

Health and Living Arrangements among Older Adults in Diverse Social and Cultural Contexts

by

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This dissertation is dedicated to my family

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## **ABSTRACT**

This dissertation consists of three empirical papers on health and living arrangements among older adults. It aims to investigate the dynamic associations between living arrangements and the physical/mental health among older adults, and to examine how these associations are influenced by various cultural factors, such as age cohort, race/ethnicity, and nationality. To accomplish these specific aims, two nationally representative panel data for older populations are examined: the 2006-2008 Korean Longitudinal Study of Ageing and the 1998-2010 Health and Retirement Study.

The first study explores the effects of physical/mental health on transitions in living arrangements among older Koreans. The effects of health on living arrangements vary by marital status; while unmarried elders with health problems are more likely to live with their children, married elders tend to live near their children. The second study investigates how different types of living arrangements influence physical function and psychological well-being in old age, and how these effects differ between the old-old and the young-old. The results show that co-residence does not always positively influence health and well-being, particularly among the young-old. Finally, the third study analyzes the trajectories of living arrangements among older Americans over a twelve-year period. This study examines to what extent physical/mental health influence the trajectories of living arrangements, and if there are racial/ethnic variations. Older Americans are more likely to move closer in proximity to one of their children, but they do not

usually move into the same household. The onsets and aggravations of health problems affect changes in living arrangements, and these linkages are stronger among Whites than African Americans and Hispanics.

The findings highlight the importance of social and cultural contexts in understanding the linkages between health and living arrangements in old age. Given the increase of rapidly aging societies, understanding the dynamic linkages between health and living arrangements is important for social, health, and long-term care policies. My dissertation can contribute to a clearer identification of the groups of elderly who are at high risk for health problems and social isolation as well as to the design and implementation of service programs for these high-risk groups.

## **CHAPTER 1:**

### **INTRODUCTION**

#### **1.1 Purpose and Significance**

My overarching research goal is to investigate the dynamic associations between various types of social support and physical and mental health among older adults in diverse social and cultural contexts. For this dissertation, I focused on intergenerational living arrangements as one type of social support. Living arrangements are the most immediate and proximate social environments that provide social support for individuals (Alwin, Converse, & Martin, 1985). Different living arrangements are associated with diverse family relations and distinct exchange patterns among family members (Kertzer, 1986; Liang et al., 2005; Won & Lee, 1999). They are particularly important in old age, because the risks of physical and mental health problems increase with aging. Older adults with health problems may need to change their living arrangements in order to receive physical support in a more effective and efficient way.

In addition, living arrangements can significantly affect physical and mental health in old age, because they are associated with the regulation of health behavior, supply and consumption of economic resources, and demands on individual roles (Li et al., 2009; Lund et al., 2002; Waite & Hughes, 1999). Moreover, whether or not an actual living arrangement matches one's preferred living arrangement also influences the health and psychological well-being among

older adults (Sereny, 2011). Therefore, living arrangements are important determinants of individuals' health and well-being in later life as well as significant predictors of the availability of informal care, the utilization of formal long-term care services and the institutionalization for the frail elderly (Gaymu, Ekamper, & Beets, 2008; Martikainen, Nihtila, & Moustgaard, 2008). As the world's population is rapidly aging, understanding the associations between health and living arrangements in old age is of interest and importance in health, long-term care, and welfare policies for the elderly.

The goals of this dissertation are to (1) investigate the dynamic associations between different types of living arrangements and the physical and mental health among older adults, and to (2) examine how these associations are influenced by various social and cultural contexts. Specifically, my dissertation research aims to achieve the following:

Aim 1. To assess the effects of a variety of physical and mental health conditions on living arrangements among older adults in South Korea; and, in particular, examine if living near children is a distinct category of living arrangement from co-residence with children and living away from children.

Aim 2. To examine how living arrangements, in turn, influence physical health and psychological well-being in old age, and how these effects differ between the old-old (defined as the elderly aged 70 years or older) and the young-old (defined as the elderly aged between 60 and 70 years).

Aim 3-1. To investigate the trajectories of living arrangements of older adults in the U.S., and to evaluate if changes in health influence these trajectories.

Aim 3-2. To examine if there are the racial/ethnic differences in the linkages between health and trajectories of living arrangements.

To accomplish these specific aims, two nationally representative panel survey data for older populations were examined: the 2006-2008 Korean Longitudinal Study of Ageing (KLoSA) and the 1998-2010 Health and Retirement Study (HRS).

## **1.2 Theoretical Perspectives**

### **1.2.1 The Convoy Model of Social Relations - Life Course Perspectives**

This dissertation is guided by the Convoy Model of Social Relations (Antonucci, 2001) that provides a theoretical perspective of the lifespan development of social relationships (Wahl & Lang, 2004). This theory conceptualizes close social relationships as a convoy that represents various resources that provide support for individuals throughout their life course. A social convoy has far-reaching and cumulative effects on both health and psychological well-being (Fiori, Antonucci & Cortina, 2006). Because the composition and quality of a social convoy is shaped by a variety of personal and situational factors (Fiori & Jager, 2012), social convoys are not static entities, but rather multilayered dynamic systems. In this respect, the social network of an individual is expected to change over time. This change may affect his/her health and psychological well-being. In addition, the health and well-being of individuals and the changes in health and well-being of individuals also influence social convoys as well.

Living arrangement can be considered a type of social convoy of intergenerational relations, since it provides support throughout the life course including both instrumental (e.g., physical help, financial assistance) and emotional support (Antonucci, Birditt, & Akiyama,

2009). Family members tend to find the most beneficial arrangement that reflects their various constraints and needs depending on life course events and stages (Chen, 2005; Moen, 1992). In particular, the aggravation of health problems in old age restricts the ability for older adults to maintain their independence and increases the need of physical assistance (Liang et al., 2005). In addition, since individuals have the most proximate social relations in their household, the living arrangements of individuals and changes in living arrangements of individuals affect their overall health and well-being.

### **1.2.2 Cultural perspectives on living arrangements and family relationships**

Interactions between individuals in society cannot avoid the influence of macro structures such as social and cultural contexts. Social and family relationships are socially and culturally patterned, and the associations between social relationships and health and well-being vary across different cultural groups and in different countries (Young & Grundy, 2009). Regarding family supports for the elderly with health problems, members of different cultural groups and different countries have varying degrees of intergenerational obligations and expectations for obtaining social support from outside the household (Gallant et al., 2010). Prior studies focusing on the living arrangements of older Americans usually address racial/ethnic differences as a cultural factor affecting living arrangements. Even in racially/ethnically homogeneous countries, the cultural differences regarding intergenerational relationships and living arrangements should exist. In this respect, there is a need to expand our current knowledge of health and living arrangements in old age to various social and cultural contexts. A study using data from different countries can contribute to evaluating the generalizability and cultural specificity of current



theory, and provide a greater understanding of how the different cultural, demographic, and policy backgrounds influence the living arrangements of the elderly.

Taking into account these theoretical perspectives, this dissertation explored the dynamic linkages between living arrangements and health and psychological well-being among older adults in diverse social and cultural contexts (Figure 1.1). All three papers were based on the nationally representative longitudinal panel data to reflect changes in personal and situational factors.

### **1.3. Organization**

This dissertation is comprised of three empirical papers that examined the dynamic associations between the health and living arrangements among older adults in two different social and cultural contexts, South Korea and the United States, and how these associations were influenced by a variety of cultural factors, such as age cohort, race/ethnicity, and nationality.

In Chapter 2, I present the first paper that explored the effects of physical and mental health conditions on transitions in intergenerational living arrangements among older Koreans. Intergenerational living arrangements were categorized into three types: co-residence, proximate residence, and distant residence, which contrasted previous studies that have focused only on the co-residence of older adults with their adult children. Proximate residence provides the privacy of separate living arrangements for older adults as well as the support of having their children in close proximity. In this respect, this type of living arrangement may be a beneficial option for the elderly particularly in societies where the traditional value of co-residential support for older parents clashes with the current trend of people to focus on individualism, instead of

collectivism.

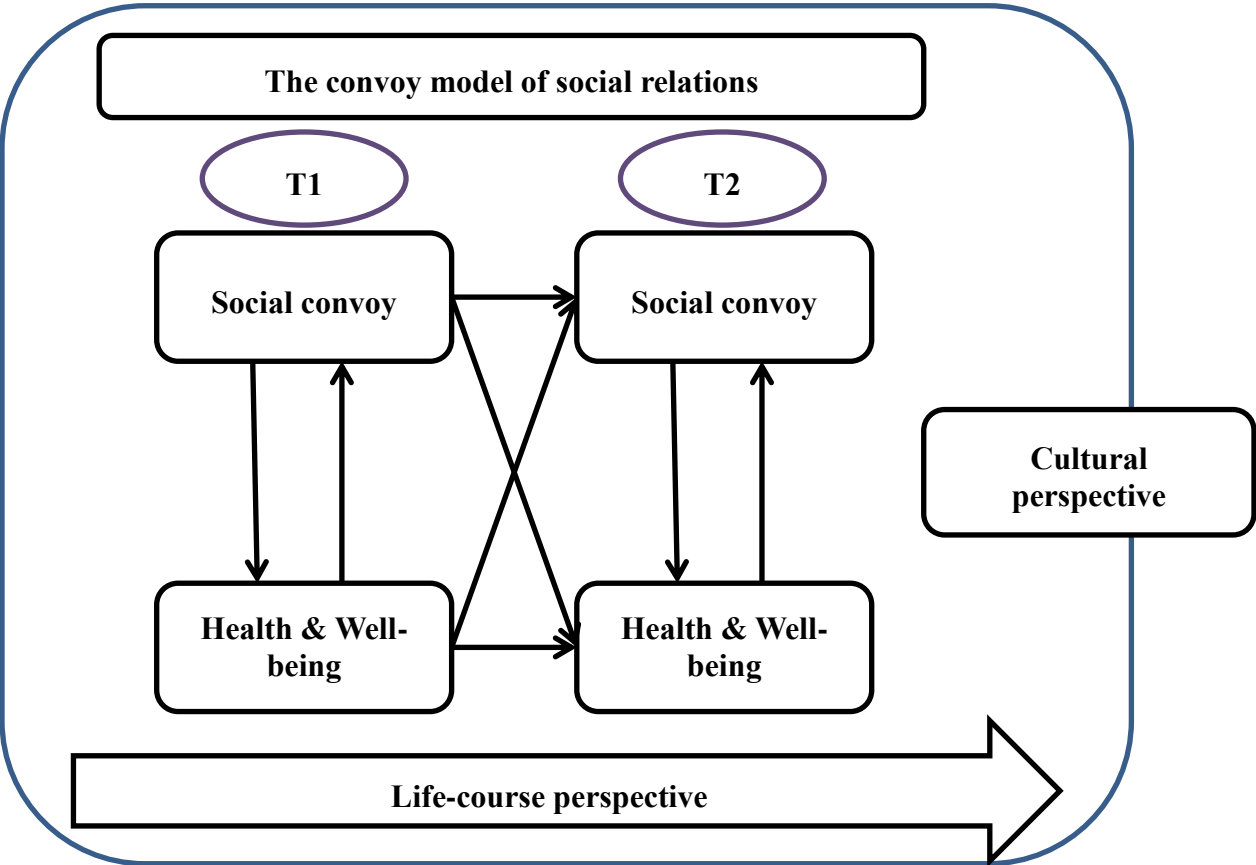
After examining the effects of physical and mental health conditions on intergenerational living arrangements among older Koreans, I then turn to examining the effects of intergenerational living arrangements on health and psychological well-being with the same sample that was used in the first paper. Chapter 3 presents the second paper that investigated to what extent different types of living arrangements influence physical health and psychological well-being in old age, and how these effects differ between the old-old (aged 70+ years) and the young-old (aged 60-70 years). This study argued that the older population cannot be considered to be homogeneous even in the same society. Due to rapid social changes in recent decades, the cultural value placed on co-residence is significantly different between the old-old and the young-old in South Korea. The young-old in South Korea tend to be more independent from their adult children and to have more social resources to support their old age (e.g., pensions, social activities), while the old-old still value family interdependence and have relatively limited social resources.

Chapter 4 presents the final paper on trajectories of living arrangements among older adults in the United States over a twelve-year period. This paper examined to what extent various physical and mental health conditions – functional status, chronic conditions, and depressive symptoms – influenced the trajectories of living arrangements. In addition, this study also evaluated if there were any racial/ethnic variations in the associations between health and the trajectories of living arrangements. Changes in living arrangements are influenced by various events in individuals' life courses, which are connected to shifts in opportunities, constraints, needs, and preferences. Therefore, living arrangements in old age should be understood in the

life course perspective. In this respect, I believe that this longitudinal study, done over an extensive period of time contributes to a more comprehensive understanding of living arrangements among older adults.

Finally, Chapter 5 presents some concluding remarks regarding the overall findings of the dissertation and discusses implications for theory, research, and practice. The chapter also reviews limitations of the dissertation and provides future directions for research and policy.

**Figure 1.1 Theoretical Framework: The convoy model of social relations, life-course perspective, and cultural perspective**



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## **CHAPTER 2:**

### **Health and Living Arrangements of Older Adults in South Korea:**

#### **Is Proximate Residence a Distinct Category?**

##### **2.1. Introduction**

As population aging continues, the living arrangements of older adults have become of interest to policy makers (Gaymu, Ekamper, & Beets, 2008; Palloni, 2001). The living arrangements of individuals are the most immediate and significant social context that provides them with physical and emotional social support. It is particularly important to consider these arrangements with regards to older adults, since their risk of physical and psychological health problems increases as they age. Older people with health problems can receive physical and emotional support from family members living within the household or nearby. This positively influences their health and well-being (Palloni, 2001; Kharicha et al., 2007), and it reduces the burden placed upon government funded and supported health and social services (Picone, Wilson, & Chou, 2003).

In recent decades, extensive research has focused on the factors affecting living arrangements in later life. Specifically, health conditions have been demonstrated to be important determinants of living arrangements among the elderly (Brown et al., 2002; Soldo, Wolf, & Agree, 1990; Speare, Avery, & Lawton, 1991; Martikaine, Nihtila, & Moustgaard, 2008;



Zimmer, 2005). Because poor health increases the need for physical support in daily lives among older people, older parents with health problems may move closer to their children in order to get physical support in effective and efficient ways (Litwak & Longino, 1987; Rogerson, Burr, & Lin, 1997; Silverstein, 1995). It has also been found that the effects of health conditions on living arrangements vary by marital status, because spouses usually play an important role as a caregiver (Liang, Brown, Krause, Ofstedal, & Bennett, 2005; Silverstein, 1995).

However, our current understanding of the effects of health on living arrangements in later life can still be substantially improved in several ways. First, most research on living arrangements has conceptualized living arrangements of the elderly as a result of a rational decision-making process between older parents and their adult children (Soldo et al., 1990). However, in order to understand intergenerational relationships and living arrangements in different social and cultural contexts, the rational choice and the cultural perspective should be addressed with equal emphasis. The rational choice perspective postulates living arrangements of older people as family adaptive strategies, which are a consequence of negotiations in which the older parents and their adult children evaluate their opportunities, needs, resources, and preferences to choose the most beneficial arrangements (Soldo et al., 1990; Spitze et al., 1992). A number of previous studies have examined how the living arrangements of older adults are influenced by a variety of attributes, such as socio-economic status and health conditions, which are implicitly or explicitly associated with factors in the rational choice model (Chappell, 1991; Hays, 2002; Liang et al., 2005).

However, it has been found that the factors in the rational choice model do not significantly influence living arrangements of older people in countries with a strong norm of

filial piety (Cattell, 1990; Hampson, 1985; Kimuna, 2005). In contrast to the rational choice model, the cultural perspective posits extended family co-residence as an expression of traditional family values based on social norms related to reciprocal obligation and interdependence across generations (Chen, 2005). For example, Asians commonly believe that adult children have lifelong debts to their older parents who gave birth to and raised them, so they should repay this moral debt by providing limitless support (Akiyama, Antonucci, & Campbell, 1997, Ishii-Kuntz, 1997). As a result, older people in Asia have been supported by family members in the same household based on filial piety (Takagi & Silverstein, 2011; Martin, 1989). Furthermore, living separately from their children could bring great shame to older parents (Maeda & Ishikawa, 2000).

Intercultural variations in residential spatial proximity across countries have been investigated in several studies. According to these studies, differences in proximity of older parents and their adult children can be explained by the strength of cultural attitudes regarding family ties rather than socioeconomic factors (Glaser & Tomassini, 2000; Hank, 2007; Lowenstein & Daatland, 2006). For example, Glaser & Tomassini (2000) demonstrated that poor health of older mothers in Britain had a greater influence on proximity to their children than that in Italy. They explained that proximity between older mothers and their children in Britain tends to arise from the need for assistance for elders with health problems, whereas the proximity in Italy reflects a cultural value of strong desire of intergenerational contact and provision of care for frail older parents regardless of need. Therefore, in order to have more comprehensive understanding of the associations between health and living arrangements, more research with data from countries with diverse social and cultural environments is necessary.

Second, when analyzing intergenerational living arrangements of older adults, *proximate residence* should be considered a distinct category from *distant residence* and *coresidence*. *Proximate residence* is a separate and independent living arrangement, but unlike *distant residence* geographic proximity enables older adults to have more interactions with their children nearby (Crimmins & Ingegnery, 1990; Litwak & Kulis, 1987). Older parents who live near their children could share resources and be supported by their children to a similar extent compared to those residing with children, even though they do not live under the same roof (Clark & Wolf, 1992; Frankenberg, Chan, & Ofstedal, 2002; Glaser & Tomassini, 2000). Comparing to *coresidence*, *proximate residence* can provide more privacy and independence with older adults. Also, older parents in this residence are less likely to be exposed to family conflicts that may occur in the same household (Aquilino & Suple, 1991; Silverstein, 1995).

In fact, proximate residence is the most prevalent living arrangement among older adults in most Western developed countries (Glaser & Tomassini, 2000), and the importance of proximate residence in old age has been demonstrated. In particular, it has been found that declining health of older parents triggers closer proximity to their adult children (Hank, 2007; Silverstein, 1995). However, many previous studies defined living arrangements in terms of whether or not older parents live with their adult children (Brown et al., 2002; Liang et al., 2005; Rogerson et al., 1997; Soldo et al., 1990; Speare et al., 1991; Spitze, Logan, & Robinson, 1992; Wilmoth, 1998; Zimmer, 2005). In this categorization, *proximate residence* (i.e. separate living but near children) and *distant residence* (i.e. separate living away from children) fell into a common category of separate living. Although the number of children who lived near their elderly parents was controlled as a covariate (Brown et al., 2002; Liang et al., 2005), this study design cannot differentiate the factors affecting *proximate residence* and *distant residence*. In

order to precisely reflect diverse family relations and distinct exchange patterns among family members, three types of intergenerational living arrangements including co-residence, proximate residence, and distant residence should be investigated.

The potential role of proximate residence from adult children deserves attention particularly for a society where the traditional norm of co-residential support for older parents and contemporary value of individualism coexist. South Korea provides a good setting for investigating the living arrangements of older people in a unique cultural and social context. Based on the cultural norm that demands a strong sense of obligation to support and care for older parents, Korean older adults have traditionally lived with their adult children (Bae, 1987). Social policy in South Korea has also encouraged families to support their elderly parents based on the principle of "family first and social welfare later." However, along with westernization, industrialization and modernization, the number of elderly living alone or only with a spouse has significantly increased in the recent decades. The preferred type of living arrangements has also greatly changed; Korean elders prefer not living with their adult children because of differences in values and lifestyles (KIHASA, 2010).

This paper aimed to expand our understanding of the linkages between health conditions and living arrangements among the elderly by filling the gaps in knowledge discussed above. Specifically, this study investigated to what extent a variety of physical and mental health conditions are associated with current living arrangements and transitions in living arrangements among older adults in South Korea. We analyzed living arrangements separately among the married and the unmarried elderly, because associations between health and living arrangements have been found to vary depending on the existence of a spouse (Liang et al., 2005). Considering

the social and cultural context of South Korea, we hypothesize that married elders with health problems are more likely to be in proximate residence rather than in co-residence or distant residence. Proximate residence can simultaneously provide them with an independent life as well as some support from children. We also hypothesize that unmarried elders with health problems are more likely to be in co-residence rather than in proximate residence or distant residence. They may need to live in the same household with their children in order to get sufficient physical support for their daily lives. Also, living alone can be viewed as indicating that an older parent is neglected by their children under the Korean culture of filial piety.

## **2.2 Method**

### **2.2.1 Data and Sample**

Data were obtained from the 2006 and 2008 Korean Longitudinal Study of Ageing (KLoSA), which is a longitudinal survey of a nationally representative sample of the older population in South Korea. This study restricted the age of its sample to adults over the age of 60. In order to investigate intergenerational living arrangements among older adults, we excluded respondents who did not have any adult child over the age of 20 at the baseline (n=128) and those who lived with people other than a spouse or children either in 2006 or in 2008 (n=336). Consequently, the sample of this study was limited to 5,209 respondents.

### **2.2.2 Measures**

***Living arrangements.*** This study included three types of living arrangements among the married and the unmarried, respectively: (a) living with at least one adult child (*co-residence*), (b) living separately – for the married, living only with a spouse and for the unmarried, living alone – but

near to children (*proximate residence*), and (c) living separately away from children (*distant residence*). Proximate residence was defined as being within a 30-minute commute via public transportation between respondents and their closest living child. For the purpose of this study, the unmarried elderly were defined as those who were divorced, separated, and widowed. The married elderly included those who were living with their spouses or partners.

**Health conditions.** *ADL limitation* was determined by impairment in at least one of the multiple activities of daily living (ADL) such as bathing, dressing, eating, transferring, toileting, washing face and hands, and continence. *Chronic conditions* were determined by self-report of whether or not a respondent had one or more of the following eight conditions diagnosed by a physician: high blood pressure, diabetes, cancer/malignant tumor, chronic lung disease, cardiac disorder, or cerebral vascular disease, liver ailment, and arthritis (Jang et al., 2009). The number of chronic conditions was coded as dummy variables that contrast having no chronic condition with having one or, greater than two chronic conditions. *Depressive symptoms* were assessed with the Center for Epidemiological Studies Depression 10-item scale (CES-D 10; Radloff, 1977) that had a 4-point scaled response format for each item ranging from 0 to 3, where 0=very rarely, 1=sometimes, 2=often, and 3=almost always. In order to calculate the CES-D 10 score, we reversely coded for two positively phrased items, and then calculated the sum of the 10 items. The final measure of depressive symptoms ranges between 0 and 30, and a higher value refers to a greater depression. The internal consistency score (the Cronbach's alpha) was .807.

**Covariates.** Based on the literature examining the factors affecting living arrangements in old age, we adjusted for additional variables regarding social stratification, family attributes, social relations, and religious affiliation.

***Social stratification.*** *Age* was measured in years at the time of the baseline survey, and was coded categorically (60-69, 70-79, 80+). *Gender* was dichotomized into female (=1) versus male (=0). *Education* was measured according to the number of years of formal schooling. *Location of living* was categorized into urban (population greater than 50,000) and rural areas (population less than 50,000). Total couples' *income* was calculated by adding both the husband's and wife's income per year (in millions of won), which included earned income, assets income, pensions and annuities, public transfers, and all other incomes. *Homeownership* was indicated by coding home owner (=1) and non-owner (=0).

***Family attributes and social relations.*** *Marital status* was indicated by coding married (=1) and not married (=0). *Number of children* was defined as the actual number of living children. Considering the traditional culture of intergenerational relationships in South Korea, marital status (*having an unmarried child* =1) and the gender of adult children (*having a son* = 1) were also included as dummy variables. Traditionally, adult children in South Korea tended to live with their parents until they get married, and the eldest son was supposed to live with his parents even after he is married. The variable for *non-family interaction* was measured as a 10-scale by assessing the frequency of meeting with friends or relatives: 0 (no close friend or relative), 1 (almost never), 2 (once or twice a year), 3 (three or four times a year), 4 (five or six times a year), 5 (once a month), 6 (twice a month), 7 (once a week), 8 (two or three times a week), and 9 (almost every day).

***Religious affiliations.*** The four major Korean religious affiliations, which are *Protestant*, *Catholic*, *Buddhist*, and *non-religious/unreligious*, were included in our analysis. Although most previous research did not address religious affiliation as a factor influencing the living

arrangements of older people, religious affiliation can be considered as a significant cultural factor in a country with ethnically homogeneous population (Martin, 1989).

### **2.2.3 Data Analysis**

This paper included three analyses regarding living arrangements of the Korean elderly. First, a descriptive analysis was conducted by cross-tabulating living arrangements at the baseline and the follow-up in order to show the pattern of changes in living arrangements of older Koreans over the study period. Second, multinomial logit regressions were used to examine the effects of a variety of health conditions on current living arrangements and transitions in living arrangements. Model 1 examined only the effects of physical and mental health conditions at the baseline (time  $t-1$ ) on living arrangements at the follow-up (time  $t$ ). Since the health conditions examined in this study (i.e., functional limitations, number of chronic disease, and depressive symptoms) were not highly correlated with each other (.023~.443), we included all these three health variables simultaneously. Model 2 controlled for social stratification, family attributes, non-family interactions, and religious affiliations at the baseline (time  $t-1$ ). Finally, in Model 3, we analyzed the effects of health conditions on transitions in living arrangement by adding living arrangements at the baseline as covariates. The data from different time periods is important due to potential reciprocal associations between health and living arrangements (Liang et al., 2005). Lastly, competing risks for non-response and mortality, relative to remaining in the community were also estimated by multinomial logit regression.

The sample was divided into those married and those not married at the follow-up survey, not only because living arrangements of the elderly are highly correlated to their marital status, but also because marital status could interact the effects of other attributes of respondents on



living arrangements (Brown et al., 2002; Liang et al, 2005). This study used a single imputation scheme to minimize the loss of respondents who failed to provide an answer or who provided a bracketed response. Because the proportion of missing values is small in KLoSA, single imputation can provide accurate estimation (Schafer, 1999).

## **2.3 Results**

### ***2.3.1 Descriptive statistics and analysis***

Characteristics of the sample at the baseline are shown in the baseline living arrangements by marital status in Table 2.1. Living arrangements among the Korean elderly significantly correlated with their marital status. While the numbers of married elders in co-residence and in distant residence were similar, co-residence was the dominant type of living arrangement among unmarried elders. More than one quarter of married respondents were in proximate residence; however, only 15% of unmarried people lived in this arrangement. Moreover, the attributes of the married were significantly different from the unmarried. Compared to unmarried elders, married elders were younger and male; had relatively better health, higher income and higher education; were more likely to have an unmarried child and their own home.

[Table 2.1 about here]

Table 2.2 shows the transitions of living arrangements among Korean older adults between 2006 and 2008. Competing risks, including non-response and death, are also presented. Since the second wave of KLoSA does not report on the subjects who dropped out from the data due to institutionalization; those who were institutionalized during the period might be included

in the category of non-response. At the follow-up survey, approximately two-thirds of the elderly in distant residence (i.e., living alone or living only with a spouse) and in co-residence remained in the same living arrangements at the baseline (Table 2.2). Compared to those two types of living arrangements, proximate residence was shown to be relatively less stable, in that 52.97% of proximate residents did not make a transition to another living arrangement. Among the older people in distant residence at the baseline, the proportion of people who moved to proximate residence was much greater than the proportion of people who moved into co-residence. Older people in co-residence at the baseline were more likely to be non-responding or dead than those in other living arrangements.

[Table 2.2 about here]

### ***2.3.2 Multivariate analyses***

Tables 3 and 4 present the results from the multinomial logit regression analyses for married and unmarried respondents, respectively. In both cases, the reference category was distant residence, which provide the comparisons of the likelihoods of living arrangements in the categories of co-residence or proximate residence with those of living only with a spouse (for the married) or alone (for the unmarried) without any children nearby.

#### ***2.3.2.1 Health and current living arrangements***

This study hypothesized that poor health is positively associated with proximate residence (for the married) and co-residence (for the unmarried) compared to distant residence. Our results show that these hypotheses are partly supported. As we hypothesized, physical health conditions such as functional status and chronic conditions increased the probabilities of co-

residence (among the unmarried) or proximate residence (among the married) as opposed to distant residence. However, mental health measured as number of depressive symptoms was negatively associated with co-residence among the unmarried.

In detail, among the married, relative to elders in distant residence, those with greater than two chronic diseases are more likely to be in proximate residence (relative risk ratio [RRR]=1.286,  $p<.05$ ), even when all covariates regarding social stratification, family attributes, social relations, and religious affiliations were controlled (Model 2, Table 2.3). However, there was no significant difference in health between co-residence and distant residence (Model 2, Table 2.3). On the other hand, among the unmarried, functional status and depressive symptoms were found to be significant predictors of co-residence relative to distant residence. Functional limitation significantly increased the likelihood of co-residence (RRR=3.754,  $p<.001$ ), but depressive symptoms were negatively associated with the probability of co-residence (RRR=0.942,  $p<.001$ ) (Model 2, Table 2.4). Furthermore, based on post-estimation tests that compared co-residence with proximate residence (data not shown), we found that the unmarried elders with functional limitations were more likely to live with their children rather than to live nearby (RRR=1.942,  $p<.05$ ). However, those with greater number of depressive symptoms tended to be in proximate residence than in co-residence (RRR=0.961,  $p<.01$ ).

### ***2.3.2.2 Health and transitions in living arrangements***

This study hypothesized that poor health leads to proximate residence (for the married) or co-residence (for the unmarried) over time. In Model 3, we added prior living arrangement to Model 2 to examine the effects of health conditions on transitions in living arrangements. Among the married respondents, none of the health conditions were associated with transitions in living

arrangements (Model 3, Table 2.3). However, among the unmarried, functional limitations at the baseline increased the probability of co-residence (RRR=3.626;  $p<.05$ ) and proximate residence (RRR=2.492,  $p<.05$ ) at the follow-up even after controlling for the baseline living arrangements (Model 3, Table 2.4). Our post-estimation tests that compared co-residence with proximate residence showed that health effects were not significantly different between these two types of living arrangements regardless of marital status.

### **2.3.2.3 Socio-demographic attributes and proximate residence**

In addition to health effects on living arrangements in old age, this study also demonstrated that elders in proximate residence differed from those in distant residence in terms of social stratification, family attributes, social relations, and religious affiliations as well (Model 2, Tables 2.3 and 2.4).

Among the married, elders who were female, lived in a rural areas, owned their home, and had non-married child were less likely to be in proximate residence than to be in distant residence. In addition, those who had greater number of children and were affiliated with Buddhism were more likely to live near their children. Similar differences were observed between those who co-resided with children and those in distant residence from children, except strong positive associations between oldes-old age (80+) / having a non-married child and co-residence (Model 2, Table 2.3). Among the unmarried, relatively fewer number of socio-demographic attributes were found to be significant in predicting proximate residence as opposed to distant residence. Elders living in rural area were less likely to live in proximate residence. Family attributes such as being widowed and having greater number of children increased the likelihoods of proximate residence. Religious affiliations including Catholicism and Buddhism

were also associated with greater probabilities of proximate residence (Model 2, Table 2.4).

Socio-demographic attributes were also significant predictors of transitions to proximate residence (Model 3, Tables 2.3 and 2.4.). Among the married, rural residency and having non-married child were negatively associated with proximate residence after controlling for baseline living arrangements. However, married elders who had greater number of children and who were affiliated with Buddhism were more likely to change to be near children. Among the unmarried, urban residency, being widowed, being affiliated with Catholicism or Buddhism increased the likelihood of transitions to proximate residence as opposed to changes to distant residence. We also found that prior living arrangements ( $t-1$ ) were significant predictors of current living arrangements ( $t$ ) regardless of marital status. In particular, co-residence was an extremely stable (Model 3, Table 2.3 and 2.4).

[Table 2.3 and 2.4 about here]

#### **2.3.2.4 Competing risks**

Over the two-year period, all respondents were subject not only to living arrangement transition, but also to major competing risks such as non-response and death. Table 2.5 shows relative risk ratios of non-response or death as opposed to remaining in the sample at the follow-up. Demographic attributes as well as health conditions at the baseline were significant predictors of non-response and mortality. In particular, older Koreans with functional limitations at the baseline interview were more likely to die at the follow-up. Considering that functional status was a factor influencing current living arrangements and transitions in living arrangements, it is possible that if those subjects were not lost, then these elders would have been

more likely to live with or nearby their children. In this respect, without selective attrition, the effects of functional limitation on living arrangements could be greater.

[Table 2.5 about here]

## 2.4 Discussion

This study investigated the effects of physical and mental health conditions on current living arrangements and transitions in living arrangements among older adults in South Korea, using 2006 and 2008 waves of panel data with a nationally representative sample. We clarified that proximate residence is an important living arrangement option for older adults in South Korea where the cultural norm of filial piety and the tendency to value privacy and independence coexist. In addition, the longitudinal data used in this study enabled us to not only examine the transitions in living arrangements, but to define a clear time-sequence between health predictors and living arrangements.

The key finding of this study is that older Koreans in proximate residence differed significantly from those in co-residence or distant residence in terms of health conditions. Also, health effects on living arrangements vary across types of health conditions and interact with marital status. Among the married, having two or more chronic conditions increased the probability of proximate residence as opposed to distant residence, and no health condition significantly affected transitions in living arrangements. In contrast, unmarried elders with functional limitations were more likely to be in co-residence, but those with greater number of depressive symptoms were more likely to be in distant residence or proximate residence rather than to be in co-residence. Functional status significantly increased the probabilities of moving to

proximate residence and co-residence.

Three types of living arrangements including coresidence, proximate residence, and distant residence provide more comprehensive understanding of intergenerational support in terms of living arrangements than two types (i.e., coresidence vs. separate residence). We conducted sensitivity analyses by comparing between the results with three categories of living arrangements and those with two. Separate residence as a category without differentiating between proximate and distant residence simply assumes that regression coefficients associated with proximate residence do not significantly differ from those associated with distant residence. Therefore, a true comparison between proximate and distant residences is not available, when these two living arrangements were considered as the same category.

Specifically, the results with two types of living arrangements concealed the significant association between chronic condition and proximate residence among married elders. In addition, this model showed that functional limitations decreased the probability of separate residence among unmarried elders, but failed to demonstrate the differences between proximate residence and distant residence. In our model with three types of living arrangements, among unmarried elders coresidence did differ from distant residence, but did not significantly differ from proximate residence in terms of functional status. Lastly, regarding transitions in living arrangements, the model with two types of living arrangements showed that functional status did not significantly influence transitions in living arrangements even among unmarried elderly. This is contrast to the results with three types of living arrangements that demonstrate that unmarried elders with functional limitations were more likely to change to either co-residence or proximate residence. Since proximate residence and distant residence are significantly different in terms of

potential family support for older adults with health problems, the living arrangement category having these two types together cannot provide meaningful findings.

In addition to health effects, this study also provided several findings that support proximate residence as a distinct category of living arrangement. Our data showed that 22% of Korean adults 60 years or older lived in proximate residence. In addition, among older Koreans in distant residence (i.e., living alone or living only with a spouse) in wave 1, the proportions of transitions to proximate residence were much greater than those of changes to co-residence. Furthermore, this study demonstrated that older people in proximate residence significantly different from those in co-residence and distant residence in terms of social stratification, family attributes and religious affiliations as well.

Why do we need to pay attention to proximate residence as a distinct category? This type of living arrangement is particularly important in a society where the traditional value for co-residential support for older parents clashes with individualism, which is influenced by westernization and industrialization. Under the culture of filial piety, older parents living separately from their adult children is often viewed as indicating that these parents are neglected by their children, particularly when the parents are very old or sick (Maeda & Ishikawa, 2000). Accordingly, co-residence has been the most common living arrangement among older adults in most Asian countries, which is not determined through an evaluation of the factors of the rational choice perspective. However, in recent years, the number of older people who wish to maintain their independent lives in separate households from their children has increased (Frankenberg et al., 2002; Kim & Rhee, 1997). For these older people, proximate residence provides not only the privacy of separate living arrangements but also the support of having their children in close



proximity.

Compared to other Asian countries such as China, Singapore, Taiwan, and Thailand, the proportion of older adults who live with their adult children in South Korea is much smaller (Yasuda et al., 2011.). While more than 70% of elders were in intergenerational co-residential arrangements in other Asian countries (Frankenberg, et al., 2002; Knodel, 2009; Sereny, 2011), only 44% of older adults in South Korea lived with their children. Does this mean that older Koreans are more influenced by modernization and westernization than elders in other Asian countries? Furthermore, has the traditional culture of filial support for older adults declined in recent Korean society? According to our findings, the answer is no. The proportion of older people living with or near their children in South Korea is not significantly smaller than the proportion of older people in co-residence in other Asian countries. In this respect, proximate residence may be a substitute for co-residence in South Korea, and Korean older adults are still supported by their children who live with or near them.

In addition, this study expanded our knowledge about the diverse effects of different types of health conditions on living arrangements in old age. Most investigators have measured health condition in terms of disability level and/or self-rated health (Speare et al., 1991; Wilmoth, 1998; Zimmer, 2005). However, we found that functional status, chronic conditions, and depressive symptoms differently influenced living arrangements among older Koreans. In particular, the effects of depressive symptoms on living arrangements were in an opposite direction to those of physical health problems. Because family support in the same household is not always positive (Gallant, Spitze, & Prohaska, 2007), co-residence can be stressful situations between older parents and adult children (Wilmoth & Chen, 2003), particularly when one of the

family members has health problems. In contrast to deterioration in physical health, depressive symptoms do not increase the need for physical support. Therefore, depressive symptoms may be negatively associated with co-residence.

In recent years, there have been concerns that including the reverse-scored items (i.e., positively phrased items) in the CES-D score may create a psychometric bias as a result of incidental response errors (Carleton et al., 2013). In order to examine if the two positively worded items significantly influenced the results, we compared our current results to the results from an analysis that measured depressive symptoms constructed using only 8 negatively worded items. These two results were not significantly different from each other. Consequently, our results are quite robust with or without including positive items in our measure of depressive symptoms.

Our results also confirmed the important role of a spouse as an informal care provider (Liang et al., 2005). In this study, married respondents with chronic diseases were more likely to live near children rather than live away from them, which may reflect the current attitude of older Koreans who prefer to live separately and do not want to depend on their adult children for as long as possible. Older person who have a spouse do not have to move into co-residential arrangements even when they have health problems, because his/her spouse can care for them. On the other hand, the elderly with functional limitations without a spouse may need someone to take care of them in the same household. Therefore, even if unmarried older individuals prefer to live by themselves, they may find it difficult to live independently when physical health problems arise.

There are several limitations that should be mentioned about our study. First, the effects

of depressive symptoms on living arrangements may not be equivalent to those of functional status or diagnosed chronic conditions. Since the respondents were asked about their depressive symptoms in the last week of the survey, depressive symptoms measured by the CES-D score may be transient or event-related. Second, although intergenerational living arrangements reflect the changing needs and resources of both generations (Glaser & Tomassini, 2000), our analysis focuses only on the perspective of older parents. The attributes of adult children (i.e., number, gender, and marital status) incorporated in our analysis might not be sufficient enough to reflect the alternative co-residence options offered by the array of children and children's needs for co-residence or living near parents (Frankenberg et al., 2002; Palloni, 2001). Future studies should take into account the broad range of characteristics of adult children such as age, income, education level of children, and the number of children's own children in investigating living arrangements of the elderly.

Furthermore, social supports that can help older people to maintain their independent lives were not fully controlled in this research due to availability of data. We only included the frequency of non-family interactions in our analyses, and found that frequent interactions with friends or relatives were positively associated with co-residence regardless of marital status, which is consistent with what previous studies have found. Because resources outside family can be important in the decision-making processes for older adults' living arrangements (Palloni, 2001), controlling for a variety of social relations and community resources available in the analyses could provide more conclusive results.

As the number of Korean elderly who live alone or only with a spouse has significantly increased in recent decades (Lee, 2010), policy concerns have arisen over whether the transition

in living arrangements of the elderly reflects a weakening of traditional family support. If this is true, caregiving and informal support for older population would be a serious issue, particularly under the pressure of rapid population aging with extremely low fertility in South Korea. This study, however, demonstrated that older people with health problems still tend to live with or near their adult children. Recent declines in co-residence may reflect preferences among older people for living separately but near children, implying little or no loss of potential family support. However, as public social services for the frail older population have greatly increased in recent years in South Korea, middle-aged Koreans who tend not to depend on their children in old age expect more public support than family support (KIHASA, 2010). Therefore, there is a clear need for further studies examining how macro level factors, beyond individual factors, such as policy changes affect family relationships and family support for older people.

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**Table 2.1 Means and Standard Deviations of Explanatory Variables by Baseline Living Arrangements and Marital Status**

Explanatory Variables	Total	Married			p-value <sup>a</sup>	Unmarried			p-value <sup>a</sup>
	(N=5,209)	Co-residence (N=1,348)	Proximate residence (N=911)	Distant residence (N=1,333)		Co-residence (N=982)	Proximate residence (N=250)	Distant residence (N=385)	
<b>Health conditions</b>									
Functional limitation (=1)	7.54%	7.34%	5.27%	6.00%		13.14%	5.20%	6.23%	***
One chronic condition (=1)	35.57%	32.94%	37.43%	36.46%		35.23%	35.60%	38.18%	
Two or more chronic conditions (=1)	26.19%	25.52%	25.25%	21.76%	*	30.96%	34.00%	21.76%	
Depressive symptoms (0-30)	7.44 (5.48)	6.78 (4.97)	6.52 (4.98)	6.85 (5.13)	**	8.53 (5.83)	9.66 (6.79)	9.72 (6.08)	**
<b>Social stratification</b>									
Age (60-105)	70.33 (7.26)	68.11 (6.60)	68.79 (5.90)	69.13 (6.07)		75.22 (8.27)	72.75 (6.76)	71.82 (7.20)	***
Female (=1)	57.29%	41.02%	45.01%	44.41%		89.61%	88.00%	85.45%	†
Education (0-23)	6.68 (5.55)	7.88 (4.16)	7.89 (9.30)	7.33 (4.28)		4.31 (3.64)	4.82 (4.08)	4.55 (3.53)	*

Rural area (=1)	27.45%	19.21%	23.27%	41.49%	***	18.74%	25.20%	41.30%	***
Income (0-39)	1.40	1.73	1.98	1.62	***	0.59	0.65	0.69	***
	(2.30)	(2.50)	(2.84)	(2.15)		(1.30)	(1.00)	(2.45)	
Homeownership (=1)	48.24%	45.47%	47.09%	51.46%	*	33.50%	69.60%	73.25%	***

**Family attributes & social**

**relations**

Married (=1)	69.00%	100.00%	100.00%	100.00%		0.00%	0.00%	0.00%	
Number of children (1-10)	3.74	3.55	3.82	3.73	†	3.93	3.98	3.61	
	(1.56)	(1.42)	(1.45)	(1.52)		(1.76)	(1.68)	(1.67)	
Having a son (=1)	93.59%	93.03%	93.74%	94.45%	***	95.21%	90.80%	89.87%	***
Having non-married child (=1)	45.15%	71.59%	33.15%	32.63%		47.76%	28.40%	28.57%	***
Non-family interactions (0-9)	6.53	6.24	6.71	6.63	*	6.23	7.08	7.19	***
	(2.99)	(3.02)	(2.74)	(2.93)		(3.35)	(2.69)	(2.65)	

**Religious affiliations**

Protestant (=1)	19.41%	20.99%	17.45%	18.08%	†	20.98%	21.60%	17.66%	
Catholic (=1)	9.33%	8.46%	11.96%	6.45%	***	12.42%	10.80%	7.27%	*
Buddhist (=1)	25.65%	24.41%	26.13%	23.71%		27.19%	29.60%	29.09%	

Note: †p<0.10. \*p<0.05. \*\* p<0.01. \*\*\*p<0.001.

a. bivariate relationships between living arrangements and explanatory variables.

**Table 2.2 Descriptive Results for Transitions in Living Arrangements among Older Adults Between 2006 and 2008 in South Korea**

Baseline status (2006)	The follow-up status (2008)						Total
	Distant-Alone	Distant-with a spouse	Proximate Residence <sup>a</sup>	Coresidence <sup>a</sup>	Non-response	Death	
<b>Distant-Alone</b>							
n	258	4	53	12	52	6	385
Proportion (%)	67.01	0.01	13.77	3.12	13.51	1.56	100.00
<b>Distant-with a spouse</b>							
n	17	875	225	35	146	35	1,333
Proportion (%)	1.28	65.64	16.88	2.63	10.95	2.63	100.00
<b>Proximate Residence<sup>a</sup></b>							
n	61	193	615	124	146	22	1,161
Proportion (%)	5.25	16.62	52.97	10.68	12.58	1.89	100.00
<b>Coresidence<sup>a</sup></b>							
n	36	117	173	1,567	347	90	2,330
Proportion (%)	1.54	4.99	7.38	67.68	14.98	3.91	100.00
<b>Total</b>							
n	372	1,189	1,066	1,738	691	153	5,209
Proportion (%)	7.12	22.77	20.41	33.56	13.30	2.96	100.00

Note: a. Spouse may or may not present in this living arrangement.

**Table 2.3 Multinomial Logistic Regression Results Showing Relative Risk Ratios [exp(b)] for Coresidence and Proximate residence Relative to Distant residence from Children Among the Married**

Baseline attributes	Model 1		Model 2		Model 3	
	Coresidence <sup>a</sup>	Proximate residence <sup>a</sup>	Coresidence <sup>a</sup>	Proximate residence <sup>a</sup>	Coresidence <sup>a</sup>	Proximate residence <sup>a</sup>
<b>Health conditions</b>						
Functional status	1.124	1.225	0.908	1.115	0.990	1.092
Chronic condition						
One	0.938	1.136	0.979	1.094	0.950	1.005
Two or more	1.163	1.401 **	1.126	1.286 *	1.030	1.174
Depressive symptoms	0.999	0.985	1.001	0.981	0.995	0.983
<b>Social Stratification</b>						
Age 70-79 <sup>b</sup>			1.109	0.815	1.197	0.891
Age 80+ <sup>b</sup>			1.872 **	0.691	1.871 *	0.792
Female			0.771 *	0.699 **	1.023	0.787
Education			0.999	0.988	1.008	0.992
Rural area			0.344 ***	0.348 ***	0.672 *	0.487 ***
Income			0.991	1.019	0.970	0.982

Homeownership	0.601 ***	0.719 *	0.780	0.811
<b>Family attributes and social relations</b>				
Married	0.638	1.698	1.130	1.470
Number of children	1.030	1.298 ***	1.103	1.297 ***
Having a son	0.905	0.982	0.949	1.069
Having non-married child	4.867 ***	0.685 ***	1.898 ***	0.618 ***
Non-family interaction	0.718 **	0.828	0.652 **	0.747
<b>Religious affiliations<sup>c</sup></b>				
Protestant	1.281 *	1.038	1.129	1.070
Catholic	1.203	1.236	1.039	0.916
Buddhist	1.022	1.622 ***	0.794	1.562 **
<b>Prior living arrangements<sup>d</sup></b>				
Coresidence			153.411 ***	4.515 ***
Proximate residence			12.806 ***	9.816 ***
Log likelihood	-3,229.842	-2,896.791	-2,036.825	



LR chi square (df)	14.30 (6)	680.40 (36)	2,400.34 (40)
N	2,977	2,977	2,977

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Note: \*p<0.05. \*\* p<0.01. \*\*\*p<0.001.

a. Reference category = distant residence from children at the follow-up; b. Reference category=60-69 years of age; c. Reference category = no religious affiliation; d. Reference category=distant residence from children at the baseline.

**Table 2.4 Multinomial Logistic Regression Results Showing Relative Risk Ratios [exp(b)] for Coresidence and Proximate residence Relative to Distant residence from Children Among the Unmarried**

	Model 1		Model 2		Model 3	
	Coresidence <sup>a</sup>	Proximate residence <sup>a</sup>	Coresidence <sup>a</sup>	Proximate residence <sup>a</sup>	Coresidence <sup>a</sup>	Proximate residence <sup>a</sup>
<b>Baseline attributes</b>						
<b>Health conditions</b>						
Functional status	4.394 ***	1.687	3.754 ***	1.933	3.626 *	2.492 *
Chronic condition						
One	0.943	0.964	0.952	0.859	1.065	0.800
Two or more	0.951	1.199	0.941	0.919	0.784	0.776
Depressive symptoms	0.956 ***	0.980	0.942 ***	0.980	0.971	0.981
<b>Social Stratification</b>						
Age 70-79 <sup>b</sup>			1.292	1.050	1.321	1.028
Age 80+ <sup>b</sup>			2.366 ***	0.896	1.624	0.850
Female			0.981	1.095	0.776	0.973
Education			1.014	0.982	1.016	0.969
Rural area			0.304 ***	0.262 ***	0.697	0.358 ***

Income	0.945 *	0.904	0.914	0.887
Homeownership	0.197 ***	1.059	0.359 ***	1.136
<b>Family attributes and social relations</b>				
Married	0.519 *	1.855 *	1.229	2.040 *
Number of children	1.020	1.145 *	0.999	1.083
Having a son	2.622 **	1.048	1.321	0.884
Having non-married child	4.413 ***	1.051	1.978 **	0.957
Non-family interaction	0.678 *	1.325	0.791	1.418
<b>Religious affiliations<sup>c</sup></b>				
Protestant	1.518 *	1.469	1.726	1.355
Catholic	2.121 **	2.023 *	2.267 *	1.978 *
Buddhist	1.471 *	1.596 *	1.909 *	1.669 *
<b>Prior living arrangements<sup>d</sup></b>				
Coresidence			276.358 ***	5.222 ***
Proximate residence			7.714 ***	7.728 ***
Log likelihood	-1,319.079	-1,112.128	-702.119	
LR chi square (df)	86.31 (6)	500.21 (36)	1,320.23 (40)	



**Table 2.5 Relative Risk Ratios of Non-response, or Death Relative to Remaining in the Community (N=5,209)**

	Status at the Follow-up	
	Non-response <sup>a</sup> (N=691)	Death <sup>a</sup> (N=153)
<b>Baseline attributes</b>		
<b>Health conditions</b>		
Functional status	1.027	4.119 ***
Chronic disease		
One	0.916	1.295
Two or more	0.945	1.169
Depressive symptoms	1.003	1.039
<b>Social Stratification</b>		
Age 70-79 <sup>b</sup>	0.931	2.049 **
Age 80+ <sup>b</sup>	1.036	4.004 ***
Female	0.895	0.415 ***
Education	1.008	0.966
Rural area	0.357 ***	1.197
Income	0.996	0.987
Homeownership	0.974	0.895
<b>Family attributes and social relations</b>		
Married	0.689 **	1.003
Number of children	0.916 **	0.959
Having a son	1.006	1.961
Having non-married child	0.909	0.858
Non-family interaction	0.997	0.706 *

**Religious affiliations<sup>c</sup>**

Protestant	1.035	0.810
Catholic	1.165	0.673
Buddhist	1.175	0.935

**Prior living arrangements<sup>d</sup>**

Coresidence	1.077	1.476 *
Proximate residence	0.956	0.963

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Log likelihood	-2,503.694
LR chi square (df)	406.93 (40)
N	5,209

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*Note:* \*p<0.05. \*\* p<0.01. \*\*\*p<0.001.

a. Reference category = remaining in the community; b. Reference category = 60-69 years of age; c. Reference category = no religious affiliation; d. Reference category=distant residence from children at the baseline.

## **CHAPTER 3:**

### **Intergenerational Living Arrangements, Psychological Well-being, and Physical Function among Older Koreans: Age Differences within Older Populations**

#### **3.1. Introduction**

Living arrangement is the most immediate social environment formed by the family, which provides a locus of social roles and social relations (Hughes & Waite, 2002). The various types of living arrangements determine the roles of individuals in a household and the different amount and types of resources available to individuals. Due to these differences, living arrangements may have an important influence on health and psychological well-being in old age. In recent decades, a number of studies have shed light on the linkages between living arrangements and health and psychological well-being among older adults. However, previous studies have yet to reach general consensus on which living arrangements are beneficial or detrimental to health and psychological well-being. The inconsistent results regarding the associations between living arrangements and health in previous studies may originate from the heterogeneity of older populations in terms of their cultural expectations on living arrangements in old age and the lack of consideration of comprehensive types of living arrangements.

First, the associations between living arrangements and health can be significantly influenced by both social and cultural contexts. Traditionally, Asian older adults have lived with

their adult children based on the cultural value of filial piety. In this culture, adult children have been expected to provide physical and financial support to their older parents while residing in the same household (Johar & Maruyama, 2011). Separate living arrangement between older parents and adult children was often viewed as neglect of older parents by their children (Maeda & Ishikawa, 2000). Moreover, the role of adult children in the same household has been critical for older parents' welfare in countries where public support systems for the elderly has not been well developed. Undoubtedly, intergenerational co-residence yields advantages for older people's health and psychological well-being in this social and cultural context.

Results from prior studies support the importance of social and cultural contexts in the associations between living arrangements and health. Older Chinese in multigenerational households (Chen & Silverstein, 2000; Chen & Short, 2008; Li et al., 2009; Liu & Zhang, 2004; Silverstein et al., 2006) and older Koreans living with married sons (An et al., 2008) had less depressive symptoms, lower mortality, and better life satisfaction and perceived health. Li and her colleagues (2009) also showed a positive linkage between living with adult children and self-rated health due to an increase of older adults' sense of pride as well as instrumental and emotional support received from co-residence.

In contrast, some studies have demonstrated that intergenerational co-residence negatively influences the physical and mental health of older parents. They showed that co-residence was generally detrimental for older people's health in terms of general health condition (Johar & Maruyama, 2011), physical disability (Chan et al., 2011; Li et al., 2009), heart disease (Ikeda et al., 2009), and mortality (Walter-Ginzburg et al., 2002). Four explanations have been suggested to support these results: the tendency of older parents to desire independence, the greater



resource transfer from older parents to adult children than from adult children to older parents, disagreements and conflicts between older parents and adult children living in the same household, and the excessive reliance on family members in the same household (Johar & Maruyama, 2011).

According to the exchange theory (Dowd, 1975), diminishing resources in old age leave elders in unbalanced exchange relations. In fact, it has been demonstrated that older parents in the U.S. prefer to be functionally autonomous for as long as possible, and wish not to become a burden on the younger generation. Accordingly, co-residence could appear to be detrimental to older parents' morale and mental health, because this could mean that elders become dependent and powerless. Moreover, in recent years, the number of occurrences of co-residence that are motivated by adult children's need rather than parents' need has increased such that older parents are able to provide some financial help to children or are healthy enough to take care of their grandchildren (Johar & Maruyama, 2011; Schroder-Butterfill, 2003). This type of co-residence can be a burden for older parents, which leads to negative health outcomes. In addition, rapid social changes have broadened the gap in values between the younger and older generation. Within this social context, both older parents and their adult children may face some difficulties in managing the clash of values, resulting in internal disagreements and conflicts in the household (Giles et al., 2003; Johar & Maruyama, 2011; Zhang, 2004). Furthermore, some scholars explained that older adults in co-residence can heavily rely on their children, which may expedite age-related physical problems (Li et al., 2009). Moreover, other scholars argued that co-residence burdens on adult children may create disincentives for altruistic parents to invest in their health to extend their lives (Johar & Maruyama, 2011; Maruyama, 2012).

In recent decades, many newly developed Asian countries such as South Korea, Singapore, and Taiwan have experienced rapid social and cultural transitions. Influenced by westernization and industrialization, traditional patterns of family exchange have significantly changed, and the differences in intergenerational values, interests, and ways of life have increased (Park, Phua, McNally, & Sun, 2006). Specifically, the cultural norm on intergenerational co-residence has weakened. More and more people prefer independence and privacy than interdependence and strong family ties. At the same time, public old-age support, such as pension and social services, has expanded. As a result, the prevalence of intergenerational co-residence has greatly declined in recent decades, while the proportions of single- and couple-only households have increased (Kim & Liang, 2014). This phenomenon is more salient among the young-old who are in their 60s than among the older generation (i.e., 70s or over) (Park et al., 2006).

While the young-old tend to view the provision of one-sided help from their children as a burden for their children rather than a duty, the old-old still expect that they will automatically receive physical and financial care from their children, which has been permitted by the norm of filial piety (Park, 1999). Also, since these newly developed countries have introduced universal economic security such as pension systems only in recent decades, the old-old are less likely to have financial resources and so they must rely more on their children compared to the young-old. In this respect, even in ethnically homogeneous societies, the older population can be heterogeneous in terms of social and cultural contexts. The linkages between living arrangements and health in these societies where the traditional norm of filial piety and the westernized value of privacy and independence coexist may differ from those in both traditional Asian countries and in developed Western countries.

Second, most previous research has usually focused on whether or not older adults live with others. Older adults who live alone have been considered the most vulnerable population, therefore needing specific policy attention (Iliffe et al., 1992; Kasper, 1988; World Health Organization, 1977; Zunzunegui, 2001). Many studies have demonstrated that older people living alone were more likely to be socially isolated, so were less likely to get sufficient physical and emotional support, resulting in poor physical (Kharicha et al., 2007; Murphy, 1997; Sarwari et al., 1998) and mental health (Chou & Chi, 2000; Davis et al., 1992; Dean et al., 1992; Greenfield & Russell, 2010; Hughes & Waite, 2002; Kharicha et al., 2007; Russell & Taylor, 2009; Schmaltz et al., 2007; Victor, Scambler, Bond, & Bowling, 2000; Yeh & Lo, 2004). However, older people who live alone are not always at a high risk of social isolation that can lead to poor health and psychological well-being (Michael, Berkman, Colditz, & Kawach, 2001; Russell & Taylor, 2009; Saito, Sagawa, & Kanagawa, 2005). Even if an older adult lives alone, social interactions in their neighborhood help them to maintain their health and psychological well-being.

Considering the possible physical and emotional family support outside a household, proximate residence with adult children should be considered as a distinct type of living arrangement when investigating the effects of living arrangements on health in old age (Kim & Liang, 2014). When compared to older adults in co-residence with their children, to a similar extent those in proximate residence may have physical and emotional support from their children (Clark & Wolf, 1992; Frankenberg, Chan, & Ofstedal, 2002; Glaser & Tomassini, 2000). This living arrangement can be beneficial to mental health and psychological well-being, because older people can enjoy their privacy and independence while having family support nearby (Crimmins & Ingegnerly, 1990; Litwak & Kulis, 1987).

Other types of living arrangements in old age that should be considered are co-residence with married children and co-residence with unmarried children. The marital status of the co-residing adult child may matter, because the pattern of intergenerational relations may differ between these two living arrangements. The level and type of intergenerational support in these two living arrangements can vary (De Vos, 2003), resulting in different health outcomes. In Western societies, married children are more likely to live far from their parents than unmarried children (Nosaka, 2009). In contrast, in Asian cultures, living with married children has been considered as an ideal family living arrangement (Logan & Bian, 1999), and the number of married children has been found to be associated with a greater probability of co-residence (Kojima, 1987). However, since older parents tend to consider it their responsibility to find their children's spouse, living with unmarried children can be seen as being negligent of their parental responsibilities. Also, unmarried children are more likely to be dependent on older parents for support (Sun, 2002). Accordingly, co-residence with unmarried children can be negatively associated with mental health and psychological well-being in old age.

This study aimed to address these issues by analyzing the associations between several types of living arrangements and health and psychological well-being among older adults in South Korea. As discussed earlier, South Korea provides a unique cultural and social context where the traditional value of family support and modern individualism coexist, which may significantly influence the linkages between living arrangements and health. Using two-wave longitudinal data of Korean elders, this study investigated the following two research questions: (1) To what extent do various types of intergenerational living arrangements influence depression, life satisfaction, and functional status among older adults in South Korea? (2) Are there generational differences (the old-old vs. the young-old) within the older population in the

associations of living arrangements and health?

## 3.2. Method

### 3.2.1. Data and Sample

Data were obtained from the 2006 and 2008 Korean Longitudinal Study of Ageing (KLoSA), a nationally representative study of the population aged 45 and older in South Korea. The present analysis focused on respondents aged 60 years or older who have at least one living adult child in order to examine intergenerational co-residence. Consequently, the sample of this study was limited to 5,209 respondents. In the follow-up survey, 2.95% of the respondents had died, and 13.27% were lost to follow-up.

### 3.2.2 Measures

***Psychological well-being and physical function.*** This study examined the effects of baseline living arrangements on three psychological well-being and physical function outcomes at the follow-up survey including depressive symptoms, life satisfaction, and functional limitation. *Depressive symptoms* were assessed with the Center for Epidemiological Studies Depression 10-item scale (CES-D 10; Radloff, 1977). The respondents were asked if they had each CES-D symptom during the last week (0=No, 1=Yes). In order to calculate the CES-D 10 score, two positively phrased items were reversely coded, and then calculated the sum of the 10 items. A total score over 4 was defined as depression (KLOSA, 2006). *Life satisfaction* refers to self-reported life satisfaction. Respondents were asked, “Compared with others your age, how satisfied are you with your quality of life?” It was measured as a continuous variable ranging

between 0 and 100 where greater values mean better life satisfaction. *Functional limitation* was assessed from a list of 17 activities of daily living (ADL) or instrumental activities of daily living (IADL) including bathing, dressing, eating, transferring from one's bed to chair and back, voluntarily controlling urinary and fecal discharge, using the toilet, walking, light housework, preparing meals, taking medications, shopping for groceries or clothes, using the telephone, and managing money. For all of the three outcome measures, this study included a lagged variable of each outcome measure to control for a possible confounding effect. In addition to the three health and psychological well-being outcomes, *chronic condition* was included as a covariate. *Chronic condition* was determined from a self-report of whether or not a respondent had at least one of the following eight conditions diagnosed by a physician: high blood pressure, diabetes, cancer/malignant tumors, chronic lung disease, cardiac disorder, or cerebral vascular disease, liver ailments, and arthritis (Jang et al., 2009).

***Living arrangements.*** This study included four mutually exclusive types of *living arrangements*: (a) distant residence (living far away from adult children), (b) proximate residence (living near adult children), (c) co-residence with unmarried children, and (d) co-residence with married children. This categorization reflects the social and cultural contexts of South Korea regarding intergenerational relationships. Proximate residence was defined as within a 30-minute distance by public transportation between the respondents' home and one of their children's homes. This type of living arrangement has increased in South Korea in recent years, because it can provide both privacy and children's support (Kim & Liang, 2014). In addition, in contrast to previous research, this study divided co-residence into two groups based on the marital status of co-residential children. Co-residence with unmarried children referred to the household consisting of older parent(s) and only unmarried children. If there was at least one married child in the

household, it was categorized into co-residence with married children regardless of other children's marital status.

**Age groups.** Age was measured in years at the time of the baseline survey, and was coded dichotomously: the young-old (60-69 years old) and the old-old (70+ years old). The age of 70 used as cut-off point between the young-old and the old-old for two reasons. First, in terms of cultural values, respondents who were less than 70 years old may cling less to the traditional value of co-residence with their adult children. In the last half of the 20<sup>th</sup> century, and particularly after the Korean War (1950-53), Korean society was strongly influenced by industrialization and westernization. This young-old age group, who were less than 70 years old at the baseline survey in 2006 and had reached adult age after the War, may be greatly influenced by social and cultural changes. Second, health conditions among people in their 60s may be significantly better than those in the 70+ old group; it has been demonstrated that health deterioration tends to accelerate after the age of 70 (Ayis, Gooberman-Hill, Bowling, & Ebrahirm, 2006). In terms of sample size, KLoSA included similar number of respondents in these two age groups.

**Marital status.** Marital status was categorized into unmarried and married. The unmarried elderly were defined as those who were divorced, separated, widowed or never married. The married elderly included those who were living with their spouses or partners.

**Covariates.** Sociodemographic attributes and health conditions at the baseline were included in the analyses as covariates. *Gender* was dichotomized into female (=1) versus male (=0).

*Education* was measured by the number of years of formal schooling. Actual number of living children (*number of children*) was also included. *Location of living* was categorized into urban

(population greater than 50,000) and rural areas (population less than 50,000). Total couples' *income* was calculated by adding both the husband's and wife's income per year (in millions of South Korean Won). *Homeownership* was indicated by coding a homeowner as 1 and a non-homeowner as 0.

### **3.2.3 Data Analysis**

First, bivariate analyses were done to identify any similarities and differences in living arrangements, health, and socio-demographic status between the young-old and the old-old. Second, multivariate regressions – logistic regression for depressive symptoms, OLS regression for life satisfaction, and negative binomial regression for functional limitation – were used to estimate the effects of intergenerational living arrangements at the baseline on a series of physical health and psychological well-being conditions at the follow-up. Negative binomial regression was used for functional limitation, because functional limitation was over-dispersed count data. Since the variances within each type of living arrangements were higher than the means within each type, these differences suggest that over-dispersion was present and a Negative Binomial model was appropriate.

After investigating the effects of living arrangements on the three outcomes, the interaction effects of age group and living arrangements on the health outcomes were evaluated. In addition, in order to show the differences in the influence of living arrangements and health between the young-old and the old-old, separate analyses for these two groups were conducted. Lastly, in order to examine sample selection bias caused by death or no-response at the follow-up, this paper conducted an analysis for competing risk. Multinomial logistic regression was



used to examine whether baseline living arrangements predict death or no-response at the follow-up, controlling for baseline health and socio-demographic characteristics.

### **3.3 Results**

#### ***3.3.1 Descriptive results***

Table 3.1 presents the characteristics of the total sample as well as by age groups (the young-old and the old-old). The sample averaged 70.33 years old (range = 60-105). More than half of the sample was women (57%) and married (69%). The average education level was 6.63 years, and the respondents had 3.74 children on average. More than a quarter (27%) lived in rural areas, and the average income was 1.4 million won (approximately US \$1,300). Less than half of the respondents owned their home (48%). Regarding living arrangements, one third of older Koreans lived away from their children, and 22% of them lived close to one of their children. 22% of the respondents lived with only unmarried children, and 23% of them lived with married children. At the baseline, approximately 40% of Korean elders had depression, and the average score of life satisfaction, and functional limitations was 59.03 out of 100, and 1.2 out of 17, respectively. Moreover, 62% of the sample had one or more chronic conditions.

This study found that all of the attributes included were significantly different between the young-old and the old-old (Table 3.1). The old-old consisted of more females and less married respondents compared to the young-old. Moreover, the education and income levels of the old-old were lower than those of the young-old. Additionally, the proportion of respondents who lived in rural areas was found to be greater among the old-old than the young-old. While more than half of the young-old had their own home, only 44% of the old-old were homeowners.

Finally, regarding living arrangements, the proportion of people who lived with their married children was much greater among the old-old than the young-old.

[Table 3.1 about here]

### ***3.3.2 The effects of baseline living arrangements on health and psychological well-being at the follow-up***

The results from a series of multivariate analyses of the effects of living arrangements on depressive symptoms, life satisfaction, and functional limitations are shown in Tables 2, 3, and 4, respectively. Table 3.2 shows the odds-ratios from the logistic model for depressive symptoms. According to the results, older adults in co-residence with unmarried children had the greatest risk of depression. Specifically, compared with those who lived with married children, individuals who lived with unmarried children were more likely to exhibit symptoms of depression (Table 3.2; Model 2; OR=1.550,  $p<.01$ ). Post-estimation tests were performed to permit further comparisons between other categories (i.e., co-residence with unmarried child vs. proximate residence, co-residence with unmarried child vs. distant residence, and proximate residence vs. distant residence). Post-estimation tests indicated that older adults who lived with their unmarried children tended to exhibit symptoms of depression than those in proximate residence (results not shown;  $X^2(1)=4.11$ ,  $p<.05$  ).

[Table 3.2 about here]

Table 3.3 presents the regression coefficients for life satisfaction. In keeping with the results for depression, older adults who lived with married children showed more positive life

satisfaction than those in co-residence only with unmarried children ( $b=-3.149$ ,  $p<.001$ ; Table 3.3, Model 1) and in distant residence ( $b=-2.476$ ,  $p<.001$ ; Table 3.3, Model 2). The effects of co-residence with married children and proximate residence were not significantly different from each other. Post-estimation tests suggested that the life satisfaction of elders in proximate residence was significantly greater than elders who lived only with unmarried children (results not shown;  $F(1, 4349) = 6.39$ ,  $p<.05$  ).

[Table 3.3 about here]

Finally, the results from the negative binomial regression for functional limitation are presented in Table 3.4. Older adults in co-residence with married children showed worse functional limitation than those in proximate residence ( $IRR=.579$ ,  $p<.001$ ; Table 3.4, Model 2) and distant residence ( $IRR=.568$ ,  $p<.001$ ; Table 3.4, Model 2), even when controlling for baseline functional limitation. Functional limitation between older adults in co-residence with married children and those in co-residence with unmarried children was not significantly different. Post-estimation tests demonstrated that the respondents who lived with their unmarried children had worse functional limitation than those in proximate residence ( $X^2(1)=6.98$ ,  $p<.01$ ) and distant residence ( $X^2(1)=10.08$ ,  $p<.01$ ) (results not shown).

[Table 3.4 about here]

### ***3.3.3 The effects of baseline living arrangements on health and psychological well-being at the follow-up by different age-cohorts within an older population***

This paper also tested if the effects of intergenerational living arrangements on health and

psychological well-being differed between the young-old and the old-old. In Tables 3.2, 3.3, and 3.4, Model 3 shows the results for interaction effects with age-cohort. It is clear that there is substantial age-cohort variation in the influence of intergenerational living arrangements on depressive symptoms, life satisfaction, and functional limitations. In order to examine these differences in detail, this study conducted separate analyses for the young-old and the old-old (Table 3.5). The results showed that the linkages between intergenerational living arrangements and health and psychological well-being were much stronger among the old-old than the young-old.

As shown in Table 3.5, among the young-old none of the living arrangement effects were significant at the .05 level compared to co-residence with married children. Post-estimation tests found that young older adults who co-resided with their unmarried children were more likely to suffer from depression ( $X^2(1)=3.91, p<.05$ ; results not shown) and to have low life satisfaction ( $X^2(1)=5.11, p<.05$ ; results not shown) than those who lived near their children. Moreover, co-residence with unmarried children was associated with a greater risk of depression even compared to distant residence ( $X^2(1)=4.32, p<.05$ ; results not shown).

In contrast, the old-old in co-residence with unmarried children (RRR=1.687,  $p<.05$ ; Table 3.5) and distant residence (RRR=1.690,  $p<.05$ ; Table 5) were more likely to have depression than those in co-residence with a married child. The level of life satisfaction of the old-old who co-resided with married children was significantly greater than those in all other living arrangements (i.e., co-residence with unmarried children,  $b=-5.452, p<.001$ ; proximate residence,  $b=-3.404, p<.001$ ; and distant residence,  $b=-4.948, p<.001$ ). In terms of functional limitations, the old-old who were in proximate residence (IRR=0.542,  $p<.01$ ) and distant

residence (IRR=0.625,  $p<.01$ ) were less likely to have functional limitations compared to those who lived with married children. Moreover, post-estimation tests demonstrated that the old-old who lived with unmarried children were more likely have a greater level of functional limitations than those in proximate residence ( $X^2(1)=4.32$ ,  $p<.01$ ; results not shown) and distant residence ( $X^2(1)=12.17$ ,  $p<.001$ ; results not shown).

[Table 3.5 about here]

### ***3.3.4 Competing risks***

Over the two-year period, all respondents were subject not only to various health changes, but also to major competing risks such as non-response and death. Table 6 shows the relative risk ratios of non-response or death as opposed to the remaining sample at the follow-up. Demographic attributes, such as older age (RRR=2.230,  $p<.01$ ; Table 3.6) and male (RRR=0.3362,  $p<.001$ ; Table 3.6), as well as functional limitations (RRR=1.101,  $p<.001$ ) at the Wave 1 were significant predictors of mortality at the follow-up. In addition, marital status (RRR=0.676,  $p<.001$ ), a greater number of number of children (RRR=0.918,  $p<.01$ ), and rural residence (RRR=0.358,  $p<.001$ ) decreased the probability of non-response. However, baseline living arrangements did not influence non-response or mortality. These results show that selective attrition is not a significant concern in this study.

[Table 3.6 about here]

## **3.4 Discussion**

The present study investigated the associations between various types of intergenerational

living arrangements and physical health and psychological well-being among older adults in South Korea, and examined if there were age-cohort differences within an older population. This study expands our knowledge of intergenerational living arrangements and health and psychological well-being in old age by considering a unique social and cultural context that has experienced rapid social and cultural changes in a short period of time. This study clarifies the importance of social and cultural contexts in understanding living arrangements and health in old age. In addition, the longitudinal data used in this study enabled us to not only examine the changes in health and psychological well-being, but to define a clear time-sequence between living arrangements as predictor of various health outcomes.

Using two waves of nationally representative panel data among older adults in South Korea, this study found that intergenerational living arrangements predicted health and psychological well-being in old age. However, the effects of living arrangements on health varied by specific health outcomes. In fact, few studies have investigated the different effects of living arrangements on both physical health and psychological well-being. In terms of depressive symptoms and life satisfaction, co-residence with married children was found to be the most beneficial living arrangement. These results confirm the positive associations between co-residence with adult children and psychological well-being among older adults in Asian societies (An et al., 2008; Chen & Short, 2008; Chen & Silverstein, 2000; Li et al., 2009; Liu & Zhang, 2004; Silverstein et al., 2006). Considering co-residence with married children has been highly desirable among older Koreans, these results show that traditional family support based on filial piety is still an important cultural norm in South Korea.

However, this study demonstrated that co-residence with adult children did not always

positively influence the psychological well-being among older Koreans. According to the results, co-residence with unmarried children was associated with the poorest depressive symptoms and life satisfaction, which was in contrast to the results regarding co-residence with married children. In fact, the different influence of these two types of living arrangements on health and psychological well-being in old age has rarely been investigated. These results may be reflective of Asian culture, in which older parents expect co-residential support from their married children. In this culture, living with unmarried children can be an emotional burden for older parents because children's marriage has long been considered a parental responsibility. However, in Western societies, the results can be different. In contrast to Asian societies, unmarried children are more likely to live with or close to their older parents, and tend to contact their parents frequently (Aquilino, 1990; Nosaka, 2009; Stoller & Earl, 1983; Wolf & Soldo, 1988). Moreover, unmarried children are more likely to provide caregiving to their older parents than married children, because unmarried children have fewer competing responsibilities, such as childcare for their own children (Stoller, 1983). Furthermore, co-residence with sons-in-law or daughters-in-law could be burden for older parents (Wolf & Soldo, 1988). Therefore, future research should be conducted on co-residence with unmarried or married children with data from Western societies.

Another interesting finding in this study is the beneficial influence of proximate residence on depression and life satisfaction. Older Koreans who lived near their children were less likely to have depression than those who lived with their unmarried children. Also, they tended to have a greater level of satisfaction compared to older adults who lived with their unmarried children and those who lived away from their children. In fact, proximate residence is the most preferred and prevalent living arrangement in developed Western countries, because older parents can

receive physical and emotional support from their children nearby while maintaining their independent lives (Kim & Liang, 2014). The positive associations between proximate residence and mental health and psychological well-being may reflect the current social and cultural transitions in terms of living arrangements among older adults in South Korea.

In terms of functional limitations, this study showed that co-residence was associated with health disadvantages, regardless of the co-residential children's marital status, which is a different pattern from the linkages between living arrangements and psychological well-being. According to the results, older Koreans in proximate residence or distant residence showed a lower level of functional limitations than those in co-residence with married or unmarried children. As discussed earlier, intergenerational co-residence may encourage older parents to have excessive reliance on their children and also aggravate age-related physical problems (Johar & Maruyama, 2011; Li et al., 2009). Future research should further investigate the mechanisms that link intergenerational co-residence and poor physical health.

When investigating the linkages between living arrangements and health, potential reciprocal associations must be addressed. For example, older individuals who have greater health problems may be more likely to live with their children. In other words, baseline living arrangements may be an indicator of prior health conditions. In order to address this issue, this study used two waves of longitudinal data, and defined a clear time-sequence between intergenerational living arrangements as predictors of health outcomes. Moreover, baseline health and psychological well-being were controlled in all analyses.

This study also demonstrated that the linkages between intergenerational living



arrangements and health and psychological well-being indeed vary between the young-old and the old-old. Examining the linkages between living arrangements and health, some prior studies have focused on specific age groups such as middle-aged to young-old adults (e.g., Hughes & Waite, 2002; Lund et al., 2002), the young-old (e.g., Davis et al., 1992), and the oldest-old (e.g., Davis et al., 1997; Li et al., 2009). However, to the best of my knowledge, no research has yet analyzed the generational or age-cohort differences in the associations between living arrangements and health within older populations.

Interestingly, the linkages between intergenerational living arrangements and health and psychological well-being were more salient among the old-old than among the young-old. Among the young-old, co-residence with unmarried children was associated with poorer depressive symptoms and life satisfaction than proximate residence and distant residence. In terms of functional status, no baseline living arrangements were found to be a significant predictor among the young-old. In contrast, the old-old who lived with married children showed the most positive psychological well-being and those who lived with unmarried children were most likely to have the poorest. Co-residence with adult children was not proven beneficial for older Koreans functional status regardless of the co-residential children's marital status.

These results regarding psychological well-being can be explained by different cultural expectations in South Korea. This age-cohort difference within an older population can be more salient in Korean society that has experienced rapid social and cultural transitions. In this society, while the young-old can be influenced by contemporary values, the old-old tend to hold onto their traditional cultural values. Co-residence with adult children as an ideal living arrangement may still be prevalent within the old-old group. Therefore, the old-old in this living arrangement

may have more positive psychological well-being. However, the young-old may be more influenced by westernization and industrialization than the old-old. The young-old still feel a responsibility to take care of their own older parents, but have a tendency to want independence from their children (Park et al., 2006). In addition, they face more frequent conflicts with the younger generation due to a clash in values and lack of tolerance of them (Giles et al., 2003; Zhang, 2004).

Moreover, intergenerational exchange patterns (Park et al., 2006), social networks (Litwin, 2001; Park, Smith & Dunkle, 2013), and levels of frailty (Li et al., 2009) can also cause differences in the associations between living arrangements and health and psychological well-being. Based on these attributes, different mechanisms may apply to the young-old and the old-old. Regarding intergenerational exchange patterns, the young-old in South Korea may provide financial and/or physical help (e.g. caregiving of grandchildren, housework) for their adult children rather than receive help from their adult children in co-residential situations. However, the old-old are more likely to be financially and physically supported by their adult children in the same household. The old-old tend to be more economically dependent on their children than the young-old due to the lack of public policy for old-age economic security in the past. Also, the old-old tend to have poorer health than the young-old, and self-regulation of health behaviors may not be easy for the old-old with poorer health.

Moreover, older cohorts have been found to be overrepresented in restricted social networks (Litwin 2001; Park et al., 2013; Kim, Park, & Antonucci, 2014). In other words, the young-old are less likely to be socially isolated even if they live alone. If older adults were able to find non-family social support outside their household, the importance of living arrangements

would be weaker. Lastly, older cohorts tend to be more vulnerable to a decline in physical and mental health (Baltes & Smith, 2003). As health deteriorates with age, independent living may become more challenging in the old-old group (Li et al., 2009).

The present study can be improved in several aspects of which future research is required. First, only two waves with a two-year gap of observations were analyzed in this study. Although longitudinal data enables investigators to address the endogeneity problem between dependent and independent variables, a dataset with more time points would allow a more detailed analysis of the changes in intergenerational living arrangements relative to the changes in various outcomes of health and psychological well-being, yielding more conclusive results.

Second, the marital status of older adults is closely related with living arrangements, and the interaction between living arrangements and marital status may significantly influence health and psychological well-being in old age. For example, the effects on health of older adults who live alone may differ from the effects on health of older adults who live only with a spouse. Although this study controlled for marital status in all models, marital status was not reflected when measuring living arrangements. Also, the interaction effects of living arrangements and marital status were not examined. In this study, intergenerational living arrangements were categorized into four types regardless of marital status (i.e., distant residence, proximate residence, co-residence with unmarried children, and co-residence with married children). Therefore, the number of types of living arrangements would be eight if marital status were considered in the measure (e.g., distant residence, proximate residence, co-residence with unmarried children, and co-residence with married children for the married and the unmarried). Since this study emphasizes the importance of new types of intergenerational living

arrangements, such as proximate residence, co-residence with unmarried children, and co-residence with married children, too many categories may make the results unnecessarily distracted. Moreover, according to the results of this study, the marital status of older adults at the baseline did not significantly influence depressive symptoms and life satisfaction at the follow-up. Future studies may need to look into additional types of living arrangements reflecting marital status with a sample of different social and cultural contexts.

Third, the influence of structural family relations on health and psychological well-being can change depending on functional family relations including intergenerational interactions. In recent decades, technological advances in communication have enabled family members to contact each other more frequently due to a greatly reduced cost of communication (Kennedy, Smith, Wells, & Wellman, 2008). Even if adult children do not live close to their older parents, they can contact them through cell phones, emails, text messages, or various types of social media. Future studies should consider the influence of this new social and cultural transition in family communication on the living arrangements of older adults and related health outcomes.

Given the rapid aging society, understanding the linkages between intergenerational living arrangements and health and psychological well-being is important in research and policy on aging and health. Since familial relations significantly differ across various social and cultural contexts, there is a need to expand our understanding on living arrangements and health to include diverse, especially non-Western, societies so as to better understand the generalizability or cultural-specificity of this important phenomenon.

### 3.5 References

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**Table 3.6 Sociodemographic and health characteristics of the sample, by age group**

	Total		Young-olds		Old-olds		Statistics
	N=5,209		N=2,712		N=2,497		
	Mean, %	SD	Mean, %	SD	Mean, %	SD	
<b>Sociodemographic status</b>							
Age (range 60~105)	70.33	7.26	64.7	2.84	76.44	5.42	F(1,5208)=9813.63****
Female (vs. male)	57.29%		55.35%		59.39%		X2(2)=8.69**
Married (vs. unmarried)	68.96%		80.31%		56.63%		X2(2)=340.60**
Education (range 0~23)	6.63	4.34	7.64	4.11	5.54	4.31	F(1,5208)=325.24****
Number of children (range 1~10)	3.74	1.56	3.31	1.29	4.21	1.69	F(1,5208)=477.38****
Rural residency (vs. urban residency)	27.45%		25.26%		29.84%		X2(2)=13.68****
Income (in millions; range 0~38.82)	1.4	2.29	1.71	2.45	1.07	2.06	F(1,5208)=102.25****
Homeownership (vs. no homeownership)	48.24%		51.77%		44.41%		X2(2)=28.18****
<b>Living arrangements</b>							X2(2)=332.97****
Distant residence	32.98%		33.74%		32.16%		
Proximate residence	22.29%		23.45%		21.03%		
Co-residence with unmarried children	22.12%		29.17%		14.46%		
Co-residence with married children	22.61%		13.64%		32.36%		

**Health and psychological well-being (W1)**

Depression (vs. no depression)	39.74%		46.90%		33.15%		F(1,5208)=134.97***
Life satisfaction (range 0~100)	59.03	22.00	61.05	21.17	56.84	22.67	F(1,5208)=48.14***
Functional limitation (range 0~17)	1.20	3.33	0.49	2.05	1.97	4.17	F(1,5208)=271.32***
Chronic condition (vs. no chronic condition)	61.76%		57.89%		66.00%		X2(2)=35.83***

**Status at the follow-up**

							X2(2)=63.97***
Death	2.94%		1.14%		4.89%		
Loss	13.27%		13.64%		12.86%		

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*Note:* \*p<.05, \*\*p<.01, \*\*\*p<.001

**Table 3.7 Logistic Regression Models for Depression Symptoms at Wave 2 (OR)**

<b>Baseline attributes</b>	<b>Model 1</b>		<b>Model 2</b>		<b>Model 3</b>	
<b>Sociodemographics</b>						
Old-old (70+years)	0.937		0.968		0.795	
Female	1.751	***	1.736	***	1.794	***
Married	0.978		0.932		0.955	
Education	0.989		0.987		0.990	
Number of children	0.958		0.960		0.955	
Rural area	0.714	**	0.724	*	0.726	*
Income	1.006		1.005		1.004	
Homeownership	1.299	*	1.225		1.207	
<b>Health conditions</b>						
Depression symptoms	2.123	***	2.100	***	2.101	***
Life satisfaction	0.983	***	0.984	***	0.954	***
Functional limitation	1.042	**	1.047	***	1.042	**
Chronic condition	1.428	**	1.437	**	1.437	**
<b>Living arrangements</b>						
Co-residence with unmarried child			1.550	*	1.482	*
Proximate residence			1.145		0.970	
Distant residence			1.249		0.938	
<b>Living arrangements x age group</b>						
Co-residence with unmarried child x old-old					0.998	
Proximate residence x old-old					1.357	
Distant residence x old-old					1.684	*
<b>LR chi-square</b>	249.49		256.77		262.43	
<b>(df)</b>	(12)	***	(15)	***	(18)	***
<b>Log likelihood</b>	-1239.635		-1235.992		-1233.162	
<b>N</b>	4,365		4,365		4,365	

Note: \*p<.05, \*\*p<.01, \*\*\*p<.001

a. reference category is co-residence with married child

**Table 8.3 OLS Regression Models for Life Satisfaction at Wave 2 (Coef.)**

<b>Baseline attributes</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>
<b>Sociodemographics</b>			
Old-old (70+years)	-0.619	-0.782	2.140 **
Female	0.527	0.714	0.370
Married	0.044	0.612	0.205
Education	0.585 ***	0.600 ***	0.570 ***
Number of children	0.366 *	0.327	0.441 *
Rural area	1.875 **	1.994 ***	1.955 ***
Income	0.206	0.213	0.207
Homeownership	-0.563	-0.008	-0.002
<b>Health conditions</b>			
Depression symptoms	-3.007 ***	-2.904 ***	-2.875 ***
Life satisfaction	0.333 ***	0.325 ***	0.324 ***
Functional limitation	-0.518 ***	-0.569 ***	-0.518 ***
Chronic condition	-0.568	-0.613	-0.627
<b>Living arrangements</b>			
Co-residence with unmarried child		-3.149 ***	-1.221 **
Proximate residence		-1.328	0.797 **
Distant residence		-2.476 ***	0.160 ***
<b>Living arrangements x age group</b>			
Co-residence with unmarried child x old-old			-3.975 **
Proximate residence x old-old			-4.041 **
Distant residence x old-old			-5.047 ***
Constant		35.702 ***	34.630 ***
<b>Adjusted R<sup>2</sup></b>	0.240 ***	0.243 ***	0.246 ***
<b>F</b>	116.09	94.31	80.27
<b>N</b>	4,365	4,365	4,365

Note: \*p<.05, \*\*p<.01, \*\*\*p<.001

a. reference category is co-residence with married child



**Table 3.9 Negative Binomial Regression of Functional Limitation at Wave 2 (IRR)**

<b>Baseline attributes</b>	<b>Model 1</b>		<b>Model 2</b>		<b>Model 3</b>	
<b>Sociodemographics</b>						
Old-old (70+years)	1.389	**	1.402	***	0.678	**
Female	0.370	***	0.377	***	0.407	***
Married	0.560	***	0.679	**	0.875	
Education	0.922	***	0.922	***	0.930	***
Number of children	1.078	*	1.077	*	1.015	
Rural area	0.893		0.966		0.957	
Income	0.954	*	0.961		0.953	*
Homeownership	0.864		0.957		1.006	
<b>Health conditions</b>						
Depression symptoms	1.184		1.196		1.172	
Life satisfaction	0.993	***	0.992	***	0.992	***
Functional limitation chronic condition	1.276	***	1.269	***	1.255	***
	1.513	***	1.527	***	1.669	***
<b>Living arrangements</b>						
Co-residence with unmarried child			0.780		0.320	***
Proximate residence			0.579	***	0.321	***
Distant residence			0.568	***	0.256	***
<b>Living arrangements x age group</b>						
Co-residence with unmarried child x old-old					5.072	***
Proximate residence x old-old					2.363	***
Distant residence x old-old					3.321	***
<b>LR chi-square</b>	446.22		483.56		543.31	
<b>(df)</b>	(12)	***	(15)	***	(18)	***
<b>Log likelihood</b>	-4190.464		-4181.794		-4151.914	
<b>N</b>	4,365		4,365		4,365	

Note: \*p<.05, \*\*p<.01, \*\*\*p<.001

a. reference category is co-residence with married child

**Table 3.10 The Results from Logistic Regressions for Depressive symptoms (OR), OLS Regression for Life Satisfaction (Coef.), and from Negative Binomial Regression for Functional Limitations (IRR) by Age Group (the Young-old vs. the Old-old)**

Baseline attributes (w1)	Depressive symptoms (w2)		Life satisfaction (w2)		Functional limitations (w2)	
	Young-old	Old-old	Young-old	Old-old	Young-old	Old-old
<b>Living Arrangements<sup>a</sup></b>						
Co-residence-unmarried child	1.285	1.687 *	-0.409	-5.452 ***	0.987	1.220
Proximate residence	0.841	1.472	1.732	-3.404 ***	0.913	0.652 *
Distant residence	0.840	1.690 *	1.001	-4.948 ***	0.946	0.625 **
<b>Socio-demographic status</b>						
Age	0.994	1.041 ***	-0.240 *	-0.149	1.190 ***	1.090 ***
Female	1.392 ***	2.481 ***	0.223	-0.392	0.348 ***	0.755
Married	0.782	1.206	0.845	-0.489	1.533	1.119
Education	0.958	1.026	0.621 ***	0.216 ***	0.890 ***	0.984
Number of children	0.989	0.931	0.617 *	0.341	0.889	0.968
Rural residency	0.626 *	0.814	2.090 *	0.948	0.597 *	1.222
Income	1.026	0.978	0.041	0.500 **	0.945	1.011
Homeownership	1.125	1.300	-0.360	0.920	1.516	1.023
<b>Health and psychological well-being</b>						

Depressive symptoms	2.277 ***	1.924 ***	-0.498 ***	-0.405 ***	1.513	1.056
Life satisfaction	0.981 ***	0.986 ***	0.298 ***	0.313 ***	0.997	0.989 ***
Functional limitation	1.069 *	1.034 *	-0.763 ***	-0.399 ***	1.507 ***	1.177 ***
Chronic condition	1.679 **	1.238	-0.556	-0.218	2.454 ***	1.340 *
Adj R-squared/Log likelihood	-595.90	-626.78	0.245	0.243	-1262.84	-2784.87
N	2,301	2,064	2,301	2,064	2,301	2,064

*Note:* \*p<.05, \*\*p<.01, \*\*\*p<.001

a. reference category is co-residence with married child

**Table 3.6. Multinomial Logistic Regression Results Showing Relative Risk Ratios**

Baseline attributes	Status at the Follow-Up	
	Non-response	Death
<b>Living arrangements</b>		
Co-residence with unmarried children	1.019	0.825
Proximate residence	0.943	0.572
Distant residence	0.968	0.621
<b>Sociodemographics</b>		
Age	0.963	2.230 **
Female	0.925	0.332 ***
Married	0.676 ***	0.962
Education	1.010	0.985
Number of children	0.918 **	0.971
Rural residency	0.358 ***	1.204
Income	0.999	0.985
Homeownership	0.953	0.867
<b>Health conditions</b>		
functional limitation	1.023	1.101 ***
depressive symptom	0.904	0.893
life satisfaction	0.996 *	1.002
<b>Log likelihood</b>	-2499.46	
<b>LR chi square (df)</b>	415.40 (32)***	
<b>N</b>	5,209	

Note: \*p<.05, \*\*p<.01, \*\*\*p<.001

a. reference category is co-residence with married child

## **CHAPTER 4:**

### **Health and Trajectories of Living Arrangements among Older Americans: Racial and Ethnic Differences**

#### **4.1 Introduction**

Among older adults, family members are a significant component of social networks, and family interactions and support varies depending on living arrangements (Himes, Hogan, and Eggebeen, 1996). Living arrangements become especially important for older adults when health problems arise. Since caregiving requires geographic proximity, frail elders tend to be supported by their children or relatives who live in the same household or nearby (Cicirelli, 1983; Stone, Cafferata, and Sangl, 1987).

A number of studies have shed light on the living arrangements of the elderly for several decades. As more longitudinal data of older adults have become available in recent years, a growing body of research has focused on the factors triggering the transitions in living arrangements among older adults. These studies have demonstrated that socio-economic and demographic factors including older age, less education, no homeownership, the death of a spouse, retirement that is usually followed by sudden changes in income, and physical and mental health problems influence older adults' transitions to co-residence (Brown et al., 2002; Hays, 2002; Hays, Pieper, & Purser, 2003; Mutchler & Burr, 1991; Spitze, Logan, & Robinson,

1992; Wilmoth, 1998; Wolf & Soldo, 1988).

However, these prior studies only looked at the transitions in living arrangements between two points in time. There is still a dearth of knowledge about trajectories of living arrangements among older adults over a long period of time. The living arrangements of older adults should be understood in the life course perspective. A living arrangement is a dynamic structure that reflects shifting opportunities, constraints, needs, and preferences over individuals' life courses (Moen, 1992; Uhlenberg & Mueller, 2003). Changes in living arrangements can be viewed as an adaptive strategy that individuals and their family members make to a changing environment (Blank & Torrecilha, 1998; Chen, 2005), and it has been found that transitions in living arrangements increase with age (Wilmoth, 1998). Therefore, repeated observations over an extended period of time enable us to have better understanding of the trajectories of living arrangements among older adults.

In addition, living arrangements in old age should be understood in various cultural contexts (Becker, Beyne, Newsom, & Mayen, 2003; Wilmoth, 2001). Cultural norms regarding family roles and filial responsibility significantly influence decisions for living arrangements in old age (Burr and Mutchler, 1992). Furthermore, it has been found that older adults change their living arrangements when they become old and sick (Moen, 1992). However, even in the same situation, older adults from different cultures may choose to accommodate their constraints and health care needs with different living arrangements (Burr and Mutchler, 1992). Although the diverse patterns of living arrangements and family relations among different racial/ethnic groups have been well documented, there is little knowledge about the differential trajectories of living arrangements among older adults across these racial and ethnic groups. Also, the different

associations between health and living arrangements across race/ethnicity have rarely been investigated.

Moreover, the categorization of living arrangements in most previous studies — whether or not the elderly were living with children or others — was not appropriate to reflect the dynamics of living arrangements in old age. The majority of older Americans live in single- or couple-only households (US Department of Health and Human Services, 2011). Although historical trends in intergenerational living arrangements in the U.S. show a long-term preference for separate and independent living in old age (Haber & Gratton, 1994), recent studies have found that many older Americans prefer to live near their adult children particularly when they have health problems (Moody, 2006). In fact, in terms of family relations and support, living away from and living near children are significantly different. Geographical proximity enables families to contact each other more frequently and to provide physical support more easily (Crimmins & Ingegnery, 1990; Litwak & Kulis, 1987). Therefore, older adults may move near their children but not into the same household when they advance in age (Glaser & Tomassini, 2000). However, research that did not differentiate living near children from living far away from children may not be able to investigate these dynamic transitions in living arrangements. In order to reflect the dynamic changes in living arrangements among older adults, a distinct category of living arrangement — proximate residence — should be considered.

The present study aimed to improve our current knowledge on health and living arrangements in old age in four respects. First, the trajectories of living arrangements among older adults over time were investigated by using seven waves of nationally representative panel data over a twelve-year period (1998-2012). Four types of living arrangements including co-

residence with children, proximate residence, distant residence, and co-residence with people other than a spouse or children were considered. Second, this study explored to what extent various physical and mental health problems influence the trajectories of living arrangements among older adults. Lastly, this study investigated if there are racial/ethnic differences in the trajectories of living arrangements and whether the associations between health and the trajectories of living arrangements differ across racial/ethnic groups.

## **4.2 Hypotheses**

In order to address the research questions, this study posed the following four hypotheses.

### ***Trajectories of living arrangements.***

According to the life course perspective, living arrangements reflect the needs and constraints of individuals and their families throughout their life course (Blank & Torrechilha, 1998; Chen, 2005; Soldo, Wolf, & Agree, 1990). In order to fit their changing situations, some older adults often experience multiple transitions in their living arrangements in old age (Borsch-Supan, 1990; Dostie & Leger, 2005; Wilmoth, 1998). In order to understand living arrangements in old age comprehensively, trajectories of living arrangements that consist of a series of transitions should be investigated. To the best of my knowledge, however, there is currently no research investigating the long-term trajectories of living arrangements among older adults. Longitudinal observation enables us to understand not only interpersonal differences, but also intrapersonal changes in trajectories of living arrangements over time (Singer, 2003).

Older adults in Western societies tend to live separately from their children. Most



American elders live alone or only with a spouse because they value privacy and independence (Kramarow, 1995). Several cohort studies of living arrangements in developed countries found that older people are increasingly likely to live separately from their adult children (Glaser & Grundy, 1998; Schoeni, 1998; Weinick, 1995). According to Liang and his colleagues (2005), approximately 78% of older Americans 70 years of age or older live alone or only with a spouse, and a quarter of elders in these living arrangements experienced a change in living arrangements even in a 2-3 year-period. Only 17% of older Americans live with their children, and 62% of them remained in co-residence between the baseline and the follow-up. Despite the high proportion of distant residence among older adults, age has been found to trigger co-residence with children (Brown et al., 2002; Liang et al., 2005).

However, it should be highlighted that older adults in developed Western countries have a preference toward living separately but near their children, and tend to live near their children when they are old and sick (Moody, 2006). This type of living arrangement can provide a greater possibility to exchange support between older parents and adult children than older parents who live far away from their children (Crimmins & Ingegnerly, 1990). In these respects, the average of the initial level of probabilities of proximate residence and distant residence may be high.

However, while the probability of proximate residence may sharply increase over time, the probability of distant residence may significantly decrease. Due to the value of independence, the initial level of the probability of co-residence may be low, and the rate of increase is possibly moderate. Therefore, three hypotheses are suggested regarding the trajectories of living arrangements in old age over time.

H<sub>1-1</sub>. On average, the initial level of probability of proximate residence is the greatest among all

types of living arrangements and the probability of proximate residence increases over time at an accelerated rate.

H<sub>1.2</sub>. On average, the initial level of probability of distant residence is as high as proximate residence, but the probability of distant residence decreases over time at an accelerated rate.

H<sub>1.3</sub>. On average, the initial level of probability of co-residence is lower than those of proximate and distant residence, and the rate of increase is low.

### ***Health and living arrangement trajectories.***

Health problems have been demonstrated to be one of the most powerful triggers to destabilize the living arrangements of older adults (Brown et al., 2002; Hay, 2002; Liang et al., 2005; Silverstein, 1995). According to the life course perspective, older adults change their living arrangements when health problems arise in order to adjust the goodness of fit between a new situation and their current environment to maximize their competence (Hays, 2002). If older adults cannot find enough physical and emotional social support for their everyday competence in their current living arrangements, they may move closer to, or in with their children. In old age, health status can significantly change over time, which may influence transitions in living arrangements. In this respect, a hypothesis regarding the effects of health problems and aggravation of health conditions on the trajectories of living arrangements is proposed.

H<sub>2</sub>. Poor health and aggravation of health conditions are associated with a greater rate of increase of the probabilities of proximate and co-residence.

### ***Health and living arrangement trajectories by racial/ethnic groups.***

The patterns of living arrangements vary across racial/ethnic groups with different cultural values of family solidarity and intergenerational relations (Becker, Beyne, Newsom, & Mayen, 2003; Wilmoth, 2001). White Americans tend to stress the importance of independence and individualism, so they prefer to live separately from their children for residential privacy (Simic, 1990; Wilmoth, 2001). In contrast to White elders, African American elders place strong value on support within the family, and their concept of family even extends to kinship and close friends (Chatters & Taylor, 1990; Dilworth-Anderson, 1992). Although African American elders play a critical role in their extended family, they do not expect deference in the relationships between family members. Intergenerational relationships among African Americans tend to be equal rather than hierarchical (Becker et al., 2003). Moreover, the direction of providing support among African American families is usually from older parents to their children (Mutran, 1985). Becker and her colleagues (2003) showed that African American children commonly moved into their older parents' residence due to economic difficulties and to receive support for childcare. However, African American elders rarely moved in with their children. Hispanics are most likely to form extended-family households based on their deep-rooted value of familism (Cuellar, 1990; Keefe, Padilla, & Carlos, 1979). Older Hispanics expect to live with or near their adult children, and they also hold a high status in their families (Becker et al., 2003). As a result, multigenerational family living arrangements are relatively common among Hispanics. Based on previous literature on living arrangements in different racial/ethnic groups, this study proposes three hypotheses for racial/ethnic differences in the trajectories of living arrangements.

H<sub>3-1</sub>. Non-Hispanic White elders have a higher probability of proximate residence and a greater rate of increase over time compared to African American and Hispanic elders.

H<sub>3.2</sub>. African American elders have a higher probability of co-residence with their children or others and a lower rate of increase over time compared to White elders.

H<sub>3.3</sub>. Hispanics elders have a higher probability of co-residence with their children and a lower rate of increase over time compared to White elders.

As discussed, the living arrangements of older adults vary across racial/ethnic groups due to different cultural values. Minority older adults, particularly Hispanics, tend to live in the same household or in close proximity to their nuclear and extended families based on their strong value of familism (Sarkisian, Gerena, & Gerstel, 2007). Since the living arrangements of Hispanic elders are more likely to be significantly determined by cultural factors, the influence of other factors such as health care needs could be weaker in this group. On the other hand, Non-Hispanic White elders prefer to live independently as long as possible. Therefore, the onset and aggravation of health problems that require physical support may more likely cause them to live with or close to their adult children. This study suggests a hypothesis regarding health and trajectories of living arrangements by racial/ethnic groups.

H<sub>3.4</sub>. The associations between health and living arrangements are stronger among Non-Hispanic White elders than among African American and Hispanic elders.

## **4.3 Methods**

### **4.3.1 Data and Sample**

Data used in this study were obtained from seven waves of the Health and Retirement Study (HRS) between 1998 and 2010. The HRS is a longitudinal survey of a nationally

representative sample of older adults aged 51 and over in the U.S. The HRS includes individuals from several age cohorts: the Asset and Health Dynamics among the Oldest Old (AHEAD: born prior to 1924), the Children of the Depression Age (CODA: born 1924-1930), the HRS cohort (born 1931-1941), and War Babies (WB: born 1942-1947). Prior to 1998, data collection on the original HRS cohort occurred on even years and in odd years for AHEAD data collection. Since 1998, the HRS has consolidated data collection efforts for all four birth cohorts.

The present study restricted its sample to community-dwelling older adults over 60 years of age with at least one living child in order to investigate intergenerational living arrangements in old age. All of the samples were selected in 1998 at the baseline of this study, and they were observed over a 12-year period. Furthermore, in order to include lagged measures and the changes between two adjacent waves for the dynamic specification, respondents who never responded to consecutive interviews during the study period were dropped from the sample. Therefore, the final analytical sample consisted of 10,914 individuals contributing to 58,083 observations.

The HRS involves a complex survey design with oversamples of African Americans, Hispanics, and residents of Florida. However, this study did not use sampling weights, because the variables that define the weights were already included in the models (Winship & Radbill, 1994).

#### **4.3.2 Measures**

***Living arrangements.*** Mutually exclusive four types of living arrangements were included in this study: (a) co-residence (living with children), (b) proximate residence (living near children),

(c) distant residence (living far away from children), and (d) other residence (living with people other than a spouse or children). Proximate residence was defined as within a 10-mile-distance between the respondents' home and the closest child's home.

***Race/ethnicity.*** Race/ethnicity was constructed as mutually exclusive groups: Non-Hispanic White, Non-Hispanic African American, and Hispanic.

***Health conditions.*** The three physical and mental health conditions were evaluated for their effects on living arrangements in old age and were included in the analyses as time-varying covariates. *Functional status* was assessed with a list of 5 activities of daily living (ADL) and 5 instrumental activities of daily living (IADL). ADL includes the 5 tasks bathing, dressing, eating, walking across a room, and getting in or out of bed, and IADL includes using a telephone, taking medication, handling money, shopping, and preparing meals. *Chronic conditions* were indicated by the number of chronic diseases that respondents had ever been diagnosed with from a doctor. The chronic diseases used in this measure included high blood pressure, diabetes, cancer, lung disease, heart disease, stroke, psychiatric problems, and arthritis. *Depressive symptoms* were measured using a score on the Center for Epidemiologic Studies Depression (CES-D) scale. CES-D scores were calculated by summing six negative indicators and two reversely coded positive indicators. Respondents were asked whether he/she experienced the following sentiments all or most of the time in the past week: depression, everything is an effort, sleep is restless, feel alone, feel sad, and could not get going for the six negative indicators; and feel happy and enjoy life for the two positive indicators.

***Other covariates.*** Various demographic and socioeconomic factors were included as time-

constant and time-varying covariates in the analyses. *Age* was measured as age in the baseline (i.e., 1998). *Gender* was indexed with dummy variables (Male=0 and Female=1). *Education* was measured by the number of years of formal schooling. Since there were few changes in the number of years of education among the older populations in this sample, education was considered as time-constant variable. *The number of children* was indicated by the total number of living children. *Marital status* was categorized into married (including the married and those living with their partner) and unmarried (including the separated, the divorced, the never married). Based on the longitudinal observations of marital status, four marital status categories were constructed, including continuously married, continuously unmarried, widowed/separated, and other marriage types (i.e., from unmarried to married and multiple marriages). *Total household assets* were derived by summing reported dollar amounts of all sources of household assets.

To ensure a clear time sequence between the time-varying covariates and living arrangements, this study used the lagged measures (i.e., observations from the prior wave,  $X_{t-1}$ ) and the change terms (i.e., changes in the value of the variables between the prior and the present waves,  $\Delta X_{t-1,t} = X_t - X_{t-1}$ ) for each of the time-varying covariates (Liang et al., 2010).

### **4.3.3 Data analysis**

This study employed Hierarchical Linear Modeling (HLM) with multinomial outcomes (Raudenbush & Bryk, 2002) to estimate the trajectories of living arrangements among older Americans over an observation period of 12 years (1998-2010). A two-level model was utilized: Level 1 for repeated observations and Level 2 for person-level variables. This multilevel model

enables us to investigate both intrapersonal changes across time (Level 1) and between-individual differences at the baseline (Level 2).

$$\text{Level 1: } \ln(p_{ij(m)}/p_{ij(M)}) = \pi_{0i(m)} + \pi_{1i(m)}\textit{Time}_{ij} + \sum \pi_{ki(m)}X_{kij} \quad (1)$$

$$\text{Level 2: } \pi_{pi(m)} = \beta_{p0(m)} + \sum(\beta_{pq(m)}Z_{qi}) + Y_{pi(m)} \quad (2)$$

In the Level 1 model,  $p_{ij(m)}$  was the probability of individual  $i$  falling into living arrangement category  $m$  at time  $j$ , and  $p_{ij(M)}$  was the probability of individual  $i$  in the reference category  $M$  at time  $j$ .  $\pi_{0i(m)}$  was the intercept of the log-odds of individual  $i$  in living arrangement category  $m$ , and  $\pi_{1i(m)}$  was the slope (i.e. the rate of change) in the log-odds of individual  $i$  in living arrangement category  $m$  over time since baseline.  $\textit{Time}_{ij}$  referred to the number of years of follow-up after the baseline interview.  $X_{kij}$  was the  $k^{\text{th}}$  time-varying covariate that may have influenced individual  $i$ 's living arrangement at time  $j$ . In the present study, lagged and change terms of health conditions, number of children, marital status, income and asset, and home ownership were included. Both linear and non-linear changes with time were considered by modeling a linear and quadratic function of time. A linear model was selected as the most appropriated model based on Bayesian information criterion (BIC).

In the Level 2 model,  $Z_{qi}$  was the  $q^{\text{th}}$  time-constant covariate associated with individual  $i$ , and  $\beta_{pq(m)}$  represented the effects of  $Z_q$  on the  $p^{\text{th}}$  growth parameter ( $\pi_p$ ).  $Y_{0i(m)}$  and  $Y_{1i(m)}$  were random effects with a mean of zero. In this study, time-invariant variables included baseline age, gender, race/ethnicity, education, and marriage type (i.e., continuously married or unmarried, became widowed or separated). Time-varying covariates in the Level 1 equation were centered at their group means, and time-invariant covariates in the Level 2 equations were centered at their



respective grand means.

To minimize the loss of participants due to item missing (Little & Rubin, 2002), multiple imputations were performed (Schafer & Olsen, 1998). Each of five imputed datasets was used in HLM analyses. Parameter estimates and their standard errors were calculated by averaging the five datasets and adjusting for their variance (Raudenbush & Bryk, 2002). This paper also addressed the potential for selection bias associated with death and attrition (i.e., no response and institutionalization) in the interval between the baseline year and 2010. Previous studies have shown that the probability of death and attrition is systematically related to living arrangements (Brown et al., 2002; Liang et al., 2005). Therefore, the binary variables including death and ever attrited were included in the Level 2 equation to address the potential for confounding effects associated with these factors (Liang et al., 2010).

## **4.4 Results**

### ***4.4.1 Descriptive results***

Table 4.1 details descriptive statistics for the total sample as well as by race/ethnicity. The mean age of the sample in the baseline (1998) was 70 years and ranged from 60 to 102 years. Females comprised 57% of the sample, and the average education was 12 years. The racial/ethnic composition of the sample was 8% Hispanics and 13% African Americans. 46% of the sample were married, and 32% of them were unmarried throughout the study period. 19% of the sample lost their spouse during the period, and 3% of them experienced multiple marriages. 39% of the respondents died during the observation period and 3% were missing information at some point between 1998 and 2010.

<Table 4.1 about here>

Table 4.2 also offers descriptive statistics for the time-varying covariates of the analyses by study year. The mean number of functional limitations was 0.66, and has increased over time (0.61 in 1998 and 0.78 in 2008). Also, the rate of change in the number of functional limitations has increased over time. The mean number of chronic conditions was 2.06 (1.75 in 1998 and 2.50 in 2008) has increased over time with a stable rate. Lastly, the mean depression score was 1.55 out of 8, and the mean change score was 0.09.

<Table 4.2 about here>

#### ***4.4.2 Trajectories of living arrangements in old age***

Table 4.3 present the hierarchical linear model results for living arrangements. Progressively complex models were explored for living arrangements, starting with the unconditional model (Model 0) to the full model (Model 2). In Model 0, only Time was included. Demographic and socioeconomic variables were added in Model 1. Lastly, health conditions in previous wave and changes in health were included in Model 2.

The first research question was about the trajectories of living arrangements among older Americans. The unconditional model showed that the initial level of the probability of proximate residence was greater than that of distant residence ( $b=0.563$ ,  $p<.001$ ; Model 0), and the initial levels of the probabilities of co-residence ( $b=-0.803$ ,  $p<.001$ ; Model 0) and other residence ( $b=-1.619$ ,  $p<.001$ ; Model 0) were lower than that of distant residence. Regarding the rate of increase, as opposed to the probability of distant residence, the probabilities of co-residence ( $b=0.036$ ,

$p < .001$ ), proximate residence ( $b = 0.040$ ,  $p < .001$ ), and other residence ( $b = 0.080$ ,  $p < 0.001$ ) increased with mean time (Table 4.3, Model 0). These increases were also found in the full model which adjusted all time-constant and time-varying covariates including socio-demographic attributes and health conditions (Table 4.3, Model 2).

The average probabilities of the trajectories of living arrangements among older Americans between 1998 and 2010 are also presented in Figure 4.1. In general, proximate residence was the most prevalent residence among older Americans, followed by distant residence. The probabilities of these two living arrangements changed significantly over the 12-year period. Specifically, the probability of proximate residence increased significantly over time from .425 in 1998 to .475 in 2010. However, the probability of distant residence rapidly declined from .375 in 1998 to .275 in 2010. The probabilities of co-residence and other residence stayed relatively constant around .19 and .06 respectively.

<Figure 4.1 about here>

#### ***4.4.3 Health and trajectories of living arrangements in old age***

The full model in Table 4.3 shows the effects of three types of health conditions including limitations, chronic conditions, and depressive symptoms on the trajectories of living arrangements, which is the second research question. In order to define a clear time-sequence between health predictors and living arrangements, health variables from the previous wave and changes in health problems were included in the equation. Interestingly, this study found that the effects of health conditions on living arrangements differed depending on the types of health problems. For example, the aggravation of functional limitations increased the probability of co-

residence ( $b=0.084$ ,  $p<.001$ ), proximate residence ( $b=0.037$ ,  $p<.05$ ), and other residence ( $b=0.134$ ,  $p<.001$ ) as opposed to distant residence. Chronic conditions reduced the probability of other residence ( $b=-0.143$ ,  $p<.05$ ). A greater number of depressive symptoms ( $b=0.085$ ,  $p<.01$ ) and an increase in depressive symptoms ( $b=0.076$ ,  $p<.001$ ) were significantly associated with other residence.

<Table 4.3 about here>

#### ***4.4.4 Trajectories of living arrangements in old age by racial/ethnic groups***

The unadjusted average probabilities of the trajectories of each living arrangements by race/ethnic groups are presented in Figures 4.2-4.5. Also, Table 4.3 also show racial/ethnic differences in the trajectories of living arrangements in old age. There were significant differences between Hispanics, African Americans and Whites in both the intercept and slope over time. Hispanic and African American elders were more likely to live with their children or others, and White elders were more likely to live near their children. The initial levels of co-residence (Hispanic:  $b=1.334$ ,  $p<.001$ ; African American:  $b=0.999$ ,  $p<.001$ ) and other residence (Hispanic:  $b=0.570$ ,  $p<.001$ ; African American:  $b=1.022$ ,  $p<.001$ ) among Hispanic and African American elders were greater than those among White elders. However, the initial levels of proximate residence (Hispanic:  $b=-0.476$ ,  $p<.001$ ; African American:  $b=-0.230$ ,  $p<.05$ ) among Hispanic and African American elders were smaller than those among White elders. Regarding changes in living arrangements, the trajectories of living arrangements among White elders were more dynamic than those among Hispanic and African American elders. The rate of increase in co-residence for Hispanics ( $b=-0.068$ ,  $p<.05$ ) was lower than for White elders. In addition, the

rate of increase in proximate residence ( $b=-0.051$ ,  $p<.05$ ) and other residence ( $b=-0.053$ ,  $p<.01$ ) for African Americans was lower than those of Whites.

<Figures 4.2, 4.3, 4.4, 4.5 about here>

#### ***4.4.5 Health and trajectories of living arrangements by racial/ethnic groups***

In order to examine if the effects of health on trajectories of living arrangements vary across racial/ethnic groups, this study conducted separate analyses by three racial/ethnic groups, instead of including interaction terms. Interaction effects were tested by performing a significance test of the differences between the unstandardized coefficients (Marascuilo & Levin, 1983; Liang et al., 2005).

Table 4.4 is an excerpt from the analytical table for each racial/ethnic group. As this study hypothesized, there were significant differences in the trajectories of living arrangements among the three racial/ethnic groups. The significance test of the difference between unstandardized regression coefficients confirms the differences in the associations between health and trajectories of living arrangements across the racial/ethnic groups. Among White elders, functional health problems and chronic conditions increased the probabilities of co-residence, proximate, and other residence as opposed to the probability of distant residence. In addition, depressive symptoms were positively associated with other residence. In other words, White elders with health problems were more likely to live with their children, near their children or live with others than to live far away from their children. However, African American elders showed significantly different patterns in the linkages between health and living arrangements. For example, functional limitations increased the probability of co-residence and proximate

residence, which was consistent with the results from White elders. However, intriguingly, among African American elders, depressive symptoms were negatively associated with co-residence or proximate residence. Lastly, among Hispanic elders, it was very obvious that the effects of health on changes in living arrangements were much weaker than those among Whites and African Americans. Only changes in chronic conditions showed significant associations with co-residence and proximate residence.

<Table 4.4 about here>

#### **4.5. Discussion**

This study analyzed the trajectories of living arrangements among older American adults over a 12-year period. This study also demonstrated significant effects of physical and mental health conditions – functional status, chronic conditions, and depressive symptoms – on the trajectories of living arrangements. Furthermore, the results showed that the associations between health and trajectories of living arrangements differ across racial/ethnic groups.

This study is possibly the first to analyze the long-term trajectories of living arrangements among older adults. Repeated observations over an extended period of time provided information on the stability and changes in living arrangements of older adults, which was not available from previous studies based on cross-sectional or longitudinal data including only two points of time. Among older Americans more than 60 years of age, the most prevalent living arrangement was proximate residence throughout the observed time period, and the probability of proximate residence has increased over time. Distant residence was the second most prevalent living arrangement, but has rapidly decreased. These findings confirm that older Americans tend to live

closer to their children over time but live separately from them (Moody, 2006). Proximate residence is a distinct category of living arrangements in old age among older Americans that provides informal family support. Co-residence with a child was a relatively stable living arrangement even over a 12-year period in the population level, which is consistent with prior research (Crimmins & Ingegneri, 1990; Liang et al., 2005; Wilmoth, 1998). All of these results provide support to the first hypotheses regarding the average trajectories of various living arrangements ( $H_{1-1}$ ,  $H_{1-2}$ ,  $H_{1-3}$ ).

The second research question is how intra-personal changes in health problems influenced the trajectories of living arrangements. Although health has been demonstrated to significantly influence living arrangements in old age, previous research usually measured health as self-rated health or functional limitations (Speare et al., 1991; Wilmoth, 1998; Zimmer, 2005). This study expands our current knowledge on the associations between health and living arrangements by including chronic conditions and depressive symptoms. Although previous studies have found that poor health increased the likelihood of co-residence (Brown et al., 2002; Soldo, Wolf, & Agree, 1990; Speare, Avery, & Lawton, 1991; Martikaine, Nihtila, & Moustgaard, 2008; Zimmer, 2005), this study demonstrated that functional limitations were positively associated with proximate residence and other residence as well as co-residence. Older adults with functional limitations tend to change their living arrangements so that they can receive support from their children or others in the same household or nearby. However, the effects of chronic conditions on trajectories of living arrangements were not significant, and depressive symptoms were positively associated with other residence as opposed to distant residence.

Lastly, the trajectories of living arrangements differ substantially across racial/ethnic groups.

In agreement with prior research (Angel, Angel, & Himes, 1992; Choi, 1991, 1995; Hayes et al., 1995; Himes et al., 1996), Hispanic and African American elders were more likely to live with their children or with others than White elders. Specifically, Hispanics ethnicity was strongly associated with co-residence with adult children, and African American elders were more likely than their Hispanic and White counterparts to live with people other than a spouse or a child. These results may reflect the Hispanic group's strong value of familism (Lopez, 2006; Rivera et al., 2008), and the African Americans' expanded concept of family that includes extended family members, close friends, fictive kin, and church members (Taylor, Hernandez, Nicklett, Taylor, & Chatters, 2013). Some scholars argue that racial/ethnic variations in elderly's living arrangements can be explained by demographic and socioeconomic differences across racial/ethnic groups. According to their research, high rates of co-residence among African American and Hispanic elders were influenced by poor economic situations, lower education levels, a higher likelihood of widowhood, and greater numbers of children (Aquilino, 1990; Choi, 2003; Crimmins & Ingegneri, 1990; Hays et al., 1995). However, this study demonstrated that the associations between race/ethnicity and the trajectories of living arrangements were significant, even after controlling for marital status, number of children, income, wealth, and education. These results confirm the importance of culture as a determining factor of intergenerational living arrangements among older adults.

Then, do the effects of health on the trajectories of elderly living arrangements differ across racial/ethnic groups? This study found significant differences in the associations between health and trajectories of living arrangements among Non-Hispanic Whites, African Americans, and Hispanics. White elders were more likely to live independently, while Hispanic and African American elders were more likely to live with their children or others. At first glance, it appears



that many Hispanic and African American elders with health problems tend to be supported by their children or by others more than White elders. However, this is not often true. According to these findings, living arrangements among White elders were more dynamic than those among Hispanic and African American elders. Decisions for living arrangements among White elders may more likely be made based on health needs, whereas decisions for living arrangements among minority elders tend to be made based on culture. This became clearer when the effects of health on the trajectories of living arrangements among the three different racial/ethnic groups were explored in depth.

Among White elders, all three health conditions including functional impairments, chronic conditions, and depressive symptoms significantly influenced the trajectories of living arrangements. Although the initial level of distant residence was relatively high among White elders compared to African American and Hispanic elders, the onset and aggravation of health problems among White elders and their need for sustained support from their children increased the probability of a change in their living arrangement from distant residence to co-, proximate, or other residence.

Similar to White elders, functional limitations increased the probabilities of co-residence and proximate residence among African American elders. However, African American elders with greater depressive symptoms were more likely to change to distant residence. This result is in contrast to the hypothesis (H<sub>4.2</sub>). In fact, the effects of mental health on living arrangements have rarely been explored in previous literature. This association is probably due to the fact that people with depressive symptoms do not usually require instrumental support. Also, sometimes depressive symptoms are not recognized by older people and/or their family members, but these

symptoms could lead to family conflicts. As a result of families' inability to deal with conflicts caused by depressive symptoms in elderly parents, family members may decide to live separately or live far away from each other. This finding suggests that there is a need to develop programs for depression detection and interventions for older people who are suffering from depression and for their family members, particularly for the African American population. However, further research is required to understand which mental health problems affect living arrangements in old age and to what extent, and how the African American cultural context is linked to these associations.

Another key finding in this study was that health problems did not significantly influence the living arrangements among Hispanic elders. Hispanic elders tended to live with their adult children, so they may be able to receive support from their family. However, this study found few significant associations between health and living arrangements among Hispanic elders. This means that Hispanic elders who live far away from their children may not change their living arrangements even when health problems arise. This may signify that there is a lack of informal care for this population. Accordingly, this group should be targeted for additional attention and support from formal social services.

Several important limitations have been recognized in this study. First, although this study focused only on the elderly's perspective, children's characteristics can also influence the living arrangements of the elderly (Aquilino 1990; Choi, 2003; Glaser & Tomassini, 2000). In fact, co-residence has been found to be associated with children's marital and employment status (Schmermann et al., 2000). Adult children who lived with their older parents were more likely to be divorced, separated or never-married, and adult children sometimes moved into their older

parents' house for economic reasons (Ward et al., 1992). It has been also found that older parents performed a much higher proportion of household tasks than adult children when in shared housing. In this respect, this research could be improved if a broad range of characteristics of adult children, such as age, marital status, income, education level, and number of children, were simultaneously taken into account with the characteristics of the elderly.

Second, it is important to consider broader social relationships beyond the immediate family (i.e., a spouse and children), such as the elder's own parents, their siblings, other relatives, and friends, when investigating the living arrangements of older people. These people constitute an important component of an individual's social capital, and therefore can be a potential reason for older adults to remain in the same or change their living arrangement. Also, since these social relationships can also provide informal care for older adults with health problems, those who have close social relations nearby tend to have less of a need to change their living arrangements even when health problems arise. Lastly, community support can also help older people to maintain their independent lives. As the number of older adults has increased, various social services for older people have become available. Older individuals with easy access to community services may not need to move in with or near their adult children when they need frequent instrumental support. Thus, controlling for these variables in the analyses could result in more conclusive results.

This research contributes to our understanding of the trajectories of living arrangements in old age over a 12-year-period by focusing on intra-personal and inter-personal differences. The findings showed dynamic transitions of living arrangements among older adults, particularly caused by health problems. The significant effects of cultural contexts were also demonstrated.

As the proportion of the older population has rapidly increased, social support for older adults with health problems has become a critical policy issue. This study complements existing studies of health and living arrangements in old age, and provides policy implications for family-based old age support in different cultural contexts.

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**Table 4.1 Descriptive Statistics for Measures at Levels 1 and 2, Health and Retirement Study (HRS) 1998-2010**

	% or mean (SD)			
	Total	White	African American	Hispanic
<b>Level 2 variables</b>				
<b>(Time-Constant)</b>	n=10,914	n=8,666	n=1,429	n=819
White	78%	100%	0%	0%
African American	13%	0%	100%	0%
Hispanic	8%	0%	0%	100%
Age (in 1998)	70.42	70.72	69.34	69.36
(60-102)	(7.81)	(7.79)	(7.87)	(7.75)
Female	57%	57%	61%	57%
Education	11.68	12.36	10.14	7.39
(0 ~ 20)	(3.43)	(2.79)	(3.66)	(4.65)
Cont. married	46%	48%	30%	44%
Cont. unmarried	32%	29%	51%	35%
Widowed/Separated	19%	20%	15%	17%
Other marriage	3%	3%	4%	4%
Died (1998-2010)	39%	39%	41%	37%
Ever attrited (1998-2010)	3%	3%	4%	5%
<b>Level 1 variables</b>				
<b>(pooled sample)</b>	n=58,083	n=45,819	n=7,722	n=4,542
Co-residence	10,966	6,482	2,393	1,822
	19%	14%	32%	41%
Proximate residence	25,557	21,303	2,556	1,356
	44%	47%	34%	31%
Distant residence	18,120	15,389	1,587	883
	31%	34%	21%	20%
Other residence	3,440	2,145	886	345
	6%	5%	12%	8%
Wealth, time (t-1)	1.97	2.15	1.25	1.28
(0 ~ 3)	(0.91)	(0.84)	(0.83)	(0.88)

$\Delta$ Wealth	0	-0.01	0.01	0.01
(-3 ~ 3)	(0.80)	(0.57)	(0.68)	(0.64)
Function, time (t-1)	0.66	0.57	1.02	0.96
(0-10)	(1.66)	(1.53)	(2.04)	(2.02)
$\Delta$ Function	0.31	0.31	0.34	0.30
(-9-10)	(1.49)	(1.40)	(1.77)	(1.78)
Chronic, time (t-1)	2.06	2.05	2.28	1.92
(0-8)	(1.37)	(1.36)	(1.38)	(1.39)
$\Delta$ Chronic	0.26	0.26	0.24	0.26
(0-5)	(0.53)	(0.53)	(0.52)	(0.53)
Depression, time (t-1)	1.55	1.41	1.96	2.26
(0-8)	(1.91)	(1.82)	(2.02)	(2.28)
$\Delta$ Depression	0.09	0.11	0.05	0.01
(-8-8)	(1.86)	(1.78)	(2.03)	(2.25)

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*Note:* Level 2 is associated with individuals at the baseline (1998). Level 1 is associated with repeated observations for survey participants.

**Table 4.2 Time-Varying Covariates by Year of Survey**

<b>Measures</b>	<b>2000</b>	<b>2002</b>	<b>2004</b>	<b>2006</b>	<b>2008</b>	<b>2010</b>
Co-residence	19.2%	18.3%	18.5%	18.9%	18.2%	18.7%
Proximate residence	38.5%	45.9%	46.3%	45.8%	47.1%	47.3%
Distant residence	36.8%	30.1%	29.5%	30.2%	29.7%	28.4%
Other residence	5.6%	5.8%	5.8%	5.1%	5.0%	5.6%
Proxy (lag)	0.07 (.25)	0.07 (.25)	0.07 (.26)	0.06 (.23)	0.06 (.25)	0.06 (.23)
$\Delta$ Proxy	0.02 (.20)	0.01 (.21)	-0.00 (.20)	-0.01 (.20)	0.01 (.20)	0.00 (.20)
Wealth (lag)	1.86 (.90)	1.91 (.90)	1.96 (.91)	2.01 (.91)	2.06 (.93)	2.08 (.94)
$\Delta$ Wealth	0.02 (.57)	0.05 (0.58)	0.01 (0.58)	0.01 (0.58)	-0.03 (.60)	-0.09 (0.64)
Function (lag)	0.61 (1.58)	0.61 (1.59)	0.66 (1.66)	0.71 (1.75)	0.76 (1.76)	0.78 (1.82)
$\Delta$ Function	0.19 (1.36)	0.27 (1.39)	0.29 (1.44)	0.35 (1.51)	0.37 (1.62)	0.53 (1.75)
Chronic (lag)	1.75 (1.30)	1.88 (1.33)	2.07 (1.35)	2.23 (1.37)	2.39 (1.40)	2.50 (1.39)
$\Delta$ Chronic	0.24 (.51)	0.27 (.54)	0.25 (.52)	0.25 (.56)	0.25 (.52)	0.29 (.55)
Depression (lag)	1.63 (1.90)	1.58 (1.59)	1.55 (1.92)	1.54 (.51)	1.49 (1.92)	1.43 (1.88)
$\Delta$ Depression	0.06 (1.85)	0.08 (1.87)	0.09 (1.86)	0.10 (1.79)	0.10 (1.87)	0.18 (1.86)
N	10,914	9,505	8,545	7,619	6,802	6,352

**Table 4.3 Hierarchical Linear Model Results for Living Arrangements in Old Age**

Covariates	Model 0			Model 1		
	Co-residence	Proximate residence	Other residence	Co-residence	Proximate residence	Other residence
<b>Fixed Effect</b>						
<b>For Intercept</b>						
Intercept	-0.803 ***	0.563 ***	-1.619 ***	-0.867 ***	0.608 ***	-1.764 ***
Death				0.218 **	-0.091	0.185 *
Ever attrited				-0.002	-0.182	-0.283
Female				0.264 ***	0.303 ***	0.094
Hispanic				1.298 ***	-0.521 ***	0.531 ***
Black				1.031 ***	-0.222 **	1.076 ***
Education				-0.098 ***	-0.098 ***	-0.092 ***
Age (b)				-0.035 ***	-0.002	-0.035 ***
# children (b)				0.327 ***	0.234 ***	0.181 ***
Unmarried				1.183 ***	0.143	0.858 ***
Widowed				0.641 ***	0.146	1.312 ***
Other				0.024	-0.228	0.934 ***
<b>For Time Slope</b>						
Intercept	0.032 ***	0.039 ***	0.068 ***	0.050 ***	0.042 ***	0.050 ***
Death				0.031	0.015	-0.009
Ever attrited				-0.029	-0.023	0.004
Female				0.034 *	0.017	-0.041 *
Hispanic				-0.039	-0.002	-0.035
Black				-0.039 *	-0.030	-0.065 **

Education				0.003	0.005 **	0.002
Age (b)				0.009 **	0.003 ***	0.008 ***
# children (b)				-0.010 **	-0.002	-0.001
Unmarried				0.040 **	-0.012	-0.011
Widowed				0.180 *	0.029 *	0.293 ***
Other				-0.013 ***	0.009	-0.008
<b>Time-Varying Variables</b>						
Proxy (lag)						
Δ Proxy						
Wealth (lag)				-0.115	-0.129	-0.182
Δ Wealth				-0.194 ***	0.026	-0.095
ADLIADL(lag)						
Δ ADLIADL						
Chronic (lag)						
Δ Chronic						
Depression (lag)						
Δ Depression						
<b>Random Effects</b>						
Intercept						
SD	2.487	2.052	1.924	2.793	2.402	2.253
Variance component	6.185	4.212	3.700	7.799	5.770	5.078
df	10,913	10,913	10,913	10,913	10,913	10,913
Chi-square	19,316 ***	28,373 ***	11,107	22,317 ***	34,746 ***	11,171

Note: reference category: distant residence

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

**Table 4.3 Hierarchical Linear Model Results for Living Arrangements in Old Age  
(continued)**

Covariates	Model 2					
	Coresidence		Proximate residence		Other residence	
<b>Fixed Effect</b>						
<b>For Intercept</b>						
Intercept	-0.875	***	0.589	***	-1.461	***
Death	0.244	**	-0.104		0.268	***
Ever attrited	-0.018		-0.200		-0.216	
Female	0.283	***	0.323	***	0.094	
Hispanic	1.334	***	-0.476	***	0.570	***
Black	0.999	***	-0.230	*	1.022	***
Education	-0.099	***	-0.098	***	-0.093	***
Age (b)	-0.029	***	0.001		-0.030	***
# children (b)	0.324	***	0.236	***	0.178	***
Unmarried	1.230	***	0.131		0.792	***
Widowed	0.790	***	0.170	*	1.414	***
Other marriage	0.049		-0.181		0.803	***
<b>For Time Slope</b>						
Intercept	0.081	***	0.086	***	0.066	***
Death	0.045		0.054	**	-0.035	
Ever attrited	-0.034		-0.021		-0.013	
Female	0.036	*	0.014		-0.047	**
Hispanic	-0.068	*	-0.031		-0.058	
Black	-0.051	*	-0.053	**	-0.090	***
Education	0.004		0.007	***	0.003	
Age (b)	0.008	***	0.003	**	0.006	***
# children (b)	-0.011	**	-0.003		0.001	
Unmarried	0.023		-0.009		0.036	
Widowed	0.180	***	0.028		0.296	***
Other marriage	-0.018		-0.014		0.025	
<b>Time-Varying Variables</b>						
Proxy (lag)	0.030		0.026		0.021	

Δ Proxy	0.015		0.018	0.011
Δ Wealth	-0.165	***	0.052	-0.037
Δ Wealth	-0.165	***	0.052	-0.037
ADLIADL(lag)	0.005		-0.023	0.073 *
Δ ADLIADL	0.084	***	0.037 *	0.134 ***
Chronic (lag)	0.065		-0.016	-0.143
Δ Chronic	0.076		-0.015	-0.021
Depression (lag)	-0.029		-0.007	0.085 **
Δ Depression	-0.018		-0.003	0.076 ***

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**Random Effects**

Intercept				
SD	2.849		2.500	1.756
Variance component	8.117		6.252	3.084
df	10,913		10,913	10,913
Chi-square	20,528***		30,778***	17,931

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*Note:* reference category is distant residence.

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

**Table 4.4 Hierarchical Linear Model Results for Health and Trajectories of Living Arrangements in Old Age by Racial/ethnic groups (excerpt)**

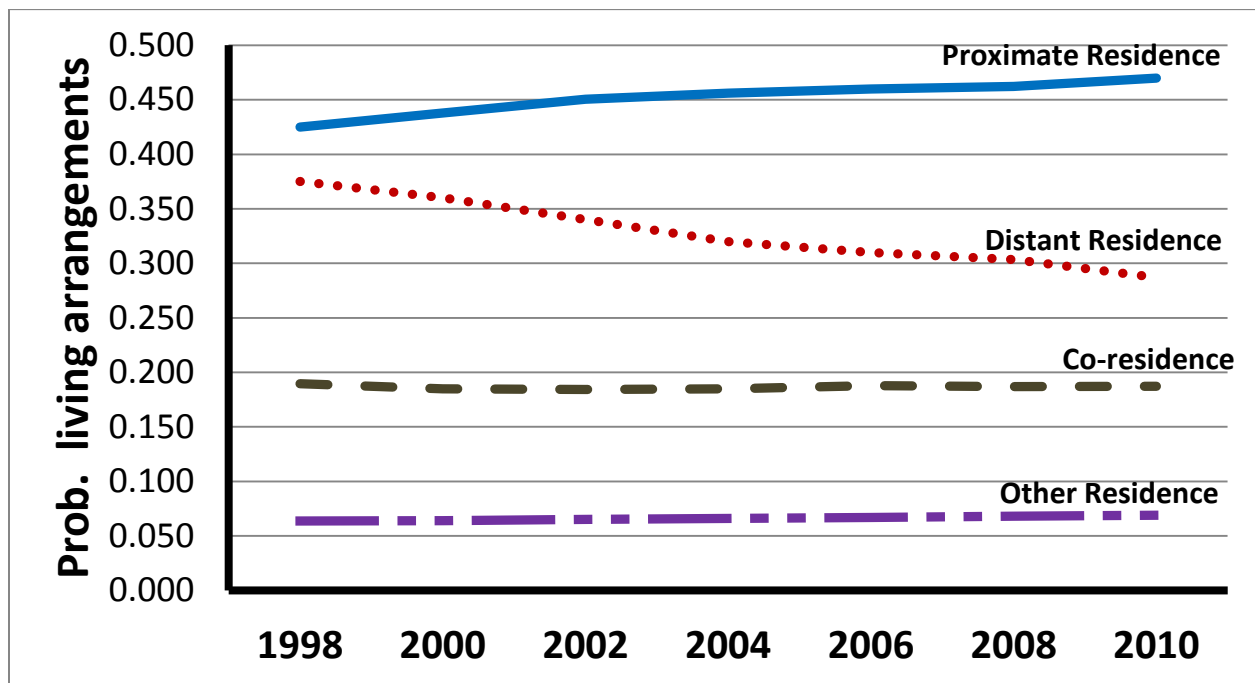
Health conditions	White			African American			Hispanic		
	Co-residence	Proximate residence	Other residence	Co-residence	Proximate residence	Other residence	Co-residence	Proximate residence	Other residence
<b>Function (lag)</b>	0.018 **	0.047 *	0.030	0.174 **	0.104 *	0.033	0.044	0.041	0.018
<b>Δ Function</b>	0.133 ***	0.024	0.112 ***	0.085 *	0.032	0.030	0.054	0.005	0.046
<b>Chronic (lag)</b>	0.154 *	0.024	0.176 *	0.021	-0.024	-0.070	0.222	0.127	0.083
<b>Δ Chronic</b>	0.111 *	0.088 *	0.069	-0.007	-0.056	-0.177	0.294 *	0.343 **	0.073
<b>Depression(lag)</b>	0.002	-0.001	0.168 ***	-0.138 *	-0.120 *	-0.001	0.041	0.036	0.043
<b>Δ Depression</b>	0.006	-0.003	0.118 ***	-0.079 *	-0.057	0.020	0.039	0.031	0.068

Note: reference category is distant residence.

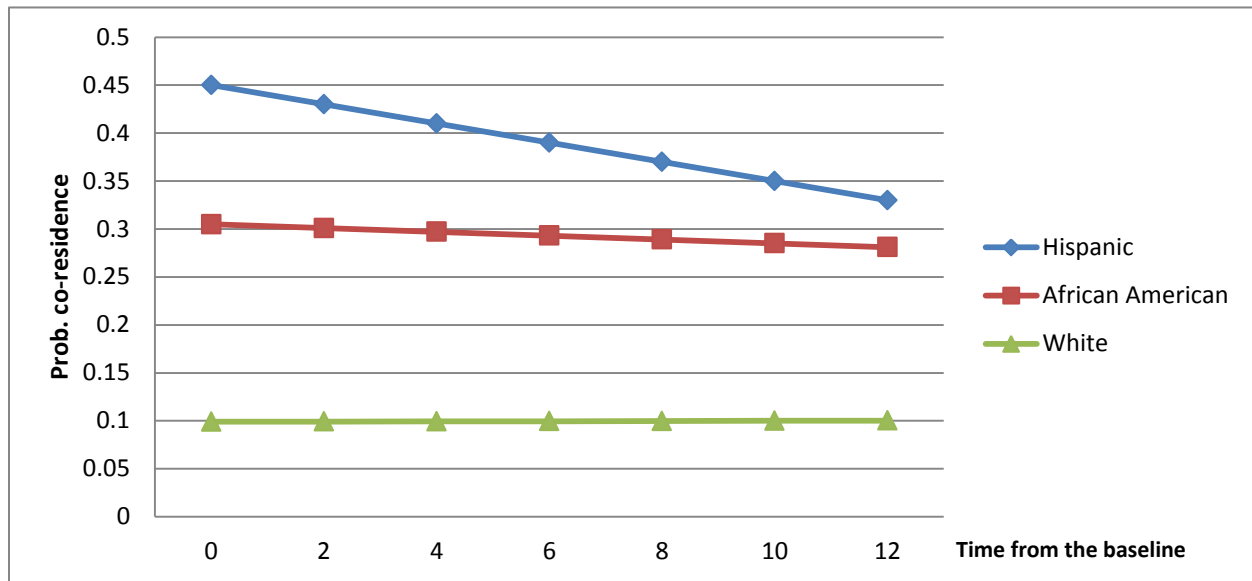
\* p<.05, \*\* p<.01, \*\*\*p<.001



Figure 4.1 Trajectories of living arrangements among older Americans between 1998 and 2010

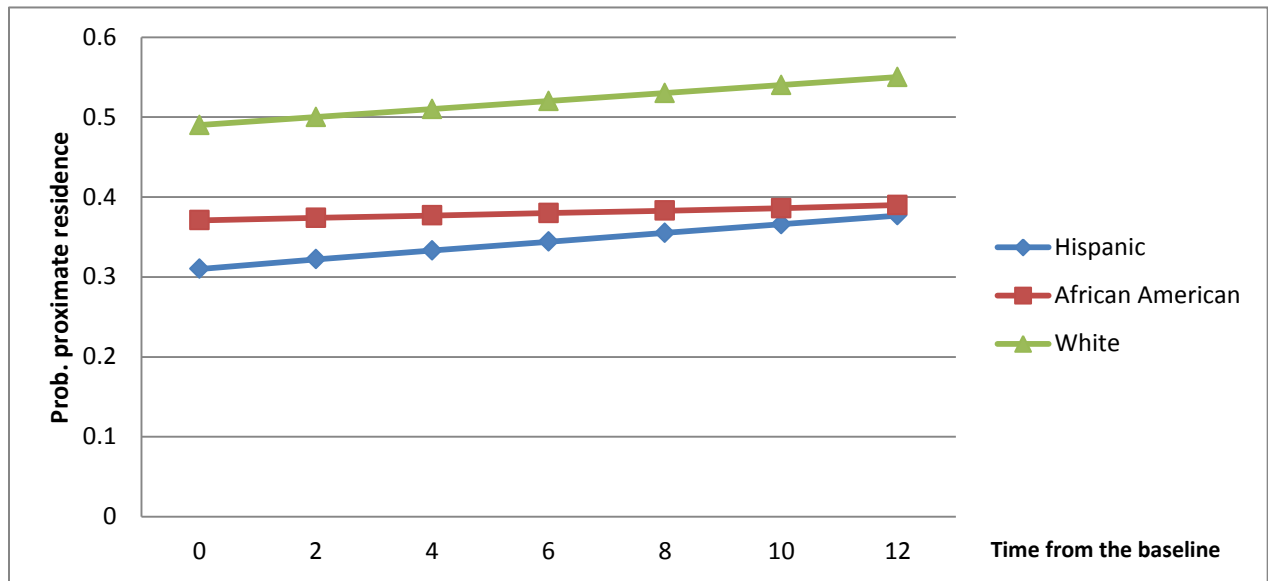


**Figure 4.2 Trajectories of living arrangements among older Americans by race/ethnicity (Co-residence)**



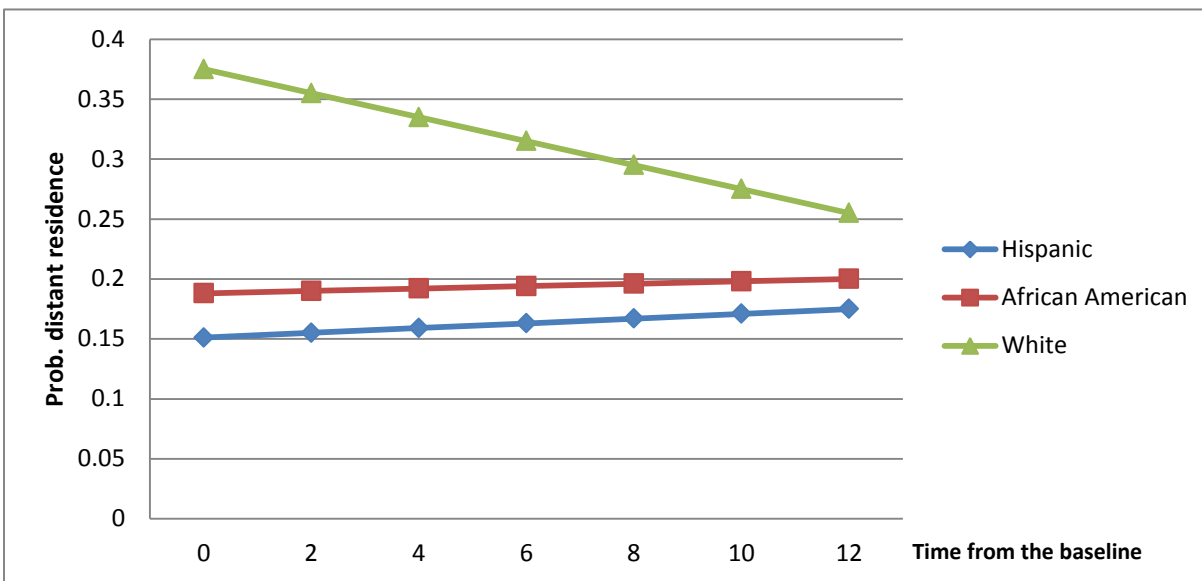
*Note:* No covariates were controlled.

**Figure 4.3 Trajectories of living arrangements among older Americans by race/ethnicity (Proximate residence)**



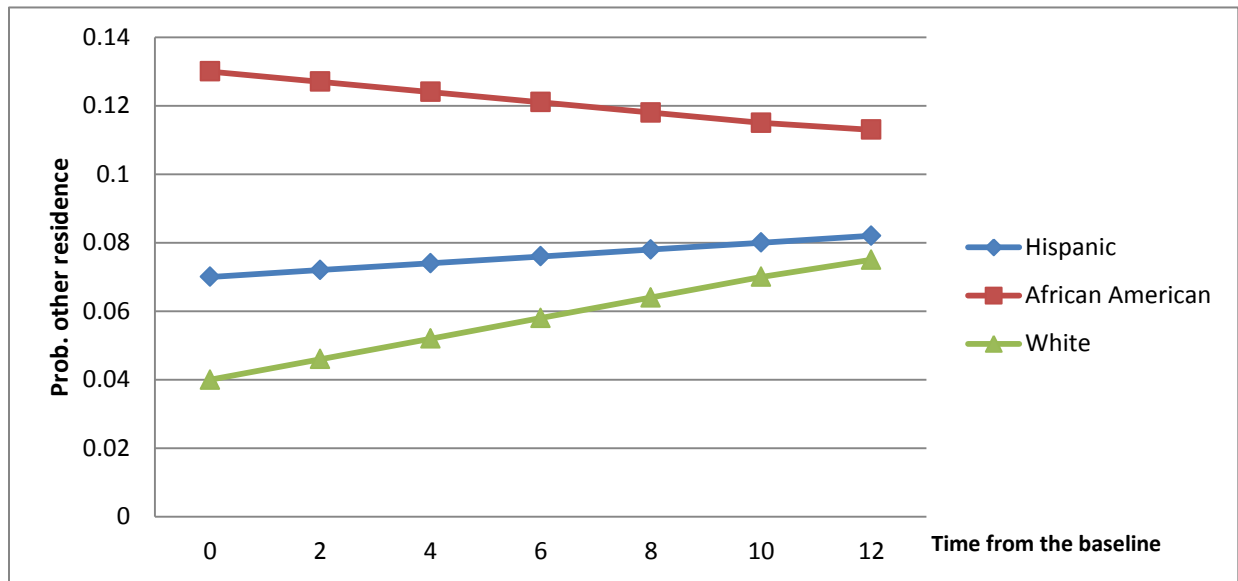
*Note:* No covariates were controlled.

**Figure 4.4 Trajectories of living arrangements among older Americans by race/ethnicity (Distant residence)**



*Note:* No covariates were controlled.

**Figure 4.5 Trajectories of living arrangements among older Americans by race/ethnicity (Other residence)**



*Note:* No covariates were controlled.

## **CHAPTER 5:**

### **CONCLUSION**

#### **5.1 Overall findings**

This dissertation examined the dynamic linkages between intergenerational living arrangements and health among older adults in South Korea and the United States. This dissertation emphasized that social and cultural contexts are important in understanding living arrangements in later life. The findings demonstrated that macro-level social and cultural factors such as age-cohort (i.e. the young-old vs. the old-old), race/ethnicity (i.e., White, African American, and Hispanic), and nationality (i.e., South Korean vs. American) significantly influence the associations between health and intergenerational living arrangements among older adults.

The first study, described in Chapter 2, explored the effects of physical and mental health conditions on transitions in intergenerational living arrangements among older Koreans. While proximate residence has been the most prevalent living arrangement in developed Western countries, co-residence has been the dominant type of living arrangement among older Koreans due to the cultural norm of filial piety (Won & Lee, 1999). However, recently in South Korea, the prevalence of co-residence has significantly declined, particularly among those older adults who are married. On the other hand, more than a quarter of older Koreans who were 60 years or

over lived in proximate residence according to the nationally representative sample used in this study. Regarding the effects of health on living arrangements, while unmarried elders with functional impairments were more likely to live with their children, married elders with chronic conditions tended to live near their children rather than to co-reside with them. This study exemplified that proximate residence is a viable substitute for co-residence for older people with health problems in South Korea, where the cultural norm of filial piety and the tendency to value privacy and independence coexist.

The second study presented in Chapter 3 investigated how different types of living arrangements influence physical health and psychological well-being in old age, and how these effects differed between the young-old (aged 60-70 years) and the old-old (aged 70+ years). Due to rapid social and cultural changes in recent decades, the young-old in South Korea tended to be more independent from their adult children and to have more social resources to support their old age (e.g., pensions, social activities), while the old-old still valued family interdependence and have relatively limited social resources. The results showed that co-residence with children did not always positively influence the health and well-being among older Koreans. In particular, living arrangements were not significant predictors of health and well-being among the young-old. Among the old-old, while respondents who lived with their married children showed lower levels of depressive symptoms and greater levels of life satisfaction than those in other living arrangements, elders who lived with their unmarried children had the worst depressive symptoms and life satisfaction. In terms of functional status, co-residence was found to be a detrimental living arrangement regardless of co-residential children's marital status. These findings underscore that the older population cannot be considered to be homogeneous even within the same society. Also, the health effects of living arrangements differ depending on older adults'

specific health conditions.

The final empirical study, described in Chapter 4, analyzed the trajectories of living arrangements among older adults in the United States over a 12-year period, and evaluated to what extent various physical and mental health conditions – functional status, chronic conditions, and depressive symptoms – influence the trajectories of living arrangements. In addition, this study also examined if there are any racial/ethnic variations in the linkages between health and trajectories of living arrangements. The results showed that, as a whole, older Americans were more likely to move closer in proximity to one of their adult children over time, but they did not usually move into the same household with their children. The onset and aggravation of health problems increased the probability of co-residence, proximate residence, and other residence, relative to distant residence.

This study also highlighted the importance of cultural factors in investigating living arrangements among older adults. Decisions for living arrangements among White elders may more likely be made based on older parents' health needs, whereas the decisions among minority elders tend to be made based on cultural preference. Specifically, the results showed that the living arrangements of White elders were more dynamic than those of African American and Hispanic elders. In particular, when health problems arose, White elders were more likely to change their living arrangement to co-residence, proximate residence, or other residence than other racial/ethnic groups. Among African Americans, functional limitations increased the probabilities of co-residence and proximate residence as opposed to that of distant residence. However, depressive symptoms decreased the probabilities of co-residence and proximate residence as opposed to that of distant residence. Furthermore, the associations between health



and living arrangements were the weakest among Hispanics.

## **5.2 Family relations and intergenerational living arrangements in different social and cultural contexts**

From the findings of three empirical papers, this dissertation illustrated the importance of social and cultural contexts in the investigation of living arrangements in old age. It is obvious that older adults in South Korea and Whites, African Americans, and Hispanics in the United States have different expectations about children's support, particularly in connection with living arrangements. These differences were closely related to the influence of health on living arrangements, and the influence of living arrangements on health.

The cultural differences between Western and Eastern societies have often been described with reference to independence/individualism vs. interdependence/collectivism (Hofstede 2001; Triandis 2001). However, interdependence/collectivism may no longer represent intergenerational relationships in South Korea. As discussed in Chapters 2 and 3, although the social norms concerning family obligations have declined rapidly in South Korea (Lee *et al.* 2010), the deeply-rooted cultural value concerning co-residential support for older parents still affects people's attitudes, particularly among the older generation.

The majority of middle-aged Koreans and young-older Koreans often now believe that caregiving is no longer a child's responsibility. They tend to think that older parents should prepare for their old age themselves and expect more assistance or support from public services rather than from family members (Lee 2008; Lee *et al.* 2010). According to a survey by the Korea Institute for Health and Social Affairs (KIHASA) in 2007, more than half of the

respondents 65 years or older preferred not to live with their married children because of differences in values and lifestyles between older parents and their adult children. Most respondents thought that co-residence with their adult children would interrupt their own private lives. However, the older generation (i.e., 70 years or older) still expects co-residential support from children, especially when they do not have a spouse or are ill. Living separately from their children, particularly living alone, often was perceived by others as neglect and meant that the children had serious failings (Maeda & Ishikawa, 2000).

The results from Chapter 2 reflected this unique social and cultural context in South Korea. While unmarried elderly with health problems were more likely to live with their children, elderly with a spouse or a partner were more likely to live near their children when they have health problems. In terms of the function of familial living arrangements, proximate residence can be referred to as 'quasi co-residence' rather than independent living (Chen, 2005). In proximate residence, older adults can maintain their independence as well as can be supported by their children and to a similar extent compare to those residing with children (Clark & Wolf, 1992; Frankenberg, Chan, & Ofstedal, 2002; Glaser & Tomassini, 2000). Chapter 3 demonstrated the positive influence of proximate residence on mental health and psychological well-being. Older Koreans who co-resided with married children still showed the most positive mental health and psychological well-being. However, compared to older adults who lived with their unmarried children those in proximate residence showed better mental health and life satisfaction. Also, the level of life satisfaction among the elders in proximate residence was not significantly different from the level among those in co-residence with married children. In this regard, proximate residence is a viable living arrangement option for older adults in South Korea where the cultural norm of filial piety and the tendency to value privacy and independence

coexist.

The United States is a culturally diverse society. Cultural values pertaining to family and social relations vary across racial/ethnic groups. Among White elders, living arrangements are determined based on family adaptive strategies, which are a consequence of negotiations in which the older parents and their adult children evaluate their opportunities, needs, resources, and preferences to choose the most beneficial arrangement (Soldo et al., 1990; Spitze et al., 1992). In fact, Chapter 4 found that the living arrangements among White elders were more dynamic than other racial/ethnic groups. They tended to live separately from their children based on the strong value of independence (Wilmoth, DeJong, & Himes, 1997). However, they changed their living arrangements when health problem arose, because health problems increase the need for family support.

African Americans tend to have stronger family ties than Whites. However, due to the strong cultural value they place on autonomy, they are less likely to get help from their social support networks (Silverman et al. 1999). Even if they do receive help, it is usually limited to transportation and the encouragement of health behaviors (Jennings, 1999). In this respect, the associations between health and living arrangements can be weaker among African American elders than among White elders. Silverman et al. (1999) demonstrated that African Americans with chronic illnesses such as heart disease and diabetes were much less likely to receive help than Whites, although their need for help was not lesser than Whites. This dissertation found that among African Americans, functional limitations, which may require physical support, were associated with the greater likelihood of co-residence or proximate residence. However, depressive symptoms increased the probability of distant residence. These conflicting results

may be reflective of the family culture of African Americans.

In addition, African Americans tend to have broader social relationships including large extended families, fictive kin, religious ties, and close friends than other groups. In particular, church relationships have been found to be a stronger factor affecting health behaviors and emotional well-being than biological family relationships (Aaron et al., 2003; Anderson et al., 2000; Becker et al., 2004; Gallant et al., 2007; Gallant, 2010; Strawbridge et al., 2001). This broader social relationship among African Americans is similarly reflected in their living arrangements. Chapter 4 showed that “other residence” which included living with people other than a spouse or children was much more prevalent among African Americans than among other racial/ethnic groups. The initial level of the probability of other residence among African Americans was significantly greater than those in other racial/ethnic groups.

Lastly, Hispanics have the strongest family oriented culture in regard to intergenerational relationships among all racial/ethnic groups in the U.S. Diez (1995) found that Mexican-Americans have more contact with and assistance from adult children than Whites or African Americans. Hispanics are more likely to live in multi-generational households than other subgroups even after controlling for socioeconomic status, and the Hispanic family plays an important role in supporting older people (Gallant et al., 2010). Since Hispanic elders’ living arrangements tend to be determined from a cultural norm, and not from rational choice, the linkages between health and living arrangements among Hispanic elders were minimal. However, it has been argued that Hispanic older people have different perspectives on the familial responsibility of caring for older parents with health problems depending on their acculturation (Van Hook & Glick, 2007; Gallant et al., 2010). In this respect, the associations

between health and living arrangements among Hispanic elders could be significantly moderated by factors related to acculturation such as the time they immigrated to the U.S. and educational level. Future studies should consider these factors in the investigations of health and living arrangements.

### **5.3 Limitations and implications for research and policy**

As discussed separately in detail in Chapters 2, 3, and 4, this study has several limitations. In this section, I will discuss the limitations that these three chapters have in common. First, this dissertation focused on intergenerational living arrangements. The elderly who did not have any children were not included in any of the papers. Future research should investigate this older population who may be more vulnerable due to a lack of family support in later life. In addition, recently in many societies the concept of family has become more complicated due to higher rates of divorce, separation and cohabitation (Bornat, Dimmock, Jones, & Peace, 1999). Intergenerational relations among stepfamilies may be significantly different from those among traditional blood families. As this dissertation emphasizes the importance of social and cultural factors, this social change should also be addressed in future research.

In addition, the living arrangements of older adults are based on joint decisions among family members. Since this dissertation focused on older parents' attributes, the needs and preferences of adult children in intergenerational living arrangements were not fully addressed. In recent years, adult children have often wanted to live with or live near their older parents in order to receive support in the form of financial assistance and/or childcare. Therefore, future research should focus on both the perspectives of older parents and their adult children. Moreover, the living arrangements of older adults can also be understood in family-level

contexts. In this dissertation, a number of individual-level socio-economic attributes were included as covariates, and macro-level social and cultural contexts were addressed. However, family contexts can also be important in the decision-making process of choosing a living arrangement in old age. It would expand our understanding of living arrangements among older adults if we could address family-level attributes such as the level of socioeconomic status of the overall families (i.e. multiple generations in a family from older parents to grandchildren) and the similarities and dissimilarities of socioeconomic attributes and closeness between family members.

In conclusion, the three empirical studies in this dissertation contribute to fill the gaps in gerontological research on family relations and support in old age as a structural form of living arrangements by focusing on various social and cultural contexts and using nationally representative longitudinal datasets. Given the rapid aging that is occurring in many societies, understanding the dynamic linkages between health and living arrangements is important for social, health, and long-term care policies. My dissertation can contribute to a clearer identification of the groups of elderly who are at high risk for health problems and social isolation as well as to the design and implementation of service programs for these high-risk groups.

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