aims to better understand social integration in older adults by extending beyond family and close support relationships to more comprehensively explore social integration ranging from close intimate to community level relationships. This study seeks to explore whether there are salient demographic differences in social integration based on age, gender, education level, marital status, and rurality. Finally, the present study examines the associations between older adults' health status and social integration while controlling for demographic factors.

CHAPTER 2. LITERATURE REVIEW

Despite persistent stereotypes of old age as a time of loneliness and isolation, gerontological research suggests that older adults are frequently active within their communities and enjoy spending time with friends and families (Broughton & Beggs, 2007; Phillips, Wójcicki, & McAuley, 2013). There is evidence showing older adults's increased interest in participating in community (e.g. senior centers), religious, and volunteer organizations (Aday, Kehoe, & Farney, 2006; Beyerlein & Hipp, 2006; Turner, 2004). Thus, it is important to acknowledge that the social integration of older adults is not limited to just intimate social relationships, but also acquaintances and less intimate social partners. Therefore, there is a greater need for studies that assess less close social partners and multiple aspects of community activities as important domains of social integration in late-life, in addition to intimate social relations.

Defining Social Integration

Social integration is an important part of life for people of all age groups. In gerontology, the concept of social integration has been discussed by researchers for several decades; however, the definition and meaning of social integration remains inconsistent. Research on the importance of social integration began as early as the 1950's with Durkheim's seminal research on suicide (Durkheim, 1951). In this study Durkheim conceptualized social integration as a belongingness and attachment to one's group, and suggested social integration as an influencing factor for the rate of suicide. There are a limited number of studies explicitly addressing social integration among older adults (Ertel, Glymour, & Berkman, 2008; Mezuk & Rebok, 2008; Sherman et al., 2006; Zunzunegui et al., 2003); however, considerable research has been conducted on various components of social integration such as social networks, social

relationships, social engagement, social participation, social support, and social ties. In many studies, these terms appear to be used interchangeably with social integration, but it is important to note that the meaning of these terms differ to a large extent.

In one study, Seeman et al., (2006) define *social support* as the perceived availability of help, affection, and instrumental aid from significant social partners, primarily family members and close friends, as well as neighbors and co-workers. Social support is often described as a function of network members and the level of instrumental and emotional help available (Bath & Deeg, 2005; Ertel et al., 2009). Accordingly, a social network is another important component of social integration that has been frequently studied. The term *social network* refers to the structure of social ties surrounding an individual including size, density, and homogeneity (Ajrouch et al., 2005; Ertel et al., 2009). It is often measured in terms of the number of individuals with whom a person interacts and spends time with, including family members, friends, confidants, and those who provides tangible assistance in fulfilling daily tasks (Arcury et al., 2012; Cornwell, 2011b; Pillemer et al., 2000). Findings from these studies consistently suggest that older adults' social networks are kin-centered and mostly include family members and friends who are available to fulfill everyday needs.

In addition to kin centered social support and social networks, some studies have assessed older adults' relationships beyond the family circle in terms of social engagement and social participation (Bath & Deeg, 2005; Bennett, 2005; Thomas, 2011b). However, there are limited empirical studies directly addressing social engagement and social participation. *Social engagement* refers to participation in community related activities such as getting together with people of the same/different age groups, or participating in an organized institution (Arcury et al., 2012; Ertel et al., 2009). *Social participation* is a broad term implying social interaction with

social partners other than immediate family members (Bukov, Maas, & Lampert, 2002; Utz, Carr, Nesse, & Wortman, 2002). In many studies both social engagement and social participation are used interchangeably to describe the frequency of participation in activities involving interpersonal relationships, interaction among people, volunteering activities, and leisure activities (Demers, Robichaud, Gelinas, Noreau, & Desrosiers, 2009; Thomas, 2011b). Some studies have also explored social integration in terms of formal and informal participation, where formal social integration means being engaged in social activities through community (e.g. charity and volunteering activities) and religious organizations, whereas informal social integration refers to daily activities and interactions with family, friends, and neighbors (Donnelly & Hinterlong, 2010; Sherman et al., 2006).

Taken together, there is clear evidence for the need to assess social integration in older adults beyond formal social roles, and extend its definition to capture the holistic picture of social integration. In the present study, the definition of social integration in older adults is expressed as a multidimensional concept that addresses social integration across the domains of i) Family, ii) Friends & Neighbors, iii) Leisure, iv) Community, and v) Productivity.

Theoretical Perspective

The Convoy Model of Social Relations (Antonucci, 2001; Kahn & Antonucci, 1980) is an approach that provides a framework for understanding social networks and resources available to an individual by taking into account changing relationships throughout adulthood. According to the Convoy Model, individuals travel throughout the life-course surrounded by people who provide support, protection, and socialization (Ajrouch et al., 2005; Antonucci et al., 2009). The model postulates that all people need social support but the amount and nature of such support may vary based on the context (Antonucci et al., 2009). As people age their social

networks and social embeddedness change. For instance, the frequency and types of social networks are based on the current needs (such as a need of companionship and care) and abilities (such as health limitations) of an older individual.

Social convoys greatly impact health and well-being of older adults. Past studies have indicated that network characteristics provide opportunities for the development of various psychobiological pathways (e.g., social support, immune system function) which ultimately influence one's overall health (Ajrouch et al., 2005; Antonucci et al., 2009; Berkman, Glass, Brissette, & Seeman, 2000;). The number and type of social convoy affects: i) tangible assistance to one's need (information and advice, financial help), ii) emotional support, and iii) psychological support which comes with sharing of similar goals and values (Antonucci et al., 2009). The influence of convoys in different aspects of life directly or indirectly affects one's health.

In addition to the association between convoy and health, the model also suggests that people might have varying need for the number and types of social support. Not everyone needs the same amount and/or types of social support. The amount and nature of social integration is likely to be determined by one's social background such as gender, marital status, socio-economic status, and rurality. In general, the convoy model emphasizes the importance of social support for wellbeing, and highlights the changes in social support over time. However, although it emphasizes the contextual differences in support, it does not broadly address social integration (for example, social engagement), and is limited to social support.

Berkman et al., (2000) present a framework in which the defining characteristic of social integration is an individual's attachment to social structures and suggest mechanisms linking social integration and well-being. Social integration theory highlights the influence of social

integration on health outcomes through mechanisms such as providing resources for daily living, improving sense of purpose, and increasing motivation to engage in health promoting behaviors as well as the potential that social integration may buffer stressors associated with old age (e.g. disease, widowhood, financial strain) (Berkman et al., 2000; Thomas, 2011a).

In addition, social integration also influences health through physiological pathways (Seeman, Singer, Ryff, Love, & Levy-Storms, 2002). The Berkman's framework of social integration is linked to the work of Blau (1960) where the researcher was interested in understanding the influence of social pressure on the behaviors of people. Blau (1960) suggested that people are naturally interested in being integrated in society, and society allows individuals to achieve a sense of satisfaction through social status and recognition by others. Furthermore, the support received as a result of social integration also serves as a buffer for adverse situations associated with old age (e.g. Stress due to physical condition, loss of family members/widowhood, financial strain) (Cohen, 2004; Li & Ferraro, 2006; Schwerdtfeger & Friedrich-Mai, 2009).

Activity Theory emphasizes the importance of daily activities on successful aging and suggests that there are differences in number and types of social relationships based on one's physical situation. Activity Theory, proposed by Havighurst (1961) asserts that being active and engaging in various activities promotes successful aging. Any form of physical activity and social participation positively affects an individual's quality of life and adjustment to aging. In contrast lack of physical activity, either because of sedentary lifestyle, chronic disease and disability may limit the number and types of social relationships (Bertera, 2003; Utz et al., 2002). In this regard, this theory suggests that older individuals with limitations in their ability to perform common activities of daily livings (ADLs) will experience changes in social integration

depending on their needs. For instance, even if the level of functioning is low, there may be increases in some forms of social networks (e.g. support from friends and family), and decreases in other types of social integration (e.g. outdoor and community activities).

The topic of successful aging has emerged as an important concept among researchers as the population of older adults around the globe is growing rapidly (United Nations Department of Economic and Social Affairs, 2012). Although the concept of successful aging appears inconsistent throughout the literature, the importance and promotion of successful aging is widely discussed (Depp, Vahia, & Jeste, 2010; Depp & Jeste, 2006). Rowe and Kahn's model of successful aging (1987, 1997) is one of the earliest and most widely used models in the aging literature. This model emphasizes social integration (e.g. meaningful and purposeful social activities) as crucial factor for successful aging. According to the initial model of Rowe and Kahn (1987), a person can attain successful aging by staying active in life through involvement in paid/unpaid activities that are beneficial to their community, maintaining higher level of physical and mental functioning, and staying free from disease and disease related disability (Rowe & Kahn, 1987, 1997; Weir, Meisner, & Baker, 2010). Furthermore, the recent and revised model of Rowe and Kahn describes the importance of spirituality for achieving successful aging in addition to physical health and social participation (Crowther, Parker, Achenbaum, Larimore, & Koenig, 2002; Sadler & Biggs, 2006).

The aforementioned theories guide us in considering social integration as a contextual phenomenon, and highlight the need for studying social integration from a multi-dimensional perspective. When viewed independently, these theories are not sufficient to explain the entire concept of social integration; however, when viewed together, collectively these theories help enlighten us about the multiple characteristics of older adults' social integration.

Components of Social Integration

Older adults may integrate in society in several ways. Older adults could be part of a social network of family and friends, as well as actively or partially involved in various social, religious, volunteer, and community associations. Social integration is a multi-dimensional concept and constitutes of both interpersonal ties and community participation. Social integration is therefore a vital part of healthy aging as it denotes the cohesion among members of a broader society.

The Social Integration in Late-Life Scale (SILLS) is a recent approach to measure social integration from a multi-dimensional perspective (Fuller & Rajbhandari, 2014). SILLS is a measure unique to late-life that includes activities of older adults ranging from interpersonal relationships to community involvement, assessed across five domains: family, friends & neighbors, leisure, community, and productivity. The components of social integration are demonstrated in Figure 1.

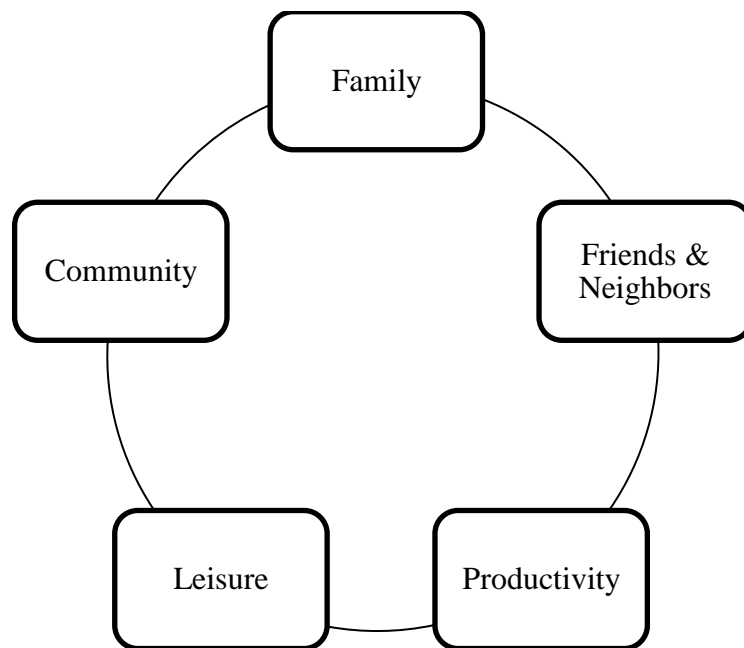


Figure 1. Social Integration in Late-life Scale (SILLS) Structure.

Family: There is a wealth of evidence suggesting that for the majority of older adults, social networks tend to focus on close family members (Fiori et al., 2007; Stephens, Alpass, Towers, & Stevenson, 2011). In general, family members are the direct source of support for majority of older adults. Some studies also suggest that the level of social integration with family members is influenced by individual's physical mobility, level of support (both basic and instrumental) needed, and geographical proximity (Fiori et al., 2007).

Friends & Neighbors: Engagement with friends and neighbors has always been important to older adults' lives (Cornwell et al., 2008; Duay & Bryan, 2008; Greenfield & Reyes, 2014). Friends and neighbors are both important sources of formal and informal support for older adults (Keating & Dosman, 2009; Sherman et al., 2006). The close relationship with friends is reported as an important source of support in late-life (Holtzman et al., 2004; Huxhold, Miche, & Schuz, 2014). As people age, the number of friends gradually decreases due to multiple reasons such as death, physical limitations, being institutionalized, and increase in dependency for basic needs. Despite the lower number of friends in late-life, older adults report satisfaction from frequent contact with friends and regard friends as a major source of happiness. Neighbors in general are a significant component of social relationships of older adults mainly due to geographical proximity and years of living in the same neighborhood (Gardner, 2011; Greenfield & Reyes, 2014; Shaw, 2005). However, relationships with neighbors may vary from non-emotional and occasional to very close. For example, neighbors mostly assist each other with non-intimate task such as transportation, bill pay, however in some instances they are also involved with personal care (Greenfield & Reyes, 2014). When the family size decreases due to loss of family members, older adults may compensate this loss by interacting more with neighbors in their close physical proximity (Chan, Wu, & Hung, 2010).

Leisure: Current generations of aging adults show increased interest in recreation, traveling, and leisure activities (Morrow-Howell et al., 2014; Staats & Pierfelice, 2003; Wang et al., 2012). However, not many studies address the recreation and leisure activities in old age as an important dimension of healthy aging. Some studies have demonstrated that leisure activities in late-life are linked to life satisfaction (Chipperfield, 2008; Guinn & Vincent, 2003; Silverstein & Parker, 2002). In addition, there are also studies suggesting the influence of leisure activities on number of social contacts (Bertera, 2003). Recreational and leisure activities provide opportunities for older adults to resume neglected interests (Purdie & Boulton-Lewis, 2003), prevent cognitive decline, reduce mortality risk, improve physical functioning and self-esteem, and predict better self-rated quality of life (Hutchinson & Kleiber, 2005; Silverstein & Parker, 2002). The challenges and fun associated with leisure activities can be instrumental for growth and development, as well as, good physical and psychological health (Agahi, Ahacic, & Parker, 2006; Ziegler, 2002). Recreation and leisure play a vital role in social integration in post retired older adults (Staats & Pierfelice, 2003). Participating in leisurely activities provide opportunities for older adults to make friends and companions. It may be especially important in the case of older women, as they are at a greater risk of developing depression resulting from loneliness in late life (Aday et al., 2006).

Community: Older adults are functionally integrated in their communities. Functional integration comprises of social, political, religious, and economic participation. Engagement in community organizations and activities is an important indicator of healthy aging (Arcury et al., 2012; Ertel et al., 2009). Community involvement gives older adults a feeling of belongingness, which is an important component of social integration (Bath & Deeg, 2005).

Productivity: Traditionally old age was considered synonymous with the period of low productivity. Certain misconceptions regarding old age still persist; as for example, older adults are stereotyped to be stubborn in nature and resistant to changes (Cuddy, Norton, & Fiske, 2005). However, recent research suggests an uptick in productive activities in late-life. Erickson's psychosocial theory of lifespan development suggest that people go through various psychosocial and emotional changes throughout life time (Erikson, 1982). In older age people have an instinctual energy towards generativity, a psychosocial process where older adults have more desire to contribute towards society and doing things that benefit future generation (Bradley, 1997). After certain life-transitions such as retirement and separation/loss of spouse, older age can offer a time for self-improvement through reflection on one's life. Some productive activities that older adults commonly become involved in during late life include volunteering, and lifelong learning opportunities such as skill building classes.

Volunteering is associated with greater social integration as it provides opportunities for older adults to increase their social contacts and social engagement (Morrow-Howell et al., 2014). Van Willigen (2000) notes that at any given time approximately 50% of Americans are involved in some kind of volunteering or charity work. It is observed that older adults find pleasure in community engagement and volunteering activities; as a result older adults are more likely to volunteer than any other age groups. Interestingly, some studies have also noted that older women report greater rates of volunteerism as compared to older men (Donnelly & Hinterlong, 2010; Einolf, 2011; Parkinson, Warburton, Sibbritt, & Byles, 2010). According to Vetter and colleagues (2009), older volunteers find volunteering opportunities as a chance to apply life experiences; the sense of satisfaction achieved from applying life experiences is a great motivating factor for being engaged in such activities. Lifelong learning opportunities are

essential for older adults to enhance skills, explore new ideas, and maintain overall wellness (Duay & Bryan, 2008). Learning opportunities in later life also play an important role in providing older adults opportunities to remain actively engaged in society (Githens, 2007; Roberson & Merriam, 2005). Furthermore, late life learning can also be helpful for those older adults who are interested in continued employment (both full-time, and part-time). Additionally, literature has illustrated several physical and psychological health related benefits of learning in late-life including enhancing cognitive functioning in older adults with dementia.

Socio-Demographic Variation and Social Integration

A large body of literature suggests that life course factors (i.e. context) have a major role in shaping older adults social integration (Cornwell et al., 2008). A person's age, gender, educational status, marital status, and rurality play an important role in how people integrate in society (Felmlee & Muraco, 2009; McLaughlin et al., 2010; Nummela, Sulander, Rahkonen, Karisto, & Uutela, 2008).

Age differences in social networks have been frequently reported in previous studies. Considerable empirical evidence suggests that in the second half of life, there is a gradual decrease in the number and types of social relationships (Jopp, Rott, & Oswald, 2008; McLaughlin et al., 2010). In particular, as people age, overall social integration changes due to the factors such as retirement, death of support partners, and changes in physical functioning (Luong et al., 2011). Furthermore, as people age they are more prone to suffer from chronic illnesses and disabilities which limit their opportunities for social integration (McLaughlin et al., 2010; Thomas, 2011a). It is more likely that the oldest old (80 years and above) are less socially integrated in terms of maintaining social and community relationship compared to their younger counterparts (Ajrouch et al., 2005; Jopp et al., 2008). There are also differences in level of daily

activities based on age. Younger older adults are relatively active in social gatherings and community involvements, whereas, the oldest old limit their activities within the living surroundings, leading to the differences in social integration characteristics based on age group.

Gender differences in various domains of social integration among older adults are frequently reported (Aday et al., 2006; Ajrouch et al., 2005; Antonucci et al., 2002; Cornwell, 2011b; Shaw, Krause, Liang, & Bennett, 2007). In general, women are considered to have better overall social integration. However, most of the past studies address gender differences mainly with regards to social network and social support. There is robust evidence suggesting that women have larger networks compared to men (Antonucci et al., 2002; Cheng & Chan, 2006; Garcia et al., 2005; McLaughlin et al., 2010). One common explanation for reported gender differences is that men and women undergo different life course experiences which are influenced by multiple factors such as personality, culture, gender roles, and expectations (Cornwell, 2011a). For instance, traditionally, women occupy kin-keeping responsibilities which makes them more likely to have a greater number of close social relationships. In addition to the size of network, studies also demonstrate considerable gender differences in network composition; women have a larger and more diverse network compared to men, who generally have limited social network (Antonucci et al., 2002; Cornwell, 2011b; McLaughlin et al., 2010). Additionally, women's friendships are more intimate in nature whereas, men tend to enjoy friendship by shared outdoor activities (Felmlee & Muraco, 2009). Women tend to provide more support, keep frequent contact with network members, and are more satisfied with their social relationships. In addition, women also have more expectations from their network members than men do (Fiori et al., 2007). Women tend to rely on friends, children, and families for emotional support whereas, men appear to solely rely on spouse for emotional support (Gurung et al.,

2003). Although gender differences in some domains of social integration (e.g. social support function and social networks) in older adults are prevalent, previous research does not shed much light on gender effects with respect to other aspects of social integration (e.g. social engagement, leisure participation, etc.).

Socioeconomic indicators such as education level can also influence the social integration in older adults. Higher SES is associated with better overall social integration (Ajrouch et al., 2005; Pahl & Pevalin, 2005). Although there are very few studies directly addressing the link between social integration and education level, class differences in social integration are frequently noted (Gray, 2009; Pahl & Pevalin, 2005). People with higher education levels tend to have larger and more diverse social networks (Ajrouch et al., 2005). In general, higher education level is associated with more diverse and less family centered networks; whereas, less educated older adults mostly rely on family and relatives. In addition to differences in social network based on SES, few studies also suggest that people of lower SES status are less likely to engage in organizational and community participation except for religious participation (Gray, 2009). Furthermore, some studies also suggest that older adults of a working class group report more loneliness compared to middle and higher class older adults (Wenger & Burholt, 2004). There is a dearth of literature addressing social integration and SES, and the few existing studies mostly address association between SES and social network. This suggests that there is greater need to explore more about relationship between SES and social integration in older adults.

Marital status also plays an important role in the level and nature of social integration. Studies indicate that social relationships and the types of social network change with time owing to the changes in life situations such as widowhood and the transition to a new partner/spouse (Ertel et al., 2009; Steverink & Lindenberg, 2006). Widowhood has a great impact on the overall

social integration of older adults. In particular, although widowhood greatly impacts men's social networks, because of their primary emotional reliance on spouse, there is a greater overall impact on women as they are much more likely to be widowed due to longer life expectancy (Aday et al., 2006; Cohen, 2004; Donnelly & Hinterlong, 2010). In women widowhood is associated with the likely decline in social ties, loneliness, and depression (Ajrouch et al., 2005; Cornwell, 2011b). However, older women tend to have increased interest in community involvement after widowhood, which can act as a buffer for their loss (Cornwell, 2011b; Einolf, 2011). Some widows who live alone compensate for the loss of social interaction with family members by being involved in community activities or making new friends, whereas some older adults become lonely. Widowed women have higher levels of informal social participation such as activities with friends, and neighbors (Utz et al., 2002). Informal social participation helps widowed women with emotional and instrumental support (Donnelly & Hinterlong, 2010). Older divorced and widowed men may be at more risk of isolation and depression compared to women as they have relatively low social network and community participation (Gray, 2009).

Furthermore, divorced and widowed individuals are more likely to develop social networks with their children and community participation whereas, never married and childless older adults are likely to have more contacts with siblings and friends (Pinquart, 2003). Separation, divorce, and widowhood have influence on social relationships of older adults (Cornwell, 2011b). This is often the case for older men who are much more emotionally reliant on their spouse, and thus separations from spouse either by death or divorce also mean a loss of relationships. However, in women separation, divorce, and widowhood may not always be a threat to form new relationship. It could also be a chance to increase network with weak social ties by becoming more involved in community (In general married older adults report a greater number of social

support partners and higher self-reported quality of life compared to never-married, widowed, and divorced (Donnelly & Hinterlong, 2010; Ertel et al., 2009). However, social network structure in married older adults mostly is kin-centered (Ertel et al., 2009).

Older adults' lifestyles vary to a great extent based on rurality. There are environmental influences on the way people age because of the difference that exist in the rural and urban setting. People living in urban regions have access to various things such as formal social groups, activities, and easy access to most of their needs (Evans, 2009). In contrast, life in rural areas is characterized by low population density, minimal infrastructure, and agriculture as a main economic source (Mair & Thivierge-Rikard, 2010). Although urban regions present access to numerous social resources, urban seniors receive less help from friends and family and from people in their social networks perhaps due to a fast paced lifestyle (Mair & Thivierge-Rikard, 2010). On the other hand, seniors in rural areas report good relationships with the family, friends, neighbors and community members. According to Greiner et al. (2004), in the United States participation in social community activities is higher in rural areas compared to urban. There is a vast difference in the nature of social integration among urban/rural older adults. In general, social integration in rural and urban region occurs in different context. Rural areas with low population density contain strong kin-based social relationships, whereas, people in more densely populated urban areas have weak kin-based relationships. In urban areas, people are more integrated in workplace, leisure activities, learning and productive activities, and social organizations (Nummela et al., 2008).

Physical Health and Social Integration in Late-Life

There has been a great deal of work linking health to various domains of social integration in late-life (Fratiglioni, Paillard-Borg, & Winblad, 2004; Nieminen et al., 2013;

Warren-Findlow et al., 2011). However, this literature is limited in only examining specific domains of social integration separately, instead of examining links between comprehensive social integration and health.

A large body of literature suggests that social network, social support and engagement in community activities influences the physical and psychological health of older adults (Avlund, Lund, Holstein, & Due, 2004; Bath & Deeg, 2005). Greater social support and community participation is linked to better outcomes in cardiovascular systems, self-rated health, memory, disability, and various psychological disorders (Amieva et al., 2010; Avlund et al., 2004; Bath & Deeg, 2005; Ertel et al., 2009; Everson-Rose & Lewis, 2004; Lund, Nilsson, & Avlund, 2010; Uchino, 2006). A number of studies have also demonstrated a positive association between social support and increased survival rates (Berkman et al., 2004; Giles, Glonek, Luszcz, & Andrews, 2005; Holt-Lunstad, Smith, & Layton, 2010).

It is important to note that the link between social integration and health is likely bidirectional. Some studies suggest that chronic illness is associated with functional impairments and activities of daily living which leads to gradual decrease in social integration (Antonucci et al., 2002; Cornwell et al., 2008; Raymond, Grenier, & Hanley, 2014). Physical inactivity as a result of chronic health condition has been frequently noted as a barrier for maintaining one's social contact and a potential cause of isolation in older adults (Bertera, 2003). Chronic conditions in older adults can lead to decrease in overall social integration mainly due to less contact with social network members and community. There may be a number of reasons for this. For example, older adults who have limited physical mobility and/or have chronic conditions need help from others with transportation. This might cause hesitation and less desire to travel for occasions other than the most important ones such as health appointments and

family gatherings (Cornwell et al., 2008). Furthermore, the presence of multiple chronic conditions can be financially challenging, and older adults tend to spend less on recreational activities and less important events. Gray (2009) also suggests that poor physical condition diminishes one's ability to reciprocate help which makes older adults more likely to minimize their network size.

Some studies also suggest the negative impact of declining physical health on social integration (Ertel et al., 2009; Felmler & Muraco, 2009; McLaughlin et al., 2010). It is plausible to imagine that older adults with chronic illness and limited activities of daily living (ADLs) tend to limit their social network and community activities to more beneficial relationships such as family and neighbors. Their network compositions are more likely to include family members and friends, and church or other supportive organizations that are direct source of functional support (Ertel et al., 2009). Overall, there is no conclusive evidence on how physical health is associated with social integration in older adults; however, a better understanding of the association between health (including chronic conditions and activities of daily living) and social integration in late-life is indispensable for helping to improve older adults' quality of life.

Present Study

The present study explores social integration among older adults from a multidimensional perspective. Social integration is assessed using the Social Integration in Late-Life Scale (SILLS) (Fuller & Rajbhandari, 2014) which assesses five dimensions of social integration: i) Family, ii) Friends & Neighbors, iii) Leisure, iv) Community, and v) Productivity. Specifically, this study is guided by the following objectives:

1) To examine socio-demographics differences in overall social integration in older adults and across five domains of social integration. This includes assessing differences by age, gender, education, marital status, and rurality.

Hypotheses 1a: There will be demographic differences in overall social integration scores such that individuals who are women, older, of higher education, married, and urban will have a greater overall social integration levels.

Hypothesis 1b: There will be demographic differences across social integration domains. Specifically, we expect women and married individuals to have higher scores in the family domain; younger and more educated individuals to have higher scores in productivity and community domains; and urban and more educated individuals to have higher scores in friend and leisure domains.

2) To examine associations between older adults' health status (as measured by number of chronic illness and ADLs) and social integration (overall and across five domains of social integration), controlling for socio- demographic variations.

Hypothesis 2a: Older adults with poorer health (more chronic diseases and higher ADL scores) will have lower overall social integration scores.

Hypothesis 2b: Older adults with poorer health (more chronic diseases and higher ADL scores) will have lower scores in productivity, leisure, and community domains; but there will be no differences in family and friend/neighbor domains based on health status.

CHAPTER 3. METHOD

The data for this study are drawn from the Social Integration and Well-being in Late-Life Study (Fuller & Rajbhandari, 2012). The Social Integration and Well-being in Late-Life Study is a community based survey of social integration and well-being in older adults in a small metropolitan area in the Midwest. The study consisted of the Social Integration in Late-Life Scale (SILLS) which assessed social integration across various dimensions, social support network structure and quality, health and well-being (such as functioning, physical and psychological health), and socio-demographic factors.

Procedure

The data were collected in a small metropolitan area in the upper Midwest. Both urban and rural participants aged 60 years and above were recruited. Analysis is based on a sample of 416 older adults (293 women and 123 men) recruited by mail and in person. Surveys were mailed to 1000 households selected from a mailing list obtained from a regional senior services organization. This included 346 household in rural area and randomly selected 654 household in urban area. Consent was determined by participant's choice to complete and return the survey. In addition, participants were recruited in-person from senior centers, senior living communities/apartments, and senior events. Participants recruited in-person were invited to participate in the study followed by a verbal presentation about the goals and purpose of the study as well as the benefits and risks. The participants who verbally consented to participate in the study completed the survey and returned it on site. As an incentive, participants who returned the completed survey were entered into a drawing for ten \$20 grocery store gift certificates.

Participants

The demographic characteristics of the sample are shown in Table 1. All respondents were above the age of 60 years (range 60 -100) with a mean age of 80.5 years old. The sample consisted of 292 (70.2%) women and 123 (29.6%) men.

Table 1. *Demographic Characteristics of Sample*

Characteristics	N	Mean	%
Age	414	80.49	
Gender			
Female	292		70.2
Male	123		29.6
Education			
No schooling completed	2		.5
Primary to middle school	19		4.6
Some high school, no diploma	26		6.3
High school	112		26.9
Some college, no degree	126		30.3
Associate or technical degree	46		11.1
Bachelor's Degree	53		12.7
Master's Degree	23		5.5
Doctorate or Professional degree	6		1.4
Marital Status			
Married	157		37.7
Widowed	194		46.6
Divorced / Separated	37		8.9
Never Married	26		6.3
Geographical Region			
Rural	95		22.8
Urban	319		76.7

The majority of respondents reported at least high school degree (89%). A majority of the sample (98%) identified their race as White Caucasian. One-hundred and fifty seven (37.7%) of participants were married, 194 (46.6%) widowed, 37 (8.9%) divorced/separated, and 26 (6.3%) were never married. Respondents reported an average of 39.33 years living in the community (<1 to 97; SD = 27.4). Three hundred and nineteen participants lived in an urban region (77%) and 95 (23%) participants lived in rural region.

Table 2 shows the health status of the sample. The participants in this sample were active in general. Almost half of the participants (47.8%) rated their overall health as good. 23 (5.5%) participants reported their health as poor. The average number of chronic condition was 3.77 ranging from 0 to 12. Participants were able to carry out IADLs with some help ($M=1.97$). Majority of participants were able to carry out basic activities (BADLs) without help ($M=.14$).

Table 2. *Health Characteristics of Participants*

Health Characteristic	N	Mean	Percentage
Self-rated health status		2.7	
Poor	23		5.5
Fair	129		31
Good	199		47.8
Excellent	54		13.3
Diseases	404	3.77	
Activities of Daily Living (ADL)			
IADL	403	1.97	
BADL	403	.14	
Overall ADL	403	2.11	

Measures

Demographic Factors. Participants' age, gender, education, marital status, and rurality were predictors for the first research question and then included as covariates for the second research question. *Age* was a continuous variable that ranged from 60 to 100. *Gender* was coded as 0 (*male*) and 1 (*female*). *Education level* was used as an indicator for socioeconomic status and coded in a range of 1 to 9 where higher number indicated higher level of study. It was measured as 1 (*No schooling completed*), 2 (*Primary to middle school*), 3 (*Some high school, no diploma*), 4 (*High school graduate*), 5 (*Some college, no degree*), 6 (*Associate or technical degree*), 7 (*Bachelor's Degree*), 8 (*Master's Degree*), and 9 (*Doctorate or Professional degree*). *Marital status* was a categorical item (married, living with a partner, widowed, divorced/separated, and never married). In order to distinguish between married and widowed individuals, two distinct marital status variables were created. The first variable, was defined as married or not married and was coded as 0 (*not married*), and 1 (*married*). The second variable was defined as either widowed or not. The widowed variable was coded as 0 (*not widowed*) and 1 (*widowed*). *rurality* was coded as 0 (*Rural*), and 1 (*Urban*).

Well-being. The well-being of the participants was assessed in two different ways: a count of chronic conditions and activities of daily living.

Chronic Conditions were assessed by providing a list of common health conditions and asking the question "Please indicate if you currently require a doctor's prescription medication or rehabilitation treatment for any of these chronic conditions". (Refer to Appendix A for the list of chronic conditions). Participants indicated either 1 (*Yes*) or 0 (*No*) for all chronic conditions. The number of conditions identified was then summed into a total score of current chronic health conditions. A higher number of diseases indicated poorer health.

Activities of Daily Livings (ADLs) were assessed using the Older American's resources and Service Program (OARS) multidimensional functional assessment questionnaire (Fillenbaum, 1978). It is assessed by answers to the following nine activities: driving, cleaning, shopping, preparing meals, handling money, eating, dressing, getting in and out of bed, and bathing. Response categories describe whether participants perform the activities with or without help. Each items were coded in a range of 0 to 2 based on level of assistance required to carry out the activity, where 0 is coded as "without help", 1 is coded as "with some help", and 2 is coded as "someone must do this for me". The scale is divided into two measures: i) Instrumental Activity of daily living (IADLs) and ii) Basic Activity of daily living (BADLs). IADLs includes the summed scores of five activities: driving, cleaning, shopping, preparing meals, and handling money ($\alpha = .86$), BADLs includes the summed scores of four daily activities: eating, dressing, getting in and out of bed, and bathing ($\alpha = .74$).

Multi-Dimensional Social Integration in Late-Life Scale (SILLS). The Social Integration in Late-Life Scale (SILLS) is a comprehensive multidimensional scale for assessing various domains of social integration in older adults. The scale and subscales were previously validated (Fuller & Rajbhandari, under review) Pearson's correlation coefficients were conducted between the SILLS overall scale and subscales, demographic characteristics, and similar social integration constructs such as Social Network Index (Berkman & Syme, 1979), SILLS consist of overall social integration score and following five factors: i) Family, ii) Friends & Neighbors, iii) Leisure, iv) Community, and v) productivity. An *overall social integration score* was calculated by summing up all five factors of social integration. ($\alpha = .71$). (Items can be seen in Appendix B).

I) The *Family Domain* included the following four items: a) How often do you get together with family? b) How often do you receive help from family members? c) How often do you provide help to family members?, and d) How often do you speak to family on the phone? Each item was measured on a 5-point scale. The items were summed to create a family subscale ($\alpha = .79$).

II) The *Friends & Neighbors Domain* includes five items about the frequency of activities with friends and neighbors such as: a) How often do you receive help from friends? b) How often do you provide help to friends? c) How often do you visit with your neighbors? d) How often do you receive help from your neighbors? e) How often do you provide help to neighbors? Each item was measured on a 5-point scale. The items were summed to create a friend & neighbors subscale ($\alpha = .85$).

III) The *Leisure Domain* included the following five items: a) How often do you get together with friends? b) How often do you visit a library? c) How often do eat out at a restaurant? d) How often do you play social games (e.g. cards, Bingo), and e) How often do you go on an outing (to a museum, the movies, a play, etc.) Each item was measured on a 5-point scale. The items were summed to create a leisure subscale ($\alpha = .55$).

IV) The *Community Domain* included the following three items: a) How often do you attend meetings of a group, club, or organization for older adults? b) How often do you attend meetings of a group, club, or organization for all age groups? and c) How often do you visit a senior center? Each item was measured on a 5-point scale. The items were summed to create a community subscale ($\alpha = .74$).

V) The *Productivity Domain* consists of five items which assess the frequency of activities of self-improvement such as volunteering, skill classes, and attending lectures. It

included following items: a) How often do you visit a gym or fitness club? b) How often do you enroll in skill building classes? c) How often do you volunteer? d) How often do you attend a lecture or a seminar? e) How often do you enroll in an educational class? Each items are measured on a 5-point scale ranging from 1 (*Never*) to 5 (*very frequently*). The items were summed to create a productivity subscale ($\alpha = .73$).

CHAPTER 4. RESULTS

A series of two-step hierarchical linear regression analysis were carried out to address the two research questions of the study. The first step addressed the first research question by examining the influence of demographic characteristics (age, gender, education, marital status, and rurality) across overall and the five domains of social integration. In the second step, the number of chronic conditions and ADLs variables were added to address the second research question to assess associations between older adults' health status and social integration (overall and across five domains of social integration), controlling for demographic variables.

Research Question 1: Are there socio-demographics differences in overall social integration and across the five domains of social integration in older adults?

Overall Social Integration. Results suggested significant socio-demographic differences in overall social integration in older adults (See Table 3). Age was a significant factor for overall social integration with younger older individuals scoring higher ($b = -.29$, $p < .001$), which is consistent with our prior assumption. It was interesting to note that the analysis did not indicate any gender differences in overall social integration, differing from our prior assumption that women will be more socially integrated in overall. Education level was also linked with overall social integration in older adults, with individuals with higher education levels scoring higher in overall social integration ($b = 2.24$, $p < .001$). Both married and widowed individuals had higher scores on overall social integration score. Rurality was associated with overall social integration such that people living in rural areas reported higher overall social integration level ($b = 5.37$, $p < .001$).

Domains of Social Integration. Results from stage one of the series of hierarchical multiple regressions revealed that demographic differences were salient across five domains of social integration. Results are shown in Table 3

Family Domain. Consistent with previous studies, gender ($b = 1.02, p < .01$) and marital status [married ($b = 2.47, p < .001$) and widowed ($b = 2.42, p < .001$)] were associated with scores on the family domain. In particular, women and those who are married and widowed scored higher in the family domain of social integration. Results also revealed some inconsistencies with past studies and suggest that younger older individuals are more integrated in the family domain than their old-old counterparts ($b = -.04, p < .05$). Education level and rurality were not associated with the family domain of social integration.

Friends & Neighbors Domain. Findings revealed no differences in social integration within the friends and neighbors domain based on age, gender, education, or marital status. But, rurality was significantly associated with social integration in the friend and neighbor domain. Individuals living in rural areas reported higher scores in the friend and neighbor integration related domain ($b = 1.24, p < .01$).

Leisure Domain. Leisure was associated with gender ($b = .82, p < .05$), marital status ($b = .170, p < .01$), and education ($b = .58, p < .001$). In particular, integration in the leisure domain was higher among women, widowed, and those with higher education levels. In contrast to our expectation, age and rurality were not associated with leisure related activities in older adults.

Table 3. Hierarchical Regression of Demographics, Health & ADL Predicting Social Integration

	Overall Social Integration		Family		Friends & Neighbors		Leisure		Community		Productivity	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>B</i>	<i>B</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
Age	-.29***	-.16	-.04*	-.04	-.03	.00	-.04	-.01	.00	.02	-.10***	-.07**
Gender	2.80	2.92*	1.02**	1.02**	-.02	.00	.82*	.84*	.39	.40	.52	.54
Education	2.24***	2.25***	.14	.14	.23	.23	.58***	.58***	.25*	.27**	.85***	.86***
Married	6.26**	5.97**	2.47***	2.45***	.89	.88	1.07	1.02	.94	.90	1.45**	1.34*
Widowed	7.72***	7.40***	2.42***	2.40***	.88	.86	1.70**	1.63**	1.46**	1.43*	1.32*	1.19*
Rurality	5.37***	4.38**	.63	.59	1.24**	.96*	-.01	-.23	1.73***	1.55**	.59	.37
Chronic Condition		.27		.04		-.01		.03		-.03*		.02
IADLs		-1.11***		-.06		-.21*		-.23**		-.18*		-.30***
BADLs		-.48		.02		-.76*		-.17		-.26		.42
R ²	.15***	.19***	.13***	.14***	.03*	.08***	.08***	.10***	.10***	.13***	.17***	.20***

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

Community Domain. We hypothesized that younger and more educated individuals would have higher scores in community related domains. As expected higher educated individuals did score higher in the community domain ($b = .25, p < .05$), but age was not associated with engagement in the community domain. Interestingly, marital status, specifically widowhood ($b = 1.46, p < .01$) was associated with engagement in the community domain however, married individuals were not more integrated within the community domain. In addition, rurality ($b = 1.73, p < .001$) was also significantly associated with the community domain such that people living in rural areas were more integrated in community. Gender was not associated with community domain.

Productivity Domain. Consistent with our hypotheses age, education, and marital status were significantly associated with the productivity related domain. Results showed that younger ($b = -.10, p < .001$), more educated ($b = .85, p < .001$), and married individuals ($b = 1.45, p < .01$) had higher scores in productivity domain. Surprisingly gender and rurality was not associated with productivity domain of social integration.

In summary, the first hypothesis was partially supported as age, education, marital status, and rurality were associated with overall social integration, whereas only gender was not associated with overall social integration in older adults. There were also significant socio-demographic differences across social integration domains. As hypothesized older, married individuals, and women had higher score on family domain; people living in rural areas scored higher in friend and neighbor domain; women, more educated, and widowed scored higher in the leisure domain; more educated, widowed and those living in rural areas scored higher in community domains; and younger, more educated and married older adults scored higher on productivity domains.

Research Question 2: Is health status (as measured by number of chronic illness and ADLs) associated with social integration (overall and across five domains of social integration) when controlling for demographic variation?

The second research question examined the association between health and social integration in older adults. To address the second research question the number of chronic conditions and Activities of Daily Living (i) Instrumental ADLs (IADLs) and ii) Basic ADLs (BADLs) variables were considered as a predictor for social integration.

Overall Social Integration. Results suggest a significant association between physical functioning and overall social integration in older adults. In particular, IADLs were significantly associated with overall social integration in older adults. Results indicated that instrumental activities of daily living (IADLs) were significantly associated with overall social integration ($b = -1.11$ $p < .001$). However, there was no association between basic activities of daily living (BADLs) and overall social integration. The number of chronic health conditions was not associated with overall social integration in older adults, indicating that having more chronic diseases does not necessarily influence overall social integration in older adults, instead physical functioning is more associated with social integration.

Domains of Social Integration

Family Domain. As hypothesized, the number of chronic health conditions was not associated with integration in the family domain. In addition, activities of daily living (ADLs) was not associated with the family domain of social integration. Findings suggest that family ties do not vary in older adults regardless of health and physical status.

Friends & Neighbors Domain. Chronic health conditions were not associated with integration in the friends and neighbors domain; however functioning (ADLs) were associated with social integration with friends & neighbors. Both IADLs ($b = -.21$ $p < .05$) and BADLs ($b =$

-.76 $p < .05$) were significantly associated with integration in the friends & neighbor domain suggesting that lower physical functioning was associated with lower engagement with friends and neighbors.

Leisure Domain. Only IADLs were associated with engagement in the leisure domain ($b = -.23$ $p < .01$) suggesting that lower instrumental functioning in older adults may lead to lower engagement on leisure domain of social integration. There was no association between BADLs and chronic health condition on leisure related domain.

Community Domain. We hypothesized that older adults with poorer health would have less integration within the community domain. As hypothesized more chronic health conditions was associated with lower engagement in the community domain ($b = -.03$ $p < .05$). It is also noteworthy to mention that the community domain was the only domain associated with the number of chronic condition. IADLs ($b = -.18$ $p < .01$) were also associated with engagement in the Community domain. However, BADLs were not associated with the community domain.

Productivity Domain. The hypothesis that poor health condition (more chronic diseases and higher ADLs scores) would be associated with engagement in the productivity domain was only partially supported. The number of chronic health conditions was not associated with social integration in the productivity domain. Functioning was associated with productivity however; only IADLs ($b = -.30$ $p < .001$) were associated with productivity domain and BADLs were not associated with productivity domain of social integration.

Overall, these findings are particularly interesting as the number of diseases was not associated with the majority of domains of social integration, yet activities of daily living were. Specifically, these findings reveal that IADLs were significantly associated with the majority of domains of social integration in older adults. In current sample social integration is linked to health function, but not necessarily with presence or absence of diseases.

CHAPTER 5. DISCUSSION

The focus of this study was to explore socio-demographic and health status variation in the social integration of older adults. This study adds to the body of empirical findings by explaining the relationship between socio-demographics and health status and the social integration of older adults from a holistic perspective. Unlike many previous studies, this study defines social integration as a multidimensional concept and uniquely addresses the context of late-life by integrating interpersonal and community level dimensions of social integration. The present study demonstrates that social integration varies by age, gender, education, marital status, rurality, as well as health status. The findings of this study and implications are discussed below.

Socio-Demographic Characteristics and Social Integration

Consistent with previous studies, results suggest that age is an important factor for social integration (McLaughlin et al., 2010; Therrien & Desrosiers, 2010). Increasing age was significantly associated with lower overall social integration. However, this association was not consistent across the individual domains of social integration; increased age was linked with less social integration in the productivity related domain, but was not associated with integration in the domains of friends/neighbors, family, leisure, or community. This suggests that with increasing age, older adults may not be able to maintain social integration within the productivity sphere. It might be because as people age they tend to suffer a decline in physical abilities, which might affect one's engagement in productivity related activities; nevertheless, integration also depends on how important productivity is for individual. For example, a person might be very motivated and active regarding charity work because it provides him/her with satisfaction but due to age and physical limitations, frequency of such activity tends to decline; however, volunteering goes beyond functional independence and a person may find other ways to

participate in such activities. Productivity related activities are influenced by age but are also influenced by the types of activities and the relative importance of the activity. Although old-old adults tend to engage less on productivity and leisure related activities, they maintain good relationship with friends, family, and neighbors.

Past studies have consistently demonstrated gender differences in social integration, Previous literature consistently suggested that women are more socially integrated: i) because of their bigger network size, and ii) because women are generally characterized as active and caring in nature (Ajrouch et al., 2005; Pillemer et al., 2000). However, the hypothesis that there would be gender differences in social integration of older adults was not supported. This could be because of the demographic structure of the sample. There was overrepresentation of females in the sample and it could be possible that the participants of the study were more likely to be socially integrated. From a multi-dimensional perspective, gender differences were only noted on some domains of social integration such as family and leisure related domains. It is not surprising that women were more integrated with family and more engaged in providing/receiving help from family members, and stayed in touch with family members and relatives.

Furthermore, it is interesting to note that except for leisure, gender differences were not salient in other community related activities such as participation in community organizations and productivity (e.g. volunteering). This finding contradicts past studies indicating women's increased involvement in productivity activities such as volunteering and other community related activities (Donnelly, 2009). In view of this finding, it is imperative to note that gender differences as described in past studies seem to be primarily about the social support system and not necessarily social integration. From a social network and social support perspective women

appear to be more engaged; however when viewed beyond interpersonal relationships women may not necessarily be more socially integrated in comparison to men.

The present study identified interesting results in relation to the link between education level and social integration of older adults. Higher education level was significantly associated with greater overall social integration of older adults. Specifically, education was associated with domains of productivity, leisure, and community. More educated adults were more likely to engage in activities related to self- improvement, volunteering, and leisure. More educated older adults were better off financially which places them in a better position to meet daily needs compared to less educated people who have to struggle to meet the needs that comes with old age (e.g. medical cost, living cost). The financial resources of educated older adults may better afford them the opportunity to contribute more towards community. Particularly in older age, educated people are more likely to be retired and wealthier, and are less likely to work for a living, and spend more time in leisurely and community activities. It is noteworthy to mention that higher SES does not necessarily entail greater family or friend involvement in old age, however influences community related domains of social integration in older adults because of their ability to contribute more towards society. SES is important in maintaining high levels of social participation.

Results of this study complement and extend previous studies by demonstrating significant association between marital status and domains of social integration. Married older adults reported better overall social integration, but more specifically were better integrated in family and productivity domains. In general, family relationships are much stronger in married adults. Widowed adults on the other hand, were more integrated in leisure and community domains, in addition to family domains. These findings have important implications for widowed older adults (more commonly women), as these findings complement previous studies which

suggest that the majority of widowed individuals describe increases in social participation as a coping mechanism to deal with negative effects of widowhood (Utz et al., 2002). Engaging in leisure and community activities may serve as a coping mechanism for widowed adults. In addition, widows may also have more leisure time to engage in activities as they are not taking care of their spouse. The sample was limited in participants who were divorced and never married; however, the current findings can be further explored in future research by including larger samples of other types of marital status such as divorced, remarried, never married, and same sex couple.

Compared to people living in urban areas, older adults living in rural areas appear to be more socially integrated overall. This study adds to prior studies and shows that there is difference in social integration in older adults based on rurality. It is interesting to note that among all of the demographic factors that were analyzed, rurality was the only factor associated with the friends and neighbors domain. While this suggests the prevalence of close relationships between friends and neighbors among older adults living in rural areas, the closer tie among rural older population is not very surprising. Because of relatively smaller population in rural areas people know each other better and are more likely to help each other in need. It has been often discussed in past studies that people living in rural areas more readily provide instrumental and emotional help and support to their friends and neighbors compared to people in urban areas (Evans, 2009). In addition to relationships with friends and neighbors, rural participants also reported higher participation in community activities such as volunteering.

Previous studies suggest that older adults living in urban areas spend more time in leisure activities compared to rural areas since urban areas offer more things to do. However, surprisingly, this study showed no association between rurality and leisure activities. This finding contradicts the hypothesis that older adults in urban area have greater advantage and

opportunities for leisure activities. This suggests that engagement in leisure and productivity related activities may not be linked with rurality, and that older adults in rural and urban areas are equally likely to spend time in productive and leisure activities.

Health and Social Integration

The second objective of this study was to explore the association between health and social integration in older adults. Numerous previous studies indicate a link between good health and better social integration in areas such as social support, social network, and community engagement. The current study extends these findings by identifying some new interesting associations between health and social integration. First, the number of chronic conditions was not associated with overall social integration in older adults. Only activities of daily living (ADLs), particularly IADLs was negatively associated with overall social integration in older adults suggesting that better physical functioning is associated with better social integration. These findings highlight the importance of physical activity on the number and types of social relationships as suggested by Activity Theory. Activity Theory suggests that any form of physical activities promotes successful aging. These findings complement this notion and suggest that activities of daily livings are important for overall social integration in older adults. In the future, researchers may benefit from using Activity Theory to better understand social integration in older adults. In addition, the findings also complement the notion of Rowe and Kahn's model of successful aging which emphasizes that aging is not just about absence of disease process but also about engaging in productive activities (Rowe & Kahn, 1987, 1997). Similar to the model of successful aging, the current findings also suggest that aging is beyond physical health, and includes the ability to actively engage in activities, as well as be able to contribute towards society.

Activities of Daily Livings (ADLs) were associated with overall social integration as well as the majority of domains of social integration other than family domain. This could be because relationship with family members may persist irrespective of physical limitations, which may not be true in case of community participation. Findings demonstrate that activities of daily living, especially instrumental activities of living (IADLs) influence one's level of social integration in productivity, friends and neighbors, leisure, and community domains. One possible explanation for this association could be related to the ability to drive. Older adults' ability to drive independently increases opportunity to engage in multiple family as well as community events, and inability of drive might limit one's opportunity to socially integrate. In addition to driving, level of IADLs might also increase individual's level of confidence. Older adults who can independently carry out IADLs might have greater self-confidence which ultimately influences their motivation to engage in activities such volunteering, attending community activities, productivity, and leisure. It is also interesting to note that only instrumental activities of daily living (IADLs) were linked with social integration and basic activities of daily living (BADLs) did not show any association with social integration. This suggests that older adults' physical functioning ability especially, one that is beyond just self-care and which is needed for independent functioning such as driving, shopping, handling finances are more linked with social integration in late life. It is also important to note that this sample was quite high functioning, with very few indicating limitations in BADLs, hence the lack of findings related to BADLs is most likely due to low variance. Future studies may seek to explore more about social integration in relatively less physically able older adults (for example, those living in nursing homes and older adults who needs caregivers most of the times).

With a great deal of literature on health and various factors of social integration suggesting a positive relation between health and social integration, to our surprise, chronic

health conditions were not associated with overall social integration and was only associated with the community related domains of social integration. This finding is both interesting and important for the scientific community because previous studies suggest that increases in the number of chronic condition decreases one's level of social integration. However, results from the current study suggest that the number of chronic condition solely does not influence social integration, rather physical functioning ability is more relevant.

The only link between number of chronic conditions and social integration was within the community domain. This finding is not surprising as it is often believed that presence of chronic condition is associated with number of factors that are likely to hinder physical activities which further leads to low social participation. For example, having a chronic condition brings changes in financial burden, physical abilities and self-confidence. With presence of chronic condition person's ability to access social network may diminish due to physical and sensory impairment. Furthermore, older adults with chronic condition are also more likely to be institutionalized which limits there access to keep in touch with the community. Increases in stress levels due to impending changes that comes with disease conditions may make people focus less on activities that are of less importance, which could lead to lower level of social integration in community related domains.

CHAPTER 6. LIMITATIONS AND FUTURE DIRECTIONS

The current study makes important contributions to the understanding of social integration of older adults. It is important to keep in mind that this sample may not be representative of a wider older adult population, and thus findings may not be applicable for the entire older population. Furthermore, the sample in the current study is limited to the Midwest and the people who responded to the survey might have more social capital in general compared to people living in other of United States (Kunitz, 2004). Future research would benefit from extending similar studies to other more diverse populations of older adults. While this study provides insight into the interesting link between social integration and five socio-demographic characteristics of older adults, future studies can expand further to explore more socio-demographic factors such as race, income level, occupation, family structure (for example, people you are living with), and religion.

It is likely that the sample has an over representation of people that are more socially integrated in nature because of the recruitment process. It is more challenging to recruit more socially isolated, less financially stable, or less physically able older adults, however future studies should aim to include those who are less socially integrated to gather a fuller picture of social integration in late-life.

The current study uses the Social Integration in Late-Life Scale (SILLS) to assess social integration from a multi-dimensional perspective. This scale addresses various contexts of late-life and incorporates interpersonal as well as community aspects of social integration. However, there are some limitations of the scale. Although the scale incorporates multi-dimensional aspects of social integration, some important social activities are not included in the scale. For example, religious activities, political activities (for example, campaigning), and use of

technology. One of the limitations of SILLS is that although, the reliability of the overall SILLS demonstrated good internal consistency; however, the reliability of the Leisure subscale was relatively low (0.55). Additionally, the scale had limited items on leisure activities that might be unique to men (for example, outdoor activities). In the future, similar studies can be carried out by expanding on areas that address social integration in a society level for older men and women. In addition to the domains of social integration, health condition is measured as a presence/absence of common disease condition. Future studies can benefit by including severity of health condition in addition to presence/absence of disease conditions

By examining the link between demographic and health differences in social integration from a multidimensional perspective, these findings give rise to several new ideas that will be worth exploring in the future. For example this study contradicts some past findings regarding gender differences in social integration. Future studies can shed more light on gender differences in social integration by looking at how men and women differ in various domains of social integration. In particular, it is important to examine social integration in men as they are usually underrepresented in many studies.

The current study indicated some interesting links between marital status and social integration. Although our sample consisted of older adults with various marital status (for example, never married, divorced, single, and remarried), due to limited number of sample in certain categories, they were not entered in the analysis as separate groups. Therefore the study examined two variables: a) married vs not married, and b) widowed vs not widowed, and the people in other marital status fell under not married or not widowed categories. Future studies can explicitly explore social integration in older adults of various relationship statuses such as: never married, divorced, and those who are in same sex relationships. In current society, the definition of family is continuously changing and people are moving beyond traditional

definition of marriage and are adopting various forms of relationships. Better understanding of the links between various relationship status and social integration can contribute greatly to future generation of older adults to provide them with appropriate social environment.

The current study has revealed a number of interesting findings about the link between health and social integration suggesting that social integration is beyond chronic condition and more about physical activities. Future studies can explore further how physical activities and chronic condition interact to explain social integration in older adults. Our sample was limited to community dwellers but future studies can compare social integration of older adults living in community with those who are weaker or more frail in nature (e.g. those living in nursing homes). Because this study is cross-sectional, the causation or directionality of findings cannot be determined. In the future, we seek to extend this research longitudinally to be able to further explore the bi-directional nature of the link between social integration and health.

CHAPTER 7. CONCLUSION

The current study highlights the social integration of older adults from a multi-dimensional approach. The sample of older adults above age 60 who participated in this study were socially well integrated overall and in various domains of social integration. Age, gender, education level, marital status, and rurality appear to have a good association with social integration of older adults. Furthermore, social integration in older adults was also associated with ADLs more than chronic health conditions which suggest that social integration is not simply about the presence/absence of disease but more about activities and physical functioning. The current study emphasizes that social integration in older adults is not limited to social network or support system but rather includes interpersonal relationship as well as community dimension. In addition, the current study supports the idea that social integration in older adults needs to be assessed from a holistic perspective. In this regard the SILLS serves as a good resource to study social integration in late-life from a multi-dimensional perspective.

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APPENDIX A. CHRONIC CONDITIONS MEASURES

Table A1. *Lists of Chronic Conditions*

Please indicate (X) if you currently require a doctor's attention, prescription medication or rehabilitation treatment for any of these chronic conditions:					
	Yes	No		Yes	No
1. Arthritis			10. Asthma and/or other breathing problems		
2. Cancer			11. Chronic skin problems		
3. Diabetes			12. Dementia (e.g. Alzheimer's)		
4. Hearing Problems			13. Heart Disease or other Heart problems		
5. High Cholesterol			14. Hypertension / high blood pressure		
6. Multiple Sclerosis			15. Injuries (such as a broken bone)		
7. Osteoporosis			16. Mood problems (e.g. depression or anxiety)		
8. Parkinson's Disease			17. Severe headaches or Migraines		
9. Stroke or Aneurism			18. Vision problems (e.g. cataracts, macular degeneration, glaucoma)		

APPENDIX B. SOCIAL INTEGRATION IN LATE-LIFE SCALE ITEMS

Table B1. *Lists of Items in Family Domain*

How often do you do each of the following:	Never	Rarely	Occasionally	Frequently	Very Frequently
1. Get together with family?					
2. Receive help from family members?					
3. Provide help to family members?					
4. Speak to family on the phone?					

Table B2. *Lists of Items in Friends and Neighbors Domain*

How often do you do each of the following:	Never	Rarely	Occasionally	Frequently	Very Frequently
1. Receive help from friends?					
2. Provide help to friends?					
3. Visit with your neighbors?					
4. Receive help from your neighbors?					
5. Provide help to neighbors?					

Table B3. *Lists of Items in Leisure Domain*

How often do you do each of the following:	Never	Rarely	Occasionally	Frequently	Very Frequently
1. Get together with friends?					
2. Visit a library?					
3. Eat out at a restaurant?					
4. Play social games (e.g cards, Bingo)?					
5. Go on an outing (to a museum, the movies, a play, etc.)?					

Table B4. *Lists of Items in Community Domain*

How often do you do each of the following:	Never	Rarely	Occasionally	Frequently	Very Frequently
1. Attend meetings of a group, club, or organization for older adults?					
2. Attend meetings of a group, club, or organization for all age groups?					
3. Visit a senior center?					

Table B5. Lists of Items in Productivity Domain

How often do you do each of the following:	Never	Rarely	Occasionally	Frequently	Very Frequently
1. Visit a gym or fitness club?					
2. Enroll in skill building classes?					
3. Volunteer?					
4. Attend a lecture or seminar?					
5. Enroll in an educational class?					

Table B6. Lists of Items Deleted from the Scale

How often do you do each of the following:	Never	Rarely	Occasionally	Frequently	Very Frequently
1. Gather with current or past co-workers?					
2. Interact with family/friends on the internet?					
3. Use the internet to make new friends?					
4. Attend a community event?					
5. Spend time outdoors?					
6. Use the internet to seek information?					
7. Attend a religious service or meeting?					
8. Participate in political events?					
9. Vote in local or national elections?					