A LONITUDINAL STUDY OF THE INFLUENCE OF SOCIAL ENGAGEMENT
ON QUALITY OF LIFE AMONG OLDER ADULTS LIVING IN SENIOR HOUSING

by

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# Table of Contents

**List of Tables** .......................................................................................................................... v

**Acknowledgements** .................................................................................................................. viii

**Abstract** .................................................................................................................................. xi

**Chapter One: Introduction** ....................................................................................................... 1

  - Background Information & Justification for Study .......................................................... 8
  - Statement of the Problem ................................................................................................. 22
  - Importance to Social Work .............................................................................................. 24
  - Purpose of the Study .......................................................................................................... 25
  - Research Questions and Hypotheses ............................................................................... 30

**Chapter Two: Review of the Theoretical and Empirical Literature** ....................................... 35

  - Literature Review ............................................................................................................. 36
  - Gaps in Research ............................................................................................................ 51
  - Conceptual Framework for the Study ............................................................................ 54

**Chapter Three: Methodology** ................................................................................................ 63

  - Research Design and Sampling .................................................................................... 63
  - Original Study Inclusion and Exclusion Criteria ......................................................... 67
  - Analysis Plan .................................................................................................................. 78
  - Human Subjects .............................................................................................................. 94

**Chapter Four: Results** .......................................................................................................... 96

  - Description of the Sample: Univariate Statistics .......................................................... 97
  - Bivariate Analyses .......................................................................................................... 105
  - Cross-Sectional Structural Equation Model ............................................................... 108
  - Latent Growth Model .................................................................................................... 124

**Chapter Five: Discussion and Implications** ......................................................................... 139

  - Cross-Sectional Analysis ............................................................................................... 141
  - Longitudinal Analysis ...................................................................................................... 146
List of Tables

Table 1  Operational Definitions, Measures, and Levels of Measurement of Focal Variables.................................................................................................................. 73
Table 2  Operational Definitions, Measures, and Levels of Measurement of Covariates 78
Table 3  Demographic Characteristics of Sample at Year 1 (N=267) .......................... 98
Table 4  Demographic Characteristics of Sample over Time ............................................... 99
Table 5  Formal Social Activity Participation after 1 Year in Senior Housing (N=267) 102
Table 6  Means, Standard Deviations, and Coding for Observed Variables .................... 104
Table 7  ........................................................................................................................................ 107
Correlation Coefficients among Observed Variables (N=130) ........................................... 107
Table 8  Standardized Path Coefficients for Quality of Life at Year 1 (N=265) .............. 113
Table 9  Standardized Regression Weights of Path Coefficients for Tangible Support .... 114
Table 10 Standardized Regression Weights of Path Coefficients for Informational Support.................................................................................................................. 115
Table 11 Standardized Regression Weights of Path Coefficients for Emotional Support .................................................................................................................. 117
Table 12 Standardized Regression Weights of Path Coefficients for Provided Support 118
Table 13 SEM Path Coefficients of Predictors and Perceived Quality of Life (N=267) 123
Table 14 Covariance and Correlations of Social Engagement Focal Predictors (Year 1) .................................................................................................................................................. 124
Table 15 Model Fit Statistics for Quality of Life over Time ................................................. 125
Table 16 Comparison of Unconditional Model Fit Statistics ............................................. 129
Table 17 Unconditional Model Parameter Estimates for Perceived Quality of Life .... 131
Table 18  Parameter Estimates for the Conditional LGM (N=248).......................... 136
# List of Figures

Figure 1  *Conceptual Model of Cross-Sectional Relationships among Social Engagement Predictors and Quality of Life after Living in Senior Housing for One Year* ........... 56  
Figure 2  *Unconditional Linear Latent Growth Model of Quality of Life* ...................... 57  
Figure 3  *Autocorrelated Unconditional Linear Latent Growth Model of Quality of Life* 58  
Figure 4  *Conceptual Model of Linear Latent Growth Model* ................................ 59  
Figure 5  *Summary of Erickson Life Study Sample Recruitment Procedures* ............... 66  
Figure 6  *Structural Model for Cross-Sectional SEM at Year One Testing the Effects of Social Engagement Predictors on Quality of Life (N=267)* ...................... 83  
Figure 7  *Erickson Life Study Attrition Over Five Years* .............................................. 91  
Figure 8  *Average Perceived Quality of Life Scores over Time* ................................ 100  
Figure 9  *Percent Satisfied with Quality of Life over Time* ....................................... 101  
Figure 10  *CFA Model of Quality of Life at Year 1 (N=265)* ...................................... 110  
Figure 11  *Final CFA Model of Quality of Life at Year 1 (N=265)* ............................ 112  
Figure 12  *Final Structural Model for Cross-Sectional SEM at Year 1 Testing the Effects of Social Engagement on Quality of Life (N=265)* ........................................ 121  
Figure 14  *Estimated Means of Quality of Life Factor Scores over Time* .................... 127  
Figure 15  *Estimated Slopes of Participants (N=245)* .................................................. 128  
Figure 16  *Final Unconditional Linear Latent Growth Model* ..................................... 130  
Figure 17  *Final Conditional Linear Latent Growth Model with Autocorrelation* ....... 133
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A Longitudinal Study of the Influence of Social Engagement on Quality of Life among Older Adults Living in Senior Housing

Abstract

by

AMY RESTORICK ROBERTS

This dissertation aims to examine the cross-sectional and longitudinal relationships between social engagement and quality of life among older adults living in the independent apartments of continuing care retirement communities (CCRC’s). Data were drawn from the Erickson Life Study (Resnick et al., 2001; 2005), a five year panel study of 300 older adults living in four CCRC’s. Quality of life is a multidimensional concept defined as older adults’ “perceptions of their positions in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns” (Bonomi et al., 2000; WHOQoL Group, 1994). Components of social engagement included four types of giving and receiving social support and participation in formal social activities organized by the retirement community. A life course perspective guided the study which integrated a theory of psychosocial development (Erikson, 1950, 1982/1997), activity theory (Lemon, Bengston, & Peterson, 1972), social exchange theory (Dowd, 1975), and the proactivity model of successful aging (Kahana & Kahana, 1996, 2003; Kahana, Kelley-Moore, & Kahana, 2012).

Findings from this dissertation research made several contributions to the literature. After living in senior housing for a year, receiving more informational and
tangible support was associated with a poorer quality of life, yet participating in formal group activities was related to better quality of life. The longitudinal latent growth model uncovered individual differences in the initial status of quality of life, and showed that quality of life declined for the group over time. Factors that explained initial differences in quality of life included providing social support, gender, housing site, and quality of life before moving to the CCRC. One component of social engagement—participating in a greater number of formal social activities organized by the CCRC—slowed the rate of decline in quality of life over time. Findings suggest that active engagement in organized social and leisure activities can have a long-term beneficial effect for older adults by forestalling the decline of quality of life. Implications for gerontological social work practice and policy recommendations are discussed.
Chapter One: Introduction

This chapter will introduce the challenge of maintaining a high quality of life in old age despite the common stressors and losses that occur in the normal aging process. The closely related concepts of successful aging and quality of life will be reviewed within the contexts of population aging and common age-related losses. Next, the relationships between quality of life and social engagement will be discussed. Following the problem statement, the importance of this topic to the field of gerontological social work will be considered. Lastly, this chapter will conclude with an explanation of the purpose of the dissertation study and conceptual definitions of key variables.

Successful Aging and Quality of Life

The challenge of successful aging, captured by a theme from the Gerontological Society of America conference in 1955, is about “adding life to years, not just more years to life.” This theme speaks to the importance of not only living longer, but also living with a high quality of life in later years. Quality of life is a broad, multidimensional concept that reflects the individual’s subjective perceptions of positive and negative aspects of life (World Health Organization Quality of Life Group [WHOQoL Group], 1998). The World Health Organization (1993) defined quality of life as “individuals’ perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns.” Capturing the extent to which people are living well in old age, quality of life is often assessed through positive and negative perceptions of positions in life, as well as through objective
criteria. In the literature, quality of life is sometimes used synonymously with concepts like successful aging and active aging.

Instead of viewing old age as a time of dependency, illness, and loss, the possibility of living well in old age and enjoying this time of life brought a new and positive perspective on adult development, capturing the imagination of gerontologists and individuals alike. Successful aging was formally defined by Havighurst (1961), as “…the conditions of individual and social life under which the individual person gets a maximum of satisfaction and happiness out of life…” (p. 8). Instead of studying the aging process through a framework of deficits and problems, the influence of Havighurst (1961) and later Neugarten (1974) shaped the conceptual development of successful aging through its inclusion of more global concepts such as life satisfaction and happiness. This paradigm shift was infused into influential lifespan developmental theories, including activity theory (Havighurst, 1961; Lemon, Bengston, & Peterson, 1972), which argued that staying active and engaging in social interactions enhances quality of life for older persons in opposition to the disengagement theory (Cumming & Henry, 1961).

As another dominant model of healthy aging and aging more successfully, the compression of morbidity hypothesis (Fries, 1980) suggested “a radically different view of the life span and of society, in which life is physically, emotionally, and intellectually vigorous until shortly before its close…” (Fries, 1980, p. 135). Fries (1980) proposed that the amount of disability in old age can be decreased by preventing or postponing the onset of chronic disease, which serves to concentrate the morbidity or negative effects of disease closer to the time of death. Although people in general are living longer,
individuals may spend only a portion of their later years in good health. The World Health Organization (WHO, 2002) defined healthy life expectancy as the number of years one may expect to live free of illness, disease, or disability. Many health promotion programs and policies focus on the prevention or delay of the onset of chronic illness through encouraging healthy behaviors and an active lifestyle (CDC, 2011). Therefore, prevention strategies may lengthen an older person’s healthy life expectancy and condense the negative effects of morbidity, as the prevalence of chronic conditions and their morbidity increase with age (Anderson, 2010). Since over 80% of all illness and health care costs occur after the age of 65 (Fries, 2005), delaying the onset of chronic conditions could promote healthy aging and reduce health care expenditures.

Perhaps the best-known framework, Rowe and Kahn’s (1997) model of successful aging, provided an empirically testable framework to capture the multifaceted dimensions of this somewhat vague concept. Rowe and Kahn (1997) suggested that successful aging results through a combination of three key components: a low probability of disease, high functioning, and “engagement with life.” In a research report from the McArthur Foundation Study of Aging in America, continued “engagement with life” was defined through aspects of social engagement, including close social relationships, involvement in activities that are meaningful and purposeful, and use of valued skills and abilities (Rowe & Kahn, 1998; Kahn, 2004).

Another testable theory of successful aging, selective optimization with compensation (Baltes & Baltes, 1990), describes how successful aging can be thought of as a process of adaptation occurring throughout the lifespan that intensifies in old age, a time of life when in general, there are more expected losses than gains. As Baltes and
Baltes (1990) fittingly state, “The world-record holder in length of life will also have experienced many undesirable events. He or she also might be the one who has most often lost friends, most often stood at open graves, and perhaps most often endured illness” (p. 5). Thus, in challenging times and through negative life events, aging individuals make the best of the situation by using adaptive strategies to maintain or improve their well-being and quality of life.

**Quality of Life**

The multidimensional concept of quality of life aims to capture subjective assessments in addition to the cultural context and larger social forces that act upon individuals. Conceptually, quality of life encompasses the macro or societal-level forces such as poverty alongside individual characteristics and concerns (Gabriel & Bowling, 2004). In the literature, quality of life has been measured through a variety of closely related variables or proxies. Previous studies assess quality of life through needs-based approaches (e.g., Maslow, 1954), models of psychological well-being, happiness, and life satisfaction (Andrews, 1986; Larson, 1978), social expectations (Calman, 1983), individual perceptions (e.g., O’Boyle, 1997), and general physical health, functioning, and mortality indicators. More sophisticated models, such as the multidimensional model of quality of life proposed by the World Health Organization Quality of Life Group (1993) includes components of physical and mental health, emotional well-being, and social functioning.

Longitudinal studies of aging point to the wide range of individual variation and heterogeneity in the quality of life of older adults (Busse & Maddox, 1985; Costa &
Andres, 1986; Maddox, 1987; Schaie, 1979, 1983). A recent study found that impairments in functional health, depression, and memory problems were significantly related to worse quality of life among older people in the United States (Baernholdt, Hinton, Yan, Rose, & Mattos, 2011). The quality of life for adults over 85 years of age living in pain was markedly lower than members of the same age group without pain (Jakobsson, Hallberg, & Westergren, 2004).

Over the last thirty years, research has begun to focus increasingly on issues of quality of life rather than the more limited construct of individual well-being, as a strategy to address social inequalities and to encourage government involvement in social problems (Gilhooly, Gilhooly, & Bowling, 2005). Conceptual similarities between quality of life and other closely related concepts such as well-being, successful aging, productive aging, and active aging may be another reason for the expanding literature base of quality of life (Bowling, 2004). Quality of life in the older adult population is a topic worthy of study, as old age is often a time of losses in health, functioning, and social relationships.

Demographic Imperative

Dramatic trends illustrate the growth of the population of older adults in the United States. In 2010, 40.4 million adults 65 years and above made up 13.3% of the overall population (Administration on Aging [AoA], 2012). These numbers of older persons will increase to 55 million by 2020, and reach 72 million by 2030, making up a full 20% of the overall population (AoA, 2012). Over the next twenty years, these demographic trends will be influenced by the addition of the youngest baby boomers
(born between 1946 and 1964) to the 65 and over group, combined with declining mortality, and decreasing fertility rates (United Nations, 2002).

On average, people can anticipate living longer than ever before. In terms of average life expectancy, people born in 2008 who live until age 65 can expect to live an additional 18.7 years, with some variation between the genders (19.9 years for women and 17.3 years for men, U. S. Census Bureau, 2012). Overall life expectancy in the United States has increased a full 30 years from 1900 to 2009 (AoA, 2011). Further, the oldest-old, those who are 85 years and above, are expected to comprise the fastest growing segment of the older adult population, increasing from 5.7 million in 2008 to 19 million by 2050 (U. S. Census Bureau, 2012). The anticipated addition of the baby boomers to the oldest-old subgroup in 2030 will contribute to the expansion of this category, as well as to a significant increase in the numbers of members of racial minority groups. In fact, among older adults, minority populations are projected to increase 160%, compared to the 59% increase for whites between 2010 and 2030 (AoA, 2012).

Population aging presents both challenges and opportunities for older persons, their families, the social work profession, and society. The National Association of Social Workers (2003) acknowledges that “…new issues surrounding staffing, family involvement, quality of life, the role of spirituality, end-of-life care, medical management, program development, and overall service delivery are emerging” (p. 5). According to the Social Work Leadership Institute (2007), social workers and the general public are increasing their understanding of old age as a time of continued growth and recognize the contributions older people make to their families and communities. At the same time, society will need to develop more formal and informal supports to respond to
older adults’ needs for income security, health care, adequate housing, and supportive
services to enhance quality of life.

*Common Age-Related Losses and Challenges*

Poor physical and cognitive health status are known risk factors for lower quality
of life in old age. Age-related physical changes include hearing impairment, changes in
vision, and the increased probability of arthritis, hypertension, heart disease, diabetes,
osteoporosis, and memory loss (American Psychological Association, 2012). Indeed, the
prevalence of chronic illnesses among older Americans suggests a high burden of disease
in later life. About 80% of older adults have one chronic condition, and 50% have two or
more chronic conditions (Center for Disease Control, 2011). Increasing impairment due
to chronic health conditions may be a reason that older people require in-home assistance,
or move into congregate living facilities where assistance and services may be more
readily available than in the community. In a comparison study, Gaines and colleagues
(2011) of the Erickson Life Study found that older adults living in continuing care
retirement communities had a higher number of chronic conditions, yet better self-rated
health, compared to a matched sample of community-dwelling older adults from the
national Health and Retirement Survey (HRS, University of Michigan).

Along with health concerns, the death of a spouse may provide another challenge
in later life, and another reason why older people may require assistance or consider
moving to a congregate housing facility (Gonyea, 2006). Widowhood is more common
among women than men. The Administration on Aging (2010) reported that 42% of
women age 65 and above were widowed, compared to 14% of their male counterparts.
Among the oldest old, 76% of women and 38% of men were widowed in 2008 (AoA, 2011). The American Seniors Housing Association (2001) found that older adults who live in congregate housing and continuing care retirement communities are often older, female, and many have smaller social networks in comparison with their peers living in the community. These normal challenges of aging may contribute to the more common occurrence of depressive symptoms among older adults who reside in congregate housing (Lavretsky & Kumar, 2002).

**Background Information & Justification for Study**

*Continuing Care Retirement Community (CCRC)*

Continuing care retirement communities, or CCRC’s, are organizations that offer a full continuum of care in terms of housing, residential services, and health care options for older adults (AAHSA, 2004). CCRC’s provide a range of living arrangements and levels of care (e.g., independent/senior apartments, assisted living, respite care, memory care, and skilled nursing care) in a campus-like setting that promotes an active social and leisure lifestyle and maintenance-free housing. As a planned housing option for seniors, CCRC’s often enhance the functioning of people through designed living spaces that are easily accessed and highly usable among people with a range of physical abilities (e.g., single floor living). Additionally, CCRC’s provide a coordinated integration of an array of supportive services if needed. Older people may enter and remain living in a senior apartment within a CCRC, or if the need arises they may transition into another program such as assisted living or nursing home care. Another advantage of moving to senior housing is that admission preference is usually given to those who were already living on
the senior campus when declines in physical or cognitive functioning require a transition to a different level of care within the CCRC (Netting & Wilson, 2006).

Moving to a continuing care retirement community is a major transition in the lives of older adults. Even though the move may be voluntary, it is an adjustment to downsize from a single family home to an apartment home. Additionally, moving away from friends and a familiar neighborhood setting to an age-segregated housing community may affect social relationships and identities (Moen, Erickson, & Dempster-McClain, 2000).

Older adults who chose to move to senior housing within retirement communities can live independently in private apartments while maintaining the freedoms they enjoyed in the community. For example, senior housing residents are encouraged to bring their car, have pets, and invite family and friends to stay for extended visits (Erickson Living, 2013). Older people living in these apartments come and go as they please, making their own decisions about how to spend time, including whether or not they want to participate in social activities within and outside of the CCRC. Without the responsibilities of home ownership, older adults have more time and energy to enjoy other meaningful activities (Sherwood et al., 1997).

An increasing number of older people are deciding to move to a continuing care retirement community (Netting & Wilson, 2006). Nationwide, an estimated 625,000 older people lived in CCRC’s in 2004 (AAHSA, 2004). Nearly 5% of older adults in the United States live in congregate housing, and this figure includes senior apartments and assisted living (Administration on Aging, 2008). From the 1980’s to the 1990’s, the increased demand for this kind of senior living option has reflected a 50% increase in the
number of CCRC’s in the U.S. (AAHSA, 2004). In 2010, there were more than 1,900 CCRC’s in the United States (U. S. GAO, 2010). In a national survey, approximately 29% of Americans 55 years and above indicated a preference to live among similarly aged people (Metlife Mature Market Institute, 2009). While the majority of older adults prefer to age in place while remaining in their homes, interest in relocating to a CCRC is likely to grow in the future, as a full 26% of the baby boomers say they would consider moving to an age-segregated living community in retirement (Del Webb Corporation, 2004).

The characteristics of people who move to CCRC’s differ in important ways from the older adults in the community. In *Continuing Care Retirement Communities*, Sherwood and colleagues (1997) described the characteristics of individuals who lived within 19 communities in Arizona, Florida, California, and Pennsylvania. CCRC’s typically serve white and well-educated, middle- to upper-middle-class people (Sherwood et al., 1989, 1993, MetLife, 2009). A descriptive study of the characteristics of older adults living in CCRC’s found that they were more likely to be older, living alone, and more educated compared to their same-aged counterparts in Massachusetts living in the community (Sherwood et al., 1997). In the same study, Sherwood and colleagues (1997) found that CCRC residents expanded their network of friends and spent more time visiting and phoning friends in comparison to older adults living in the community who were more reliant on children living nearby for informal support.

Because admission to the independent senior housing within a CCRC usually requires at least middle-class income and assets and good health for admission, this living arrangement is not a feasible housing option for many older people. The cost of living
independently within a CCRC tends to be high, as most communities require entrance fees and monthly payments (Resnick et al., 2005). Potential residents also complete an application and assessment process in order to move into senior housing. One study found that around 50 percent of the applicants for CCRC settings were not accepted due to health reasons, and 39% were not accepted due to financial reasons (Sloan, Shayne, & Conover, 1995). The admission criteria was most selective among CCRC’s that provided life care contracts which assumed the responsibility for taking care of all of the older adults health care needs (Sloan et al., 1995). Although the independent living sections within CCRC’s are not likely to accept applicants with debilitating physical or cognitive health conditions, communities may accept some people with health issues because they have a caregiver or have modified a contract to secure financial coverage for future care needs (Resnick et al., 2005).

It is true that the majority of older adults prefer to remain in their homes in the community; however, some opt to relocate to a senior living environment. The “Retirement-Migration-Model” (Wiseman, 1980) describes the push and pull factors that are part of the decision-making process older adults use to make decisions about where to live. Push factors are “the life events or circumstances that loosen an individual’s attachment to his or her current residence and lead him or her to consider relocation” (Gonyea, 2006, p. 563). Common push factors include neighborhood decline, the death of a spouse, and a decreasing ability to function in the current environment due to health issues. A qualitative study found that older adults also desired to plan ahead and exercise their autonomy and freedom to make decisions about where they want to live (Groger & Kinney, 2006). On the other hand, pull factors attract the older adult to the new location.
Examples of pull factors include the amenities of the CCRC, a chance to live closer to family, or to access more affordable or safer housing.

Older adults have reported a variety of push and pull factors when asked about the reasons for relocation to an age-segregated community. Participants within the Erickson Life Study were motivated to move to the CCRC to avoid home upkeep, to prepare for anticipated future care needs, to enjoy an easier lifestyle, and to devote more time to socialization and activities (Marx et al., 2011). Similarly, the *Pathways to Life Quality* Study which studied residential change and well-being among older adults in New York found that 85% moved to a CCRC because of the anticipation of future care needs and the availability of long term care options, 53% moved to end home maintenance and upkeep, and 44% moved to avoid being a burden to others (Krout, Moen, Oggins, Holmes & Bowen, 2000). Some additional pull factors included attractive amenities of the CCRC, such as good apartment unit design and choice, good management, maintenance-free living, on-site medical and nursing care, close proximity to friends and family, and the availability of cultural and recreational activities (Krout et al., 2000).

**Social Engagement and Quality of Life**

As one of the key components of successful aging, social engagement has been highlighted in many models of successful aging (Depp & Jeste, 2006; Fischer, 1995; Rowe & Kahn, 1998). Rowe and Kahn’s (1998) popular conception of social engagement has been described in the literature as ‘remaining involved in activities that are meaningful and purposeful’ and ‘maintaining close relationships’ (Rowe & Kahn, 1998). Social engagement is the focal predictor in this study, operationalized through
activity participation and four different types of social support that are given and received within context of close personal relationships.

Social participation is positively related to quality of life (Adams, Leibrandt, & Moon, 2011; Horowitz & Vanner, 2010; Levasseur, Desrosiers, & Noreau, 2004; Mitchell & Kemp, 2000; Rodriguez, Latkova, & Sun, 2008). Nearly sixty years ago, Havighurst and Albrecht (1953) proposed the importance of social role participation to positive adjustment in old age. As Maddox (1963) concluded from a longitudinal study of older people, “… the social self emerges and is sustained in a most basic way through interactions with others…” (p. 202-203). In 2011, Thomas found that older people with high and increasing levels of social engagement experienced lower levels of physical and cognitive limitations over time. Research in this area consistently concludes that the social environment, and the quality of social relationships with family and wider social networks, plays an important role in the quality of life of older persons (Bowling, 1995; Victor & Scharf, 2005).

**Activity Participation and Quality of Life**

Formally testing activity theory among older people living in a retirement community, Lemon and colleagues (1972) found a direct association between social activity and life satisfaction, with a stronger relationship between informal activity and life satisfaction in comparison to the relationship between formal activity and life satisfaction. With a larger and more diverse sample, Longino and Kart (1982), found that informal activity contributed positively and strongly to life satisfaction, while formal activity had a negative effect. Along with the opportunity to become more actively
engaged, formal social activities may recruit or attract older adults with lower life satisfaction, which could explain the negative relationship between formal social activity and life satisfaction in the cross-sectional study (Longino & Kart, 1982). Counter to the presumption by Lemon and colleagues (1972) that formal social activities are social settings where supportive relationships can develop over time, Longino and Kart (1982) suggested that formal activities may not provide positive role support.

More recent research has supported the relationship between activity participation and an enhanced quality of life. For older adults, taking part in social, leisure, productive, physical, intellectual, service, and solitary activities was associated with greater subjective well-being in a recent review article, though informal social activities showed the strongest influence on well-being (Adams, Leibrandt, & Moon, 2011). Satisfaction with social participation and feelings of accomplishment were positively related to quality of life in old age (Lavasseur, Derosiers, & Whiteneck, 2010). Productive activities such as volunteering in the retirement years have been linked to better health and functioning, lower depressive symptoms, and increased longevity (Burr, Tavares, Mutchler, 2011; Hao, 2008; Hinterlong, 2008; Hong, Hasche, & Bowland, 2009; Krause, 2009; Lum & Lightfoot, 2005). A longitudinal study by Silverstein and Parker (2002) revealed that increasing activity participation led to a perceived improvement in life conditions – and this effect was stronger for older people who became widowed, developed functional impairments, or had minimal contact with family. Similarly, maintaining consistency in formal social participation after the death of a spouse was used as a strategy to cope with loss (Utz, Carr, Nesse, & Wortman, 2002).
Activity participation has also been associated with better physical and mental health outcomes. In a meta-analysis of the effectiveness of psychosocial interventions on emotional well-being, Forsman, Nordmyr, & Wahlbeck (2011) found that social activities significantly improved quality of life and life satisfaction, while decreasing depressive symptoms. Similarly, social and productive activities are associated with lower depressive symptoms (Glass, Mendes de Leon, Bassuk, & Berkman, 2006; Hong, Hasche, & Bowland, 2009) and a higher quality of life (Harlow & Cantor, 1996). A cross-sectional study by Everard, Lach, Fisher, & Baum (2000) found that instrumental, social, and leisure activities were related to better physical health. In addition, longitudinal studies suggest that engaging in social, productive, and physical activities was associated with living longer (Agahi, Silverstein, & Parker, 2011; Glass, Mendes de Loen, Marattoli, & Berkman, 1990; Sampson, Bulpitt, & Fletcher, 2009).

Limited empirical research has examined social engagement among older adults with disabilities. One study of older adults with physical disabilities found a weak positive relationship between social participation and quality of life over time, and identified social roles as an important indicator of quality of life (Levasseur, Desrosiers, & Noreau, 2004). Another study found that more socially engaged older adults reported less disability over time, suggesting a strong association between the two concepts (Mendes de Leon, Glass, & Berkman, 2003). On the other hand, studies have also found that people with higher levels of disability tend to have lower life satisfaction and participate in fewer social activities than their healthier counterparts (Jang, Mortimer, Haley, & Graves, 2004). Yet for older people with disease and disability, social engagement was more strongly associated with life satisfaction compared to people
without a disability (Jang et al., 2004). Jang and colleagues (2004) brought attention to
the possibility of enhancing quality of life through improved social engagement,
particularly as a strategy for people with disabilities to compensate for functional
limitations.

Research suggests that the relationship between activity and quality of life within
the context of a retirement community is similar. Continued involvement with leisure
and social activities in assisted living populations is related to higher life satisfaction and
greater quality of life (Horowitz & Vanner, 2010; Mitchell & Kemp, 2000). Among
older adults living within two CCRC’s in the Midwest, Jenkins, Pienta, and Horgas
(2002) found that higher levels of activity participation were associated with better
health-related quality of life. In order to cope with various stressors, older adults in age-
segregated congregate housing who reported coping through either positive
attitude/adaptations or activity participation had fewer depressive symptoms (Adams &
Roberts, 2010). Active social participation among these same older adults living in
senior housing also mediated the relationship between poor health and depression
(Adams, Roberts, & Cole, 2011). Taken together, these studies suggest that activity
participation may be seen as an adaptive strategy to help to maintain abilities, cope with
losses, and improve quality of life for older adults.

Social Support and Quality of Life

Social support refers to the emotional, social, physical, and financial resources as
well as other types of care that are provided by others, which may be exchanged among
members of a social network through the process of giving and receiving (Berkman &
Social support reflects a variety of aspects of an older person’s social world that may promote well-being and increase resilience to health problems in late life (Cohen, Gottleib, & Underwood, 2000).

As a major topic of interest among gerontologists, it is worthwhile to mention that social support has been widely studied and defined in many different ways, through both structural and functional measures. Gottleib (1985) noted that various measurement strategies coincide with diverse definitions of social support, including social integration/community participation, the social network approach to understand the structure and function of social relationships, and finally, the social intimacy approach to assess the quality of social relationships. Several main characteristics of social support measures, according to Barrera (1986) include the constructs of social embeddedness (e.g., social ties and participation in community organizations), perceived support (e.g., cognitive appraisal of being reliably connected to others), and enacted support that assesses actual actions or behaviors that are performed to help someone.

Social support has been measured in the literature through general perceptions of the availability of support in addition to assessments of the exchange of socially supportive behaviors. Enacted support describes the actual transfer of behaviors, rather than subjective evaluations of transactions or the perception of the availability of support for future transactions. Measures of enacted support may also be tapping the extent to which social support is recognized, since older adults must first cognitively appraise the availability of social support as a resource before receiving enacted support (Barrera, 1986).
Types of enacted social support that an older adult may receive include informational support (e.g., sharing advice, expertise, and referrals), tangible support (e.g., loaning money or items, help with completing tasks, or looking after a family member or pet), and emotional support (e.g., expressing interest and concern for another’s well-being, Krause & Markides, 1990). Older adults can receive social support, as well as provide social support to others (Krause & Markides, 1990). Over time, individual level change in social support is common among older adults (Krause, 1999). While giving and receiving social support is a dynamic process, older adults tend to retain social support as they age (Antonucci, 1990; Field, 1999; Gurung, Taylor, & Seeman, 2003; Lang, 2000).

The majority of social support research has viewed social support through a stress-buffering model. As Gottlieb (1985) described, social support can be thought of as “a resource of resisting stress-induced illness and disability” (p. 5). In a review article, Helgeson (2003) found support for the stress buffering hypothesis, and concluded that the functional aspects of social support are directly related to quality of life. Others have found support for both a main effect model as well as the stress buffering model (Cohen & Wills, 1985).

In terms of the influence of social support on well-being or quality of life, the majority of research in this area has reported a beneficial relationship between social support received from others and overall health and well-being among older adults (House, et al., 1988; Krause, 1986; Krause & Markides, 1990; Larson, 1978; Mendes de Leon et al., 1999; Seeman, 2000; Silverstein & Bengston, 1991). Social support from spouses, family members, and neighbors plays a role in improving functional ability and
quality of life (Tang, Brown, Funnell, & Anderson, 2008; Shaw, 2005; VonDras & Madey, 2004). Using data from the 2000 Missouri Older Adults Needs Assessment Survey of people 60 years and above, the CDC (2005) reported that visits with friends and relatives, having close friends for emotional support, and the perception of help being available if needed were all associated with better health-related quality of life and mental health.

Some studies have reported no relationship between social support and enhanced well-being (Cohen & Sokolovsky, 1980; Lee & Ellithorpe, 1982), while others suggest that receiving support may actually increase stress (Barrera, 1981; Cohen & Hoberman, 1983; Newsom & Schultz, 1998).

Often, social support is received by older adults in response to negative life events. For example, the death of a spouse is a major loss that can reduce the quality and availability of social support. A recent study found that after the death of a loved one, the amount of social support received and social connectedness partially mediated the effects of the loss on life satisfaction (Sun, Waldron, Gitelson, & Ho, 2012). A national sample of adults 65 and over found that lower levels of social support were associated with lower life satisfaction and increased depressive symptoms (Newsome & Schulz, 1996).

Researchers often suggest interventions to bolster social support among assisted living residents, as low perceived social support was associated with increased depression, impaired immune functioning, and reduced life expectancy (Winningham & Pike, 2007).

A small number of studies have explored how giving or providing social support to others influences aspects of older adults’ quality of life. Providing support to others may improve well-being for older adults (Krause & Shaw, 2000; Reissman, 1965;
Silverstein, Chen, & Heller, 1996). For example, in a national sample of older people, Krause and Shaw (2000) found that providing emotional support to others was associated with higher self-esteem. Among older adults with multiple illnesses, providing support was also positively related to physical and mental quality of life (Warner, Schuz, Wurm, Ziegelmann, & Tesch-Romer, 2010). A three-year study found that higher levels of providing social support to others predicted better physical functioning and lower odds of hospitalization and death (Ostir, Simonsick, Kasper, & Guralnik, 2002). Lastly, as a closely related concept of providing social support, altruism has been linked with enhanced well-being and longevity among older adults (Post, 2005).

The transactional nature of giving and receiving social support is consistent with the concept of reciprocity. According to a study by Liang, Krause, & Bennett (2001), there are both positive and negative consequences to well-being from giving and receiving support. Further, older adults were more satisfied with the support received if it was similar to the amount of help they had provided others (Krause, 1995). A recent study found that providing social support is more beneficial to the well-being of older people than receiving social support, unless the support was received from a spouse or sibling (Thomas, 2010).

Social Support within CCRC’s

Within retirement communities, the extent to which social support is readily available is not well understood. Empirical research suggests a great deal of complexity and variability in the quality of relationships that develop within a CCRC, and in turn, how these social relationships affect older people. Several conceptualizations of social
engagement among older adults living in retirement communities have emerged from the literature (Potts, 1997).

The first view suggests that a high level of social interaction takes place within retirement communities, and this fosters the development of important friendships and larger social networks that increase well-being in old age (Adams, 1985-86; Brown, 1990; Lawton, Moss, & Moles, 1984). Adams & Sanders (2010) found that life in congregate housing led to renewed feelings of neighborliness among many residents.

The literature has also offered a less optimistic view of relationships within age-segregated living environments, which suggests that living in close proximity with neighbors may not result in an expanded social network. Studies have found that while social interactions with peers may occur frequently, these relationships lack intimacy and may have no effect on well-being (Husaini, Moore, & Castor, Stephens & Bernstein, 1984; Sullivan, 1986). Still other studies suggest that some older people living in retirement communities feel isolated within the CCRC as well as the larger community (Leavitt, Antonucci, Clark, Rotton, & Finley, 1985-86; Mullins & Tucker, 1992; Sheehan, 1986). In a study of friendship and social networks among older adults in one retirement community, Stacey-Konnert and Pynoos (1992) found that while the CCRC may provide a rich environment for older adults to maintain friendships with neighbors, some older people were socially isolated and had difficulty becoming a part of the community’s culture. Persons who had difficulty fitting in with the culture tended to be “residents with cognitive deficits, depression, physical health problems, or long-standing isolative patterns… In addition, caregivers, widows, and the very old were also vulnerable to social isolation,” (Stacey-Konnert & Pynoos, 1992, p. 309). The social
world of a CCRC on the West Coast was explored through a qualitative study that described the efforts older adults made to cope with the negative stereotypes of moving into the CCRC, maintain family life identity, and manage their own increasing frailty while placing greater distance in relationships with peers after the health and abilities of others decline (Williams & Guendouzi, 2000). As Netting and Wilson (2006) stated, the “adjustment and integration into the community is different for each person as they set boundaries, establish their network, and seek to maintain ties to the broader community” (p. 674). For these reasons, quality of life is expected to change over time, in response the transition of moving into senior housing and the changing social worlds of older people living in retirement communities.

**Statement of the Problem**

This review of the literature suggests that older people may be vulnerable to a declining quality of life. A number of factors associated with aging are known to influence quality of life, including decreased physical and mental capabilities, economic difficulty in retirement, the breakdown of extended families, and social isolation after the death of a spouse, loved ones, and friends (Williams, 1977). In the United States, older adults with worse functional health, depression, and memory problems experience a significantly lower quality of life (Baernholdt, Hinton, Yan, Rose, & Mattos, 2011).

In addition, loneliness and social isolation are major issues in old age. The oldest-old, single women, and individuals with poor health are at highest risk of social isolation (Erickson, Dempster-McClain, Whitlow, & Moen, 2000). In a meta-analysis, Pinquart & Sörensen (2001) found that between 5% and 15% of older adults reported feeling lonely
on a frequent basis, and loneliness was higher for women and older people with lower socioeconomic status, fewer feelings of competence, and for those who lived in a nursing home. In other studies, a full 20-40% of older people reported that they occasionally feel lonely (Prince, Harwood, Blizard, Thomas, & Mann, 1997; Shanas et al., 1968). Additionally, Pinquart and Sörensen’s (2001) meta-analysis supported a stronger role in preventing loneliness through improving the quality of the older person’s social network. In their study, the effects of social interactions with friends and neighbors had a greater influence on reducing loneliness than did social contact with family members (Pinquart & Sörensen, 2001). In addition, an increasing body of evidence suggests that social isolation is closely linked with lower physical and mental well-being (Victor et al., 2009; WHO, 2002). Being connected to others through meaningful social relationships, as well as becoming socially integrated within communities, is known to have a positive effect on health and well-being for people of all ages (Berkman & Glass, 2000; Putnam, 2000).

The quality of life of people living in retirement communities is an important area of study. The social environment heavily influences quality of life for older adults (Bowling, 1995). Some studies have found that older people living in retirement communities feel isolated within the CCRC as well as the larger community (Leavitt, Antonucci, Clark, Rotton, & Finley, 1985-86; Mullins & Tucker, 1992; Sheehan, 1986). In addition, an early study of older adults living in subsidized senior housing found that quality of life, social activity, well-being, and morale decreased over time (Lawton, Moss, & Grimes, 1985). Those who live in congregate housing often have smaller social networks and tend to be older than to their counterparts living in the community (The American Seniors Housing Association, 2001). Furthermore, chronic health conditions,
physical frailty, and living in an age-segregated residential facility have been identified as risk factors for depressive symptoms among older adults (Lavretsky & Kumar, 2002).

**Importance to Social Work**

Quality of life is a central issue for all older adults. While old age can be a time of continued personal growth and meaningful pursuits, potential losses of health, functioning, and social relationships can threaten older adults’ ability to live independently and fully. Dramatic demographic changes in the aging of the U. S. population will present opportunities as well as a variety of challenges for older persons, their families, the social work profession, and society. Already, the National Association of Social Workers (2003) acknowledged that “…new issues surrounding staffing, family involvement, quality of life, the role of spirituality, end-of-life care, medical management, program development, and overall service delivery are emerging” (p. 5).

Through case management, program development, and advocacy roles, social workers are in an optimal position to help older adults adapt to the challenges of aging and to support an optimal quality of life for all older persons. According to the National Association of Social Workers (2003), social workers in long-term care focus on several main goals, including “the social and emotional impact of physical or mental illness or disability, the preservation and enhancement of physical and social functioning, the promotion of the conditions essential to ensure maximum benefits from long-term health care services, the prevention of physical and mental illness and increased disability, and the promotion and maintenance of physical and mental health and an optimal quality of life” (p. 9).
While CCRC’s may provide a rich environment for older adults to maintain friendships with neighbors, studies also suggest that more socially isolated and marginalized members of the CCRC community may experience a poorer quality of life. For example, older adults with memory problems, depression, physical health problems, or isolative behaviors, as well as spousal caregivers, widows, and the very old may be socially excluded from life within the age-segregated community (Stacey-Konnert & Pynoos, 1992). A primary goal for social work is to improve the health and social functioning of all older people, to help prevent and forestall lengthy periods of morbidity and declining quality of life in old age. These goals apply for the range of older people, whether in the community or in congregate living environments, from those who are socially integrated and functioning well, to those whose functioning is impaired and who may be more socially isolated. Research examining the factors that influence quality of life over time will contribute towards accomplishing this important goal for gerontological social work.

**Purpose of the Study**

The purpose of this study is to examine the cross-sectional and longitudinal relationships between aspects of social engagement and quality of life for older people living in the independent senior apartments of continuing care retirement communities. First, as a preliminary step, relationships between components of social engagement and quality of life for older people one year after moving to the CCRC will be examined. A structural equation model will test the strength and direction of hypothesized relationships between the social engagement predictors of social support provided, social
support received (emotional, informational, and tangible), and formal activity participation in social activities organized by the retirement community. Second, this study will examine changes in quality of life over five years, and the individual trajectories of quality of life. Third, the study will identify the social engagement predictors and other factors that explain initial differences in quality of life for individuals and those that influence changes in quality of life over time.

A major goal of this dissertation is to examine the trajectories of change in quality of life for older adult residing in senior housing over five years using data from the Erickson Life Study (Resnick et al., 2001; 2005). The author is not aware of any other published data on the trajectories of quality of life for older adults living in senior housing within continuing care retirement communities. In addition, this study will identify the factors that explain individual differences in the initial status of quality of life.

The second major goal of this study is to identify the facets of social engagement that are associated with changes in quality of life over time. A latent growth model will examine the long-term influence of components of social engagement at one year on the changes in quality of life over time, after controlling for the effects of covariates. This model will control for the effects of quality of life before move-in to the senior apartment building, along with the effects of age, income, gender, widowhood, physical functioning, comorbidity, and CCRC site.

The independent senior housing of continuing care retirement communities provides a unique opportunity to examine the effects of social engagement on quality of life within a resource-rich environment that promotes an active lifestyle. While the
characteristics of older people living within CCRC’s differ from older adults living in the community, the availability of a variety of social and leisure activities, along with the removal of common barriers such as transportation or a lack of financial resources, provide an ideal context for studying the relationship between social engagement and quality of life.

Given current trends of a dramatic increase in the population of older adults and common losses in late life, coupled with the deleterious effects of social isolation and loneliness in old age, studying the quality of life of older adults is a timely and meaningful endeavor. As older adults report, the social environment is integral to quality of life (Bowling, 1995). It follows that older adults living in this setting may look to social engagement in the forms of providing social support to others, seeking out and receiving social support, and taking on new roles or meaningful activity through getting involved in formal activities—all of which may be used as adaptive strategies to cope with losses and negative life events. Thus, it is important to examine how social engagement within a CCRC may be related to changes in quality of life.

As stated by NASW (2003), “social workers in long-term care support the optimal quality of life and independent functioning of each resident, and play a substantial role in preserving and enhancing older adults’ social functioning through encouraging personal relationships and community involvement” (p. 9). This study may also inform intervention strategies to promote social engagement and enhance quality of life (Victor & Sharf, 2005).


**Conceptual Definitions**

In this study, the outcome variable, quality of life is a multidimensional construct that includes physical functioning and well-being, social functioning and well-being, and cognitive functioning and well-being that will be measured through the Perceived Quality of Life Scale (PQOL, Patrick, Danis, Southerland, & Hong, 1988; Patrick et al., 2001). The PQOL (Patrick et al., 2001) measures older adults’ overall assessment of their satisfaction with the “perceptions of their positions in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns” (Bonomi et al., 2000; WHOQoL Group, 1994).

As the focal predictor, social engagement is conceptualized through participation in formal social activities organized by the continuing care retirement community and different kinds of social support. Formal social activity participation is defined as participating in group activities with others which have been organized by the CCRC. These group activities include: *creative* activities (e.g., art or dance groups), *active social* activities (e.g., dinner or tour groups), *passive social* activities (e.g., attending concerts, movies, or the theater), and *productive* activities (e.g., community service, volunteer groups, or educational pursuits). Social support refers to the emotional, social, physical, and financial resources as well as other types of care that are provided by others, which may be exchanged among members of a social network through the process of giving and receiving (Berkman & Glass, 2000). Social support is measured through the Krause and Markides (1990) version of the widely used Inventory of Socially Supportive Behaviors (ISSB, Barrera et al., 1981) which assesses the extent to which older adults give and receive socially supportive behaviors in the last two weeks. The four types of social
support assessed through ISSB include received support (e.g., emotional, informational, and tangible) and provided support. Theoretical and empirical research perspectives on each of these concepts are presented in Chapter 2.
Research Questions and Hypotheses

The following research questions address gaps in knowledge and provide a guiding framework for the analysis plan. A small number of covariates were selected for the cross-sectional model which focuses on relationships between the predictors of social engagement and quality of life one year after older adults moved into senior housing. Selected covariates include: age, gender, education, CCRC facility, the number of medical conditions (comorbidity) and functional status. A more extensive array of control variables is included in the longitudinal analysis to take into account the array of factors known to be associated with quality of life, including: quality of life before moving in to senior housing, age, gender, education level, marital status, CCRC facility, number of medical conditions (comorbidity), and functional status.

Cross-Sectional Structural Equation Model

RQ1: What explains quality of life for older adults at the time point when they have spent their first year in senior housing? The purpose of RQ1 is to test the conceptual model of the hypothesized cross-sectional relationships among the study variables after older adults live in senior housing for one year, to determine the strength and direction of relationships between social engagement and quality of life at one point in time.

H1.1. Informed by activity theory (Lemon et al., 1972), which proposes that participation in meaningful activity will be related to better quality of life, a positive, direct relationship between formal social activity participation and quality of life is expected, after controlling for covariates.
**H1.2.** In recognition of the importance of feeling emotionally supported and cared for in close personal relationships, there will be a positive, direct relationship between receiving emotional support and quality of life, after controlling for covariates.

**H1.3.** There will be a positive, direct relationship between receiving informational support through advice, expertise, and referrals from others and quality of life, after controlling for covariates.

**H1.4.** There will be a positive, direct relationship between receiving tangible support to get help when needed to complete a task and quality of life, after controlling for covariates.

**H1.5.** There will be a positive, direct relationship between providing social support to help others and quality of life, after controlling for covariates.

**H1.6.** Based on the literature demonstrating the benefits of volunteering and other altruistic activity participations, providing social support will be the most influencing factor associated with quality of life, after controlling for covariates.

**H1.7.** Consistent with social exchange theory, there will be significant relationships between providing social support and receiving each of the three different kinds of social support.

**H1.8.** Because increased formal activity participation may allow for increased opportunity to provide social support, there will be a positive, direct relationship between
providing social support and participating in formal social activities, after controlling for covariates.

*Latent Growth Model Unconditional Trajectory Hypotheses*

**RQ2:** Are there initial differences in quality of life among older adults living in senior housing over time? The purpose of RQ2 is to assess whether heterogeneity in quality of life exists for this sample of elders living in senior housing.

*H2.1.* There will be significant differences in the initial level of quality of life among older adults living in senior housing that arise from a diversity of experiences over the lifespan.

*H2.2.* As time passes, there will be significant individual variation in terms of the rate of change of quality of life for older adults living in senior housing.

**RQ3:** Does quality of life change over time for older adults living in senior housing? The purpose of RQ2 is to understand how quality of life for older adults living in senior housing changes over time. No other predictor variables are included in the model.

*H3.* Consistent with previous longitudinal research, the quality of life of older adults living in senior housing will decrease over time.
Latent Growth Model Conditional Trajectory Model Hypotheses

RQ4: Does the social engagement of older adults living in senior housing help to explain individual differences in the initial status of quality of life after living in senior housing for one year and patterns of change in quality of life over time? RQ4 will determine if and how social engagement measures (formal activity participation, social support provided, and three types of social support received) in the first year explain initial individual differences in quality of life and influence changes in quality of life over time.

H4.1. Formal social activity participation among older adults living in senior housing for one year will explain initial differences in quality of life and slow the decline in quality of life over time.

H4.2. For older adults living in senior housing, receiving emotional support from others in the first year will explain initial differences in quality of life and slow the decline in quality of life over time.

H4.3. For older adults living in senior housing, receiving informational support from others in the first year will explain initial differences in quality of life and slow the decline in quality of life over time.

H4.4. For older adults living in senior housing, receiving tangible support from others in the first year will explain initial differences in quality of life and slow the decline in quality of life over time.
For older adults living in senior housing, providing social support to help friends and family in the first year will explain initial differences in quality of life and slow the decline in quality of life over time.
Chapter Two: Review of the Theoretical and Empirical Literature

This chapter will first review the major theoretical literature that supports a conceptual relationship between social engagement and quality of life of older adults. In recognition of the importance of past experiences in shaping the present, a life course perspective will guide the examination of individual differences in how quality of life changes for older adults living in senior housing over time. Hypotheses are also informed by several theories, including Erikson’s theory of psychosocial development (Erikson, 1950, 1982/1997), activity theory (Lemon, Bengston, & Peterson, 1972), social exchange theory (Dowd, 1975), and a more recent model of successful aging, the proactivity model (Kahana & Kahana, 1996, 2003; Kahana, Kelley-Moore, & Kahana, 2012). Empirical evidence for understanding quality of life among older adults will be presented and gaps in previous research will be discussed. The chapter will conclude with a conceptual model for the proposed study, along with a presentation of the aims of the study and specific research questions to be addressed.

Historical Development of Theory Related to Successful Aging and Quality of Life in Old Age

Centuries ago, the Roman philosopher Cicero (106-43 BC) challenged the negative images of aging in the essay De Senectute (44 BC/1979) with an elaboration of the many positive aspects of growing older—suggesting that it is precisely during these golden years when it is finally possible to further develop the mind and truly enjoy life. Over the years, the multifaceted concept of quality of life has been an overarching theme used to describe physical, social, mental, and cognitive well-being throughout the
lifespan. Capturing the extent to which people are living well in old age, rather than simply living longer, quality of life is often assessed through positive and negative perceptions of positions in life, as well as through more objective criteria. Quality of life shares many similarities, and is sometimes used synonymously with concepts like successful aging or active aging. Over the last thirty years, quality of life research has proliferated compared to other subjective indicators such as well-being and happiness because it is more comprehensive and has greater potential to address social, political, and environmental inequalities (Gilhooly, Gilhooly, & Bowling, 2005). Regardless of the strains and losses in health, functioning, and social relationships that may occur in later life, questions remain about how older adults can achieve and maintain a high quality of life.

**Literature Review**

The conceptualization of successful aging and specific frameworks to explain it have paralleled several decades of theory development in social gerontology focused on stress, adaptation, and well-being in aging. The life course perspective will provide an overarching framework to examine the heterogeneity within the trajectories of quality of life for older adults living in senior housing. Hypotheses have been informed by several theories, including a theory of psychosocial development (Erikson, 1950, 1982/1997), activity theory (Lemon, Bengston, & Peterson, 1972), social exchange theory (Dowd, 1975), and the proactivity model of successful aging (Kahana & Kahana, 1996, 2003; Kahana, Kelley-Moore, & Kahana, 2012).
The Life Course Perspective

The life course perspective is a multi-theoretical and multidisciplinary approach that examines how age, relationships, life transitions, and social change shape the life experiences of individuals from birth to death (Hutchinson, 2011). Rather than a unified theory, life course scholars agree to a set of principles that guide research (George, 1996). Human development is viewed as a lifelong process, whereby experiences, relationships, and life events from earlier life stages influence well-being in late life (Bengston, Elder, & Putney, 2005). These social and cultural influences can produce cohort effects among different groups, in which social contexts and historical time changes the patterns of later cohorts (Elder, 2001). At the same time, human agency is emphasized to affirm that individuals have the ability to influence their own functioning and life circumstances (Bandura, 2006).

The cumulative experiences of earlier phases of life experiences matter in old age because adaptation in late life is shaped by earlier experiences (Elder, Johnson, & Crosnoe, 2003). Throughout life, individuals experience a number of transitions. For instance, older adults who decide to relocate to senior housing face a big transition in the process of relinquishing their attachment to a family home and starting over in a new living environment. How older people deal with this relocation is likely to be related to how they have handled other challenges and transitions in their lives. When this new chapter of life begins, the transition changes the life course and gives rise to different patterns of stability and change over the long run.

Within the life course perspective, there is an acknowledgement of the range of diversity in life experiences. There is a focus on the trajectories of individuals in terms of
their long-standing patterns of change and stability which occur after life transitions or role changes (Elder, Johnson, & Crosnoe, 2003). Because of the differences in life experiences that have accumulated over time, heterogeneity in human development is expected. Diversity of human experiences within members of the same cohort can be shaped by gender, age, ethnicity, level of education, and social class (Scherger, 2009; Settersten, 2003). These differences in experiences may have positive or negative influences on the individual at any stage of the life course (Settersten, 2003).

The life course perspective also places importance on human relationships. Social relationships link lives together, and the dynamic interaction of these close personal relationships facilitate the exchange of social support. The interactive nature of social relationships influences how the life course trajectories of individuals change over time (George, 2003).

_Erikson’s Theory of Psychosocial Development_

As one of the best known developmental theories, the theory of psychosocial development (Erikson, 1950, 1982/1997) proposed that humans face crucial tasks as they advance through life, described through a set order of stages of development. From birth until death, individuals face common conflicts, challenges, and goals that coincide with the aging process. The positive resolution of these challenges and tensions fosters goal attainment and personal growth. These psychosocial crises are ultimately assessed through positive or negative outcomes (e.g., “trust versus mistrust” in infancy and “generativity versus stagnation” in middle adulthood). After each developmental task is completed, it is carried forward into the next phase of psychosocial development,
ultimately leading toward ego integrity and wisdom. “Yet throughout, we must allow for a human being’s potential capacity, under favorable conditions, more or less actively to let the integrative experience of earlier stages come to fruition,” (Erikson, 1997, p. 65).

The last two stages are dedicated to middle and old age and focus on themes of generativity and wisdom. The eighth stage, represented as “integrity versus despair” (Erikson, 1950, 1982), a central issue in old age, is the process of reflecting back on life and its meaningfulness as one realizes the closeness of death (Erikson, 1950, 1982/1997). Those with satisfaction from a life well lived will achieve the developmental goals of integrity and wisdom in old age. Conversely, “despair expresses the feeling that the time is now short, too short for the attempt to start another life and to try out alternate roads…” (Erikson, 1963, p. 269). More contemporary interpretations of “despair” include regret and depressive symptoms. In the expanded version of Erikson’s Psychosocial Stages of Development (1997), Joan M. Erikson incorporates “transcendence” as the ninth and final stage of life to address the difficulties and opportunities of advanced old age. As she explained, transcendence “may be a regaining of lost skills, including play, activity, joy, and song, and above all, a major leap above and beyond the fear of death,” (Erikson, 1997, p. 127).

Erikson’s seventh stage, generativity versus stagnation, originally applied to middle adulthood. Yet, as the longest phase of adult development, generativity, or the concern and activity dedicated to contributing to the well-being of others, also continues through late life (Erikson, 1950, 1997/1982). A growing body of evidence suggests that generativity through productive and creative leisure pursuits is of great consequence in old age and older adults are interested in contributing to the well-being of others as much
as people in midlife are (McAdams, 2001; Steward & Vandewater, 1998). In fact, informal volunteering, such as helping family, friends, and neighbors, is a common activity among older persons (Choi, Burr, Mutchler, & Caro, 2007; Hinterlong, 2008) that is associated with better physical and emotional outcomes (Krause, 2009). A longitudinal study of older adults from age 60 to 75 from the Study of Midlife in the United States (MIDUS) found that perceptions of generativity and generative contributions at baseline predicted lower odds of disability in activities of daily living and mortality ten years later (Gruenewald, Liao, & Seeman, 2012). Therefore, generativity was associated with trajectories of better physical health and longevity over time (Gruenewald et al., 2012). Finally, the internal motivation to participate in social and productive activities enhances feelings of usefulness for older adults (Narushima, 2005; Okun, 1994).

*Activity Theory*

The active lifestyle and social interaction promoted by many retirement communities is consistent with the activity theory of aging, which posits that new roles and activities in later life may compensate for losses in social roles and that great greater participation in social and leisure activities promotes well-being (Havighurst & Albrecht, 1953; Havighurst, 1961). Empirical findings of the Kansas City study informed this perspective, which was formally articulated by Lemon, Bengston, and Peterson in 1972, and later by Longino and Kart in 1982. Activity theory was related to the earlier role theory (Biddle & Thomas, 1966), which explained the ways in which individual behavior is influenced by the values of status, differential expectations, and cultural norms within
the social environment. According to role theory, people may experience positive role enhancement, or may be stressed when roles are ambiguous, too complex, or in conflict with one another. In fact, the Pathways to Life Quality Study found that role identities changed after moving to a CCRC and three typologies of role identities were identified: a highly involved group with a large number of social role identities, a group focused on family identities, and a group focused on the friend identity (Moen, Erickson, & Dempster-McClain, 2000).

The premise of activity theory suggests that older adults who participate in activity and reduce role loss will have higher life satisfaction. Activity was defined as “any regularized or patterned action or pursuit which is regarded as beyond routine physical or personal maintenance” (Lemon et al., 1972, p. 513). Three types of social and leisure activities were described, including informal activities such as social interaction with friends, neighbors, and family members, formal activities meaning social interaction with others through the organized structure of clubs, voluntary organizations, or other membership groups, and solitary activities like reading or watching television that are usually completed alone (Lemon et al., 1972, p. 513). Although these classifications are commonly used to describe different types of activities, this dissertation focuses on participation in formal activities that were organized by the retirement community. According to activity theory (Lemon et al., 1972), an older person’s self-identity and social roles are supported through activity participation, and role loss in old age will be negatively related to life satisfaction. As Lemon and colleagues (1972) summarized:

"Activity provides various role supports necessary for reaffirming one's self concept. The more intimate and the more frequent the activity, the more reinforcing and the more
specific will be the role supports. Role supports are necessary for the maintenance of a positive self-concept which in turn is associated with high life satisfaction” (p. 515).

With a sample of older adults who recently moved to a retirement community, Lemon and colleagues (1972) examined relationships between these different types of activities, the role loss of retirement for men and widowhood for women, and life satisfaction. They hypothesized that formal, informal, and solitary activities would be directly associated with life satisfaction, however more intimate, informal activity would be more strongly associated with life satisfaction than formal activity (p. 516). This follows from the idea that informal and formal social activities are more beneficial to older adults than solitary activities, as they provide higher levels of social intimacy and opportunities to confirm the role identities of older adults. Additionally, Lemon et al. (1972) expected that role loss would decrease the strength of the relationship between activity participation and life satisfaction. The empirical results partially supported activity theory, and found (1) a direct association between informal activity and life satisfaction, and (2) the relationship between informal activity and life satisfaction was stronger than the relationship between formal activity and life satisfaction. In the study, all types of activities were positively related to life satisfaction, yet the strongest observed (and only statistically significant) relationship found was between participation in informal social activities and life satisfaction (Lemon et al., 1972). These findings led to emphasis on informal social activity in subsequent gerontological practice and research (Lemon et al., 1972; Longino & Kart, 1982).

Greater participation in social and leisure activities has been positively linked with emotional health and quality of life. A recent meta-analysis of 44 psychosocial
Interventions found that increased participation in social activities improved mental health, life satisfaction, and quality of life, and reduced depressive symptoms (Forsman, Nordmyr, & Wahlbeck, 2011). Cross-sectional research has supported the relationship between activity and better emotional health and life satisfaction in old age (Harlow & Cantor, 1996; Rodriguez, Latkova, & Sun, 2008). Longitudinal studies of patterns of activity have found that greater participation in social and productive activities was associated with lower baseline status of depression and less increase in depression over time, suggesting that social activities may be important in both preventing and reducing depression among older persons (Hao, 2008; Hong, Hasche, & Bowland, 2009; Glass, Mendes de Leon, Bassuk & Berkman, 2006). A recent critical review of the literature found an association between all types of activity and subjective well-being, with the most evidence to support the influence of informal social activity on well-being (Adams, Leibbrandt, & Moon, 2011).

Engagement with social and leisure activities may enhance physical health in old age and extend lifespan. Participation in social activity has been associated with better functional health (Everard, Lach, Fisher, & Baum, 2000; Luoh & Herzog, 2002) and longevity (Agahi, Silverstein, & Parker, 2011; Glass, Mendes de Leon, Marattoli, & Berkman, 1990). In another study, Thomas (2011) found that older persons with high or increasing trajectories of social engagement over a number of years had lower levels of physical and cognitive limitations over time.
Social Exchange Theory

With strong ties to the economic theory of supply and demand, social gerontology literature has given attention to the costs and rewards that arise in exchanges between individuals and society. Social exchanges are the mechanism through which individuals seek to gain intrinsic or material rewards such as social approval, social acceptance, respect, and power, while minimizing their costs (Knipe, 1971). Every social exchange is characterized by variation in the amount of rewards associated with it.

The idea of exchange in social behavior was introduced by Homans (1961) and developed by Blau (1964) and Emerson (1962, 1972) in their conceptualization of power and dependency dynamics in social relationships. Homans (1961) applied the concept of economic exchanges to social exchanges, concluding that an interaction between two or more individuals will be continued and positively assessed if the interaction provided the individual with more rewards than costs. As such, an individual will seek to maximize rewards and minimize losses in relationships with others (Berscheidt, & Walster, 1969; Homans, 1961). In a situation where each person in the exchange relationship is equally dependent on one another for the desired rewards and each has similar resources, the social exchange is said to be balanced (Emerson, 1962). Yet, inequality in the distribution of rewards is common in social exchanges. In response to imbalances in social exchanges, the least powerful exchange partner may take some kind of action to attempt to reduce the costs of the exchange. These balancing operations include withdrawal, extending power network through taking on new roles, increasing status through valued skills, or forming a coalition to equalize power (Emerson, 1962).
Dowd (1975) applied the social exchange theory to the field of aging and viewed the aging process as a problem of diminishing power resources that arise from losses of roles, skills, and resources (p. 584). Common challenges in late-life, including widowhood, poor health, lower income after retirement, and society’s negative images of aging also contribute to lower amounts of power held by older people. Dowd (1975) and Bengston and Dowd (1981) found that power differences were responsible for the decreased social interaction between younger and older people because older people had fewer resources to bring to the exchange. Power differences arise in situations where one person in the social exchange values the rewards from the relationship more than the other, or when rewarding behavior cannot be reciprocated. Therefore, individuals who are less dependent on the social exchange for rewards have a power advantage over those who rely on the exchange more (Dowd, 1975, p. 587). Social exchange theory (Dowd, 1975) has been applied to examine the structure of giving and receiving social support, patterns of these exchanges under different conditions, and social and financial exchanges between generations (Antonucci, 1985; Cox and Rank, 1992; Eggebeen & Hogan, 1990; Hendricks, 1995; & Hogan, Eggebeen, & Clogg, 1993).

An important assumption of social exchange theory (Dowd, 1975; Gouldner, 1960) is the expectation of reciprocity in the exchange of resources that take place in all interpersonal relationships. Reciprocity often occurs between the older person and a family caregiver, where there is an expectation that the adult child will help the aging parent in late life (Silverstein & Parker, 2002). Antonucci and Jackson (1990) elaborated on the concept of social exchange in their long-term approach to the accumulation of social support over the lifespan. They proposed the concept of a “support bank” in which
support the older person has provided to others can serve as an investment that may be withdrawn at a later time. Therefore, social exchanges may depend on the amount of support elders have provided to others in the past.

Because they are the mechanism through which social support is given and received, the quality of social exchanges is integral to well-being (Antonucci, 1990; Wahrendort, Ribet, Zins, Goldberg, & Siegrist, 2010). Most gerontological research has focused on how receiving social support influences well-being in old age. Considerable empirical research has found support for the stress-buffering function of social support received in enhancing psychological well-being especially during times of stress (Cohen & Wills, 1985; George, 2006; Silverstein & Bengston, 1991; Thompson & Heller, 1990; Thorsteinsson & James, 1999). Cohen and Wills (1985) found support for both a main and an indirect positive relationship between social support received and well-being. A large number of studies report that older adults who receive social support from a network including family members, friends, and spouses have better health than those with fewer members of their social network (Krause, 1986; Larson, 1974; Leavy, 1983; Wood & Robertson, 1978). In the same vein, a longitudinal study concluded that receiving high levels of social support was related to greater well-being among older people (Matt & Dean, 1993).

Studies have also revealed contradictory findings about the relationship between social support received and well-being in late life. Some studies have found no relationship between social support received and well-being (Cohen & Sokolovsky, 1980; Lee & Ellithorpe, 1982), while others report that receiving social support is associated with reduced well-being or greater distress (Barrera, 1981; Cohen & Hoberman, 1983;
Lee, Netzer, & Coward, 1995). This association may be explained when a loss or poor health elicits a response of social support from friends, family members, and neighbors, yet despite receiving the support, the older person may still experience greater distress or diminished quality of life. Scholars have also suggested that the inverse relationship between social support received and well-being may be understood within the context of dependency. As older adults become more dependent upon others for emotional, instrumental, or tangible social support due to physical limitations and social losses, the feeling of dependency can create guilt and conflict (Baltes & Carstensen, 1996; Brown, Dahlen, Mills, Rick, & Biblarz, 1999). Consistent with the concept of reciprocity, Krause (1995) found that older adults reported satisfaction the level of social support received if it was approximately equivalent to the help they had given to others.

In comparison to social support received among older persons, far less attention has been directed to the support or helping behavior that older adults themselves provide to others. Overall, the evidence to date suggests a positive relationship between social support provided to others and well-being in old age. Altruism, in terms of helping others through providing social support, has been associated with greater older peoples’ well-being (Gruenewald et al., 2012; Krause & Shaw, 2000; Reissman, 1965; Post, 2005; Thomas, 2010). Older adults’ satisfaction with support provided to family, friends, or the community has been positively associated with their future health outcomes (Ostir, Simonsick, Kasper, & Guralnik, 2002). Benefits of providing social support to others also included lower morbidity (Brown, Consedine, & Magai, 2005) and higher self-esteem (Krause & Shaw, 2000).
Successful Aging

In an editorial from the first issue of *The Gerontologist*, Havighurst (1961) was the first to use the term “successful aging.” He eloquently defined successful aging as “the conditions of individual and social life under which the individual person gets a maximum of satisfaction and happiness out of life and society maintains an appropriate balance among satisfactions for the various groups which make it up—old, middle-aged, and young, men and women, etc.” (p. 8). Early models of successful aging from Havighurst (1961) and Neugarten (1974) were broadly described in terms of life satisfaction, helping to guide definitions of successful aging beyond merely the absence of problems in old age.

The concept of successful aging provides gerontologists with a more optimistic view of the possibility of modifying the negative aspects of aging to enjoy an extended lifespan that is not characterized by dependency and sickness in old age. According to Rowe and Kahn (1997), successful aging is “the avoidance of disease and disability, the maintenance of high physical and cognitive function, and sustained engagement in social and productive activities” (p. 433). According to this conceptual model, all three conditions must be integrated in order to achieve successful aging.

Rowe and Kahn (1998) elaborated on the importance of the relationships among these three conditions of “successful aging”, as follows:

“… The absence of disease and disability makes it easier to maintain mental and physical function. And maintenance of mental and physical function in turn enables (but does not guarantee) active engagement with life. It is the *combination* of all three – avoidance of disease and disability, maintenance of cognitive and physical function, and sustained engagement with life – that represents the concept of successful aging most fully.”
Furthermore, each of these components of successful aging is itself a combination of factors. Avoiding disease and disability refers not only to the absence or presence of disease itself, but also to the absence or presence of risk factors for disease and disability. Maintaining a high level of overall functioning requires both physical and mental abilities, which are substantially independent of each other. And, finally, they tell us what a person can do, but not what he or she actually does. Many older people, for many reasons, do much less than they are capable of doing. Successful aging goes beyond potential; it involves activity, which we have labeled “engagement with life.” Active engagement with life takes many forms, but successful aging is most concerned with two-relationships with other people, and behavior that is productive… (p. 39-40).

Proactivity Model of Successful Aging

Kahana and Kahana (1996, 2003; Kahana, Kelley-Moore, & Kahana, 2012) have proposed the proactivity model of successful aging that emphasizes the active role older people take in enhancing their quality of life. Drawing from the work of Lawton (1989), the proactivity model (Kahana & Kahana, 1996, 2003; Kahana, Kelley-Moore, & Kahana, 2012) incorporates the idea of personal agency among older adults in the dynamic process of enhancing and utilizing resources to shape their living environment. As Lawton (1989) explained in the environmental proactivity hypothesis, “as personal competence increases, the variety of environmental resources that can be used in satisfaction with the person’s needs increases” (p. 639). With a focus on continual adaptation, this model contrasts with dependency-oriented models in old age (Kahana, Kahana, & Kinney, 1990).

From a stress and coping framework, Kahana and Kahana (1996) suggest that that the normal aging process entails common challenges including chronic illness, loss, and poor fit between the person and the living environment that can interfere with one’s ability to achieve a high quality of life in old age. Internal resources like coping strategies, self-esteem, and hopefulness as well as external resources such as the
availability of formal and informal social supports are viewed as a stress buffering mechanisms (Pearlin, Lieberman, Menaghan, & Mullan, 1981). The proactivity model of successful aging (Kahana & Kahana, 1996, 2003; Kahana, Kelley-Moore, & Kahana, 2012) posits that older adults will practice proactive adaptations as a strategy to build up external resources which ultimately function to prevent and reduce the stressors of normal aging (Kahana & Kahana, 1996, p. 25). This emphasizes the personal agency of the older person in enacting adaptive behaviors to improve his or her own well-being (Thoits, 2006). Importantly, this model does not require a stressor to elicit a response. Rather, it is anticipated that older adults may engage in these proactive adaptations before they experience stresses or loss of resources (Kahana & Kahana, 1996, p. 23).

The proactive coping theory (Aspinwall & Taylor, 1997) also described how people anticipate future events such as aging and prepare in advance for them. Proactive coping was defined as “efforts undertaken in advance of a potentially stressful event to prevent it or modify its form before it occurs” (p. 471). Early preparation for the possibility of needing assistance in later life has been associated with having more choices and more control over their environment (U. S. Department of Health and Human Services, 2008). Therefore, proactive coping may allow older adults to experience personal growth and development in late life in addition to avoiding or reducing the effects of future stressors (Pope & Kang, 2010).

Recently, a five-year longitudinal study of the proactivity model of successful aging examined the effect of stress exposure, proposed buffers of stress, and quality of life outcomes for older adults living independently within a retirement community in Florida (Kahana, Kelley-Moore, & Kahana, 2012). Quality of life outcomes were
operationalized through depressive symptomatology (CES-D 10-item short scale, Irwin, Haydari, & Oxman, 1999) and engagement in social activity (a scale of the amount of time older adults participated in social activities). Three of the nine proactive adaptations detailed in the Kahana and Kahana (2003) model were included in the 2012 study, including health promotion (exercise), planning ahead, and marshaling support. Through a path analysis, Kahana and colleagues (2012) found that stress exposure (e.g., chronic illnesses, recent injury or illness, functional limitations, and social losses) negatively influenced quality of life four years later. At the same time, internal resources (active coping and religious coping), and the external resources of income, presence of a spouse, and number of living children positively influenced quality of life four years later, both directly and indirectly through the proactive adaptations of marshaling support and planning for the future (p. 438). Findings suggest that proactive adaptations mediate the relationship between internal and external resources that have accumulated over the lifespan and quality of life outcomes. This study supports the influence of proactive adaptations on quality of life, suggesting that older adults benefit from both preventative and corrective adaptations that enhance quality of life in old age.

**Gaps in Research**

The Erickson Life Study (Resnick et al., 2001, Resnick et al., 2005) provides a unique opportunity to examine the quality of life of older adults who live in senior housing within a continuing care community setting. Previous research with the Erickson Life Study has assessed the use of the Erickson Resident Profile to examine changes over time for older adults living in senior housing. The Erickson Resident Profile has been
used as a screening tool to determine the fit between different residential and health care options for older adults (Resnick et al., 2001; Resnick et al., 2005; Marx et al., 2011), and to identify the advantages and disadvantages of moving to a CCRC (Marx et al., 2011).

With data from the Erickson Life Study, Marx and colleagues have examined older adults’ patterns of service use and participation in group activities offered by the CCRC (Marx et al., 2010). Participants who completed all six waves of assessment were included in the study. Better health status and less functional dependence were associated with greater participation in formal social activities. This study identified five main patterns of change in terms of overall service use within the study (e.g., no change over time, change in the first year only, change after the first year, a trend of decreasing participation, and a trend of increasing participation in services). Overall, residents significantly increased their participation in formal social activities, such as art groups, dance groups, music, volunteer activity, education, computer use, social groups, movies, concerts, and theater over five years.

Most of the research on quality of life among older people is cross-sectional. Less is known about how quality of life changes over time, and how predictors may influence this change over time for older adults (Zaninotto, Falaschetti, & Sacker, 2009).

Understanding the multidimensional construct of quality of life among older people has been somewhat limited through a research focus on specific diseases and assessments of health-related treatment outcomes (Zaninotto, Falaschetti, & Sacker, 2009). Examples of these disease-specific populations include participants with diabetes (Ribu, Hanestad, Moum, & Birkeland, & Rusteon, 2007; Tang, Brown, Funnell, & Anderson, 2008) and heart disease (Barbareschi, Sanderman, Kempen, & Ranchor, 2009;
Brown et al., 1999; van Jaarsveld, Sanderman, Miedema, Ranchor, & Kempen, 1999). Instruments to measure quality of life also vary in terms of content and focus; for example, the SF-36 measures burden of disease/health-related quality of life rather than an overall quality of life. Broader measures are able to capture multiple components of quality of life, such as physical, mental, and social well-being (e.g., WHOQOL-BREF; PQOL, Patrick et al., 2001). Rather than focusing on health-related quality of life, proponents of overall quality of life measures recommend that all domains are assessed through a more inclusive and global understanding of quality of life (Bilotta, Bowling, Case, Nicholini, Mauri, Castelli, & Vergani, 2010; Zaninotto et al., 2009). A strength of this study is the use of a multi-dimensional measure of quality of life to capture the physical, social, and cognitive components of quality of life.

Additionally, studies on quality of life for older adults residing in the independent living apartments within continuing care retirement communities are scarce in the literature. As of this writing, the author is not aware of any other study that examines the trajectories of change in quality of life among individuals living in these settings. The characteristics of older adults living in senior housing within continuing care retirement communities suggest that they differ from elders living in the community (Gaines et al., 2011; Sherwood et al., 1997). As noted in Chapter 1, this population is not limited by complicating barriers such as poverty or transportation issues which can negatively influence social interactions in late life, providing an appropriate group for study of the effects of elements of social engagement upon changes in quality of life.

Questions also remain about the influence of social engagement on the trajectories of quality of life for older adults over time. Studies have reported a positive correlation
between giving and receiving social support, as expected from the social norm of reciprocity (Davey & Eggebeen, 1998; Lee & Ellithorpe, 1982; Liang, Krause, & Bennett, 2001). Liang and colleagues (2001), in describing this complex relationship, found that major dimensions of the constructs of social support are interrelated and influence well-being both positively and negatively. Although aspects of social engagement and quality of life have been explored in several studies, most studies have used cross-sectional data. Thus, the long-term influence of social engagement on quality of life for older adults living within CCRC’s is a topic that deserves study.

This dissertation posits that social engagement may be a strategy that older adults use to successfully adapt to the challenges of aging. As noted above, the study by Kahana and colleagues (2012) tested the proactivity model of successful aging supported by the influence of proactive adaptations on quality of life, suggesting that older adults benefit from preventative and corrective adaptations that support quality of life in old age. However, their study included only three specific types of proactive activities: health promotion (exercise), planning ahead, and marshaling support. This study builds upon the Kahana et al. (2012) study by broadening the scope of proactive adaptations and conceptualizing different types of social engagement as potential active and adaptive strategies that older adults may use to maintain and improve quality of life in old age.

**Conceptual Framework for the Study**

This study uses a life course perspective to examine the cross-sectional and longitudinal relationships among types of social engagement and quality of life. Social engagement is conceptualized as an active and adaptive strategy that older adults may use
to maintain and improve quality of life in old age. Components of social engagement include formal activity participation, receiving emotional, tangible, and informational support from others, as well as the support older adults provide to their family, friends, and neighbors. Previous literature suggests that older people may benefit from participating in formal social activities, as a mechanism for role support and social connectedness, so that those who take advantage of social activities arranged by the CCRC may report a higher quality of life. A small, but growing body of work suggests that it is beneficial for older people to provide social support to others, enacted through helping behaviors. Finally, it is expected that receiving adequate social support from others will serve an important function through fulfilling a need for emotional, informational, and tangible support in old age, so that receiving these types of support will be positively related to quality of life.

The cross-sectional conceptual framework described in Figure 1 proposes that social engagement significantly influences quality of life within the first year of living in senior housing. Activity theory (Lemon et al., 1972) and the generativity component from a theory of psychosocial development (Erikson, 1950, 1982/1997) support a positive relationship between participation in formal social activities and quality of life over time. Social exchange theory (Dowd, 1975) will be applied to examine how social support provided and social support received influence quality of life for older adults over time, as well as interrelationships among the types of social support.
The first step of the longitudinal model is to identify how quality of life changes over time at the group and individual level. This step in the research design (the “unconditional model”) examines changes in quality of life as a function of time. It includes the repeated measures of quality of life and the initial status (intercept) and rate of change (slope) latent factors (see Figure 2). Waves of assessment were completed.
annually and the slope factor values represent the years since older adults moved into senior housing (e.g., 0 (year 1), 1 (year 2), 2 (year 3), 3 (year 4), and 4 (year 5).

Figure 2

*Unconditional Linear Latent Growth Model of Quality of Life*

In addition to the unconditional linear latent model in Figure 2, the fit of the model to the data will also be compared to an unconditional linear latent model of autocorrelation (Figure 3). Autocorrelation allows for the error terms of the waves of
quality of life to be correlated with one another. If autocorrelation is present in the data, it must be modeled appropriately to avoid bias in the latent growth model parameter estimates (Kwok, West, & Green, 2007; Murphy & Pituch, 2009).

Figure 3

*Autocorrelated Unconditional Linear Latent Growth Model of Quality of Life*

The next step of the longitudinal analysis involves testing whether residents’ levels of social engagement after they had lived in the CCRC for one year influences their quality of life at that time or their changes in quality of life over time. The full model with the social engagement predictors (measured through four types of social
support and formal activity participation) is shown in Figure 4. After controlling for covariates, the influence of social engagement will be tested on the intercept and slope factors which give rise to changes in the quality of life scores over time.

Figure 4

*Conceptual Model of Linear Latent Growth Model*
Explanation of Key Variables in Conceptual Model

The dependent variable, quality of life, is a multidimensional construct of individual perception of satisfaction with social, physical, and cognitive health. Quality of life was assessed through the older adults’ “perceptions of their positions in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns” (Bonomi et al., 2000; WHOQoL Group, 1994). Due to the subjective perceptions of quality of life that were assessed in this dissertation, the terms of quality of life and perceived quality of life are used synonymously. A brief description of the measures can be found in Table 1 (Chapter 3).

In this study, social engagement was conceptualized through formal social activity participation in the leisure activities organized by the CCRC and four types of social support. Formal social activity is measured through the sum of total participation among 17 facility-organized group social activities within the CCRC over the last year. The overall construct of social support was separated conceptually in the model into the four types of social support (received support: instrumental, tangible, emotional, and provided support). Social support provided assessed the frequency of helping behaviors given by older adults on behalf of others within their social networks. On the other hand, receiving social support was measured through the frequency of instrumental, tangible, and emotional helping behaviors from members of the older adults’ social networks on behalf of older adults. Social support was measured through four subscales (emotional, informational, tangible, and provided support) of the Krause & Markides (1990) version
of the Inventory of Socially Supportive Behaviors measure (Barrera et al., 1981). A more
detailed description of the social engagement and quality of life measures will be
discussed in Chapter 3.

The cross sectional and longitudinal models will also control for socio-
demographic, environmental, and functional health characteristics of respondents. These
covariates include age, gender, income, marital status, education, comorbidity, functional
status, and location of the senior housing building. Several socio-demographic and health
variables were chosen for the model to control for heterogeneity in the sample in areas
that are known to be associated with quality of life. Drawing from several cross-sectional
studies, Zaninotto, Falashetti, and Sacker (2009) summarized that poorer quality of life
for older people has been associated with functional limitations and difficulties
performing activities of daily living (Netuveli, Wiggins, Hildon, Montgomery, & Bland,
2006), long-term illnesses and comorbidity (Wiggins, Higgs, Hyde, & Blane, 2004), and
older age (Netuveli et al., 2006; Von dem Knesebeck, Wahrendorf, Hyde, & Siegrist,
2007). Greater socioeconomic resources, such as higher income and higher educational
level have been associated with better quality of life (Von dem Knesebeck et al., 2007).

With longitudinal data from the English Longitudinal Study of Ageing, a large
panel study that included individuals age 50 and above, Zaninotto and colleagues (2009)
used a latent growth model to describe individual differences in quality of life and age
trajectories in quality of life for the population. Overall, quality of life declined with
older age, however the decline can be modified through better psychosocial and physical
health limitations. A worse quality of life at the initial status was associated with gender
(being male), low levels of education, more symptoms of depression, poverty, functional
difficulties, fewer friends, and not receiving positive support from spouses, other family members, or friends. Additionally, living with a partner appeared to positively influence quality of life for men but not for women (Zaninotto et al., 2009). To develop the most comprehensive model, this overview guided the selection of covariates that influence quality of life. In the Chapter 3, each of the measures and covariates will be described in more detail.
Chapter Three: Methodology

Research Design and Sampling

Research Design

Secondary data for this dissertation are drawn from the completed Erickson Life Study, a longitudinal cohort study (2003-2009) of 300 older adults who moved into senior apartments within four continuing care retirement communities (CCRC’s) in Virginia (Green Spring Village) and Maryland (Charlestown, Oak Crest, and Riderwood Village). This quantitative non-experimental panel survey design was used in the original study to examine the usefulness of the Erickson Resident Profile in assessing the optimal initial placement of older adults within the appropriate level of care, monitoring physical and psychological changes over time, and guiding transitions in the level of care among older adults residing in continuing care retirement communities (Bintrim, Gaines, Resnick, & Parrish, 2005; Marx, Gaines, Resnick, & Parrish, 2011). The data from the Erickson Life Study are appropriate for this dissertation research, as they provide information about quality of life and social engagement in addition to comprehensive socio-demographic and health characteristics over the first five years of living in senior housing within a CCRC. The original study was funded by Erickson Retirement Communities, which is now known as Erickson Living. Currently, over 20,000 older people live in sixteen communities managed by Erickson Living in nine states, including Colorado, Kansas, Maryland, Massachusetts, Michigan, New Jersey, Pennsylvania, Texas, and Virginia (Erickson Living, 2012).
Sample

Four continuing care retirement communities located in Maryland and northern Virginia served as recruitment sites for the study (Bintrim et al., 2005). A convenience sample of 300 older adults who moved to senior apartments within CCRC’s enrolled in the study and completed the Erickson Resident Profile in a 60-90 minute in-person interview with a nurse or social worker at the time of move-in and five subsequent annual re-assessments (Bintrim et al., 2005; Marx et al., 2010).

This dissertation research includes older adults who were active participants after living in senior housing for a year in the longitudinal analysis. The current study focuses on the one year time point to provide the initial wave for the longitudinal analysis in order to capture the most meaningful status as the “baseline” for the examination of influences on quality of life in senior housing over time. The one year mark provides an optimal initial status measure to allow for participants to have “gotten up to speed” in terms of integration into the living environment and their activity participation. The longitudinal model will also take into account participants’ prior functioning and lifestyle by including quality of life just before moving in as a covariate in the model. Thus, this study selected five waves of data for the longitudinal analysis, from one to five years after move-in. From the 300 participants enrolled at move-in, 267 participants were active in the study after one year.

Recruitment

The recruitment of the Erickson Life Study participants took place over thirteen months (February 2003-April 2004). A total of 1,267 older adults moved into four
CCRC’s and every second or third new person who moved in was invited to participate in the Erickson Life Study through a mailed letter with a research study brochure. Additional strategies were also used to encourage participation among people moving in through making research brochures available within the retirement community and enlisting help from direct care staff to share information about the study in person (see Bintrim et al., 2005 for detailed recruitment and retention strategies).

The recruitment procedures for the Erickson Life Study are summarized in Figure 5. Of the 1,267 individuals who moved in to the four communities; 695 (54%) were invited to be part of the study through a mailed letter. A follow-up phone call was made to potential participants, and 593 were reached by telephone. More than half who were followed up with by telephone were assessed to participate in the study (n=312), and 300 eligible participants enrolled. Several reasons were provided for not participating in the study. Older adults decided not to participate for the following reasons: lack of interest (n=253), medical reasons (n=27) and a language barrier (n=1). The final sample (N=300) is comprised of 67 participants from Charlestown (22.3% of sample), 75 participants from Green Spring Village (25% of sample), 68 participants from Oak Crest (22.7% of sample), and 90 participants from Riderwood Village (30% of sample). Study participants were compensated with a token gift valued at below $10, and retention efforts included sending birthday and holiday cards, and communicating study results through the monthly community newsletter (Bintrim et al., 2005).
Figure 5

Summary of Erickson Life Study Sample Recruitment Procedures

1,267 Total Older Adults Moved-in to the Senior Housing of 4 CCRC’s

695 Approached by Mailed Letter (54% of move-ins)

593 Reached by Phone (85.3% of Move-ins Received Letters)

253 Not Interested (42.7% of reached)

27 Unable: Medical (4.6% of reached)

1 Unable: Language Barrier (0.2% of reached)

102 Not Reachable by Phone (14.7% of Move-ins Received Letters)

312 Assessed (52.6% of reached)

300 Eligible and Enrolled (96.2% of those assessed)

12 Not Eligible (3.8% of those assessed)
Original Study Inclusion and Exclusion Criteria

The Erickson Life Study participants were older adults who moved to independent senior housing in four continuing care retirement communities. Study inclusion criteria required adults age 60 or older who agreed to be interviewed within their first two months of moving to the apartments within a continuing care retirement community operated by Erickson Living, a for-profit provider of independent living and supportive services (Bintrim et al., 2005). Potential participants were screened for cognitive impairment through the Mini-Mental State Examination (MMSE, Folstein, Folstein, & McHugh, 1975) as well as their ability to speak or understand the English language. Ongoing inclusion in the study required participants to remain in the independent living senior housing and to continue to meet all study inclusion criteria throughout the five year longitudinal study. In order to participate in the study over time, participants needed to demonstrate good cognitive functioning (MMSE > 24, Folstein, Folstein, & McHugh, 1975), and remain living in the independent senior housing. Those who moved out of the apartment (due to relocation or transition to assisted living or nursing home) at any time over the longitudinal study assessment intervals became ineligible to participate.

Measures

The Erickson Resident Profile is a comprehensive, self-report questionnaire that assesses demographic characteristics, the health and functioning, and psychosocial well-being of older adults residing in senior housing (Resnick, et al., 2001; Resnick et al., 2005). Developed by a multidisciplinary group of physicians, social workers, and nurses,
the Erickson Residential Profile (ERP) captures subjective and objective data focused on the physical, functional, mental, cognitive, and social aspects of aging for older adults who live in senior housing (Resnick et al., 2001, 2005). The ERP was initially piloted in ten continuing care retirement communities operated by Erickson Retirement Communities as a tool to assess placement in the appropriate level of care (e.g., senior apartments, assisted living, or nursing home care). Summary tables of the operational definitions, measures, and level of measurement for the focal predictors and outcome variables (Table 1) and covariates (Table 2) in this study are provided.

**Quality of Life (Outcome)**

The Perceived Quality of Life Scale (PQOL, Patrick, Danis, Southerland, & Hong, 1988) was used to measure older adults’ overall assessment of their satisfaction with the “perceptions of their positions in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns” (Bonomi et al., 2000; WHOQoL Group, 1994). The scale items for the Perceived Quality of Life (PQOL, Patrick et al., 1988) scale were developed from human needs theory (Maslow, 1943; Doyal & Gough, 1991) and qualitative interviews with older adults with disabilities and without disabilities. Originally, the PQOL was developed as a 12-item version to assess the quality of life of people after intensive care (Patrick et al., 1988). Internal consistency for the 12-item version measured by Cronbach’s alpha was ($\alpha = 0.88$) and above for ill and healthy older adults (Patrick et al., 2001).
The original version was expanded to the 19-item PQOL to include an assessment of the functional status of respondents (Bergner et al., 1981; Patrick & Peach, 1989). The items consist of statements that assess subjective satisfaction or dissatisfaction with quality of life, which participants rate on an 11 point scale (0 = extremely dissatisfied to 10 = extremely satisfied, Patrick et al., 2001). The scale may be interpreted after items 1 through 19 have been summed and the mean or median value is calculated. For the general population or specific patient groups in cross-sectional studies, scores below 7.5 are interpreted as “Dissatisfied” and scores 7.5 and higher are interpreted as “Satisfied” (Patrick et al., 2001). According to the developers of the scale, the majority of older adults are generally satisfied with their overall quality of life (Patrick et al., 2001). The total score of the PQOL may range from zero to a maximum of 10, with higher scores indicating greater levels of quality of life.

A factor analysis of the 19-item PQOL within a sample of 2,500 well community-dwelling older adults investigated potential multidimensionality and identified three factors including (1) satisfaction with physical health and well-being, (2) satisfaction with social health and well-being, and (3) satisfaction with cognitive health and well-being (Patrick et al., 2001). The scale developers recommend using either the total score or the three subscales, although the total score has been reported most frequently in the literature (Patrick et al., 2001). Further, the authors of the instrument have not yet completed validation testing (Patrick et al., 2008).

In the current study, the internal consistency of the total PQOL scale across all five waves was good and ranged from 0.896 to 0.929. The internal consistency for the subscales in this study was good for the five-item physical dimension (ranged from
α=.779 to α=0.810) and the eleven-item social dimension (ranged from 0.866 to 0.895). The cognitive dimension, made up of only two items, had lower internal consistency (ranged from α=0.574 to α =0.604). Given the low number of items on the cognitive dimension, the internal consistency for the cognitive factor is acceptable.

Convergent validity was examined through testing the strength of the relationship between item 20, “How happy are you?” and the total PQOL score. Patrick and colleagues (2001) suggested that there should be a strong, positive relationship (e.g., Pearson’s correlation coefficient should exceed 0.70) between the total PQOL score and item 20. In this study, there is a strong positive relationship between the PQOL and item 20 across all waves; Pearson’s correlation coefficient ranged from 0.66 to 0.77.

**Formal Social Activity (Focal Predictor)**

Formal social activity was operationalized as the number of different social and leisure group activities older adults participated in that were organized by the CCRC. The Assessment of Community Use scale measures the frequency of participation in 17 social and leisure activities over the last month or year which were available to all of the participants in the study in a formally organized group format. These 17 different group activities provided an opportunity for socialization in passive and active leisure activities that were voluntarily selected by older adults depending on their preferences and interests. Examples of more passive leisure activities included going out to the movies, theater, or dinner groups with individuals from the CCRC. A variety of more active group activities were also available within the community, such as educational and self-
improvement pursuits organized community service projects, physical fitness classes, and
groups to express creativity through dance, music, and art. For example, one of the items
asks older adults, “During the past month, how often did you participate in art groups
such as ceramics, pottery, quilting or other craft workshops?” This measure was
designed by the Erickson Foundation in order to understand more about the interests and
preferences of older adults in terms of the group oriented leisure and social activities that
were offered, along with the frequency of participation. Response options for each item
included four categories: “not at all”, “1 time”, “2-3 times”, and “4 or more times”. In
the current study, participation was dichotomized (e.g., yes/no) for each formal social
activity and a total score of the number of social and leisure activities older adults took
part in was created.

*Four Types of Social Support (Focal Predictors)*

The Krause and Markides (1990) version of the widely used Inventory of Socially
Supportive Behaviors (ISSB, Barrera et al., 1981) assessed the frequency of socially
supportive behaviors that are given and received during the last two weeks. Response
options include “not at all,” “once in a while,” “fairly often” and “very often/about every
day”. Higher scores indicate that older adults more frequently give and receive various
kinds of assistance from members of their social network.

Older adults were asked to indicate how frequently they received three distinct
types of social support from family or friends: giving information, tangible assistance, or
expressing concern and emotional support, over the last two weeks. The ISSB also
captures how often older adults provided support to others (referred to as provided support). The four types of social support are consistent with the sub-scales of the Inventory of Socially Supportive Behaviors (Krause & Markides, 1990). The original numbers of items per sub-scales include informational support (7 items), tangible support (8 items), emotional support (12 items), and provided support (13 items) to assess these distinct types of social support (Krause & Markides, 1990).

The informational support sub-scale contains items that assess the extent to which family and friends shared advice, expertise, and referrals with the older person (e.g., “How often in the last two weeks has someone given you information that made a difficult situation clearer and easier to understand?”).

In response to an older person’s needs, tangible support refers to the frequency that older adults got help from someone who allowed the older person to borrow money or items, helped to complete a task, or looked after a family member or pet (e.g., “How often in the last two weeks has someone pitched in to help you do something that needed to get done, like household chores or yard work?”).

Older adults also may receive emotional support when someone expresses interest and concern for the well-being of the older person. The expression of care and concern produces feelings of closeness in personal relationships. For example, an item from the emotional support sub-scale asked, “How often in the last two weeks has someone comforted you by showing you physical affection like giving you a hug?”

In addition to receiving social support, older adults also provide support to others in personal relationships. Support provided includes behaviors given by older adults that are intended to be helpful to others within the context of interpersonal relationships (e.g.,
“In the last two weeks, have you expressed interest and concern in someone’s well-being?” or “In the last two weeks, have you helped someone with their shopping?”). Reported internal consistency estimates for the Inventory of Socially Supportive Behaviors (Barrera et al., 1981) among older adults range from 0.665 to 0.827 for subscales and from 0.792 to 0.838 for the global index (Krause & Borawski-Clark, 1995, Krause & Shaw, 2002). In this study, internal consistency for three of the four sub-scales was good, with the Cronbach’s alpha of 0.820 for the emotional support, 0.751 for the informational support, 0.817 for the provided support, and was moderate (0.516) for the tangible support subscale.

Each subscale also contains a single item measure of overall satisfaction with social support provided from their social network members (e.g., “Are you satisfied with the amount of support you (received from or provided to others), or do you wish that you had received help (or helped others) more often or less often?”). Response options include “more often,” “satisfied” and “less often.”

Table 1

*Operational Definitions, Measures, and Levels of Measurement of Focal Variables*
<table>
<thead>
<tr>
<th>Variable</th>
<th>Operational Definition</th>
<th>Measure</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Quality of Life (PQOL)</td>
<td>Overall satisfaction with older adult’s positions in life, including physical, social, and cognitive well-being.</td>
<td>Perceived Quality of Life (PQOL); (Patrick et al., 2001). 19 items with 11 point response option (0=extremely dissatisfied, 10=extremely satisfied). 19 items are summed and the median or mean score is interpreted (7.5 or above indicates satisfaction in cross-sectional studies). This scale includes subjective assessments of physical (5 items), social (11 items), and cognitive (2 items) functioning.</td>
<td></td>
</tr>
<tr>
<td>*Social Support Received</td>
<td>Assesses the frequency and satisfaction with helping behaviors that older adults accept from others within the context of interpersonal relationships in natural support systems.</td>
<td>Inventory of Socially Supportive Behaviors (Krause &amp; Markides, 1990) was used to measure the quantity and quality of social support received by the older adult in the last two weeks.</td>
<td></td>
</tr>
<tr>
<td>*Social Support Provided</td>
<td>Assesses the frequency and meaning of helping behaviors given by older adults that are intended to be helpful to others within the context of interpersonal relationships in natural support systems.</td>
<td>Inventory of Socially Supportive Behaviors (Krause &amp; Markides, 1990) was used to measure the quantity and quality of social support provided by the older adults in the last two weeks.</td>
<td></td>
</tr>
<tr>
<td>Formal Social Activity</td>
<td>Participation in and satisfaction with facility-organized group social activities within the community.</td>
<td>The Assessment of Community Use scale measured the frequency of participation in 17 formal social activities over the last month or the last year. Response options included four categories (1=not at all, 4=4 or more times) for every item. Participation may be dichotomized (Y/N) among 17 different group activities organized by the community.</td>
<td></td>
</tr>
</tbody>
</table>

Note: Quality of life before move-in was used as a control variable in the conditional latent growth model.
Covariates

Several socio-demographic and health variables were chosen for the cross-sectional and longitudinal model to control for heterogeneity in the sample in areas that are known to be associated with quality of life. These covariates include a variety of socio-demographic information (e.g., older adults’ age, gender, marital status, highest level of education completed, income level, and the location of their senior housing) as well as health and functional status. In the following section, each of the covariates will be briefly described.

Socio-Demographic Characteristics

- **Age:** Respondents provided information about their current age in an open-ended response format.
- **Gender:** Respondents selected their gender.
- **Marital Status:** Marital status was measured through five categories of current relationship type, including the options of single, married, widowed, separated, and divorced. In this study, marital status was dichotomized (e.g., widowed, not widowed).
- **Income Level:** Income level was measured through four current yearly income categories (e.g., under $15,000; $15,000-$25,000; $25,000-$35,000; and above $35,000). In this study, income level was dichotomized (e.g., above or below
$35,000) based on distribution of the income levels reported and the majority of respondents reported income in the highest category ($35,000 or above).

- **Educational Attainment**: Response options of highest year of education completed included grade school/middle school, high school, college, and post-college. The education variable was dichotomized (e.g., less than a bachelor’s degree or a bachelor’s degree or higher).

- **CCRC Site**: Participants in this study were recruited from the independent living sections within four different continuing care retirement communities, and this variable will control for differences between locations.

**Comorbidity and Functional Health**

- **Comorbidity**: The Medical Conditions Questionnaire portion of the Erickson Resident Profile asks respondents, “*Has a doctor or other health professional ever told you that you have...*” from a list of thirty common chronic diseases that offered yes/no response options. Chronic conditions listed include the following: cardiovascular disease (e.g., hypertension), peripheral vascular disease (e.g., stroke), neurological disease (e.g., Parkinson’s disease), musculoskeletal disease (e.g., osteoarthritis), respiratory disease (e.g., emphysema), and other diseases (e.g., cancer or diabetes). The total medical conditions scale was created through summing the number of self-reported medical conditions that are currently being treated so that higher scores indicate more diagnosed chronic conditions.
• **Functional Status:** Functional ability relates to the extent to which disability interferes with activities of daily living. As a widely utilized measure of functional status, the Fillenbaum (1988) version of the Activities of Daily Living (ADL) Scale was used to understand older persons’ ability to complete some everyday activities. This measure describes basic tasks of living (e.g., “Can you get in and out of bed...” or “Can you dress and undress yourself...”) through a total of 8 items. For each task, respondents select whether they can complete the task “without any help at all” (coded as 2), “with some help” (coded as 1), or “completely unable/totally dependent on someone” (coded as 0). Fillenbaum’s (1988) version of the Instrumental Activities of Daily Living Scale (IADL) was used to assess the older person’s ability to complete tasks in order to remain living independently (e.g., “Can you take your medication...” or “Can you handle your own money...”) through a total of 7 items. For each task, respondents select whether they can complete the task “without any help at all” (coded as 2), “with some help” (coded as 1), or “completely unable/ totalement dependent on someone” (coded as 0). In this dissertation, the ADL and IADL measures were combined through a mean score in which higher scores indicated better functional status.
Table 2

*Operational Definitions, Measures, and Levels of Measurement of Covariates*

<table>
<thead>
<tr>
<th>Covariates</th>
<th>Operational Definition</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Current age</td>
<td>Open-ended response</td>
</tr>
<tr>
<td>Gender</td>
<td>Self-identified sex</td>
<td>0=female, 1=male</td>
</tr>
<tr>
<td>Income Level</td>
<td>Current yearly income</td>
<td>2 categories (Under $35,000; Above $35,000)</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Relationship type</td>
<td>2 categories (not widowed; widowed)</td>
</tr>
<tr>
<td>Education</td>
<td>Years of education</td>
<td>2 categories (Less than Bachelor’s degree; Bachelor’s degree or higher)</td>
</tr>
<tr>
<td></td>
<td>completed</td>
<td></td>
</tr>
<tr>
<td>Total Medical Conditions</td>
<td>Self-reported medical conditions</td>
<td>Medical Conditions Questionnaire (sum of medical conditions)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fillenbaum (1988) Activities of Daily Living Scale (8 items) and Instrumental Activities of Daily Living Scale (7 items). Mean scores range from 0 (no assistance needed with any activities) to 2 (complete assistance in all activities).</td>
</tr>
</tbody>
</table>

*Note: * indicated variables with standardized measurements or indices/checklists

**Analysis Plan**

A latent growth model using a structural equation modeling approach was used to examine group and individual differences in quality of life over time, and to assess the influence of social engagement at one time point on quality of life over time. This kind of longitudinal structural equation modeling is best suited to analyze five waves of data,
as it allows for the examination of within-person change over time as well as between-person variability in quality of life over five years. The dataset met the assumptions of latent growth modeling because it has at least three waves of data, the outcome is a continuous scale, and data should be collected at equal intervals for all study participants (Byrne, 2010, p. 304-305). This technique also increases statistical power, tests the hypothesized predictors that influence changes in the outcome over time, minimizes measurement error, and makes use of all available data through the maximum likelihood estimation (Preacher, Wichman, MacCallum, & Briggs, 2008).

Missing data were handled through full information maximum likelihood (FIML) estimation, a state-of-the-art approach to handling missing data with the missing at random (MAR) or missing completely at random (MCAR) pattern (Bollen & Curran, 2006; Little & Rubin, 2002; Peugh & Enders, 2004; Schafer & Graham, 2002). The FIML estimation allows all information in the data for a case so that no cases are excluded for the analysis and it maintains the properties of the maximum likelihood estimation (Bollen & Curran, 2006, p. 65). The FIML technique is highly regarded among methodologists because it provides unbiased parameter estimates under a missing at random (MAR) pattern when there is multivariate normality (Enders, 2010; Schafer & Graham, 2002).

Data screening and preliminary analysis were performed by using SPSS version 20. The confirmatory factor analysis and cross-sectional structural equation modeling were analyzed in AMOS version 20. The latent growth modeling was analyzed in Mplus version 6.11.
Preliminary Analyses

The study required several preliminary analyses. First, the data were cleaned and item level frequencies were examined to identify inconsistencies or potential errors in coding. All variables in the study were examined to understand the extent to which the univariate observed variables have a normal distribution through assessing the degree of skewness and kurtosis. Kline (2005, p. 30) suggests that values of skewness below -3 or above +3 may be considered “extreme” skewness, and more liberal standards of below -10 and above +10 indicate “problematic” kurtosis (p. 50).

The descriptive statistics are reported according to the measures of central tendency and variability appropriate for the level of measurement (Weinbach & Grinnell, 2010, p. 59), as follows: descriptive statistics for ratio or interval level data are reported through means and standard deviations; ordinal level data is described through the median or mode and range; and nominal/categorical data is communicated through the mode, the frequency of value categories, and percentages.

Bivariate correlations to assess the relationship between continuous variables are reported through Pearson’s product moment correlation coefficient. The presence of multicollinearity (strong relationships between predictors $r > .80$) was also assessed. In addition, the reliability/internal consistency for all of the measures was estimated.

To begin to conceptualize the average trajectories of the repeated measures, general trends can be understood after examining the means, standard deviations, and correlations of the repeated measures over each wave of data collection (Bollen & Curran, 2006). These general trends may indicate whether the average score on quality of life is increasing or decreasing over time. The individual-level data may also be
examined to estimate a line that fits the repeated measures for the individual and provide an indication of process of change over time for the individual (Bollen & Curran, 2006).

Initial screening of multivariate multicollinearity and the presence of multivariate outliers or influential cases was evaluated through requesting the diagnostics from regression analyses, as suggested by Bowen and Guo (2012). Regression analyses with all of the variables in the model provide information about multivariate multicollinearity and multivariate non-normality (e.g., VIF, Mahalanobis’ distance, Cook’s distance). A problem with multivariate multicollinearity can be identified through a VIF value greater than 10 (Klein, 2005; Kutner, Nachtsheim, & Neter, 2004). Cases with a Cook’s D value of 1.0 or higher will be considered potentially influential cases (Cook & Weisberg, 1982). The Mahalanobis distance diagnostic statistic also provides information on multivariate multicollinearity (Klein, 2005, p. 51-52).

**Confirmatory Factor Analysis: Cross-Sectional Measurement Model**

Before testing the relationships among latent variables, confirmatory factor analyses (CFA’s) were run to determine whether the scales had good measurement properties within this group of older adults living in senior housing and to confirm the factor structure of quality of life. This process of testing the measurement model was completed through creating a model consistent with the hypothesized factor structure of the measures and determining whether or not the model was consistent with the data. The Perceived Quality of Life Scale has a three factor structure with physical, social, and cognitive dimensions of quality of life with specific items that load on only one of these three factors (Patrick et al., 1988). For example, the item that assessed “ability to think
and remember” was specified to load on the cognitive factor, but not the physical or social factors of the Perceived Quality of Life Scale (Patrick et al., 2001). Each item had a nonzero loading on the factor it was designed to measure, and a zero loading on all other factors (Byrne, 2010, p. 54). The CFA’s were run for the outcomes of quality of life as well as each type of social support separately. The four subscales of the Krause and Markides (1990) version of the Inventory of Socially Supportive Behaviors (Barrera et al., 1981) assess the extent to which older adults give and receive four different kinds of social support.

*Cross-Sectional Structural Equation Modeling (SEM)*

After establishing the measurement model through the CFA’s, the next step was to develop a structural model to test the hypothesized relationships among these social engagement predictors and quality of life for older adults who lived in the senior apartments for a year (see Figure 6). The cross-sectional model addresses the first research question (RQ1), “What explains quality of life for older adults at the time point when they have spent their first year in senior housing?” The strength of the relationships among the predictors was also assessed for potential multicollinearity. The constructs of four kinds of social support and quality of life were represented through factor scores that were created from the confirmatory factor analyses. As a preliminary analysis for the longitudinal study, this general structural equation model estimates the overall model fit for the data, tests hypothesized relationships, and identifies covariates with statistically significant relationships to quality of life.
Figure 6

Structural Model for Cross-Sectional SEM at Year One Testing the Effects of Social Engagement Predictors on Quality of Life (N=267)

Longitudinal Latent Growth Modeling (LGM) with Structural Equation Modeling Approach

A latent growth model using a structural equation modeling approach was used to examine inter- and intra-individual patterns of changes in quality of life over time and to assess the influence of social engagement at one point in time on quality of life over time. Advantages of the latent growth model include the ability to examine both within-person changes over time and between-person variability; increase statistical power, test the
hypothesized predictors that influence changes in the outcome over time, minimize measurement error, and maximize available data with the maximum likelihood estimation (Preacher, Wichman, MacCallum, & Briggs, 2008). Byrne (2010) provides several conditions that are necessary to satisfy the assumptions of latent growth modeling, as follows: the outcome should be a continuous scale, the data should be collected at equal intervals for all study participants, and data must be collected at three or more assessment timeframes (p. 304-305). Additionally, the sample size needs to be large enough to detect individual-level effects (Willett & Sayer, 1994).

Unconditional Latent Growth Model

As recommended by Jöreskog (1969), the latent growth model analysis will first test the unconditional linear latent trajectory model to focus on the process of change in quality of life over time. The model in Figure 2 pictorially represents the unconditional latent trajectory model of quality of life at five time points. In the figure, the latent variables of the intercept and slope are represented by circles, and the repeated measures of quality of life appear in boxes. The single-headed arrows signify the impact of the intercept or slope on the repeated measure of quality of life, and the double-headed arrow represents covariation of the intercept and slope. Conceptually, this analysis uses data from the repeated observed measures within an individual to estimate an unobserved (latent) trajectory of change that gives rise to the scores on the measures (Bollen & Curran, 2006, p. 35). This unconditional model investigates the change patterns in quality of life and analyzes the statistical significance of the intercept/slope mean and the intercept/slope variance of quality of life.
The unconditional latent growth model addresses the second and third research questions, to determine if there is individual variability in the initial status of quality of life among older adults living in senior housing or rates of change over time (RQ2), and to examine how quality of life changes over time (RQ3). To determine the pattern of change in quality of life over time, different models of change are tested and compared to determine which pattern of change best fits the data. First, a linear pattern of change is represented through fixing the intercept of the five repeated measures of quality of life to one, and fixing the linear slope parameters based on each year of assessment to model change as a function of time. The waves of data represent years since moving in to the senior housing, assessed annually (e.g., 0 (year 1), 1 (year 2), 2 (year 3), 3 (year 4), and 4 (year 5). Other patterns of change may be tested through freeing a slope parameter and comparing these models through the chi square difference test. Ultimately, the best fitting and most parsimonious model that fits the data will be accepted and used in the conditional model.

In the unconditional model, each annual measurement of quality of life is an indicator of two latent growth factors (the intercept and slope). Model identification is confirmed if there are unique solutions for the model parameters of the variances, covariances, and means of the observed data from at least three time points and if there are at least as many known parameters as unknown model parameters (Bollen & Curran, 2006, p. 129). The intercept and slope are expected to covary so that the initial levels of quality of life are expected to be related to the rate of change.

The unconditional latent growth model provides information about the average level of quality of life of older adults living in senior housing over time by modeling the
mean and covariance structures of the observed indicators. The results of this analysis provide: (1) an estimate of the mean baseline status of all older adults in the sample and an average rate of change in quality of life over time, (2) an estimate of the variance in the intercept and slope factors that provide information about the amount of variability of the random intercepts and random slopes around the mean, and (3) an estimate of the covariance between the intercept and slope.

In latent growth models, individual trajectories are computed from the mean intercept (the initial status), the mean slope (rate of change), and a disturbance term, as the equation below details (Bollen & Curran, 2006, p. 21):

\[ y_{it} = (\mu_\alpha + \lambda_t \mu_\beta) + (\zeta_{\alpha i} + \lambda_t \zeta_{\beta i} + \epsilon_{it}) \]

**Definition of Symbols:**
y_{it} = Value of the trajectory variable y for the ith case at time t
i = The total number of cases
t = The total number of time points
\( \lambda_t \) = Value of the outcome for time t
\( \mu_\alpha \) = The mean of the intercepts
\( \mu_\beta \) = The mean of the slopes
\( \zeta_{\alpha i} \) = Disturbance deviation from \( \mu_\alpha \) for case i
\( \zeta_{\beta i} \) = Disturbance deviation from \( \mu_\beta \) for case i
\( \epsilon_{it} \) = Disturbance (assumed to equal zero)

**Conditional Latent Growth Model with Covariates**

After determining the pattern of change in quality of life from the conditional model, the next step in the latent growth model is to add predictors and covariates in the conditional model. The conditional latent growth model estimates the means and the variance of both the intercept (the initial status) and slope (the rate of change) over time. It also determines the extent to which social engagement influences the variation in the latent factors of quality of life over time, after controlling for covariates (see Figure 4).
Research question 4 (RQ4), which tests the influence of the types of social support and formal social activity on quality of life over time, is examined through the direct effects of the predictors and covariates at the end of year one on the repeated measure of quality of life. The conceptual model in Figure 4 includes all of the variables in the full model.

Covariates include the social engagement predictors (formal social activity and four kinds of social support) and the following control variables: age, gender, education, income, widowhood, functional status, comorbidity, CCRC site, and quality of life before move-in. In the analysis, the intercept and slope were regressed on the covariates.

In the latent growth model, the variances and covariances of the intercept and slope are reviewed to provide an indication of variances in trajectories. If confidence intervals include zero, the variance of the individual trajectory is not significantly different from the group’s mean intercept of slope. Additionally, the magnitude, direction, and significance of the parameter estimates were examined closely. The estimates from the conditional model are interpreted through the direct effects of covariates and predictors on latent growth factors.

The combined equation (Bollen & Curran, 2006, p. 129) to calculate trajectories with fourteen predictors and covariates follows:

\[ Y_{it} = (\mu_a + \lambda \mu_p) + (\gamma_{a1} + \lambda \gamma_{p1})x_{1i} + (\gamma_{a2} + \lambda \gamma_{p2})x_{2i} + (\gamma_{a3} + \lambda \gamma_{p3})x_{3i} + (\gamma_{a4} + \lambda \gamma_{p4})x_{4i} + (\gamma_{a5} + \lambda \gamma_{p5})x_{5i} + (\gamma_{a6} + \lambda \gamma_{p6})x_{6i} + (\gamma_{a7} + \lambda \gamma_{p7})x_{7i} + (\gamma_{a8} + \lambda \gamma_{p8})x_{8i} + (\gamma_{a9} + \lambda \gamma_{p9})x_{9i} + (\gamma_{a10} + \lambda \gamma_{p10})x_{10i} + (\gamma_{a11} + \lambda \gamma_{p11})x_{11i} + (\gamma_{a12} + \lambda \gamma_{p12})x_{12i} + (\gamma_{a13} + \lambda \gamma_{p13})x_{13i} + (\gamma_{a14} + \lambda \gamma_{p14})x_{14i} + (\xi_{ai} + \lambda \xi_{p1i} + \epsilon_{it}) \]

Definition of Symbols:
- \( Y_{it} \) = Value of the trajectory variable y for the i'th case at time t
- \( i \) = The total number of cases
- \( t \) = The total number of time points
- \( \mu_a \) = The mean of the intercepts when the covariate coefficients are zero
\( \mu_\beta \) = The mean of the slopes when the covariate coefficients are zero
\( x_I \) = The covariates or predictors in the random intercept equation (e.g., \( x_1, x_2, x_3 \))
\( \gamma_{\alpha i} \) = The covariate coefficients for the predictors of the random intercepts
\( \gamma_{\beta i} \) = The covariate coefficients for the predictors of the random slopes
\( \lambda_t \) = Value of the outcome variable for time \( t \)
\( \zeta_{\alpha i} \) = Disturbance deviation from \( \mu_\alpha \) for case \( i \)
\( \zeta_{\beta i} \) = Disturbance deviation from \( \mu_\beta \) for case \( i \)
\( \varepsilon_{it} \) = Disturbance (assumed to equal zero)

**Model Fit**

Appropriateness of the model to the data was determined through several indicators of model fit. The model chi-square \( (\chi^2) \) is the most common fit statistic which tests the significance of the null hypothesis that the input and implied matrices are statistically equivalent. It is most desirable for the \( \chi^2 \) value to be statistically non-significant, to conclude that the model is consistent with the data, yet the model chi-square is sensitive to sample size. Also, the large sample size requirements of SEM often make it difficult to meet the absolute fit index criteria of non-significance. According to Bowen and Guo (2012), “Although the \( \chi^2 \) value should always be reported, it is widely considered acceptable to conclude that a model fits the data well even if the value is statistically significant, if other preselected fit indices meet their established criteria for fit” (p. 144). A chi-square difference test can be used to compare the goodness of fit for two models.

Model fit is further assessed through several supplemental indices of model fit, such as the comparative fit index (CFI, Bentler, 1990), the Tucker Lewis Index (TLI, Tucker & Lewis, 1972), and the root mean square error of approximation (RMSEA). The baseline fit indices of CFI and TLI compare a more restricted baseline model to the hypothesized model and provide researchers with criteria to assess the overall model fit.
to the data (Bollen and Curran, 2006). Criteria that suggest a good fit include a CFI value equal to or greater than 0.90 (Bentler, 1990) and a TLI (Tucker and Lewis, 1973) value of not less than 0.9 or above 1.2 (1 is an ideal fit). More stringent criteria for assessing the comparative fit indices suggest a value of .95 or higher for CFI and TLI (Bowen & Guo, 2012). The RMSEA (Steiger & Lind, 1980) is a stand-alone index that tests how poorly the model fits the data. Lower values on the RMSEA indicate a better fit so that values of 0.05 or less are considered a good fit, values less than or equal to 0.08 are considered an adequate or reasonable fit, and values above 0.1 indicate a poor fit (Browne & Cudeck, 1993).

**Handling of Missing Data**

The strategies to handle missing data and attrition are important due to this study’s longitudinal research design. Study inclusion criteria required older adults to remain in an independent living setting without cognitive impairment (maintaining a score of 24 or above on the MMSE, Folstein et al., 1975) throughout the duration of the study. At any point in the longitudinal study, “inactive” participants included those who experienced a transition such as a decline in health status (n=11, 3.7%), moved to a higher acuity assisted living or skilled nursing care setting (n=11, 3.7%), cognitive impairment (n=24, 8.0%), or death (n=31, 10.3%), as well as those who voluntarily withdrew from the study (e.g., moved away from the community (n=12, 4.0%) or who lost interest in continuing with the study (n=27, 9.0%). The original study did not follow up with individuals who became “inactive.” The total sample that enrolled baseline (N=300) lost cases at each annual wave of data collection, described in Figure 7. The current
study includes those participants who were active after living in senior housing for one year in the longitudinal analysis. By the last wave of data collection (year 5), 184 or 61.3% of the original sample remained active participants.
Figure 7

Erickson Life Study Attrition Over Five Years

Baseline Sample
(N = 300)

After 1 Year: Wave 1
(N = 276)

Withdrawals Year 1 (n=24, 8%)
- 16 Transitioned (Moved to long term care; medical reasons; low cognitive score; or passed away)
- 8 Voluntarily Withdrew (Not interested; Moved to another independent living environment)

After 2 Years: Wave 2
(N = 248)

Withdrawals (n=28, 9.3%)
- 14 Transitioned (Moved to long term care; medical reasons; low cognitive score; or passed away)
- 14 Voluntarily Withdrew (Not interested; Moved to another independent living environment)

After 3 Years: Wave 3
(N = 221)

Withdrawals (n=27, 9%)
- 17 Transitioned (Moved to long term care; medical reasons; low cognitive score; or passed away)
- 10 Voluntarily Withdrew (Not interested; Moved to another independent living environment)

After 4 Years: Wave 4
(N= 204)

Withdrawals (n=17, 5.7%)
- 14 Transitioned (Moved to long term care; medical reasons; low cognitive score; or passed away)
- 3 Voluntarily Withdrew (Not interested; Moved to another independent living environment)

After 5 Years: Wave 5
(N= 184)

Withdrawals (n=20, 6.7%)
- 16 Transitioned (Moved to long term care; medical reasons; low cognitive score; or passed away)
- 4 Voluntarily Withdrew (Not interested; Moved to another independent living environment)
To understand the level and nature of missing data, a descriptive analysis examined the extent of missing data at the item level, providing information about the number and percentage of missing data for each variable. Patterns of missing data were examined to determine whether the missing data are missing completely at random (MCAR), missing at random (MAR) or missing not at random (MNAR) (Rubin, 1976, 1987; Little & Rubin, 2002). Patterns of missing data over time were identified through coding each unique pattern across all waves of data. Fourteen patterns of missing data were found, which were simplified into three main categories (completers, dropouts, and all other patterns). An analysis of variance compared the group means of the quality of life scores by these three patterns of missingness. The ANOVA results indicated that there were no statistically significant differences between the mean scores of the completers, the dropouts, and all other patterns at baseline \((F (2, 288) = 1.61, p > 0.05)\), year 1 \((F (2, 259) = .862, p > 0.05)\), year 2 \((F (2, 255) = 2.081, p > 0.05)\), year 3 \((F (2, 185) = 1.525, p > 0.05)\), year 4 \((F (2, 192) = 0.339, p > 0.05)\), and time 5 \((F (1, 174) = 0.052, p > 0.05)\). Similar mean values that are not statistically significant allow a researcher to preliminarily conclude that patterns of missing data are missing at random (MAR). In this study, fives waves of data will be used for the analysis, from year one through year five.

Full information maximum likelihood estimation was used in this study because it is widely regarded as a state-of-the-art approach to handling missing data with the missing at random (MAR) or missing completely at random (MCAR) pattern (Bollen & Curran, 2006; Little & Rubin, 2002; Peugh & Enders, 2004; Schafer & Graham, 2002). This approach improves upon traditional methods of listwise or pairwise deletion of
missing data. According to Bollen and Curran (2006), several advantages to using maximum likelihood estimation include that it (1) maintains the asymptotic properties of ML estimators such as consistency, asymptotic unbiasedness, asymptotic normality, and asymptotic efficiency, and permits the computation of asymptotic estimates of standard errors for significance testing (Arbuckle, 1996) which provides for the availability of all parameter estimates, asymptotic standard errors, and significance tests; (2) is appropriate for both MCAR and MAR patterns of missing data; and (3) includes all available information in the data for a case so that no cases are excluded from the analysis (p. 65). The full information maximum likelihood technique is highly regarded among methodologists because it provides unbiased parameter estimates under a missing at random (MAR) pattern, although it requires multivariate normality (Enders, 2010; Schafer & Graham, 2002).

**Power Considerations**

The purpose of a power analysis is to understand the probability of rejecting a null hypothesis that is true (α), the statistical power needed to reject a false null hypothesis (β), and to determine adequate sample size for the estimated effect size (Cohen, 1988). Before conducting the cross-sectional or longitudinal analysis, the sample size should be assessed to ensure adequate statistical power. For a structural equation model, a common rule of thumb suggests that a sample of less than 100 is considered “small,” between 100 and 200 participants “medium,” and more than 200 as “large” (Kline, 1998); however more complex models usually require larger sample sizes. In this study, statistical power was estimated by the root mean square error of approximation (MacCallum, Brown, &
Sugawara, 1996; Kline, 2011). The Rweb computer software program developed by Preacher and Coffman (2006) performed the power analysis by setting the criteria as an alpha level of .05. The statistical power for the cross-sectional structural equation model exceeded the desired power level of .80 (Cohen, 1988).

Since measurement error is removed in the latent growth model approach, reliability and power generally increase while sample size requirements often decrease. A power analysis determined the sample size needed for latent growth model statistical analysis. The power analysis was completed using a Monte Carlo studies approach to determining the adequacy of the sample size and power using the Mplus statistical software program (Muthén & Muthén, 2002). The power analysis was completed first with the unconditional model with no predictors or covariates. The conditional model was run with an estimated number of covariates and selected regression coefficients to estimate small and medium effect sizes (Cohen, 1969). Results from the power analysis indicate that the sample size available over five waves is sufficient to complete the latent growth model analysis. The Erickson Life Study satisfies the requirement of three or more repeated observations to estimate underlying linear trajectories and model parameters for the structural equation modeling approach to latent growth models (Bollen & Curran, 2006).

**Human Subjects**

This study was granted exemption by the Institutional Review Board (IRB) of Case Western Reserve University (CWRU) on February 2, 2012 (IRB Protocol Number 20120113). The current study involves a secondary analysis of existing retrospective
data in which participants cannot be identified either directly or through identifiers linked to the participants. All data are stored under a participant assigned numeric identifier, and these data will be analyzed and reported in aggregate form. The original study that collected that data was approved by the University of Maryland – Baltimore IRB, and ethical procedures were followed regarding informed consent, voluntary participation, and confidentiality.
Chapter Four: Results

A descriptive overview of the study variables is presented first, with a review of bivariate relationships. This is followed by a presentation of confirmatory factor analyses that examined the measurement properties of quality of life and social support. The cross-sectional structural equation model describes the effects of social engagement, measured through four types of social support and formal social activity participation within the continuing care retirement community, on quality of life after living in senior housing for one year. The purpose of this analysis is to gain a preliminary understanding of the nature of relationships between the predictors of social engagement and quality of life, after controlling for some demographic, health and functioning characteristics of participants and the location of the senior housing site. The cross-sectional structural equation model addressed the first research question in this study and informed the selection of significant covariates for the longitudinal analysis.

As the focal analytic strategy, the latent growth model was conducted in two steps. First, the unconditional model which included only the repeated measures of quality of life examined individual variability in the initial status and patterns of change in quality of life over time. This unconditional latent growth model addressed the second and third research questions, determine the extent of individual differences in quality of life in terms of the initial status and variation in the rate of change of quality of life over time, and to examine how quality of life changes over time for the group. Finally, the conditional model was tested to examine the influence of social engagement, measured
through four types of social support and formal social activity participation, on the initial status and rate of change in quality of life, after controlling for covariates.

**Description of the Sample: Univariate Statistics**

At move-in, respondent ages ranged from 60 to 94, with an average age of 78 years ($SD = 6.1$). Table 3 shows descriptive information about the sample at the time of move-in. About half of the sample were married (52%), 40.7 percent were widowed, and 4% were single. Approximately two-thirds (65.3%) were female. On average, participants reported 3.3 medical conditions ($SD = 2.1$). The majority of participants reported very good physical functioning, and 75% of the older adults living in the senior apartments did not need any help completing self-care tasks, the activities of daily living (ADLs) such as eating, dressing, and grooming. In addition, 88% did not require any help at all with instrumental activities of daily living (IADLs), those activities that are necessary to live independently, such as taking medications, managing money, or doing housework. In terms of education, 53% held a bachelor’s degree or higher. Ninety six percent of the respondents were Caucasian, and two-thirds (66.3%) reported income greater than $35,000 per year. Table 4 describes changes in demographic characteristics for the sample over time.
### Table 3

**Demographic Characteristics of Sample at Year 1 (N=267)**

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>%</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>78.8</td>
<td>6.0</td>
<td></td>
<td>61</td>
<td>95</td>
</tr>
<tr>
<td>Female</td>
<td>176</td>
<td>65.9%</td>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Bachelor's or Higher</td>
<td>159</td>
<td>53%</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Widowed</td>
<td>109</td>
<td>40.8%</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Income &gt; $35,000/year</td>
<td>182</td>
<td>69.5%</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Comorbidity</td>
<td>3.8</td>
<td>2.0</td>
<td></td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>ADL</td>
<td>15.3</td>
<td>1.3</td>
<td></td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td>IADL</td>
<td>13.6</td>
<td>1.2</td>
<td></td>
<td>7</td>
<td>14</td>
</tr>
</tbody>
</table>

**Note:** Highest level of education completed was measured through four categories (grade school/middle school, high school, bachelor’s degree, post-bachelor’s or higher). Marital status was measured through five categories (single, married, widowed, separated, and divorced). Annual income was measured through four categories (Under $15,000, $15,000-$25,000, $25,000-$25,000, and $35,000 and above). Comorbidity is the total number of medical conditions reported by participants. Functional status was measured through the Fillenbaum ADL (Activities of Daily Living) and IADL (Instrumental Activities of Daily Living). _M_=Mean, _SD_=Standard Deviation.
Table 4

Demographic Characteristics of Sample over Time

<table>
<thead>
<tr>
<th>Wave</th>
<th>Baseline (n=300)</th>
<th>Year 1 (n=267)</th>
<th>Year 2 (n=239)</th>
<th>Year 3 (n=205)</th>
<th>Year 4 (n=194)</th>
<th>Year 5 (n=175)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Size</td>
<td>100%</td>
<td>89%</td>
<td>80%</td>
<td>68%</td>
<td>65%</td>
<td>58%</td>
</tr>
<tr>
<td>Age</td>
<td>78.1 (6.1)</td>
<td>78.8 (6.0)</td>
<td>79.6 (6.2)</td>
<td>80.3 (6.2)</td>
<td>81.3 (6.0)</td>
<td>82.2 (6.0)</td>
</tr>
<tr>
<td>Female</td>
<td>196 (65%)</td>
<td>176 (66%)</td>
<td>166 (67%)</td>
<td>148 (67%)</td>
<td>138 (68%)</td>
<td>119 (68%)</td>
</tr>
<tr>
<td>Bachelor's +</td>
<td>159 (53%)</td>
<td>145 (54%)</td>
<td>130 (52%)</td>
<td>117 (53%)</td>
<td>108 (53%)</td>
<td>93 (53%)</td>
</tr>
<tr>
<td>Widowed</td>
<td>122 (41%)</td>
<td>109 (41%)</td>
<td>103 (43%)</td>
<td>94 (46%)</td>
<td>93 (48%)</td>
<td>83 (47%)</td>
</tr>
<tr>
<td>Income</td>
<td>193 (66%)</td>
<td>182 (70%)</td>
<td>159 (68%)</td>
<td>140 (68%)</td>
<td>133 (71%)</td>
<td>123 (71%)</td>
</tr>
<tr>
<td>$35K+</td>
<td>3.3 (2.1)</td>
<td>3.8 (2.0)</td>
<td>4.4 (2.4)</td>
<td>4.4 (2.3)</td>
<td>4.2 (2.5)</td>
<td>5.0 (2.9)</td>
</tr>
<tr>
<td>Comorbidity</td>
<td>15.4 (1.1)</td>
<td>15.3 (1.3)</td>
<td>15.4 (1.1)</td>
<td>15.5(1.1)</td>
<td>15.2 (1.3)</td>
<td>15.2 (1.5)</td>
</tr>
<tr>
<td>IADL</td>
<td>13.7 (0.9)</td>
<td>13.6 (1.2)</td>
<td>13.6 (1.0)</td>
<td>13.7 (0.9)</td>
<td>13.5 (1.2)</td>
<td>13.5 (1.1)</td>
</tr>
</tbody>
</table>

Note: The following variables were dummy-coded: education (below bachelor’s degree, bachelor’s degree or higher), marital status (not widowed, widowed), annual income (below $35,000, $35,000 or above). Comorbidity = total number of medical conditions reported by participants. Functional status was measured through ADL (Activities of Daily Living) and IADL (Instrumental Activities of Daily Living). M=Mean, SD=Standard Deviation.

Quality of life was measured through the Perceived Quality of Life Scale (Patrick et al., 2001). This measure includes the social, physical, and cognitive dimensions of quality of life and items ask respondents to indicate the extent to which they are satisfied with the quality of their lives. As shown in Figure 8, after an initial increase in quality of
life between the time of move-in and the first year, average scores indicate a declining trend in quality of life over time.

Figure 8

*Average Perceived Quality of Life Scores over Time*

The authors of the Perceived Quality of Life Scale (Patrick et al., 2001) identified a cutoff value of 7.5 to indicate overall satisfaction (e.g., below 7.5 is interpreted as “not satisfied”, 7.5 or above is interpreted as “satisfied”). During the first five years of living in senior housing, the number of older adults who were satisfied with their quality of life ranged from a high of 78.1% at the one year point to a low of 66% during the last wave of data collection (shown in Figure 9).
Social engagement is operationalized in this study through participation in formal social activities organized by the CCRC as well as giving and receiving social support. Older people living in senior housing for one year were actively involved in the organized activities of the CCRC. On average, respondents participated in an average of 5.634 ($SD=2.45$) different formal social activities organized by the CCRC over the last year (range from 0 to 17). As shown in Table 5, the most popular formal social activities were going out to movies (80.1%), concerts (77.2%), or the theater (55.8%), and participating in social engagement events such as dinner groups or tour groups (53.2%). On average, participants went out to the movies ($M=2.03$, $SD=1.18$) and concerts ($M=1.90$, $SD=1.20$) between two to three times per year. Respondents reported going to the theater ($M=1.11$, $SD=1.16$), social engagement events ($M=1.38$, $SD=1.39$), volunteering to serve the community ($M=1.22$, $SD=1.45$), and attending educational offerings about once a year ($M=0.97$, $SD=1.35$). Older adults also attended other groups, according to their interests and preferences. These included a spiritual development
group, the health club and exercise groups, alumni groups, support groups, as well as other special interest groups for games, hobbies, computer users, art, music, and dance.

Table 5

*Formal Social Activity Participation after 1 Year in Senior Housing (N=267)*

<table>
<thead>
<tr>
<th>Types of Formal Social Activity</th>
<th>N</th>
<th>%</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movies Group (Annually)</td>
<td>214</td>
<td>80.1</td>
<td>2.03</td>
<td>1.18</td>
</tr>
<tr>
<td>Concerts Group (Annually)</td>
<td>206</td>
<td>77.2</td>
<td>1.90</td>
<td>1.20</td>
</tr>
<tr>
<td>Theater Group (Annually)</td>
<td>149</td>
<td>55.8</td>
<td>1.11</td>
<td>1.16</td>
</tr>
<tr>
<td>Social Engagement Group (Annually)</td>
<td>142</td>
<td>53.2</td>
<td>1.38</td>
<td>1.39</td>
</tr>
<tr>
<td>Game Group (Monthly)</td>
<td>120</td>
<td>44.9</td>
<td>1.20</td>
<td>1.40</td>
</tr>
<tr>
<td>Community Service Group (Annually)</td>
<td>113</td>
<td>42.3</td>
<td>1.22</td>
<td>1.45</td>
</tr>
<tr>
<td>Educational Group (Annually)</td>
<td>95</td>
<td>35.6</td>
<td>0.97</td>
<td>1.35</td>
</tr>
<tr>
<td>Spiritual Development Group (Monthly)</td>
<td>87</td>
<td>32.6</td>
<td>0.84</td>
<td>1.27</td>
</tr>
<tr>
<td>Health Club Group (Monthly)</td>
<td>65</td>
<td>24.3</td>
<td>0.72</td>
<td>1.27</td>
</tr>
<tr>
<td>Exercise Group (Monthly)</td>
<td>61</td>
<td>22.8</td>
<td>0.63</td>
<td>1.19</td>
</tr>
<tr>
<td>Alumni Group (Annually)</td>
<td>53</td>
<td>19.9</td>
<td>0.35</td>
<td>0.80</td>
</tr>
<tr>
<td>Hobby Group (Monthly)</td>
<td>52</td>
<td>19.0</td>
<td>0.39</td>
<td>0.88</td>
</tr>
<tr>
<td>Computer Group (Annually)</td>
<td>47</td>
<td>17.6</td>
<td>0.46</td>
<td>1.03</td>
</tr>
<tr>
<td>Support Group (Annually)</td>
<td>39</td>
<td>14.6</td>
<td>0.39</td>
<td>0.96</td>
</tr>
<tr>
<td>Art Group (Monthly)</td>
<td>32</td>
<td>12.0</td>
<td>0.30</td>
<td>0.86</td>
</tr>
<tr>
<td>Music Group (Monthly)</td>
<td>17</td>
<td>6.4</td>
<td>0.19</td>
<td>0.73</td>
</tr>
<tr>
<td>Dance Group (Monthly)</td>
<td>14</td>
<td>5.2</td>
<td>0.10</td>
<td>0.50</td>
</tr>
</tbody>
</table>
Note: The frequency of formal social activity participation was measured through 4 categories. Participation in art, dance, exercise and physical health, games, hobby, music, spiritual, and health club groups was assessed monthly (0= none at all/never, 1=1 time per month, 2=2-3 times per month, and 3=4 or more times per month), while participation in alumni groups, community service, education, computer support, movies, concerts, social engagement, support groups and theater was assessed annually (0=none at all/never, 1=1 time, 2=2-3 times, and 3=4 or more times per year) All activities had the full range of participation.

After living in senior housing for the first year, older adults indicated the extent to which they were involved in receiving three types of social support and giving social support to others over the last two weeks. In this sample, low levels of receiving informational support ($M=0.18$, $SD=0.30$) and receiving tangible support ($M=0.22$, $SD=0.23$) were reported. However, when they rated their satisfaction of each type of support, 97.4% were satisfied with the level of tangible support they received, and 95.5% were satisfied with the level of informational support they received. Only 2.6% reported a need for more tangible support, and 3.7% indicated a need for more informational support. These older adults indicated a higher endorsement of receiving emotional support ($M=0.61$, $SD=0.44$), and 95.9% of the sample reported being satisfied with the amount of emotional support received over the last two weeks (4.1% said that they could have used emotional support more often). Overall, the majority of senior housing dwellers were satisfied with the amount of social support they received, and they reported receiving emotional support more frequently in their personal relationships than tangible or informational support.

Descriptive information also suggests that older adults were actively involved with providing support to their family, friends, and neighbors ($M=0.62$, $SD=0.41$) after living in senior housing for a year. In terms of their satisfaction with the amount of social
Table 6

*Means, Standard Deviations, and Coding for Observed Variables*

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Coding Scheme</th>
<th>Min</th>
<th>Max</th>
<th>M</th>
<th>SD</th>
</tr>
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<tbody>
<tr>
<td><strong>Social Engagement at Year 1</strong></td>
<td></td>
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<td></td>
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<tr>
<td>Formal Social Activity</td>
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<td>Emotional</td>
<td>Range 0 to 3</td>
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<td>2.4</td>
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<td>Informational</td>
<td>Range 0 to 3</td>
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<td>1.6</td>
<td>0.18</td>
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</tr>
<tr>
<td>Tangible</td>
<td>Range 0 to 3</td>
<td>0</td>
<td>1.3</td>
<td>0.22</td>
<td>0.23</td>
</tr>
<tr>
<td>Provided</td>
<td>Range 0 to 3</td>
<td>0</td>
<td>2.1</td>
<td>0.62</td>
<td>0.41</td>
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<tr>
<td><strong>Perceived Quality of Life</strong></td>
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</tr>
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<td>Baseline</td>
<td>Range 0 to 10</td>
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<td>Year 3</td>
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<td>Year 5</td>
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<td>7.87</td>
<td>1.25</td>
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</tbody>
</table>

support they provided, 84.2% reported being satisfied; however, 15.8% expressed that they wished they could have provided support to others more often. In sum, older people received emotional support in close personal relationships and provided support to others more often than receiving tangible or informational support. While the majority reported
being satisfied with the amount of socially supportive behaviors received, a portion of the older adults living in senior housing (about 16%) wanted to provide more support to others. Table 6 provides summary descriptive information about the coding and average scores for the observed variables, including formal social activity, four kinds of social support, and quality of life.

**Bivariate Analyses**

It is also important to examine the bivariate correlations among variables in the study to understand relationships among variables. Data were screened for problematic multicollinearity, as indicated by values of 0.85 or above (Kline, 1998). The correlation analysis (Table 7) describes the strength and direction among variables planned for the analyses.

As shown on Table 7, the repeated measures of quality of life were significantly related to one another. For each wave of data, quality of life was strongly and positively related to the other annual assessments (\( r \) values range from 0.611 to 0.782, \( p<.01 \)).

Significant bivariate relationships also described positive relationships among the types of social support reported by older adults after living in senior housing for one year. The different kinds of social support were positively related to each other through weak to moderate strength relationships. For example, providing support to family and friends was significantly associated with receiving emotional support (\( r = .541, p<.01 \)) and informational support (\( r = .283, p<.01 \)).

Bivariate relationships also described how different kinds of social support and formal activity participation are related to quality of life over time. As Table 7 shows, receiving informational and tangible support at year one was consistently associated with
a lower quality of life over time. On the other hand, receiving emotional support and providing social support to others in the first year were associated with a better quality of life. Lastly, involvement in a higher number of social and leisure activities organized by the CCRC was also associated with better quality of life over time.

At the time of moving into senior housing, there was a weak positive relationship between participating in formal social activities and quality of life ($r = .207, p < .05$), a weak positive relationship between functional health and quality of life ($r = .139, p < .05$), a weak negative relationship between comorbidity and quality of life ($r = -.204, p < .05$), and a weak negative relationship between receiving tangible support and quality of life ($r = -.229, p < .01$). Informational support, emotional support, and provided support were not significantly related to quality of life. Also, there were non-significant associations between quality of life and CCRC site, gender, or level of education completed at the time of move-in. However, receiving informational support ($r = .211, p < .05$) and providing support to others ($r = .320, p < .01$) were related to the CCRC site.

After living in senior housing for one year, receiving informational support and tangible support was negatively correlated with quality of life ($r = -.199, p < .05$). Therefore, higher quality of life after living in senior housing for one year was associated with participating in formal social activities, receiving less tangible ($r = -.290, p < .01$) and informational support ($r = -.199, p < .05$), having fewer medical conditions ($r = -.230, p < .01$), and functioning at a high level ($r = -.250, p < .01$) to carry out the tasks of daily living independently. In conclusion, the correlation analysis has identified significant relationships among study variables and this finding warrants a more formal test of the theoretical model.
<table>
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<td>.686**</td>
<td>.723**</td>
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<td>Info. (YR1)</td>
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<td>-.199*</td>
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<td>-.047</td>
<td>-.046</td>
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<td>-.290*</td>
<td>-.228*</td>
<td>-.226*</td>
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<td>.041</td>
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<td>.029</td>
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<td>.175</td>
<td>.283**</td>
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<td>.541**</td>
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<td>.205*</td>
<td>.258**</td>
<td>.247**</td>
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<td>-.042</td>
<td>-.004</td>
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<td>.192*</td>
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<td>12</td>
<td>Gender</td>
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<td>-.090</td>
<td>-.048</td>
<td>-.109</td>
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<td>-.031</td>
<td>.274**</td>
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<td>13</td>
<td>Functioning (YR1)</td>
<td>.193*</td>
<td>.250**</td>
<td>.243**</td>
<td>.207*</td>
<td>.164</td>
<td>.217</td>
<td>-.122</td>
<td>-.219*</td>
<td>-.031</td>
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<td>.068</td>
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<td>.097</td>
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<td>-.230**</td>
<td>-.311**</td>
<td>-.304**</td>
<td>-.204*</td>
<td>-.293**</td>
<td>.070</td>
<td>.102</td>
<td>-.067</td>
<td>-.069</td>
<td>-.033</td>
<td>-.038</td>
<td>-.129</td>
<td>-.278**</td>
</tr>
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<td>15</td>
<td>Site (YR1)</td>
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<td>.002</td>
<td>-.044</td>
<td>-.050</td>
<td>-.003</td>
<td>.059</td>
<td>.211*</td>
<td>.154</td>
<td>.172</td>
<td>.320**</td>
<td>.075</td>
<td>.120</td>
<td>-.032</td>
<td>.080</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01, ***p < .001. (two-tailed test)
Cross-Sectional Structural Equation Model

Data Preparation

To prepare data for structural equation modeling, several steps were completed. First, the univariate normality was assessed by examining the skewness and kurtosis of all items. A review of the exploratory factor analyses of each social support sub-scale examined how the items loaded on informational support received, tangible support received, emotional support received, and social support provided. As a result of low loadings (below 0.4), two items (“Told you who to see for assistance”…. and “Helped you understand why you didn’t do something well”) were removed from the informational support sub-scale. Also, very low loadings from the tangible support subscale suggested that four items should be removed. These items asked respondents about the frequency that someone loaned them money, watched their possessions, looked after a family member, or provided them with a place to stay. Therefore, the final subscales of social support were made up of the following number of items: Tangible Support Received (4 items), Informational Support Received (5 items), Emotional Support Received (12 items), and Provided Support (13 items).

Missing Data

The extent of missing data for the cross-sectional analysis was minimal. All variables had less than 5% missing values. Only three cases were missing on two items (1.1% of the sample at year one) that asked older adults about the extent to which they are dissatisfied or satisfied with (1) how you are respected by others, and (2) the meaning and purpose of your life. Incomplete data were handled by using a Full Information
Maximum Likelihood (FIML; Arbuckle, 1996) approach, which estimates values based on using all available data.

*Screening for Outliers*

Data were screened for the presence of multivariate outliers through reviewing diagnostic information from a regression analysis and the structural equation model. Two cases with extremely low scores on quality of life were identified and removed from the analyses.

*Confirmatory Factor Analysis (CFA)*

Confirmatory factor analyses were conducted to test the adequacy of the measures. This technique provides tests the measurement model and determines whether or not the measures perform adequately in the sample. In order to run a CFA, the model must be over-identified, meaning that the number of parameters (e.g., factor loadings and error variances) to be estimated in the model cannot exceed the number of data points (Kline, 2005). The equation to determine if there are more observations than free parameters is \( p(p+1)/2 \), where \( p \) represents the number of observed variables.

The measurement model for quality of life was comprised of three latent variables that represent the social (12 items), physical (5 items), and cognitive (2 items) dimensions of quality of life. Figure 10 shows the measurement model of quality of life, which illustrates how the higher order factor of quality of life is comprised of three latent factors that give rise to scores on the 19 indicators (observed variables) plus error terms.
In the quality of life CFA, the number of parameters to be estimated is equal to 66 and the number of data points is 19(19+1)/2 or 190. Because this number exceeds 66, the CFA is over-identified, and the analysis is able to run and provide information about the model fit and estimate path coefficients.

**Figure 10**

*CFA Model of Quality of Life at Year 1 (N=265)*

Testing the measurement model revealed that the model’s fit was marginally acceptable ($\chi^2 = 417.928$, df=149, CFI=0.873, and RMSEA=.083). To improve model
fit, changes may be made to the model if they are minor, can be theoretically justified, and do not cause significant changes in other model parameters (Byrne et al., 1989). Conceptual and statistical information was used to guide the modification of the model. After reviewing the model closely, several of the twelve items on the social factor of quality of life were correlated with one another. For example, the item that assessed satisfaction with the amount of recreation and leisure was significantly associated with the level of satisfaction with the amount of variety in life. Thus, correlated error terms were added that were theoretically justifiable and had high modification indices (above 10). In total, six correlated error terms were added to the model ($\chi^2 = 344.389$, df=143, CFI=0.905, and RMSEA=.073) to control for relationships between conceptually similar items (Items 8 and 9, 9 and 13, 10 and 20, 18 and 13, 15 and 16, and 16 and 17). The chi-square difference test confirmed that the modification resulted in a much better fitting model to the data ($\Delta \chi^2 (74.619)/ \Delta df (6), p<.001$). The final confirmatory factor analysis (CFA) model for perceived quality of life is shown in Figure 11.
Table 8 details the standardized factor loadings for quality of life after living in senior housing for one year. Standardized regression loadings can be interpreted as estimated correlations between the items and the factor, and values at or above 0.5 indicate strong construct reliability and convergent validity. An item that asked respondents about their level of satisfaction with their income loaded weakly on the social dimension of quality of life. All of the other items loaded moderately to highly on their respective factors. In addition, the internal consistency of the scale was very good ($\alpha=0.919$), well above the 0.70 value usually used to assess reliability (Koufteros, 1999).
Table 8

*Standardized Path Coefficients for Quality of Life at Year 1 (N=265)*

<table>
<thead>
<tr>
<th></th>
<th>Standardized Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOCIAL &lt;--- QOL</td>
<td>0.885</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>PHYSICAL &lt;--- QOL</td>
<td>0.921</td>
<td>0.176</td>
<td>8.058</td>
<td>***</td>
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<tr>
<td>COGNITIVE &lt;--- QOL</td>
<td>0.919</td>
<td>0.147</td>
<td>7.009</td>
<td>***</td>
</tr>
<tr>
<td>20 (happy) &lt;--- SOCIAL</td>
<td>0.728</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>18 (variety) &lt;--- SOCIAL</td>
<td>0.769</td>
<td>0.118</td>
<td>12.029</td>
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</tr>
<tr>
<td>17 (purpose) &lt;--- SOCIAL</td>
<td>0.748</td>
<td>0.102</td>
<td>11.691</td>
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</tr>
<tr>
<td>16 (respect) &lt;--- SOCIAL</td>
<td>0.575</td>
<td>0.095</td>
<td>8.913</td>
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<td>15 (income) &lt;--- SOCIAL</td>
<td>0.351</td>
<td>0.108</td>
<td>5.459</td>
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<tr>
<td>14 (sex) &lt;--- SOCIAL</td>
<td>0.483</td>
<td>0.160</td>
<td>6.815</td>
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<tr>
<td>13 (rec.) &lt;--- SOCIAL</td>
<td>0.710</td>
<td>0.122</td>
<td>11.072</td>
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<td>12 (retire) &lt;--- SOCIAL</td>
<td>0.671</td>
<td>0.101</td>
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<td>11 (contribute) &lt;--- SOCIAL</td>
<td>0.690</td>
<td>0.142</td>
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<td>10 (give help) &lt;--- SOCIAL</td>
<td>0.745</td>
<td>0.122</td>
<td>11.118</td>
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<td>9 (get help) &lt;--- SOCIAL</td>
<td>0.614</td>
<td>0.097</td>
<td>9.559</td>
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<tr>
<td>8 (see or talk) &lt;--- SOCIAL</td>
<td>0.673</td>
<td>0.108</td>
<td>10.519</td>
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<tr>
<td>1 (physical) &lt;--- PHYSICAL</td>
<td>0.665</td>
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<tr>
<td>5 (get out) &lt;--- PHYSICAL</td>
<td>0.764</td>
<td>0.136</td>
<td>10.188</td>
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<td>4 (walk) &lt;--- PHYSICAL</td>
<td>0.613</td>
<td>0.151</td>
<td>8.542</td>
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<td>2 (self-care) &lt;--- PHYSICAL</td>
<td>0.632</td>
<td>0.084</td>
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<td>19 (sleep) &lt;--- PHYSICAL</td>
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<td>0.119</td>
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<td>3 (think) &lt;--- COGNITIVE</td>
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<tr>
<td>6 (conversation) &lt;--- COGNITIVE</td>
<td>0.679</td>
<td>0.153</td>
<td>7.240</td>
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***p < .001
The measurement properties of the social support measures for older adults living in senior housing for one year were examined next through the same confirmatory approach. Tangible support was measured through four items that assessed the extent to which older adults received help with completing tasks. Testing the measurement model revealed that the model’s fit was good ($\chi^2 = 4.553$, df=2, $p >0.05$, CFI=0.977, and RMSEA=0.070). The internal consistency was moderately low ($\alpha= .591$). The standardized regression coefficients for the items measuring tangible support are shown in Table 9. Two of the items, help with shopping and help with transportation, loaded strongly on the tangible support. The items that dealt with borrowing something from someone or having someone pitch in to help the older person loaded more weakly on the tangible support factor.

Table 9

*Standardized Regression Weights of Path Coefficients for Tangible Support*

<table>
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<tr>
<th>Item Description</th>
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<td>Help with shopping</td>
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<tr>
<td>Someone pitched in to help</td>
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<td>0.129</td>
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</tr>
<tr>
<td>Loaned you something</td>
<td>0.378</td>
<td>0.082</td>
<td>4.440</td>
<td>***</td>
</tr>
<tr>
<td>Helped with transportation</td>
<td>0.621</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

***p < .001
Informational support, or advice that was received by older adults, was measured through five items. The measurement model of informational support had an acceptable degree of fit ($\chi^2 = 12.575$, df=5, $p < 0.05$, CFI=0.974, and RMSEA=0.076), and good internal consistency ($\alpha = .717$). In addition, the five items loaded strongly on the informational support factor (see Table 10).

Table 10

*Standardized Regression Weights of Path Coefficients for Informational Support*

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared what they did in situation</td>
<td>0.625</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Got suggestion to take action</td>
<td>0.647</td>
<td>0.139</td>
<td>7.864</td>
<td>***</td>
</tr>
<tr>
<td>Learned information about situation</td>
<td>0.538</td>
<td>0.100</td>
<td>6.883</td>
<td>***</td>
</tr>
<tr>
<td>Checked back about advice given</td>
<td>0.673</td>
<td>0.102</td>
<td>8.053</td>
<td>***</td>
</tr>
<tr>
<td>Commented on how you deal/cope</td>
<td>0.707</td>
<td>0.154</td>
<td>8.279</td>
<td>***</td>
</tr>
</tbody>
</table>

***$p < .001$***

Emotional support, the warmth and nurturance older adults receive from members of their close personal relationships, was assessed through twelve items. Upon examining the emotional support measurement model, a poor fit to the data was evident ($\chi^2 = 220.905$, df=54, $p < 0.05$, CFI=0.796, and RMSEA=0.108). Modifications to the emotional support measurement model were guided by theory and modification indices. In total, four correlated error terms were added and a moderate model fit was found ($\chi^2 = 109.981$, df=50, $p < 0.05$, CFI=0.927, and RMSEA=0.067). The chi-square difference
test confirmed that the modification resulted in an improved model fit ($\Delta \chi^2 \ (110.924)/\Delta df \ (4) \ p<.001$). Emotional support received had good internal consistency ($\alpha= .816$). As shown in Table 11, six of the twelve items loaded strongly on the emotional support factor (e.g., someone shared their feelings about you, felt as though they understood you, helped by taking your mind off of things, told you that things would be OK, and listened to your private feelings). Four items were close to or above 0.4 (e.g., someone got closer to you by joking or kidding, someone went with you, someone said they were close to you, and received comfort and affection). The two remaining items (someone stayed with you during a stressful situation and trusted someone to keep things private) were weaker indicators of emotional support.
Lastly, provided support was operationalized as the helping behaviors that older adults give to others in the context of social relationships. The provided support measure is reliable (α= .821), however the initial model revealed a poor fit to the data ($\chi^2 = 300.116$, df=65, $p < .05$, CFI=0.720 and RMSEA=.117). Six correlated error terms were added to reflect the shared variance among items which resulted in a moderate to good fit of the model to the data ($\chi^2 = 132.767$, df=59, $p < .05$, CFI=0.912 and
RMSEA=.069). The chi-square difference test confirmed that the model’s modification significantly improved model fit ($\Delta \chi^2 (167.349)/ \Delta df (6), p<.001$).

Table 12

*Standardized Regression Weights of Path Coefficients for Provided Support*

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Someone depended on you for guidance</td>
<td>0.719</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>You expressed interest and concern</td>
<td>0.637</td>
<td>0.090</td>
<td>8.938</td>
<td>***</td>
</tr>
<tr>
<td>Someone depended on you for something</td>
<td>0.617</td>
<td>0.094</td>
<td>8.663</td>
<td>***</td>
</tr>
<tr>
<td>You helped someone talk about feelings</td>
<td>0.574</td>
<td>0.083</td>
<td>8.13</td>
<td>***</td>
</tr>
<tr>
<td>You stayed with someone in stress</td>
<td>0.569</td>
<td>0.084</td>
<td>8.08</td>
<td>***</td>
</tr>
<tr>
<td>You comforted someone with affection</td>
<td>0.532</td>
<td>0.099</td>
<td>7.589</td>
<td>***</td>
</tr>
<tr>
<td>Someone depended on you for transportation</td>
<td>0.518</td>
<td>0.092</td>
<td>7.325</td>
<td>***</td>
</tr>
<tr>
<td>You suggested an action</td>
<td>0.472</td>
<td>0.067</td>
<td>6.761</td>
<td>***</td>
</tr>
<tr>
<td>You told someone what you did</td>
<td>0.466</td>
<td>0.070</td>
<td>6.638</td>
<td>***</td>
</tr>
<tr>
<td>You told someone where to go for help</td>
<td>0.451</td>
<td>0.063</td>
<td>6.466</td>
<td>***</td>
</tr>
<tr>
<td>You helped someone with shopping</td>
<td>0.235</td>
<td>0.059</td>
<td>3.423</td>
<td>***</td>
</tr>
<tr>
<td>You helped someone with chores</td>
<td>0.232</td>
<td>0.069</td>
<td>3.382</td>
<td>***</td>
</tr>
<tr>
<td>You provided financial support</td>
<td>0.174</td>
<td>0.044</td>
<td>2.547</td>
<td>***</td>
</tr>
</tbody>
</table>

*p<.05, **p<.01, ***p < .001

Table 12 presents the standardized regression estimates of provided support.

Seven of the thirteen items loaded strongly on the provided support factor. Three of the
items (you told someone what you did, you suggested an action for someone to take, and told someone where to go for help) were slightly below 0.5. The three items that related to helping others by helping with chores, helping with shopping, or by giving financial support loaded weakly on provided support.

In summary, examining the measurement properties of quality of life over time and social support at one year after move-in confirmed that the measurement models are adequate to test hypothesized relationships in structural equation modeling techniques. To retain the precision of measurement and to account for correlated items in some of the measures, factor scores were calculated from centering and weighting items according to the strength of their influence on the quality of life and social support factors. Factor scores also reduce a large number of items into composite scores that can be easily applied to the structural model. This approach can increase the reliability and validity of computed scale scores, reduce the number of parameters that must be estimated in SEM, and minimize measurement error in the items.

*General Structural Equation Model*

In Chapter 3, Figure 6 illustrated the structural relationship among social engagement predictors on quality of life after living in senior housing for one year, after controlling for comorbidity, functional status, education, gender, CCRC site, widowhood and age. Factor scores were entered into the model for quality of life and the social support measures. The first model tested the relationship among five components of social engagement and quality of life with all seven covariates ($\chi^2 = 239.384$, df=83, $p=0.000$, CFI=0.898, and RMSEA=.084). The model fit statistics suggested a less than
ideal fit and the estimates showed that several of the potential covariates were not related to quality of life. In an effort to develop the most parsimonious model, non-significant relationships among two of the covariates (age and marital status) with quality of life were removed from the model. The simplified model had a moderate fit to the data ($\chi^2 = 153.569$, df=58, $p=0.000$, CFI=0.935, and RMSEA=.079). These two models were significantly different ($\Delta \chi^2 (83.815) / \Delta \text{df}(25), p<.001$), and the more parsimonious model was selected for interpretation.

Figure 12 illustrates the final structural model for the cross-sectional structural equation model at year one, testing the effects of social engagement on quality of life. Because the model fit was satisfactory, the regression coefficients can be interpreted to test the hypothesis derived from the study’s first research question, “What explains quality of life for older adults at the time point when they have spent their first year in senior housing?” The model explained 17.9% of the variance in quality of life at the same time point, after living in senior housing for one year.
Results from the cross-sectional structural equation model suggest that components of social engagement are related to quality of life for older adults living in senior housing for a year both positively and negatively. These findings also provide preliminary information about the selection of control variables for the longitudinal analysis. The statistical significance of the path coefficients of the proposed model are presented in Table 13.
Higher formal activity participation was associated with a better quality of life \( (b = 0.065, p < 0.05) \). Hypothesis 1.1 was supported because participation in a greater number of formal social activities organized by the CCRC was significantly related to a better quality of life one year after move-in.

Two types of social support received, tangible and informational support, were negatively related to quality of life. Receiving more informational support was associated with lower quality of life \( (b = -0.611, p < 0.05) \), as was receiving more tangible support from others \( (b = -0.393, p < 0.05) \) after controlling for the effects of the covariates. These two negative relationships suggest that family, friends, and neighbors may be more likely to share advice, expertise, and referrals (informational support) and offer tangible support to help to get tasks done for the older people who have greater needs (e.g., a lower quality of life). Since the direction of the relationship was opposite of the positive relationships predicted, Hypotheses 1.3 and 1.4 were not supported.

Contrary to expectation, emotional support received and support provided were not significantly associated with quality of life in the cross-sectional model. Consistent with the literature, receiving emotional support and providing support to others showed a positive association to quality of life, however the path coefficients in this study were not statistically significant. Therefore, Hypotheses 1.2 and 1.5 were not supported. Hypothesis 1.6, which proposed that providing social support to others would be the strongest influencing factor on quality of life, was also not supported in this cross-sectional analysis.

As shown on Table 13, most of the covariates in the analysis were significantly related to quality of life, with the exception of CCRC site. The relationships between the
control variables and quality of life indicate that better quality of life after living in senior housing for a year is associated with better functional status ($b = 1.749, p < 0.001$), less formal education ($b = -0.287, p < 0.05$) and being a woman ($b = 0.298, p < 0.05$). Among these significant relationships, functional status was the strongest predictor of perceived quality of life ($\beta = 0.234, p < 0.001$).

Table 13

*SEM Path Coefficients of Predictors and Perceived Quality of Life (N=267)*

<table>
<thead>
<tr>
<th>Paths</th>
<th>Unstandardized Estimates</th>
<th>S.E.</th>
<th>Standardized Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>PQOL &lt;--- Emotional</td>
<td>0.651</td>
<td>0.402</td>
<td>0.125</td>
</tr>
<tr>
<td>PQOL &lt;--- Tangible</td>
<td>-0.393*</td>
<td>0.180</td>
<td>-0.140</td>
</tr>
<tr>
<td>PQOL &lt;--- Informational</td>
<td>-0.611*</td>
<td>0.268</td>
<td>-0.168</td>
</tr>
<tr>
<td>PQOL &lt;--- Provided</td>
<td>0.113</td>
<td>0.122</td>
<td>0.062</td>
</tr>
<tr>
<td>PQOL &lt;--- Formal Activities</td>
<td>0.065*</td>
<td>0.026</td>
<td>0.148</td>
</tr>
<tr>
<td>PQOL &lt;--- Comorbidity</td>
<td>-0.058</td>
<td>0.030</td>
<td>-0.110</td>
</tr>
<tr>
<td>PQOL &lt;--- Functional Status</td>
<td>1.749***</td>
<td>0.428</td>
<td>0.234</td>
</tr>
<tr>
<td>PQOL &lt;--- Education</td>
<td>-0.287*</td>
<td>0.121</td>
<td>-0.135</td>
</tr>
<tr>
<td>PQOL &lt;--- CCRC Site</td>
<td>-0.045</td>
<td>0.053</td>
<td>-0.049</td>
</tr>
<tr>
<td>PQOL &lt;--- Gender</td>
<td>0.298*</td>
<td>0.128</td>
<td>0.133</td>
</tr>
<tr>
<td>SOCIAL &lt;--- QOL</td>
<td>0.688</td>
<td>0.022</td>
<td>0.923</td>
</tr>
<tr>
<td>PHYSICAL &lt;--- QOL</td>
<td>1</td>
<td></td>
<td>0.960</td>
</tr>
<tr>
<td>COGNITIVE &lt;--- QOL</td>
<td>0.849</td>
<td>0.018</td>
<td>0.991</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01, ***p < .001*
The cross-sectional structural equation model evaluated the conceptual model and tested the hypothesized relationships among social engagement and quality of life. The model equation provided support for the reciprocal nature of giving and receiving social support (Hypothesis 1.7). Participating in the formal social activities organized by the CCRC was also related to providing support to others (Hypothesis 1.8, see Table 14).

Table 14

_Covariance and Correlations of Social Engagement Focal Predictors (Year 1)_

<table>
<thead>
<tr>
<th>Covariance</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional &lt;---&gt;</td>
<td>Informational</td>
<td>0.034***</td>
<td>0.004</td>
<td>8.149</td>
</tr>
<tr>
<td>Emotional &lt;---&gt;</td>
<td>Provided</td>
<td>0.058***</td>
<td>0.008</td>
<td>7.151</td>
</tr>
<tr>
<td>Tangible &lt;---&gt;</td>
<td>Informational</td>
<td>0.047***</td>
<td>0.007</td>
<td>6.359</td>
</tr>
<tr>
<td>Emotional &lt;---&gt;</td>
<td>Tangible</td>
<td>0.027***</td>
<td>0.005</td>
<td>5.442</td>
</tr>
<tr>
<td>Informational</td>
<td>&lt;---&gt;</td>
<td>Provided</td>
<td>0.055***</td>
<td>0.011</td>
</tr>
<tr>
<td>Tangible &lt;---&gt;</td>
<td>Provided</td>
<td>0.034**</td>
<td>0.014</td>
<td>2.541</td>
</tr>
<tr>
<td>Provided &lt;---&gt;</td>
<td>Activities</td>
<td>0.301***</td>
<td>0.079</td>
<td>3.795</td>
</tr>
</tbody>
</table>

*p<.05, **p<.01, ***p < .001

_Latent Growth Model_

A latent growth model with a structural equation modeling approach was used to determine the growth trajectories of quality of life over time. First, the unconditional model of quality of life will be presented to describe the growth trajectory of quality of
life for older adults over a five year period, starting after individuals live in the senior apartment within the continuing care retirement community for a year. Next, the conditional model examines the influence of social engagement on quality of life over time, controlling for a comprehensive set of variables that are known to influence quality of life. The conditional model controlled for the effects of quality of life before move-in to the senior apartment along with the effects of age, income, gender, widowhood, physical functioning, total number of medical conditions, and CCRC site.

In order to test the stability of the measurement of quality of life over time, the measurement structure of the outcome for each wave of data was constrained to be consistent across all waves. For each wave of data, the measurement model was identical. In all waves, the social factor of quality of life had items that covaried with one another. Theoretical and empirical criteria were used to develop the model that was held constant over time in the analysis. As shown in Table 15, the measurement of quality of life indicates a moderate fit of the measurement model to the data over time.

Table 15

*Model Fit Statistics for Quality of Life over Time*

<table>
<thead>
<tr>
<th></th>
<th>Chi Square</th>
<th>DF</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>373.565</td>
<td>137</td>
<td>0.918</td>
<td>0.076</td>
</tr>
<tr>
<td>Year 1</td>
<td>284.778</td>
<td>137</td>
<td>0.936</td>
<td>0.060</td>
</tr>
<tr>
<td>Year 2</td>
<td>311.797</td>
<td>137</td>
<td>0.927</td>
<td>0.065</td>
</tr>
<tr>
<td>Year 3</td>
<td>330.227</td>
<td>137</td>
<td>0.890</td>
<td>0.069</td>
</tr>
<tr>
<td>Year 4</td>
<td>333.989</td>
<td>137</td>
<td>0.909</td>
<td>0.069</td>
</tr>
<tr>
<td>Year 5</td>
<td>334.945</td>
<td>137</td>
<td>0.889</td>
<td>0.070</td>
</tr>
</tbody>
</table>
Unconditional Model

The unconditional model represents the change model of the repeated measure of quality of life over time and estimates the trajectories of quality of life for individuals. Figure 13 describes the individual trajectories of quality of life for 50 randomly selected participants over five years. In addition, Figure 14 shows a declining trend in the estimated means of quality of life factor scores over time and graphically represents a good fit between the sample means of quality of life and the estimated means based on a linear rate of change.

Figure 13

Individual Trajectories of Quality of Life for 50 Randomly Selected Cases

Note: Perceived Quality of Life factor scores are on the y axis. The x axis describes year in the study (e.g., 0=Lived in senior housing for 1 year, 1=Lived in senior housing for 2 years, 2=Lived in senior housing for 3 years, 3=Lived in senior housing for 4 years, and 4=Lived in senior housing for 5 years).
Figure 14

*Estimated Means of Quality of Life Factor Scores over Time*

*Note:* Perceived Quality of Life factor scores are on the y axis. The x axis describes year in the study (e.g., 0=Lived in senior housing for 1 year, 1=Lived in senior housing for 2 years, 2=Lived in senior housing for 3 years, 3=Lived in senior housing for 4 years, and 4=Lived in senior housing for 5 years).

The estimated slopes of all participants in the sample are presented in Figure 15. The histogram below describes the estimated slopes for the full sample of older adults after living in senior housing for a year. The majority of participants had a negative slope, which implies that most of the sample experienced a decline in their quality of life over time. Yet, the graph shows that a small portion had a positive slope which shows improvements in their quality of life over time.
A variety of unconditional models were tested to determine which pattern of change best fits the data, and a better fit of the model to the data can be visually inspected through lower $\chi^2$ values, lower RMSEA values, and higher CFI values (see Table 16). Model A is an unconditional model that proposed that quality of life would not change over time and quality of life over time is not correlated. The next two models test a linear pattern of change, represented through fixing the intercept of the five repeated measures of quality of life to one, and fixing the linear slope parameters based on each year of assessment to model change as a function of time. The waves of data represent years since moving in to the senior housing, assessed annually (e.g., 0 (year 1), 1 (year 2), 2 (year 3), 3 (year 4), and 4 (year 5). In Table 16, Models B and C represent autocorrelated unconditional models with linear patterns of change. Thus, the waves of the repeated
measures of quality of life are correlated (e.g., quality of life at year 1 is correlated with year 2, quality of life at year 2 is correlated with year 3, quality of life at year 3 is correlated with year 4, and quality of life at year 4 is correlated with year 5). In Model B, the variance of the slope was fixed to the value of zero and Model C allows the variance of the slope to be freely estimated. A chi-square difference test was used to determine which model fit the data best. Model B was significantly better than Model A ($\Delta \chi^2 =125.776$, $\Delta df=9$, $p < .001$). When Model B was compared to Model C, the autocorrelated model with a linear pattern of change and freed variance, the chi-square difference test confirmed that Model C was superior ($\Delta \chi^2 =20.069$, $\Delta df=2$, $p < .001$). Therefore, Model C (presented in Figure 16) was the best fitting and most parsimonious model selected to test the conditional model.

Table 16

*Comparison of Unconditional Model Fit Statistics*

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>RMSEA</th>
<th>CFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model A - No Autocorrelation/No Change</td>
<td>167.011</td>
<td>17</td>
<td>0.172</td>
<td>0.798</td>
</tr>
<tr>
<td>Model B - Autocorrelation Y1 Slope Fixed/Linear</td>
<td>41.235</td>
<td>8</td>
<td>0.124</td>
<td>0.955</td>
</tr>
<tr>
<td>Model C - Autocorrelation Y1 Slope Freed/Linear</td>
<td>20.069</td>
<td>6</td>
<td>0.093</td>
<td>0.981</td>
</tr>
<tr>
<td>Model A &amp; Model B</td>
<td>$\Delta \chi^2 =125.776^{***}$</td>
<td>$\Delta df=9$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model B &amp; Model C</td>
<td>$\Delta \chi^2 =21.166^{***}$</td>
<td>$\Delta df=2$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* $p < .05$, **$p < .01$, ***$p < .001$ (two-tailed test)
The unconditional model examined the statistical significance of the means of the intercept and slope, and also tested for individual differences in the initial status of quality of life and variation in the rates of change over time. Results from the unconditional model are presented in Table 17. Variances of the intercept showed significant individual variability in the level of quality of life after living in senior housing for one year ($t = 6.057, p < 0.001$), which indicates that older adults in this study are not a homogenous group and supports Hypothesis 2.1. Contrary to expectation, there
were not significant individual variation in the rate of changes in quality of life over time ($t = 1.694, p > 0.05$), and Hypothesis 2.2 was not supported. The resulting significant mean slope indicates that on average, quality of life for the older adults in this sample decreased over time ($t = -4.167, p < 0.001$). This finding supports Hypothesis 3 which expected quality of life would decrease over time. On average, quality of life scores decreased by 0.054 from year to year, between each annual assessment. The estimated covariance between the slope and intercept was not significant, which means that the initial status and rate of change were not related to each other. Therefore, the rate of decline in quality of life over time was similar for individuals who initially started with higher or lower quality of life scores.

Table 17

Unconditional Model Parameter Estimates for Perceived Quality of Life

<table>
<thead>
<tr>
<th></th>
<th>Unstandardized Estimates</th>
<th>S.E.</th>
<th>$t$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>0.043</td>
<td>0.045</td>
<td>0.950</td>
</tr>
<tr>
<td>Slope</td>
<td>-0.054</td>
<td>0.013</td>
<td>-4.167***</td>
</tr>
<tr>
<td><strong>Variance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>0.447</td>
<td>0.074</td>
<td>6.057***</td>
</tr>
<tr>
<td>Slope</td>
<td>0.015</td>
<td>0.009</td>
<td>1.694</td>
</tr>
<tr>
<td>Covariance</td>
<td>0.019</td>
<td>0.020</td>
<td>0.946</td>
</tr>
</tbody>
</table>

***$p < .001$ (two-tailed test)
Conditional Model

The conditional model tested the influence of the five components of social engagement on the intercept and slope growth factors of quality of life over five years after controlling for covariates. This model controlled for the effects of quality of life prior to moving into senior housing, as well as the effects of age, income, gender, widowhood, physical functioning, total number of medical conditions, and CCRC site at the end of the first year’s annual assessment (see Figure 17). Study participants at the one year time point were 79 years old (SD=6.14), 69.5% had incomes above $35,000 per year, 65.3% were women, and 40.8% were widowed. This group had very good physical functioning overall (61% did not need any help at all with instrumental tasks activities of daily living), but four medical conditions were reported (M=3.79, SD=2.01). In terms of the five predictors of social engagement, older adults reported participating in from zero to 13 different formal social activities organized by the CCRC in the last year (M=5.63, SD=2.45). Study participants lived in four locations in Maryland and Virginia managed by Erickson Living (e.g., Riderwood (31.5%), Green Spring Village (25.8%), Charlestown (21.7%), and Oak Crest (21.0%). Receiving emotional support (M=0.61, SD=0.44) and providing support to others (M=0.62, SD=0.41) were endorsed more frequently than receiving informational support (M=0.18, SD=0.30) or tangible support (M=0.22, SD=0.23). These covariates were entered into the model simultaneously to identify their impact on the initial status and rate of change of quality of life over time.

Since the unconditional model found a significant declining trend in quality of life over time, the conditional model aims to understand whether the social engagement predictors and other personal characteristics influenced the way that older adults
experienced quality of life after living in senior housing for one year and accounted for changes in quality of life over time.

Figure 17

*Final Conditional Linear Latent Growth Model with Autocorrelation*
A review of the fit statistics showed that the conditional model indicated a good fit despite a significant chi-square value ($\chi^2(54) = 78.905, p = .0152$; CFI = 0.976; TLI = 0.960; SRMR = 0.024; RMSEA = 0.043 with 90% confidence interval between 0.020-0.063). The probability that the RMSEA is less than or equal to 0.05 is 69%.

The effects of the focal predictors of social engagement and covariates on the individual differences in initial status, or the intercept, for quality of life in the latent growth model were examined next. The unstandardized parameter estimates for the intercept described on Table 18 identify if the predictors or covariates explain individual differences in quality of life after living in senior housing for a year. In this study, the only component of social engagement that was related to individual differences in the initial status of quality of life was provided support. Providing higher amounts of support to others was significantly associated with a better quality of life after living in senior housing for a year ($b = 0.127, p < 0.05$). The four components of social engagement (participating in formal social activities and receiving informational, emotional, or tangible support) did not explain statistically significant individual differences in quality of life in the first year. As the intercept parameter estimates on Table 18 describe, participating in formal social activities ($b = 0.007, p > 0.05$), receiving tangible support ($b = -0.075, p > 0.05$), informational support ($b = -0.183, p > 0.05$), or emotional support ($b = 0.131, p > 0.05$) were not related to differences in the initial status of quality of life. Although not statistically significant, the direction of the relationships between these types of social support received by older people are consistent with the structural equation model that found a negative association between receiving more tangible and informational support with a lower quality of life. Similarly, receiving emotional support
and participating in formal social activities were positively associated with quality of life, but these relationships were not statistically significant.

In sum, findings partially supported Hypothesis 4.5, which stated that for older adults living in senior housing, providing social support to help friends and family will explain some of the initial differences in quality of life. On the other hand, Hypotheses 4.1, 4.2, 4.3, and 4.4 which expected that receiving informational, tangible, and emotional support and participating in formal social activities would explain some initial differences in quality of life was not supported in this study.

In addition to the focal predictors of social engagement, individual differences in quality of life for older adults who had lived in senior housing for one year were also attributable to other factors. First, the quality of life experience that older adults reported prior to moving in to senior housing explained some initial differences in quality of life a year later (b = 0.692, p < 0.001). This suggests that if older people reported a high quality of life before moving in to the senior housing, they were more likely to experience a better quality of life in the senior living environment. There were also gender differences in the initial status of quality of life, with men reporting lower quality of life than women (b = -0.121, p < .05). Furthermore, the location where participants lived also explained some initial differences in quality of life, as each location was significantly different from the reference group (Riderwood). Participants recruited from Charlestown, Green Spring Village, and Oak Crest tended to have slightly higher initial status of quality of life than participants from Riderwood (e.g., Charlestown b = 0.257, p < .001, Green Spring Village b = 0.136, p < .05, and Oak Crest b = 0.156, p < .05).
### Table 18

*Parameter Estimates for the Conditional LGM (N=248)*

<table>
<thead>
<tr>
<th></th>
<th>b</th>
<th>S.E.</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intercept Estimates</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional</td>
<td>0.131</td>
<td>0.168</td>
<td>0.789</td>
</tr>
<tr>
<td>Informational</td>
<td>-0.183</td>
<td>0.111</td>
<td>-1.644</td>
</tr>
<tr>
<td>Tangible</td>
<td>-0.075</td>
<td>0.081</td>
<td>-0.931</td>
</tr>
<tr>
<td>Provided</td>
<td>0.127</td>
<td>0.051</td>
<td>2.491*</td>
</tr>
<tr>
<td>Activities</td>
<td>0.007</td>
<td>0.012</td>
<td>0.638</td>
</tr>
<tr>
<td>QOL (pre-move)</td>
<td>0.664</td>
<td>0.032</td>
<td>20.665**</td>
</tr>
<tr>
<td>Comorbidity</td>
<td>-0.010</td>
<td>0.013</td>
<td>-0.785</td>
</tr>
<tr>
<td>Education</td>
<td>-0.063</td>
<td>0.054</td>
<td>-1.163</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.121</td>
<td>0.058</td>
<td>-2.093*</td>
</tr>
<tr>
<td>Functioning</td>
<td>0.338</td>
<td>0.195</td>
<td>1.732</td>
</tr>
<tr>
<td>Widowhood</td>
<td>0.052</td>
<td>0.059</td>
<td>0.872</td>
</tr>
<tr>
<td>Site (Charlestown)</td>
<td>0.257</td>
<td>0.071</td>
<td>3.616***</td>
</tr>
<tr>
<td>Site (Green Spring)</td>
<td>0.136</td>
<td>0.069</td>
<td>1.972*</td>
</tr>
<tr>
<td>Site (Oak Crest)</td>
<td>0.156</td>
<td>0.073</td>
<td>2.126*</td>
</tr>
<tr>
<td><strong>Slope Estimates</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional</td>
<td>-0.026</td>
<td>0.085</td>
<td>-0.310</td>
</tr>
<tr>
<td>Informational</td>
<td>0.085</td>
<td>0.056</td>
<td>1.525</td>
</tr>
<tr>
<td>Tangible</td>
<td>-0.043</td>
<td>0.041</td>
<td>-1.042</td>
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<tr>
<td>Provided</td>
<td>0.024</td>
<td>0.025</td>
<td>0.942</td>
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<tr>
<td>Activities</td>
<td>0.012</td>
<td>0.006</td>
<td>2.038*</td>
</tr>
<tr>
<td>QOL (pre-move)</td>
<td>0.005</td>
<td>0.017</td>
<td>0.276</td>
</tr>
<tr>
<td>Comorbidity</td>
<td>-0.020</td>
<td>0.006</td>
<td>-3.173**</td>
</tr>
<tr>
<td>Education</td>
<td>0.014</td>
<td>0.026</td>
<td>0.524</td>
</tr>
<tr>
<td>Gender</td>
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<td>0.030</td>
<td>0.572</td>
</tr>
<tr>
<td>Functioning</td>
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<td>0.112</td>
<td>-0.499</td>
</tr>
<tr>
<td>Site (Charlestown)</td>
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<td>-1.557</td>
</tr>
<tr>
<td>Site (Green Spring)</td>
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<td>0.033</td>
<td>0.244</td>
</tr>
<tr>
<td>Site (Oak Crest)</td>
<td>-0.039</td>
<td>0.036</td>
<td>-1.067</td>
</tr>
<tr>
<td>Covariance</td>
<td>0.021</td>
<td>0.011</td>
<td>0.053</td>
</tr>
</tbody>
</table>

* p < .05. **p < .01. ***p < .001. (two-tailed test)
To determine if social engagement in the first year influences the trajectories of change in quality of life, parameter estimates for the slope were reviewed (see Table 18). The unconditional model reviewed earlier established that without any covariates, quality of life decreased each year overall. Statistically significant relationships in the conditional model identify whether social engagement predictors influence the rate of change in the slope of the growth factor of quality of life. Among the social engagement predictors, participation in a larger number of formal social activities significantly slowed the rate of decline in quality of life over time ($b = 0.012, p < .05$), which partially supported Hypothesis 4.1. Contrary to expectation, measures of the four types of social support at the end of the first year of living in senior housing did not significantly influence long-term changes in quality of life. Therefore, Hypotheses 4.2, 4.3, 4.4, and 4.5 were not supported. The only other variable that influenced changes in quality of life over time was comorbidity ($b = -0.020, p < 0.01$), which indicated that older people with a higher number of medical conditions experienced a steeper decline in quality of life compared to those with fewer medical conditions.

After controlling for quality of life prior to move-in and the other covariates in the full model, the residual variance not explained by the model for the intercept ($b = 0.017, p > 0.05$) and the residual variance of the slope ($b = 0.004, p > 0.05$) were not significant. The non-significant residual variance of the slope and intercept suggests that the model explained most of the variance in quality of life and captured the underlying latent process of changes in quality of life over time. The residual covariance was also not statistically significant, ($b = 0.021, p = 0.053$). Because the significance level is on the
threshold, there may be a weak association between the residual variance of the intercept and slope.

In conclusion, the latent growth model identified the social engagement predictors and covariates that explained initial differences in quality of life for older adults living in senior housing for a year, and examined the longitudinal influence of social engagement in the first year on changes in quality of life over time. The variables that explained individual differences in the initial status of quality of life included providing social support, gender, the senior housing site, and quality of life before moving in. A longitudinal relationship between social engagement in the first year and changes in quality of life over time was supported in this study. Specifically, participating in a greater number of formal social activities organized by the continuing care retirement community slowed the decline in quality of life over time. These findings suggest that actively engaging in the social and leisure activities organized by the CCRC can have a long-term beneficial effect for older adults by forestalling the decline of quality of life over time.
Chapter Five: Discussion and Implications

This dissertation investigated the cross-sectional and longitudinal relationships between social engagement and quality of life for older adults living in senior housing within continuing care retirement communities. In this study, social engagement was measured through four different kinds of giving and receiving social support and participation in formal social activities organized by the retirement community. In the cross-sectional structural equation model, the effects of social engagement on quality of life were studied one year after move-in. A latent growth model examined initial differences in quality of life, how quality of life changes over time for older adults living in senior housing, and investigated the impact of social engagement in the first year of living in senior housing on the trajectories of quality of life over time.

This dissertation research contributes several interesting findings to the gerontological social work literature. First the cross-sectional model identified that for older adults living in senior housing for a year, the predictors of social engagement were both positively and negatively associated with quality of life. For these older people, receiving more informational and tangible support was associated with a poorer quality of life, whereas participating in formal social activities was related to better quality of life. The various components of social engagement did not influence quality of life in the same way. Second, the unconditional latent growth model found that quality of life declined for the group over time, although there was significant variability among individuals in their initial status of quality of life. Third, a conditional latent growth model identified the social engagement predictors and covariates that explained initial differences in quality of life. In this study, providing social support, gender, the senior
housing site, and quality of life before moving in to the senior housing explained the initial differences in quality of life. Finally, one component of social engagement—participating in a greater number of formal social activities organized by the continuing care retirement community—significantly slowed the rate of decline in quality of life over time. These findings suggest that active engagement in organized social and leisure activities within the continuing care retirement community can have a long-term beneficial effect for older adults through delaying the decline of quality of life.

This dissertation affirms the connection between social engagement and quality of life for older people residing in senior housing within continuing care retirement communities. Moreover, these findings raise awareness of the range of quality of life reported by older adults living in this environment, and the general decline in quality of life experienced by the group. This dissertation also provides a more nuanced understanding of how different aspects of social engagement may influence perceptions of quality of life. For these older people, participating in many formal social activities organized by the CCRC significantly slowed the rate of decline in quality of life over time. This information is meaningful to gerontological social workers who provide direct services and interventions for elders to improve or maintain a good quality of life. A variety of policy implications will also be considered, beginning with strategies to enhance the quality of life for older adults living within age-segregated residential settings. Next, attention will be given to policies needed to ensure access to adequate housing and long term care services. Finally, the strengths and weaknesses of this study and recommendations for future studies will be discussed.
Cross-Sectional Analysis

The first research question inquired about the extent to which social engagement influenced quality of life at one time point: one year after moving to senior housing. Model testing of the hypothesized relationships among the components of social engagement and quality of life, after controlling for the effects of socio-demographic and health characteristics, provided additional information about how these social engagement variables influenced quality of life. One difference between this cross-sectional analysis and the latent growth model analysis was the cross-sectional structural equation model did not incorporate or control for the baseline quality of life score prior to move-in. This model, therefore, was truly a snapshot of one point in time.

Findings of the cross-sectional structural equation model indicated that participating in formal social activities had positive direct effects, while receiving informational support and receiving tangible support had negative direct effects on quality of life for older adults living in senior housing. In this higher income and very well-educated sample, better quality of life was associated with better functional status, less formal education, and being a woman.

Consistent with activity theory, (Lemon et al., 1972) and the concept of generativity from a theory of psychosocial development (Erikson, 1950, 1982/1997), participating in formal social activities organized by the CCRC was positively associated with quality of life one year after moving in to senior housing. The CCRC offered an array of active and passive activities that were arranged in a group format to encourage social interaction. These activities promoted active aging and personal and social enrichment for the residents through learning new skills, being physically active,
exercising creativity, volunteering through community service, and sharing intellectual and cultural interests with peers. Consistent with research that suggests that an actively engaged lifestyle is an important aspect of successful aging, this dissertation found that older adults who participated in these formal social activities enjoyed a better quality of life. Within continuing care retirement communities, participation in more types of activities has been associated with better health-related quality of life (Jenkins et al., 2002). Additionally, greater role involvement and participation in organizations and formal volunteering have been associated with better health and psychological well-being (Moen, Dempster-McClain, & Williams, 1992). Finally, in a critical review, Adams and colleagues (2012) found that social, productive, and leisure activities are positively related to psychological well-being or survival; however, individual choice and the meaningfulness of the activity also influence this relationship.

Unlike the fairly clear positive findings in the literature on social activity participation, the effects of receiving social support on quality of life have been inconsistent in the literature. For older adults in this study, receiving more informational and tangible support was significantly related to poorer quality of life in the first year of living in senior housing. Shaw and colleagues (2007) found that older adults tend to receive more tangible and informational support as they age. Receiving more tangible and informational support could be in response to increasing functional disability (Verbrugge & Jette, 1994). Consistent with the life course perspective, the support bank model (Antonucci & Jackson, 1990) suggests that older adults provide support to others throughout their lives in order to draw upon support from family, friends, and neighbors in order to tap into the social support resources needed in later life.
Another view in line with social breakdown theory (Bengston & Kuypers, 1986) suggests that older adults who received more support also had greater feelings of dependency. In CCRC’s, older adults residing in the most independent living situation enjoy a more privileged status within the community compared to those in the assisted living or nursing home. Yet, they also report a feeling of being “on the edge” in terms of their ability to maintain this independence despite potential health and social declines (Shippee, 2012). The overall low endorsement of informational support and tangible support indicated that the older people in this study were able to live independently, plus they were free from home maintenance and repair responsibilities after moving to senior housing, which may have substantially reduced their need for help in these areas. Participants may have also been less dependent on family and friends for tangible support because of the availability of supportive services that could be arranged within the CCRC.

Contrary to expectation, this study did not find a significant relationship between receiving emotional support and quality of life. Although not statistically significant, receiving emotional support did have a positive influence on quality of life. For elders living in the community, receiving emotional support has been positively related to a high quality of life and better physical functioning (House, et al., 1988; Krause, 1986; Krause & Markides, 1990; Larson, 1978; Mendes de Leon et al., 1999; Seeman, 2000; Silverstein & Bengston, 1991). The support from spouses, family members, and neighbors has been shown to improve functional ability and quality of life (Tang, Brown, Funnell, & Anderson, 2008; Shaw, 2005; VonDras & Madey, 2004). Also, in this cross-sectional
model, providing support to others was positively, although not significantly, associated with quality of life after living in senior housing for a year.

Given that these individuals reported being satisfied with the quantity of socially supportive behaviors they received from their personal relationships, the support these older people received seemed adequate relative to their life situation. In an earlier assessment of the effectiveness of the Erickson Resident Profile in determining the appropriate level of care for the older adults in the Erickson Life Study, Resnick and colleagues (2005) also found that social support was not related to the placement of older adults in different levels of care in the CCRC.

In the literature, the construct of social support is conceptualized as both the perception of social support being available if needed, as well as actual socially supportive behaviors. This dissertation used a more objective, behavior-oriented measure of social support, the Inventory of Socially Supportive Behaviors (ISSB, Krause & Markides, 1990; Barrera, 1986). Received support measures such as the ISSB required older adults to recall how often they have received assistance with specific tasks or events over the last two weeks, and they are thought to more accurately represent the actual support provided within the social environment (Barrera, 1986) and to have higher inter-rater reliability (Cohen, Lakey, Tiell, & Neely, 2005). However, the behavioral measures of social support tend to predict outcomes less consistently than perceived support (Sarason et al., 1990). Perceived support, on the other hand, may be influenced by individual differences, personal value judgment, and relationship contexts (Sarason, Sarason, & Pierce, 1995). Haber and colleagues (2007) recently conducted a meta-analysis of 23 studies that evaluated the relationship between the behavioral ISSB
(Barrera, Sandler, & Ramsey, 1981) and any measure of perceived support. Interestingly, their study found only a small effect size (.35) between the two, which suggested that receiving supportive behaviors and perceptions of social support shared only 10-15% of the variance in the combined measures (Haber et al., 2007). Hence, behavioral accounts of social support are only one of many factors that influence perceptions of social support. This also points to a limitation of the measure of social support used in this study (ISSB, Krause & Markides, 1990), which relied upon behavioral accounts of the exchange of socially supportive behaviors. Perceptions of social support could be related to the characteristics of the giver of support, characteristics of the receiver of the support, or the dynamics of the relationship between the two. Haber and colleagues (2007) conclude the meta-analysis with a recommendation for future studies to include multiple measures of social support and more than one method of data collection.

In conclusion, these relationships between components of social engagement and quality of life for older adults living in senior housing for a year supported a longitudinal examination. Though the cross-sectional model fit the data, the model only explained 17.9% of the variance in quality of life. Future research is needed to investigate what other variables would better explain the variation in quality of life for older adults living within age-segregated communities and explore interactive relationships among them. For instance, an individual’s personality traits (Costa & McCrae, 1995) and their self-esteem and perceptions of control (Warner et al., 2010) may be strongly related to quality of life.
Longitudinal Analysis

The first step in the latent growth model identified the individual growth trajectories of quality of life over the first five years for residents of senior housing. As the life course perspective would suggest, this study found support for considerable variability among individuals in terms of the initial level of quality of life as well as an empirical model which allowed for the repeated measures of quality of life to be correlated with one another. Other longitudinal studies of community dwelling older adults have also found a wide range of individual variation and heterogeneity in the quality of life of older adults (Busse & Maddox, 1985; Costa & Andres, 1986; Maddox, 1987; Schaie, 1979, 1983). In this study, most of the older adults reported being satisfied with the quality of their lives, which is similar to findings from nationally representative samples of older people living in the community (Baernholdt et al., 2011).

Similar to studies of older adults living in subsidized senior housing (Lawton, Moss, & Grimes, 1985), on average, the quality of life for this group also tended to decrease over time. This trend is also consistent with findings from a general, population based study on aging in England (Zaninotto et al., 2009). Studies of older adults with advanced illness have found stability in quality of life over time (Bretscher, Rummans, & Sloan, 1999), while others have shown a slight declining trend over time with significant individual variability in quality of life trajectories (Solomon, Kirwin, Van Ness, O’Leary, & Fried, 2010).

Next, the conditional model identified characteristics of participants that accounted for individual differences in quality of life after living in senior housing for one year and examined the influence of components of social engagement on quality of
life over time. To determine the effects of social engagement on the quality of life trajectories, five hypotheses predicted a positive effect of the components of social engagement on quality of life over time. It was hypothesized that higher levels of providing social support to others, receiving emotional support, receiving informational support, receiving tangible support, and more engagement in a variety of social and leisure activities would slow the decline in quality of life for older adults over five years.

Results of the full model suggest that components of social engagement are related to quality of life in different ways. In this model, receiving instrumental, tangible, or emotional support did not explain initial differences in quality of life. Along with gender, the senior housing site, and ratings of quality of life just before moving in, providing social support to others was the one component of social engagement that significantly and positively influenced individual differences in quality of life at the one year mark.

For older people, the act of providing social support to others is thought to be beneficial for the giver as well as the receiver (Riessman, 1965). Providing support to others has been associated with generativity (Rossi, 2004), feelings of usefulness (Gruenwald et al., 2007), and higher self-esteem (Krause & Shaw, 2000). In a sample of older adults with multiple illnesses, providing support was also positively related to physical and mental quality of life (Warner, Schuz, Wurm, Ziegelmann, & Tesch-Romer, 2010). Older people can provide support informally as an important source of support to family, friends and neighbors as well as through more formal strategies to give back to the community through volunteering. In terms of formal helping behavior, older people who lived in the independent and assisted living of a continuing care retirement
community indicated an interest in getting more involved in volunteer work (Resnick, Klinedinst, Dorsey, Holtzman, & Abuelhiga, 2013).

Consistent with activity theory (Lemon et al., 1972) and psychosocial theory’s concept of generativity (Erikson, 1950, 1982/1997), the major findings of this dissertation revealed that it was only participating in a greater number of formal social activities organized by the continuing care retirement community that slowed the decline in quality of life over time. Similar findings have been reported in a longitudinal study by Silverstein and Parker (2002) which found that increasing activity participation led to a perceived improvement in life conditions, especially among older adults who became widowed, developed physical limitations, and had a low level of contact with family members. For older adults living in the community, engaging in more productive activities was associated with greater happiness (Baker, Cahalin, Gerst, & Burr, 2005). More involvement in productive and social activities also predicted mortality among older adults (Glass, Mendes de Leon, Marottili, & Berkman, 1999).

Studies have most consistently linked quality of life with informal social activities, rather than formal social activities (Everard, 1999; Litwin & Shiovitz-Ezra, 2006; Maier & Klumb, 2005; Ritchley et al., 2001; Warr et al., 2004). Yet, a recent qualitative study confirmed that social participation is a major source of belonging or isolation within the retirement community (Shippee, 2012). Being connected to others through meaningful social relationships, as well as becoming socially integrated within communities, is known to have a positive effect on health and well-being for people of all ages (Berkman & Glass, 2000; Putnam, 2000). For example, in the Pathways to Life Quality study, feelings of perceived social integration increased for older adults who
attended religious services and got involved in volunteering after moving to the CCRC (Erickson et al., 2000). Formal social activities may be particularly important in continuing care retirement communities, where opportunities for social engagement are intentionally embedded within the culture to increase life satisfaction and well-being (Jenkins, Pienta, & Horgas, 2002).

While the literature has supported a relationship between social engagement and well-being (Everard et al., 2000; Krause, 2006; Wahl, 2003), this study connects a specific aspect of social engagement (participation in the array of social and leisure activities offered by the CCRC) with changes in quality of life over time. This study did not find support for the long-term influence of giving and receiving social support in the first year of living in senior housing on changes in quality of life over time. Similarly, in a cross-sectional study by Everard and colleagues (2000), social support was not associated with physical and mental health when social engagement was operationalized through activity and social support. Regardless, Everard and colleagues (2000) emphasized the need to examine the constructs of activity and social support together.

Additionally, the importance of participating in more social and leisure activities also lends support to the Proactivity Model of Successful Aging (Kahana and Kahana (1996, 2003; Kahana, Kelley-Moore, & Kahana, 2012). While stressors negatively influenced quality of life for older people living in a retirement community in Florida, proactive adaptations such as marshaling support and planning for the future led to better quality of life four years later (Kahana, Kelley-Moore, & Kahana, 2012). This process of building resources to prevent or reduce the stressors of normal aging is done in advance of a major loss or stressor (Kahana & Kahana, 1996, p. 25), and personal agency is
paramount to carrying out adaptive behaviors (i.e., adjusting after stressors occur) to improve well-being (Thoits, 2006).

Older adults may seek out more involvement in a variety of formal social activities as a proactive coping strategy to build resources and perhaps marshal support in advance of a loss or stressful situation. This process of building resources after relocation was explored in a qualitative study of older people living in senior housing in Canada (Dupuis-Blanchard, Neufeld, & Strang, 2009). Dupuis-Blanchard and colleagues (2009) found that older adults sought out personal connections with neighbors in senior housing for a variety of reasons, including to establish feelings of security in case help would be needed, for more casual social interaction, and to have opportunities to be supportive and help others. In the same study, friendship seemed to be a lesser priority compared to the desire to seek out the other types of relationships to fulfilled personal needs or goals (Dupuis-Blanchard et al., 2009, p. 1192). For community-dwelling older adults with chronic illness, leisure was also viewed as a resource for successful aging (Hutchinson & Nimrod, 2012). For these reasons, participation in a high number of formal social activities may be a proactive coping strategy for older adults living in senior housing.

These findings suggest that actively engaging in the social and leisure activities organized by the CCRC can have a beneficial effect for older adults by forestalling the decline of quality of life over time. The lasting influence of participating in many social and leisure activities is promising, because it can be used to develop early interventions to help older adults age successfully and maintain a better quality of life. Enhancing the opportunities for older adults to become more involved in formal social activities may
also help them develop greater resiliency to age-related losses. Older adults with higher levels of resiliency use adaptive behaviors to improve social functioning, morale, and health (Wagnild & Young, 1993). Furthermore, resilience may have a strong influence on older adults’ ability to live independently (Resnick et al., 2005).

**Implications for Social Work Practice**

*Quality of Life and Social Work Practice*

A major aim of gerontological social work practice is to improve the quality of life of older people. Although these residents were fairly high functioning individuals with adequate financial resources who lived independently, some older adults were not satisfied with their quality of life. And while quality of life declined for the sample over time, this dissertation research provided evidence of the heterogeneity in the experience of quality of life for older adults who live within the senior housing of continuing care retirement communities. Furthermore, most of the sample experienced a declining trend in quality of life, yet a small number had an increasing slope trend and experienced an improvement in quality of life over time.

In light of the diversity in how quality of life is experienced by older adults living in senior housing, social workers have a key role in helping them to transition to a new living environment. One way to do this is through sharing information and providing encouragement to take full advantage of the available programs and services within the CCRC. With data from the Erickson Life Study, Marx and colleagues (2010) found that older adults differed in the patterns of use of the CCRC’s general services, medical services, and formal group activities. The same study identified five main patterns of
change in terms of overall service use within the study (e.g., no change over time, change in the first year only, change after the first year, a trend of decreasing participation, and a trend of increasing participation in services). Overall, older adults significantly increased their participation in formal social activities, such as art groups, dance groups, music, volunteer activity, education, computer use, social groups, movies, concerts, and theater over five years. However, this increased participation was associated with better health status and less functional dependence.

This dissertation also found that older adults’ perception of quality of life prior to move-in was a strong determinant of quality of life one year later, suggesting that an initial assessment is critical to identify older adults who may have a lower quality of life. It is known that impairments in functional health, depression, and memory problems are significantly related to worse quality of life among older people in the United States (Baernholdt, Hinton, Yan, Rose, & Mattos, 2011). Therefore, screening and treatment should reflect the multidimensional nature of quality of life and assess its physical, social, emotional, and cognitive dimensions. Practitioners also need to be aware of the complicating issue of pain (Jakobsson, et al., 2004).

This study makes a meaningful contribution to social work practice through identifying factors that are related to differences in quality of life for older adults living in senior housing for a year. In this study, perceptions of quality of life before moving in, gender, and providing social support to others accounted for differences in the initial status of quality of life in the first year of living in senior housing. Even though all four senior living communities were managed by the same company and offered the same services, the CCRC site where participants lived also explained some initial differences
in quality of life. Consistent with the life course perspective, the quality of life of older adults before moving in to senior housing was responsible for differences in quality of life after residing within the continuing care retirement community a year later. Gender differences were also related to the initial status of quality of life, and men reported worse quality of life than women. One aspect of social engagement, support provided by older adults to help others, helped explain some of the initial differences in quality of life. These findings point to other potentially important factors in determining good outcomes for older adults entering a new communal living environment for social workers.

*Influence of Social Engagement on Quality of Life*

The connection between social engagement and quality of life is a matter of great relevance to gerontological social work practice. Within these communities that promote an active social and leisure lifestyle, participating in facility organized formal social activities slowed the decline in quality of life over time. Group activities provided a way for seniors to stay active by taking advantage of opportunities for personal growth, learning, skill development, service, and cultural pursuits. The variety of activities provided a social mechanism through which older adults living in senior housing could become friends or acquaintances with people who share mutual interests, a situation which can enhance perceptions of social integration. Being connected to others through meaningful social relationships, as well as becoming socially integrated within communities, is known to have a positive effect on health and well-being for people of all ages (Berkman & Glass, 2000; Putnam, 2000). This study suggests that it is imperative for social workers serving older adults to encourage participation in meaningful group
activities as a strategy for senior housing residents to enhance and maintain quality of life over the long run. At the same time, the group activities available within the CCRC must be representative of the interests of its residents and considered meaningful.

Critics, however, may argue that not every older person seeks out an active social life or even wants to take advantage of the social and leisure activities available. Indeed, personality factors may influence how older adults adjust to the transition of moving to a CCRC (Costa & McCrae, 1995). One study found that while more extroverted older adults reaped the benefits of living in a richer social environment, those who were more introverted before move-in became even more disengaged after moving to congregate housing (Carp & Carp, 1980). Certainly, social workers need to be mindful of these individual differences and find ways to enhance quality of life while respecting the preferences of older adults. A review article of interventions to prevent social isolation and reduce loneliness of older people also identified several effective interventions that included components of education and social support (Cattan, White, Bond, & Learmouth, 2005).

Social workers can also facilitate opportunities for older adults to provide support to others and contribute to society in meaningful ways. Providing more social support to help others explained some of the initial differences in quality of life for older adults who lived in senior housing for a year. In the first year of the Erickson Life Study, around 16% of the respondents indicated that they wanted more opportunities to provide social support to others. Several other studies have found that providing support to others may improve well-being for older adults (Krause & Shaw, 2000; Reissman, 1965; Silverstein, Chen, & Heller, 1996). Older adults can provide support and help others informally as
well as formally. For people who recently move in to senior housing, social workers can help older adults form relationships with their peers. This may help older adults expand their social network, increase feelings of neighborliness, and reveal opportunities to provide mutual aid. Social workers can share information about more formal ways of providing support within the CCRC or wider community. In addition, social workers can help to remove barriers for older people with high comorbidities to take part in social activities. A promising strategy to create opportunities for social engagement among older adults with more functional limitations involves the use of technology.

As a pilot study in two retirement communities, the MacArthur Foundation’s Masterpiece Living program (Kahn, 2004) has studied how behavioral changes in diet, exercise, intellectual involvement, social relationships, and voluntary activity are related to successful aging. In both communities, equipment was added or modified to ensure accessibility for all people, a new executive chef was hired to prepare more healthful food, and intellectual activities such as a book club, discussion groups, and free access to courses at a nearby college with transportation were provided. Additionally, opportunities to volunteer within the CCRC as well as the larger community were shared with senior housing residents. A questionnaire tracked gains, losses, and stability so that the older person could track their progress, discuss plans with peers, and share suggestions for facility improvements to support successful aging. Over a year, this pilot study found small reductions in risk factors and improved gait and balance. The implications of this pilot suggest that retirement communities can take steps to further enhance successful aging.
The literature supports myriad benefits to activity participation in old age. A longitudinal study in Sweden found that regardless of earlier activities and health, participation in leisure activities in old age was associated with living longer (Agahi, Silverstein, & Parker, 2011). Participating in only a small number of leisure activities doubled the risk of mortality compared to those with the highest levels of participation after controlling for demographic and health characteristics (Agahi & Parker, 2008). At the same time, the quality of the living environment is linked to social participation and quality of life. Thus, older adults who live in inadequate housing or disadvantaged neighborhoods with few opportunities for social participation are at risk for poorer quality of life (Tomaszewski, 2013).

One of the contributions of this study involves the identification of risk and protective factors to assist social workers with identifying older adults who may experience a lower quality of life in senior housing. The cross-sectional relationship between social engagement and quality of life found that worse quality of life in the first year was associated with a lack of participation in formal social activities and receiving more informational and tangible support in personal relationships. In the longitudinal analysis, gender, the senior housing site, ratings of quality of life just before moving in, and providing social support to others explained the individual differences in quality of life for residents of senior housing in the first year.

Social workers who complete comprehensive assessments at the time of move-in that include consideration of physical, social, cognitive, and psychological functioning can identify individuals at risk of poor quality of life and provide options for early intervention through inviting them to become involved in formal social activities and
facilitating opportunities to provide social support to others. Also, the perceptions of quality of life that individuals reported before move-in were strongly related to quality of life after living in senior housing for a year. This suggests that by completing a comprehensive assessment, social workers can identify those who are most vulnerable to a lower quality of life over time.

Gender differences in quality of life are also important considerations for gerontological social workers. According to Pinquart and Sörensen (2001), improving the quality of the older person’s social network is important to reduce loneliness. In this sample drawn from four CCRC’s, men reported lower quality of life than women. In other studies, women reported worse quality of life than men (e.g., Gallicchi, Hoffman, & Helzlsouer, 2007). Interestingly, other studies have found that social connectedness and perceptions of being socially integrated increased after moving to a CCRC for older adults most at risk of social isolation, such as the oldest-old, single women, and individuals with poor health (Erickson, Dempster-McClain, Whitlow, & Moen, 2000). Given the importance of group-oriented social activities in the social worlds of CCRC residents, facilities may need to create new groups that more closely align with the interests of men. Due to the fact that most of the people who live in senior housing within CCRC’s are women, social workers also need to carefully assess the quality of life for men and the challenges they face.

Finally, this study found that higher comorbidity was related to a steeper decline in quality of life. Chronic medical conditions can lead to a process of disablement in which the physical abilities of older adults become more restricted and it is increasingly more difficult to perform the tasks of daily living (Verbrugge & Jette, 1994). Social
workers within continuing care retirement communities help older adults manage chronic conditions, maintain functional abilities, and cope with functional decline.

Policy Implications

Within continuing care retirement communities, the impact of different components of social engagement on quality of life for older adults living in senior housing draws attention to the importance of the social environment within age-segregated living arrangements. A qualitative study in Ohio found that some older adults were excited about moving to the CCRC to begin a new and interesting phase of their lives (Groger & Kinney, 2006). Participants in the Erickson Life Study valued having more time and access to socialization and activities (Marx et al., 2011), and the current study identified a link between involvement with formal social activities and the maintenance of a better quality of life over time. In the Pathways to Life Quality study, social connectedness and perceptions of being socially integrated increased after moving to a CCRC (Erickson, Dempster-McClain, Whitlow, & Moen, 2000). Taking advantage of a wide array of formal social activities is an important determinant of quality of life for older adults over the first five years of living in senior housing. The implications of this finding support policies that take a more preventative approach to maintaining the quality of life of older adults. These long term effects of social engagement can be used to develop policies and environmental initiatives to address social isolation and prevent declines in quality of life.

It is important for providers of senior housing to invest in group-oriented formal social activities to forestall the decline in quality of life over time. Consistent with a
number of theories that endorse the benefits of active aging, such as psychosocial theory (Erikson, 1950, 1982/1997), activity theory (Lemon, Bengston, & Peterson, 1972), and the proactivity model of successful aging (Kahana & Kahana, 1996, 2003; Kahana, Kelley-Moore, & Kahana, 2012), staying actively engaged in meaningful activities is an important aspect of aging successfully and emphasizes that human development continues throughout the lifespan. Although older adults are likely to lose formal roles over time, senior housing offers a setting where older adults can stay actively involved in group-oriented social and leisure pursuits which may foster the formation of social relationships with peers. As Lawton and Nahemow (1973) recognized, the resources available within the environment have a powerful role in shaping the competence, stimulation, and interests of older adults. Therefore, access to a wide array of social and leisure activities may be a preventative strategy to help be able to maintain a better quality of life.

This study also highlights several critical policy issues for aging Americans. Senior housing within continuing care retirement communities provides safe housing for older adults who no longer desire the environmental barriers, maintenance responsibilities, and financial commitment required to maintain a home. These elder-friendly environments are designed with needs of older adults in mind, encourage active aging, and support an independent lifestyle. Relocation to senior housing in later life is usually a voluntary decision that is made to attain a better congruence between the environment and the needs of the individual (Kahana, 1982). Yet many factors can influence the person in environment fit between housing and the needs and preferences of older people. For example, widowhood and health declines can change how features of
housing fit with the individual (Erickson & Kantrowitz, 2000). Research is needed to examine how housing for seniors can support successful aging throughout life’s transitions. Recently, the MacArthur Foundation has awarded funding to study how senior housing can be designed with additional services to support improved health and quality of life outcomes (MacArthur Foundation, 2012). In turn, public support may be needed to ensure the availability of these housing options for older people. In *Continuing Care Retirement Communities*, Sherwood and colleagues (1997) aptly articulated the need to preserve the choice and independence of older adults while maintaining the benefits of their informal care network. Because older adults are a diverse group, policies need to respond to the preferences of older adults and affirm their decision-making power.

By virtue of personal preference or a lack of financial resources, most of the aging population does not have the benefit of living in an environment where housing and health care needs are guaranteed over the lifespan. Within America, the older adult population is growing at an unprecedented rate, and by 2030, older adults will make up a full 20% of the overall population (AoA, 2012). Plus, those who are 85 years and above are expected to comprise the fastest growing segment of the older adult population, increasing from 5.7 million in 2008 to 19 million by 2050 (U. S. Census Bureau, 2012). These demographic trends point to an enormous demand for policy alternatives to address the need for access to affordable and adequate housing, as well as to supportive services in the community to help older adults age in place. Less attention in the literature has been paid to how the physical aspects of the lived environment can help older adults live with a higher quality of life. For example, unaccommodating physical environments may
limit older adults’ ability to remain actively engaged in life. Modifications to the existing physical environment consistent with elder-friendly universal design principles allow for greater accessibility and an improved quality of life for people of all ages and abilities (Hokenstad, 2006). Modifying the living environment through incorporating universal design features that increase accessibility and functionality for everyone can also help older adults complete tasks with less effort and promote a more actively engaged lifestyle (Carr, Weir, Azar, & Azar, 2013). Furthermore, neighborhood factors, such as safety, social cohesion, and walkability were important influences on quality of life for older people living in New York City (Friedman, Parikh, Giunta, Fahs, & Gallo, 2012).

Services that can help more frail older adults with the tasks of home maintenance and fostering supportive social networks are needed within urban and rural communities (Cho, Cook, & Bruin, 2012). Therefore, policy makers and community planners have a role in designing how the services and supports available within the community can support successful aging.

Social workers also have a critical role in creating societal conditions that support health and well-being into late adulthood through advocating for health care based on the older person’s needs, goals, and strengths (WHO, 1998). In addition to the need for adequate housing, studies have shown that anticipation of their future care needs in terms of access to medical care and long term care services is the primary reason that older adults relocate to senior housing (Kroot et al., 2000; Marx et al., 2011). Currently, about 10 million Americans need long term care services to assist with carrying out activities of daily living, and this number is expected to increase to 15 million by 2020 (National Council on Aging, 2010). Due to increasing longevity, old age is often accompanied by
chronic illness that may cause physical or cognitive frailty for an extended period of time. Approximately 80% of adults 65 and above in the United States have one or more chronic illness (National Center for Chronic Disease Prevention and Promotion, 2004), and the majority of health care expenditures for older adults are a result of treating chronic illnesses (Hoffman, Rice, & Sung, 1996). Estimates suggest that the lifetime probability of an American becoming either physically disabled in at least two activities of daily living (e.g., bathing, dressing, transferring, or eating) or cognitively impaired is 68% for people at age 65 (AARP, 2003). Yet it is also important to recognize that chronic illnesses in old age are a culmination of behaviors and experiences throughout the lifespan (WHO, 2005).

In *Ageing in the Twenty-First Century*, the United Nations (2012) communicated ten priority actions to maximize opportunities for the aging population. One of the top directives was to help families and communities develop support systems for older adults, which involves ensuring access to long-term care for frail elders in addition to promoting active and healthy aging at the local level to support aging in place (United Nations, 2012). With the growing older adult population, there is also a need for policies to expand the social engagement of older adults and foster the mutually beneficial inclusion of older adults in society. Older people, including those living within senior housing, have the knowledge, skills, and desire to make significant contributions to the community at large. In conclusion, greater attention is needed to social policies that invest in human development throughout the lifespan, support the development of informal and formal care options for older adults, provide safe and affordable housing, and enhance the inclusion of older people in society.
Limitations, Strengths and Future Directions

This dissertation research examined the trajectories of quality of life over time for older adults living in senior housing and focused on the influence of social engagement after living in senior housing for a year on quality of life. Social engagement was operationalized through giving and receiving four kinds of social support and participating in formal social activities that were organized by the continuing care retirement community. Though not assessed in this study, informal activities such as involvement in social activities among friends in senior housing that were not formally organized, as well as other social activities that took place outside of the continuing care retirement community, may also be related to quality of life. While it is not possible to examine how these informally organized activities and other social activities interact to shape the social worlds of older adults in this study, this is an exciting line of future research that can inform social work interventions to enhance quality of life.

The generalizability of these findings is limited to individuals with similar characteristics who live within the independent senior housing within large-scale continuing care retirement communities that offer integrated health, supportive services, and a rich array of formal social activities. Accordingly, these findings cannot be applied to residents of smaller CCRC’s that do not offer the same amenities, services, and variety of formal social activities or other levels of care (e.g., nursing home) within a CCRC. Continuing care retirement communities are able to connect older adults with a variety of housing options, health care, and social and leisure opportunities. Another aspect that limits generalizability is the fact that the sample was drawn from only four continuing
care retirement communities in a small geographic area (Maryland and Virginia) that were managed by a single for-profit provider.

As a requirement of admission to the independent living senior apartments within a CCRC, older adults in this sample had at least moderate financial resources. Therefore, it is important to emphasize that these research findings are not generalizable to lower-income older adults. The socioeconomic differential underscores the range of differences between the characteristics of this group of older adults living within a retirement community compared to either older adults living in the wider community or older people with more limited financial resources who live in other kinds of age-segregated environments. For example, findings from this study are not applicable to low-income older adults living in public housing. Public housing senior apartments typically do not provide a wide array of formal social and leisure activities for their residents on site. Furthermore, residents of public housing are likely to face additional barriers to participate in formal social activities available in the community-at-large, such as a lack of financial resources and difficulty with transportation. For older adults living at or near poverty, greater challenges with meeting basic needs including adequate housing, health care, nutrition, socialization, and mobility would be expected.

Consequently, the relationship between social engagement and quality of life is worthy of study in more diverse groups of older adults. Similar to the ethnic background of the vast majority of individuals who move to the independent living within retirement communities, almost all of the respondents in this study were Caucasian. Older adults opting to move into retirement communities are mostly white women who are well-educated with at least moderate financial resources (MetLife, 2009). Since so few
members of ethnic minority groups choose to move to a CCRC, it is not known whether relationships between social engagement predictors and quality of life are similar for minority groups. While older adults in this study reported some comorbidity, study inclusion criteria required that physical and cognitive functioning remained good over time to continue to live in the independent senior housing. On average, the study’s sample reported better health than a matched community-based sample (Gaines et al., 2011). Indeed, additional research is needed determine if the relationship between social engagement and quality of life is supported among more marginalized groups of older people who are less well off in terms of their physical, cognitive, social, and financial resources.

The Erickson Life Study data provided rich information about the changes in quality of life over the first five years of living in senior housing, along with factors that influence the initial status of quality of life and changes in quality of life over time. The simplified model of the influence of social engagement after living in senior housing for a year on quality of life over the next five years did not control for changes in social engagement or other control variables at each subsequent annual assessment. Future quantitative and qualitative research should consider a more dynamic approach to studying how changes in social engagement impact changes in quality of life over time for older adults within age-segregated living environments. In regard to latent growth modeling, future research should consider more complex interactions that include perceptual and behavioral indicators of social engagement and trajectories of quality of life. In larger samples, a multiple group analysis can test gender differences among older people living in senior housing. Non-linear patterns of change models might be tested to
reflect the most precise patterns of change. Ideally, these studies will also assess quality of life over a longer timeframe and include more diverse groups of older adults living in age-segregated environments as well.

Continued research is needed to understand the long-term success of individuals living in CCRC’s. This dissertation applied a methodologically rigorous approach to examine changes in quality of life for older adults living in senior housing at the group and individual level of analysis. While quality of life declined overall for the group, there was notable individual variation in the perception of quality of life after living in senior housing for a year. Interestingly, there were non-significant differences in the trajectories of individuals over time regardless of initially higher or lower quality of life. Factors that explained differences in the experiences of quality of life in the first year were identified, and the influence of social engagement on quality of life over time was examined through a latent growth model. These findings lend support to the long-term benefits of formal social activity participation in slowing the rate of decline in quality of life over time.
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