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AGING IN JAPAN: IMPORTANCE OF SOCIAL INTEGRATION

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ABSTRACT

AGING IN JAPAN: IMPORTANCE OF SOCIAL INTEGRATION

By

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Intergenerational mutual care in Japan developed in the context of various factors, including cultural ideals, centralization of the civil state, and the family unit called the *ie* (家). Prior to the Meiji period, there were regional and class diversity in family life and no cultural ideal for women to take care of the dependent elderly. However, many scholars start with this patriarchal *ie* system (the system of primogeniture legally recognized in the Meiji Civil Code in 1898) as the benchmark against which to gauge the continuity, uniqueness, and change of eldercare during the twentieth century. This has resulted in many scholars assuming that the cultural underpinnings of the *ie* defined the care of 'frail elderly' as 'women's work' undertaken to preserve 'women's morality.' Since care has been pessimistically perceived as a caregiver's obligation, the elderly have too often been stereotyped as frail and dependent.

Owing to longevity and reduced disability among the elderly after the Second World War, more elderly have challenged these stereotypes. Now perhaps Social Gerontologists should start to view the Japanese elderly as proactively choosing their opportunities to care and be cared for by important people beyond the family. This new view has broadened studies of aging beyond just the maintenance of physical and mental vitality to the social integration of older people with family, friends, and communities.

In examining the relationship between social integration and the well-being of the elderly, previous studies supported the role-enhancement perspective. For the elderly who went through various life events, holding diverse roles is more likely to benefit their well-being through enhancing individual resources and social connections.

The current study examines the importance of social integration on the well-being of the Japanese elderly using two waves of the Nihon University Japanese Longitudinal Survey of Aging. The findings support the role-enhancement perspective. Especially, residence showed complex effects. The rural elderly had greater odds than the urban elderly of having a disability. However, the rural elderly had lower odds than their urban peers of feeling depressed. The advantage of ruralites over urbanites in escaping from depression may arise from a greater integration of rural people into social networks of mutual care.

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Last not but not least, many thanks to my husband, my family, and my friends for their tremendous patience and support, and to David Barr and Elizabeth Barr for their encouragement teaching me academic English. I hope this study will help to increase understanding of aging and health in Japan as well as other nations in the world.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Japan became the nation with the greatest longevity in the world in 2005, having the longest life expectancy at birth (82 years in 2006), the largest portion of the elderly (25 percent), and the smallest proportion of the population 15 years and younger (13.6 percent) (Ota 2006). This resulted in an urgent agenda for promoting healthy aging in Japan. In this context, research that identifies factors contributing to healthy aging in Japan became important to advance sociological theory about aging as well as to guide policy initiatives to promote healthy aging in Japan and other nations in the world.

In the past, studies of aging in the U.S. and Japan explicitly or implicitly assumed that the elderly were dependent and passive recipients of care. Elders and children have been perceived as socially marginal and incapable of engaging in relationships beyond their families (Hazan 1992; Thang 2000). In the United States, the elderly have too often been associated with problems rather than promises, although the idea that older persons cannot maintain active participation in society and the economy appears to be more myth than reality (Cohen 2005; Cohler and Altergott 1995; Garstka, Shaner and Strahm 1994; Palmore 2005; Robertson 1995; Troll 1995). Such an "elderly myth" treated the elderly as if they were a homogeneous group marked by stereotypes, which Garstka et al. (1994) reduced to four negative notions

(severely impaired, shrew/curmudgeon, recluse, despondent) and three positive stereotypes (perfect grandparent, John Wayne conservative, golden-ager).

In Japan, elders and children have also been perceived as socially marginal, belonging to the supernatural world with God (Thang 2000). Benedict (1946) described the life course of Japanese people as shaped like a U-curve, with maximum indulgence and freedom allowed to babies and the elderly. The ethics of Confucianism taught children to respect the elderly because not only were they perceived as knowledgeable, but also they were described as frail and dependent. For example, one of the proverbs in *Meiji Iroha Karuta* (明治いろはかるた), a sort of traditional and popular Japanese card game utilizing proverbs, says, *Oitewa ko ni shitagae* (老いては子に従え). It means that, when you are old, obey your children. The ideology behind this proverb derived from Confucian precepts for women that, "When you are young, obey your parents. When you marry, obey your husband. When you are old, obey your children." This precept suggests that stereotypes toward the elderly not only homogenized as dependents, but also gendered the life course of the elderly. In both contexts, "care" meant the caregiver's responsibility and obligation of looking after someone weak and dependent, and care receivers were perceived as passive recipients.

Today, owing to longevity and reduced disability among the elderly, more elderly are coming to be seen as proactively choosing their opportunities to care and to be cared for by important people in their later life course. In the U.S., where individual choices and autonomy are highly valued and preferred (Hashimoto 2000; Long and

Harris 2000), many elderly actively sustain or develop social networks to fulfill their life, to make their life meaningful, and to stay connected to society. As Klinenberg (2002) observed, longevity is shifting its meaning from individuals simply living longer to "forging new opportunities for creating things, for making or developing meaningful relationships, for contributing to society, to family, and to friends" (p 40).

In Japan, in its history of nationalization, modernization, and industrialization, the responsibility and obligation of the eldest son to support his elderly parents was once legitimized by the stem family system known as *ie seido* (家制度) (Hamabata 1990; Ochiai 1996; Thang 2000). In other words, Japanese elderly were legitimized to be dependent on their family members. However, after the new Civil Code in 1946 replaced the *ie seido* with the conjugal family system, industrialization, democratization, and urbanization increased the mobility of younger generations and contributed to the nuclearization of the family (Thang 2000). Reflecting such dramatic institutional change, increasingly the elderly started to show their preference not to be solely dependent on family members for care as passive recipients (Ogawa and Retherford 1997). According to Ogawa and Retherford (1997), expectations of old-age support from one's own children declined from 65 percent in 1950 to 13 percent in 1996. Although the government remains criticized for heavily relying on families for the filial care for the elderly, there are improvements in the quantity and quality of private and public care facilities as well

as various activities and volunteering programs for the elderly provided by local governments and non-profit organizations.

In the twenty-first century, these facilities, programs, and activities aim to provide the elderly opportunities to avoid social isolation in the later life course, and to remain in the circle of harmonious integration (*wa*: 和), where people can ask for reliance on the indulgence or the goodwill of one another (*amae*: 甘え) beyond the traditional stem family (*ie*: 家) in Japan. To be a good elderly person in Japan, one needs to be a "socially engaged individual who is involved in activities that incorporate social interaction; failure to maintain activity and social involvement invites loss of well-being" (Traphagan, 2004: p. 9). In such a context, the importance of social integration on the well-being of the elderly was recognized.

Advancing research on social integration and health in later life not only has important policy implications for paths to healthy aging, but also calls for new research to extend our knowledge of what social factors are important. The research on social integration and health has thus emerged as an urgent and important issue of both public and scientific concern. In the twentieth-first century, as more nations in the world continue to have expanding populations of the elderly, scholars are in the midst of a theoretical revision to explain the relationship between social integration and health in later life. The purpose, as well as the major scientific merit, of my dissertation research is to advance the theoretical and empirical study of social integration and health by examining a longitudinal survey of the elderly in Japan.

The broader merit of this study is to identify and develop recommendations to promote healthy aging.

The next chapter looks at historical changes in the cultural superstructure defining the proper organization of eldercare. It provides historical evidence to explain how intergenerational mutual care in Japan developed in a context of various factors, including cultural ideals, centralization of the civil state, and the family unit called the *ie*. It shows that the cultural superstructure defining the proper organization of eldercare is not immutable. Rather, it has changed historically because of its interaction with period-specific demographic, economic, and political realities. This historical background is a key to reconsider the social organization of eldercare in contemporary Japanese society, the most long-lived society in the world.

The third chapter describes the theoretical framework and reviews previous literature regarding social integration and health. Previous studies of the role enhancement perspective suggest that having multiple roles is linked to better health by preventing social isolation, increasing social connectedness to the society, and buffering stress caused by role loss or role strain. Incorporating the life course framework, I argue that the elderly who occupy not only many but also diverse roles over time may be buffered from role loss or may have enhanced social support in later life and thus have better emotional and physical outcomes than those who do not. I also argue that these effects are expected to differ by gender, residence, and birth cohort. This chapter ends with three research questions, based on the theoretical

framework adopted and previous studies, which are answerable from a national level longitudinal survey (wave 1 and wave 2) of elderly Japanese people.

The fourth chapter first describes the data, two waves of the Nihon University Japanese Longitudinal Survey of Aging (NUJLSOA). Then I explain how variables were measured and used in analyses and describe why the statistical method I chose was the proper method. The fifth and the sixth chapters report findings from statistical analyses. The fifth chapter includes findings from the cross-sectional analyses of the first wave of the NUJLSOA data set, and the sixth chapter includes findings from longitudinal analyses looking at changes in health conditions of the elderly respondents between the first wave and the second wave of the NUJSOA data set.

Finally, the last chapter summarizes my dissertation research as well as addresses policy implications and future research based on the findings and limitations of my dissertation.

Chapter 2

BACKGROUND

The Shifting Roles of Women in Intergenerational Mutual Caregiving in Japan: The Importance of Peace, Population Growth, and Economic Expansion[1]

Introduction

Various scholars have discussed aging in Japan as a result of demographic, cultural, and economic transformations after World War II that altered the balance of intergenerational caregiving (Asai and Kameoka 2005; Maeda 2004; Ogawa and Retherford 1993; Retherford, Ogawa and Sakamoto 1996). The major problem in some of these literatures is the historical starting point scholars choose, because they usually assume that intergenerational caregiving changed only after that point. For instance, many scholars start with the patriarchal *ie* system, *ie seido* (家制度), the system of primogeniture legally recognized in the Meiji Civil Code in 1898, as the benchmark against which to gauge the continuity, uniqueness, and change in elder care during the twentieth century (Asai and Kameoka 2005; Long and Harris 2000). These scholars assume that the cultural underpinnings of the *ie* (家), pronounced "ee-eh", define the care of 'frail elderly' as 'women's work', undertaken to preserve 'women's morality'. This assumption is misleading because the *ie* did not clearly

[1] This chapter was presented at the annual meetings of American Sociological Association, New York, August 12, 2007.

assign elder care to the wife of the eldest son until the Meiji period (1868 A.D. – 1912 A.D.).

The goal of this chapter is to show that the cultural superstructure defining the proper organization of elder care is not immutable. Rather, it has changed historically because of its interaction with period-specific demographic, economic, and political realities. This historical background is a key to understanding the social organization of elder care in contemporary Japanese society, the most long-lived society in the world. Towards this goal, I have organized this chapter into five historical periods according to the predominant mode of government: (1) the establishment of the Ritsuryō State (645 A.D – 900 A.D), (2) the transition from the Ritsuryō State to the Tokugawa Period, (3) the Tokugawa Period (1603 A.D – 1868 A.D), (4) the Meiji Period until the Second World War (1868 A.D – 1939 A.D), and (5) postwar Japan.

The Establishment of the Ritsuryō State (645 A.D. – 900 A.D.)

During the Yayoi era (200 B.C. – A.D. 300), the Japanese people experienced two innovations – bronze and iron articles introduced from mainland Asia, and settled agriculture, especially wet-rice cultivation. These improved people's lives compared to the preceding stone age, called the Jōmon era (10,000 – 200 BC). The Jōmon era is known for pottery that bears cord markings, which reflect cultural enrichment prior to this era. Prior to the Jōmon era, 10,000 to 7,000 years ago, people's lives were dependent on fishing and hunting. They lived in partly sunken, pole-and-thatch

dwellings in scattered and small arboreal communities near the seashore (Totman 1982). They obtained fish by netting, diving, digging, and line fishing, and they supplemented this fare with game and forest fruit, which continued until around the third century B.C. (Totman 1982). During the Jōmon era, the single-room house was enlarged and its framing was reorganized so that they no longer needed a center pole to support the roof, and bare earth was replaced by drier stone flooring (Totman 1982).

Beginning about the third century B.C., by replacing and supplementing the hunting, fishing, and gathering habits of previous generations, settled cultivation contributed to the population growth in the Yayoi period (Farris 1985). Increased food supply through farming enabled people to live in much larger villages, some estimated to include 500-600 houses, which gradually required and enabled trading activities, a hierarchical community, and political consolidation (Totman 1982). Consequently, social inequalities widened as the nation moved from a system based on unstable slash-and-burn agriculture to more productive settled agriculture accompanied by population growth. A more reliable food supply probably spurred population increase by depressing the mortality rate. Before the Yayoi era, the population was estimated to be between 120,000 and 350,000 people. By the end of the Yayoi period, iron farming tools and more sophisticated irrigation techniques had contributed to further population growth, increasing the population to between 1.5 million and 4.5 million (Farris 1985). Despite archaeological evidence including

burial practices, the lack of reliable data makes the trends from 300 A.D. to 645 A.D. rough estimates (Farris 1985).

According to a Chinese report of ca. A.D. 297, Chinese visitors observed the Japanese people ("the people of Wa") living in houses where father and mother, elder and younger, slept separately. They also reported "men of importance" enjoyed four or five wives and the deference of their inferiors. They also described, however, that there was no distinction between father and son, or men and women, in their meetings and their deportment (Totman 1982). Even with very limited resources, it is possible to infer that the system of primogeniture was not established before the Ritsuryō state.

In the mid-seventh century, emerging powers in East Asia, especially China's Tang empire, became a growing threat to Japanese rulers. In response, Japanese political leaders established the Ritsuryō state (645 A.D. – 900 A.D.) – a Chinese-style centralized civil state based on legal codes. The emperor Tenji proclaimed that the state bureaucracy was to be a rationalized and systematic organization, and announced a plan to use Chinese systems of taxation, local government, and land tenure in the Taika Reform Edict in 646 A.D. Under Tenji's hegemony, the Japanese people were enrolled in a civil register, and surnames were established for the purposes of taxation and conscription. The first census followed in 670 A.D. (Farris 1985). Errors of coverage and accuracy, however, make these registers unreliable as a source of population analysis. Despite these difficulties and limitations, Farris (1985) used stable population analysis and estimated that the life expectancy at birth

ranged from 28 to 33 years. The infant mortality rate was so high that, although peasants were given grants of rice paddies at birth in 690 A.D., children aged five or younger in calendar years soon became the exception (Farris 1985).

The Ritsuryō state brought the ancient Chou principle of inheritance by the eldest son of the sole legal wife, at least among the leading nobility (Holcombe 1997). Because the Ritsuryō state also brought social stratification based on class, age, and gender, this resulted in official resources containing very little evidence about women, although they played a surprisingly powerful role as *toji* (刀自). To promote Chinese concepts of patrilineality and male dominance, official documents recorded conventional gender-biased images of the productive activities of men (Yoshie 2005). According to hidden sources such as old tales (*setsuwa*: 説話) relating the lives of common people and to archaeological findings such as wooden tablets (*mokkan:* 木簡) used for keeping routine records when paper was an expensive commodity, *toji* played a major role in rural society, managing agricultural enterprises and supervising labor (Yoshie 2005). Thus, although *toji* became the term "housewife" (*shufu*: 主婦) in later history (Gotō 2002), *toji* should not be regarded as "wives' who exercised leadership as proxies for their husbands in the local community (Yoshie 2005). On a higher level, *ōtoji* (大刀自), grand *toji*, managed productive enterprises within their independent residences. In addition, from studying lineage records and inheritance patterns, historians have concluded that Japan was not organized along patrilineal lines; it was a bilateral society in which lineages of both father and mother were important (Yoshie 2005). Hence, there were

many gaps between the idealized patriarchal Ritsuryō state and actual social conditions. Efforts at both central and local levels to cope with these gaps gradually transformed the nation to the Ritsuryō system, which better fit the social and economic actuality of the time (Yoshie 2005).

Along with a Chinese-style centralized state, the Ritsuryō system also brought the Confucian spirit of filial piety to Japan (Kasugai 2004). For instance, the Ritsuryō system required men to pay a tax depending on their age. Men ages 61-65 years paid only half of the tax paid by men between 22 and 60 years old; and men ages 66 or older paid no tax (Kasugai 2004). Because of the low survival rates of infants and the elderly, their existence was often described as spiritual, which is reflected in the saying, "*Oite futatabi chigo ni naru*" (老いて二度児になる). It means that, people become a child again as they become the old (Kasugai 2004).

In such a context, senile dementia was considered an existence that moved a person close to God, and people warmly watched over them. From pictures on scrolls that depict children holding the hand of the elderly and the elderly walking while holding children's shoulders (Kasugai 2004), it appears that children, rather than daughters-in-law, took care of the elderly. Although Confucianism taught children to respect the elderly, the cultural ideal of a woman, a daughter-in-law, taking care of the elderly was not established. Many picture scrolls (*emaki*: 絵巻) and old tales (*setsuwa*) also described the elderly farming and taking care of grandchildren (Kasugai 2004). The elderly also were described as great contributors to the society by virtue of their wisdom and experience. Along with women and children, however,

the elderly were also described as socially weak and considered to be socially marginal. This was reflected in old tales in which the young left the elderly in the mountains (*ubasute-yama*: 姥捨て山). These tales appear, however, to exist for people to criticize such impious children; hence, it appears that children took caregiving roles of the elderly (Kasugai 2004). Due to high infant and child mortality, there were also old tales that described the elderly worrying and grieving about their care in later life (Kasugai 2004). In other words, women's morality to be responsible for elder care was not prevalent, not even universalized. It appears that morality was contextual rather than universal. Rather than being regulated by a centralized government with formal and abstract rules and orders, moral life was preserved in a community, especially among peasants.

Moving From the Ritsuryō State to the Tokugawa Period (1603 A.D. – 1868 A.D.) – Birth of the *ie*

During the Classical Period (710 A.D. – 1185 A.D), at least among the elite, the estate was equally divided among all the children, including daughters (Smith 2000). From the tenth century to the eleventh century, gradually from upper noble classes, the concept of *ie* emerged; and by the beginning of the Tokugawa period, the concept had developed to be systematized as the *ie* system, a way to bequeath government posts from fathers to sons through primogeniture. *Ie* is a term that is widely defined as the Japanese "stem family" in current literatures (Hashimoto 1996; Kawano 2003; Knight and Traphagan 2003; Ochiai 1996); however, as various anthropologists

argued, originally the term *ie* connoted a "household" based on coresidence that could include members unrelated by blood, marriage, or adoption. In other words, the *ie* was a term used to describe traditional Japanese "households" based on participation in the *ie* economy and coresidence, rather than on kinship ties or the Confucian dyad of father and son.

Conceptually, the *ie* included not only its members but also the *ie* economy (e.g., crafts production, farming, retail sales) and resources (e.g., tools and land) (Smith 2000). The *ie* was the basic economic unit in society. Rather than biological continuity, the heart of the *ie* was to continue the *ie* throughout generations (Nakane 1967, 1970). The core structure of the *ie* was not the household head and his spouse, and it was not narrowly defined as the idealized Confucian dyad of father and son. To continue the *ie* economy, adopted men of proved competence could inherit the *ie*, occasionally at the expense of direct biological heirs (Smith 2000). Thus the *ie* could stand in contrast to the kinship-based term *kazoku* (家族), a term invented in the nineteenth century to deal the Western idea of the nuclear family in Japan (Johnson 1964).

As the militarization of Japanese society flourished under the samurai class during the Medieval Period (1185 A.D. -1600 A.D.), the social position of women declined. Many women lost their right to inherit property and to exercise public authority. The political leadership fostered equal inheritance among sons during the Kamakura Period (1185 A.D. – 1336 A.D.) to prevent families from building an economic power base (Smith 2000). Although some variations (inheritance by the

firstborn female or last-born child) were seen across regions during the Muromachi period (1336 A.D. -1573 A.D.), inheritance through primogeniture gradually replaced equal inheritance among sons (Smith 2000). Bequeathing the authority and resources to the eldest son increased the chance that the *ie* estate could be passed down and maintained throughout generations.

Such an *ie* system was not prevalent except among noble families and samurai families until the middle of the nineteenth century (the Tokugawa period) (Benedict 1946). In fact, marriage was an official ceremony only for the privileged classes (Kasugai 2004). Around the tenth century, men could have multiple wives and mistresses; but noble men were restricted to one lawful wife (*seisai*: 正妻) during the eleventh century (Gotō 2002). Wives of the upper classes took care of the household not only by preparing meals but also by providing maintenance of weapons; managing the food supply for the *ie*; managing apprentices, followers, and their families who supported the *ie*; and managing the *ie* economy, as well as the marriage to sustain and nurture the *ie*. After the death of their husband, these wives became *goke* (後家), who often had the final say about the management of the *ie* (Gotō 2002). Therefore, the division of labor was not strictly and clearly gendered. Both husbands and wives supported each other to nurture the *ie* by increasing their land and resources through wars and political contributions, by increasing their followers through taking care of their families to gain their trust, and by expanding their land and resources through a marriage of convenience (Gotō 2002). The

important status of wives as decision makers of the household economy was also the same for other lower classes (Gotō 2002).

Prior to the Tokugawa period, most of the population was rural, and the economy was based on subsistence agriculture due to the lack of an urban population (Hayami and Kurosu 2001). Due to high mortality and unstable socioeconomic conditions caused by wars and famine, few elderly could be taken care of by their relatives. Even when elders in the lower classes could survive, it appears that many of them lacked immediate kin and lived on a lord's manor in a community as servants (Kasugai 2004). It appears that ideal caregivers were relatives, not strictly women (Kasugai 2004). One of the Buddhist tales, *Shasekishū* (沙石集), talked about a priest who suffered from paralysis mourning his situation that he did not have any wives or children to take care of him. The elderly in noble families and samurai families could enjoy their authority as the succession of the *ie* became important. Some upper-class elderly, however, decided not to be dependent on the *ie* and spent their later life in temples as Buddhist priests or nuns (Kasugai 2004). Hence, although the elderly were scarce in the past but are abundant in the present, there was diversity in family and aging before the Tokugawa period. Although most did not survive to old age, some worried about their care in later life, some tactically used their power to sustain autonomy in later life, some detached from the *ie* by becoming priests and nuns, some wished to be dependent on their children, and others contributed to society as laborers or caregivers of grandchildren.

The Tokugawa-Period (1603 A.D. – 1868 A.D.) – Transition to Modernization

During the Tokugawa period, the Tokugawa shogunate ordered the populace to register at a Buddhist temple and practice ancestor worship (Mori 1993). The main purpose of this order was to suppress Christianity (Cornell 1996; Kawano 2003; Kito 2000; Yasuda 1992), which places one's relationship to God before all others; hence, it posed a threat to the subjects' loyalty to the feudal lords and the shogunate (Kawano 2005).

Temples began to function as centers of religious and household registration (*shumon aratame-chō*: 宗門改帳) (Hanley 1972; Hayami and Kurosu 2001). The government used the feudal structure of the *ie* as a fundamental social group to regulate and govern people's behaviors and ideas. Nakane (1970) claimed that the effectiveness of regulations reaching every village and household even up in the remote hill areas was not simply a reflection of the power of the Tokugawa shogunate, but also a by-product of the layers of loyalty and the lord-vassal relationship (*oyabun* and *kobun*: 親分子分). According to Nakane (1970), China had a strong horizontal social organization, and their central administration was constructed on horizontal bases, such as the network of patrilineal clan organizations, guilds and castes, had difficulty in extending the basis of its authority throughout the entire population. Hence, Japanese vertical social organizational pattern – Japanese cultural emphasis on putting the collective over the individual to preserve harmonious integration (*wa*) in families and communities – was natively rooted before the advent of Chinese influence.

Demographically, the Tokugawa period was innovative compared with the preceding period. The religious investigation registers or the village population registers (*shumon aratame-chō*) were census-type listings of village populations compiled every year, with information added in many cases about births, deaths, and marriages that occurred during the year (Saito 1992). Significant improvement in historical demography to use such registers contributed to current scholars revising previous studies of the relationship between demography and economy in the Tokugawa period.

About 1730, Japan ranked in size with France, holding a population of between 20 and 30 million. A century and a half later, it fell to a lower ranking with Italy, considerably smaller than France and Germany. It took Japan close to 200 years to double its population level to reach 60 million (Cornell 1996). Hence, the first generation of population historians up to the early 1960s pointed to a stagnating population trend during the Tokugawa period due to poor economic conditions of both samurai and peasant classes (Hanley 1972).

The literature published in the past fifty years in the field of Tokugawa historical demography analyzed that population stagnation during the Tokugawa period could be explained by the Malthusian notions of "preventive checks" such as abortion and infanticide (*mabiki*: 間引き) and "positive checks" such as famine and epidemics (Jannetta and Preston 1998; Saito 1992). These literatures analyzed that fertility was high due to high infant and maternal mortality, and lack of effective contraceptive knowledge and skills. These factors led the Japanese to practice abortion and

infanticide when too many children were conceived or born (Kito 2001). Similarly, these literatures argue that population stagnation is consistent with the Marxist notion of exploitation: both positive and preventive checks to ameliorate starvation operated directly to kill peasants who were exploited by samurai lords (Cornell 1996).

In the past 20 years, new evidence based on the religious investigation registers or the village population registers have refuted such Malthusian and Marxist assumptions of population stagnation during the Tokugawa period, and these suggest that the majority of peasants enjoyed rising productivity and a higher standard of living (Hayami and Kurosu 2001). Scholars argued that establishment of the Tokugawa shogunate led to a flourishing of castle towns and post towns, and rural residents were forced to increase the efficiency of agricultural productions to catch up with growing urban demand (Hayami and Kurosu 2001). In addition, the spread of commercial and handicraft industries enabled an increasing number of people to make a living outside of farming because they could leave for commercial centers (Hanley 1972). According to Hanley (1972), economic development in the Tokugawa period can be likened to that in England in the century prior to the Industrial Revolution. The English limited family size because they understood that too many children could threaten their ability to accumulate resources. For instance, the village of Fujito experienced economic development but limited families by postponing the age at marriage for women to their mid-thirties, and sending younger sons out to work in another village or to be adopted in by another household (Hanley

1972). Hence, the new evidence suggests that, prior to industrialization, although famine and disease contributed to slow population growth (and there were regional differences), Japan experienced increasing urbanization, a growth in the commercial sector, rising incomes, and gradual commercialization of agriculture, all good indicators of a growing economy (Cornell 1996; Hanley 1972; Hayami and Kurosu 2001).

Looking at fertility in detail, the well-documented village of Yokouchi reported in the religious investigation registers or the village population registers that for women born before 1700, the Total Fertility Rate (TFR), defined as the average number of children a woman would have, assuming that current age-specific birth rates remained constant (Weeks 2002), was 5.8 children per woman. For the 1701-1750, 1751-1800, and post-1800 periods, TFR decreased to 4.0, then to 3.2 and 3.4 respectively. The TFR was low due to unregistered infant deaths. Infant deaths before the next census-taking date were likely to be under-recorded. Taking this deficiency into account, the decrease in TFR was from about 7 to 4–5 (Saito 1992). This reduction of TFR was also accompanied by the rise in life expectancy. For the village of Yokouchi, the life expectancy at 2 years increased from 33 to 43 years (Saito 1992).

Patterns of marriage and fertility were geographically diverse in the Tokugawa period. Hayami and Kurosu (2001) divided Japan (excluding Hokkaido and Okinawa) into three regions (Figure 1) – the northeast, central, and southwest – where necessary historical sources were available, and analyzed regional diversity in

demographic and family patterns based on the data that are samples from within the larger region. According to Hayami and Kurosu (2001), the northeastern region was characterized by an extremely low median age at marriage (19 years old for men and 13 years old for women). For women, this age reached 17.1 years by the end of the period. In this region, women also stopped having children early (about 33 years), and the number of births per couple was quite low despite early marriages (3 to 4 children per couple) (Hayami and Kurosu 2001). Another characteristic of this region was that people in this northeastern region temporarily migrated to other regions in Japan, often cities, to supplement their income during the winter (*dekasegi*: 出稼ぎ). Although Japan was closed to international immigration and emigration for more than 200 years (1641 A.D. – 1853 A.D), there were both temporary and permanent internal migrations for purposes of employment (*dekasegi*) (Cornell 1996). Because people migrated to other places for income on a temporary basis, marriage was a way to keep both men and women bound to villages and households (Hayami and Kurosu 2001). The word *dekasegi* implies that they would come home after a while, reflecting parental power over their children (Saito 2000b). These temporary internal migrations in this region lessened the risk of pregnancy and lengthened the birth interval, which in turn reduced the overall number of births (Hayami and Kurosu 2001). In this region, Saito (1992) found that peasant women also had to limit births by practicing infanticide due to poor economic conditions, but this was not because they had too many children.

In the central provinces (Figure 1), where relatively large preindustrial cities were located, average age at the first marriage was higher than in the northeastern provinces (about 28 years for men, and 20.5 for women, in the late eighteenth century and the mid-nineteenth century). The number of children per couple was also higher than the northeastern provinces (5.9 to 6.5 children per couple). Although some people in this region were work migrants, they migrated on a permanent basis, rather than on a temporary basis (Hayami and Kurosu 2001). Lower-class people were more likely to migrate to other places of Japan to supplement their income (*dekasegi*), and in contrast to the northeastern region, the majority of them migrated to other places in Japan, often cities, to supplement their income prior to marriage. Therefore, many families in the lower stratum risked the termination of the lineage (*zekke*: 絶家), but families in upper stratum married early and tended to have more children to maintain the family line (Hayami and Kurosu 2001).

Unlike the central regions, the southwestern regions (Figure 1) had no large cities; but the age at marriage was high, just as in the central regions. Marital fertility rate and the number of premarital births were high; and divorce, remarriage, and premarital childbearing were common in this region (Hayami and Kurosu 2001). The higher standards of living enabled peasants in southwestern Japan to limit their family size not because of poverty, but as means of adjusting the size of the family labor force to changing economic environments (Saito 1992). Hence, there was regional and class diversity in marriage and fertility in the Tokugawa period.

Historical demographers and economists have argued that poor economic conditions caused many villages to limit their family sizes and, thus, for population size to stagnate during the Tokugawa period (Taeuber 1958). But other scholars have claimed that peasants limited their family size, even resorting to infanticide, to maintain a favorable man-to-land ratio and to attain a higher standard of living (Hanley 1972; Hayami and Kurosu 2001; Saito 1992). Taking a different perspective, Cornell (1996) argued that, rather than using deliberate controls on fertility, people controlled their family size by natural methods, such as through long-term breast-feeding practices and spousal separation through migration to emerging and developing cities. The fertility decline in the Tokugawa Period refutes the underlying assumption of the demographic transition theory that people were ignorant about fertility control in preindustrial societies. Historical demography is still in its development in Japan, and more research is necessary to interpret patterns of marriage and fertility for both men and women during the Tokugawa period.

Mortality was high during the Tokugawa period. The life expectancy at birth was estimated to be in the lower thirties from 1776 to 1875 (Cornell 1996). Bad weather, poor harvests, high prices, and possible famine were prevalent in modern agriculture when vaccination and medical treatment were not available. There were major food crises in the 1730s, 1780s, and 1830s. The Japanese population was large enough to have epidemic and infectious diseases as well. Epidemics such as smallpox, measles, influenza, and diarrheal diseases also raised death rates (Cornell 1996). In addition, infant mortality rates were very high, implying one death out of every three to four

children before they reached their first birthday (Cornell 1996). Hence, before industrialization, population growth was gradual in premodern Japan (Figure 2). Famine and disease greatly contributed to this slow population growth, as did social control – deliberate behavior to limit population growth, or consequences of relatively long-term breastfeeding practice and migrant workers (*dekasegi*) (Cornell 1996; Hanley 1972; Hayami and Kurosu 2001).

The household, not the individual, was perceived as the basic social unit and legal unit of the society (Hanley 1985; Saito 2000a). The title to rights in the village community was attached not to the head of the *ie* as an individual, but to the *ie*. This was because during the Tokugawa period, the peasant household was an economic entity – the unit of economic production and consumption – and the family members included kin as well as tenants and servants (Kumagai 1995). From the paddy field, to the forest, and to dry land, these rights were attached to the *ie* rather than to any individual family member (Cornell 1987). The increase of surplus productions owing to a significant increase in agricultural productions during the Tokugawa period, however, gradually enabled more people (e.g., more employees and their families, and more relatives) to establish their own *ie* (Kasugai 2004). Consequently, the *ie* began to shift its meaning from a social group based on cooperation in the *ie* economy to a group based on kinship ties or the Confucian dyad of father and son (Kasugai 2004).

Kumagai (1995) explained that among the lower strata, including peasants, artisans, and merchants, and *eta* (穢多) meaning "pariahs of society", systematized

succession of the *ie* did not exist. Although all the people except *eta* had names given to show their occupations, they were not family names. The headship of the household was not restricted to the eldest son: each household selected a son of superior character to guarantee the succession of the household (Kumagai 1995). Among the upper strata, aristocrats, the shogunate, samurai warriors, and the increasing numbers of independent farmers, the *ie*, gradually formed from the late tenth century to the eleventh century, matured in the Tokugawa period into the feudal family structure of the *ie* system. As the succession of the *ie* became more important, systematizing the *ie* succession became as a promising way to pass on the *ie* from one generation to another.

Under the *ie* system, one son, preferably the eldest son, remained in the parents' household, while others had to leave. Family members were divided into those on the stem family line and out of the line, and son-heirs enjoyed a higher social status than other siblings (Saito 2000b). Because the marriage of the eldest son became the most important and urgent matter for the succession of the *ie*, those who stayed in the *ie* tended to marry earlier than those who left. Whether the other brothers stayed in the household also depended on how large and extensive the *ie* estate was. To sustain the material wellbeing of the collectivity and to adjust the size and structure of the *ie* to meet the demands of family farming, parents sent children to work for someone else such as merchants, kept in or removed other siblings from the household, took in an employed farm laborer, or deliberately or unintentionally limited family size (Saito 2000b). As was common in pre-industrial Europe, one of the sons would marry and

take over the farm. In pre-industrial Europe, however, this process took place at the retirement of the father (Davis and Blake 1956). In Japan, the old household head did not need to retire when his heir married (Saito 2000b). Some elderly in the upper strata held power and autonomy until or even after they retired from work to help the *ie* succeed and to manage its members.

Although primogeniture was prevalent among the upper strata, the succession of the *ie* itself was not an easy task. Children, especially boys, had a vested interest in the continuation of the *ie* throughout time. Because of the lack of vaccination and medical treatment in those times, however, infectious diseases often killed the eldest son. Hence, demographically, it was necessary, especially among people in lower strata, to keep the *ie* as a household based on economic cooperation and coresidence, and not to restrict the position of heir to the eldest son. Because of the lack of vaccination and medical treatment in those times, elderly parents were less likely to rely on their children for a long time. According to Kito (2000), children needed to take care of their parents for only about three years after their retirement.

After the beginning of the eighteenth century, writings about the morality of care, concrete ways of caring for the elderly, and health began to increase. Hence, the importance of care prevalent among the upper strata of society began to be socially recognized (Yanagiya 2001). Ideologically, the Tokugawa shogunate emphasized the Confucian ideology of filial piety. Several writings of Ekiken Kaibara, a Confucian, emphasized the moral importance of children, especially the man as the head of the *ie*, to care for the elderly. There are various kinds of such writings for men, and some

of them include concrete ways to take care of the elderly. There are also moral writings for women, but they did not include such practical information about care (Kasugai 2004). Some people in the upper social strata also hired servants to care for the elderly, but these servants were not restricted to women. Some wealthy families hired male servants to care for the elderly in the case of emergencies, including a fire (Yanagiya 2001).

In addition, the Tokugawa shogunate also made an effort to strengthen and spread this ideology to the people in the lower strata by providing such writings about filial piety targeted at the populace. Owing to an emphasis on literacy for commoners as well as the samurai, and the development of popular folk schools (*tera koya*: 寺子屋), it is estimated that close to 40 percent of the Japanese were literate before 1868, a very high figure by the world standard (Fusé 1975). Among these writings, more works again emphasized and valued the moral necessity of men, rather than women, to take care of the elderly through coresidence (Kasugai 2004). According to *Kōgiroku* (孝義録), the popular moral writing describing the importance of filial care of the elderly, the father as head of the household sits at the head of the table, often being replaced after his death by his wife, not his son, even among families in the lower strata (Sugano 1999). This practice reflects the spirit of the Edo period based on Confucianism.

The heavy duties of elder care, even when elders did not live as long as they do today, are suggested by stories in *Kogiroku*. A man remained celibate to take care of his parents. A woman's parents, worried about her heavy duty of care, suggested her

that she divorce, but she refused. A man who took care of his mother divorced his wife because she was not obedient to his parents (Sugano 1999; Yanagiya 2001). Hence, *Kogiroku* not only highly valued women who were obedient and cared for their husbands and his parents, but also highly praised men who financially, emotionally, and physically took care of their parents.

Recently, Kyoto Prefectural Library and Archives (2005) reported that the village of Kameoka allowed elder care leave for samurai. There was a letter written by a firefighter in Kyoto in 1819, asking to take elder care leave to take care of his grandmother. Hence, in the Tokugawa period, caregiving was not restricted to women (Kyoto Prefectural Library and Archives 2005). There was no cultural or universal ideal that daughters-in-law should be the main caregiver for the elderly. Rather, care was often emphasized as part of men's morality, as a responsibility assumed by a head of household. As Kasugai (2004) pointed out, care was also valued by the public, because it represented the Confucian precept of filial piety and the spirit of the Tokugawa shogunate. It was only after the unification of the Meiji period that the morality of care shifted from men to women, and from public to private.

Emerging from 150 years of civil war, the Tokugawa period brought 150 years of peace, which transformed the samurai class during the Tokugawa period. At the beginning of the Tokugawa period, the samurai class was the real warrior class. Without actual battles and separation from the land, however, the samurai class was gradually transformed to a bureaucratic elite class of civil administrators living in

urban areas. Transformation of samurai into civilian administrators increased the numbers of schools and literacy. Without actual battles, the number of the samurai class also increased to two million people by the time of the Meiji restoration; the number was larger than that of the English or European aristocracy (Tipton 2002). Consequently, more ranks were created within the class and resulted in bureaucratization of the samurai class. Bureaucratization also gradually transformed the nature of loyalty and the lord-vassal relationship (*oyabun* and *kobun*) to impersonal loyalty to the office. Accompanied by increasing costs of living, maintaining the samurai in various rankings resulted in samurai impoverishment. Hence, not from below but from within the ruling class, lower-class samurai who were dissatisfied with the Tokugawa system led the struggle for the Meiji restoration (Tipton 2002). Farmers suffered from an increasing burden of land tax as well. From 1824 to 1836, frequent bad weather led to famine, and the dissatisfaction of starving peasants increased toward the rich who taxed and relied on food they cultivated (Tipton 2002). Finally, the Tokugawa shogunate fell, and the Meiji Period began in 1868.

The Meiji Period to the Second World War (1868 A.D – 1939 A.D.): Modernization of the State and the *Ie* System

The new Meiji government achieved a centralization of political authority unparalleled in history, and it pushed industrialization and economic growth to catch up with and to build national strength to ward off American and European

imperialism (Fusé 1975). Meiji leaders encouraged the adoption of Western social customs and cultural styles to reach the goal of "enlightenment and civilization" (*bunmei kaika*: 文明開化) (Tipton 2002). To become a modern state, Japan also opened its markets to foreign trade and began to industrialize. These changes aided economic and agricultural development. Cholera, however, frequently attacked the Japanese people and killed thousands in 1886. One record indicated that the Japanese government purchased rats from people to reduce cholera because they realized that a flea parasite on the rats brought the cholera bacterium to Japan (Hayami 2001).

Due to crowded working conditions, diseases, such as tuberculosis, increased with industrialization. In addition, endemic and infectious diseases were more common than chronic degenerative diseases. In 1920, the leading causes of deaths were pneumonia, bronchitis, gastroenteritis, and tuberculosis. Chronic degenerative diseases such as heart disease, cancer, and stroke did not replace them until 1958. Owing to gradually improving living standards, medical technology, and sanitary conditions, however, the Japanese population gradually transformed from the stage of high mortality and high fertility to the stage of low mortality and lowered fertility during the Meiji era (Hayami 2001). The mortality rate fell faster than the fertility rate, and so population growth accelerated and provided an expanding labor force (Kito 2001). This course of industrialization was also a course for militarization and nationalization in Japan. The concept of the *ie* became an unparalleled means for the government to unify and strengthen its population.

Before 1898, there was no legal system governing people's behaviors except for the upper classes, including aristocrats and samurai (Asai and Kameoka 2005). The *ie* was legally recognized in the Meiji Civil Code in 1898 and officially called the *ie* system (*ie seido*). The *ie* system came to characterize both lower class as well as upper class families in Japan (Kumagai 1995). The purpose of the Meiji Civil Code was to recognize the family system, the pattern of primogeniture, as the basis for the Meiji government to rule over people. Based on the Confucian teachings of filial piety, the *ie* system formed the ideological ground for the Meiji government that put the emperor as its head of the state and the state as a single family (Asai and Kameoka 2005). Along with the Confucian ethos of the father and son relationship being preeminent over the husband and wife relationship and the father and daughter relationship (Tamney 1998), the relationships between parents and children and between husband and wife were like the relationship between superior and subordinate, suppressing individuality to preserve the harmony of the family (Asai and Kameoka 2005; Kumabara 2000).

The *ie* system effectively functioned for the government to unify and control the thoughts of an ever-increasing Japanese population. To catch up with foreign nations and to become a modern nation, the government socially constructed motherhood (*bosei*: 母性) as woman's morality. Prior to the Meiji period, there were no widespread cultural expectations for women to show maternal affection in raising children. For instance, although women in an upper-class family were considered tools to produce a male successor, their infants were often given to a nurse to raise

(Kano 2000). Under the slogans "*Fukoku Kyohei* (富国強兵)", to enrich the country and strengthen the military, and "*Umeyo, fuyaseyo* (産めよ殖やせよ)", to give birth and increase the population, abortion was largely prohibited so as to increase the quantity of children. To improve quality, however, abortion became legal under the National Eugenics Law in 1940 to save the life of the mother and for a woman suspected to be carrying a genetically defective child (Harrison 1999). To compete with foreign nations as a modern state, the government privatized the role of women by suppressing and educating them to be nurturing, wise mothers, and tactically used the *ie* system to become one collective under the emperor. Women became socialized to be nurturing mothers who contributed to increasing the quantity and improving the quality of the population (Harrison 1999). As a result, Japan kept its TFR higher than 3.0 until the end of the baby boom period in the late 1940s (Figure 3), which contributed to its population growth (Figure 2).

As the population rapidly grew and industrialization proceeded, the government required more men and money to support nationalism and industrialization. The government tactically used the *ie* system to supply these resources by privatizing the *ie* and reconstructing the morality of care. In 1872, the Meiji government replaced the religious investigation registers or the village population registers (*shumon aratame-chō*) with the family register system (*koseki:* 戸籍). In the former system, all the members of a village were registered by household, whereas in the latter system, the vital events were recorded on the basis of the stem family (Jannetta and Preston 1998). In other words, the *ie* became increasingly recognized more as a

"family" based on blood-ties and marriage rather than as a "household" based on economic participation. The *ie* system provided the eldest son a legal right to inherit family property, thereby placing considerable moral obligation on the eldest son and his wife to take care of his elderly parents. Tied to the Confucian precepts that stressed the responsibility of a wife to be obedient and take care of her family (Tamney 1998), the wife of the eldest son became the primary caregiver for any frail, dependent, or sick family members by becoming unpaid housekeepers, nurses, and companions (Harris and Long 1999; Long and Harris 2000; Traphagan 2003; Wu 2002). Women's morality was tactically emphasized to supply an obedient population for the emperor under the myth of motherhood (Kano 2000) and to repay limitless obligations (*on*: 恩) to the revered elderly under the tradition of Confucian precepts. The ethics of care became increasingly recognized as women's morality in the private sphere, rather than men's morality in the public sphere (Kasugai 2004). Consequently, the life course became gendered, and aging and the family became universally idealized. The dependent elderly were now expected to place themselves in the care of their eldest son's family and under the hands-on assistance of his wife (the daughter-in-law).

The idealization and privatization of the *ie* enabled men to work in industries, such as machinery and metal manufacturing, to support booming capitalism and nationalism. According to the 1909 central government survey of factories employing five or more operatives, two percent of women worked in machinery and metal manufacturing industries. Importantly, however, capitalism and nationalism in

Japan were also achieved through hidden women's work. In fact, no less than 85.2 percent of them, mostly young unmarried women, worked in the textile industry, which was a leading sector in the early development of industrialization (1880 A.D.–1940 A.D.) in Japan (Okada 1998). In addition, along with booming industrialization, a great number of families engaged in trade or professional services came to hire female domestic servants. In 1930, there were 710,000 maids in Japan, calculated as one in every seventeen households (Okada 1998). These female domestic servants and female textile workers were mainly younger girls, the majority of whom were rural in origin (Okada 1998). Hence, the modernization, industrialization, and nationalism of Japan were supported by what Coontz (2000:97) called "women's altruism".

From the Tokugawa period to the beginning of the Meiji period, from the upper strata to the lower strata, more elderly became "priceless" that their status became sentimentalized with respect in the public community. A couple of decades after the Meiji period started, textbooks described the elderly as socially weak and dependent on care, while valuing those elderly who were active and independent (Kasugai 2004). On the surface, based on the Confucian precepts of filial piety, the elderly were highly respected because they were resourceful; but in reality, they were often identified as those who were unable to adapt to the modernization process (Kasugai 2004). In contrast with the Tokugawa shogunate that was based on the Confucian spirit of filial piety, the Meiji period represents the time the government was eager to modernize and to nationalize Japan. As the nation became capitalized, supporting

one's wife and children was considered more profitable than supporting the elderly. Hence, although demographically more elderly became culturally revered from the Tokugawa to the Meiji period, their cultural status suffered with the privatization of the moral responsibility for their care. It could be possible to state that the peak of the social value of the dependent elderly was in the Tokugawa period when the ethics of care was publicly valued and recognized.

Postwar Japan – The Path to Becoming the Most Long-Lived Nation in the World

The *ie* system was legally abolished after Japan lost the Second World War. The United States took over the nation to democratize and Westernize it in a short period. As a result, Japan has gone through dramatic social and demographic change since the Second World War. For example, Japan experienced a steep fertility decline after the baby boom faded out in the early 1950s (Figure 3). In 1947, it was high (TFR=4.54); however, ten years later, it was 2.11, the replacement level. This steep fertility decline was related to the legal abolition of the gender-biased *ie* system and its replacement by a new family system based on equality. It led Japanese women to legally claim equal rights in inheritance, education, and employment. More and more Japanese women gained greater opportunity to attain autonomy and freedom (Atoh, Kandiah and Ivanov 2004; Kumagai 1984). Enrollment of women in senior high school increased significantly in the 1960s. By 1975, the enrollment rate rose to 90 percent, reaching, by 1985, 97 percent (Shirahase 2000). In addition, a new

government policy instituted in the mid-1970s to encourage enrollments in higher education, especially for women, effectively supported the increase in women's enrollment (Retherford, Ogawa and Matsukura 2001). Between 1970 and 1975, the rate of women's enrollment almost doubled, reaching 26 percent of age-eligible women in universities and 22.9 percent in junior colleges (Shirahase 2000).

Enrollment ratios increased rapidly at the junior college level for women and at the university level for both men and women. Nevertheless, this postwar education reform especially benefited women. The proportion of those who graduated from junior colleges or universities climbed steeply for both sexes, and by 1998, the proportion became greater for women than men (Retherford et al. 2001). According to *Japan's Education at a Glance 2005*, the entry rate to higher education reached 74.5 percent in 2004, and it was 75.1 percent for women (Ministry of Education Culture Sports and Science and Technology 2005). In addition, as the proportion of women among four-year college graduates increased, more of them chose fields such as the social sciences, natural sciences, or engineering rather than the arts and home economics (Atoh et al. 2004). Along with rising qualifications, labor shortages, associated wage increases, and the fast growth of the service sector enabled women to enter paid employment. Although some deny the direct influence of education on marriage (Retherford et al. 2004; Ueno 1998), higher education for both men and women has a salient influence on the postponement of marriage by strengthening individual autonomy, raising educational qualifications, and increasing the labor-force participation of women (Retherford et al. 2001). In fact, economic gains from

education (wage gain per additional year of schooling) have been greater for women than for men. Average monthly wage differences between junior high schoolers and university graduates also have been higher for women than men (43 percent for men and about 60 percent for women). This wage gap indicates that the economic returns to education have been higher for women than men (Retherford et al. 2001) and implies that college diplomas for women became instruments for furthering their careers by raising their wage potential (Atoh et al. 2004).

As both men and women gained equal educational opportunities, attitudes towards gender roles and expectations also started to change for both men and women. According to Harris and Long (1999), those who agreed with the statement that men should work outside the home and women should remain at home decreased from 36.6 percent to 22.3 percent for women, and from 51.7 percent to 32.9 percent for men, between 1987 and 1995. In addition, not only did women's time become more expensive due to higher educational attainment and longer female participation in the labor market, but also rising economic costs for the education of children became the main burden for women of reproductive age (Atoh et al. 2004). It created an antinatalist pressure to below-replacement TFRs.

Although a larger share of Japanese women gained more education and employment and married for romantic reasons, after they worked for a couple of years, they found husbands who enabled them to climb up the social ladder, and then withdraw from the formal labor force to become full-time homemakers (*sengyō-shufu*: 専業主婦). These women then took care of the domestic needs of their

husbands and children and his parents. Many companies congratulated women for leaving jobs due to marriage (*kotobuki-taisha*: 寿退社), thereby pressuring single women at work to follow this pattern. This pattern was reflected in the M-shaped curve of female labor force participation in Japan (Figure 4). The left- hand peak of the M indicates women entering the labor force after school, and the right- hand peak of the M indicates their reentry into the labor force after raising a family (Ochiai 1996). Until Japan's Equal Employment Opportunity Law went into effect in 1986, most female workers were assigned to different career tracks than male workers. Gender-segregated job tracks in large firms assumed that women would resign at marriage or childbirth, and excluded women from promotional opportunities and pressured them to quit their jobs on marriage or pregnancy (Lee and Hirata 2001). Based on the 1991 National Survey of Occupational Mobility and Careers of Women, Lee and Hirata (2001) found that a husband's college education increased the probability of his wife's job separation. When men brought enough income to the home, companies and families expected women to quit their job after marriage to raise their family. This resulted in uniformity in fertility. Ochiai (1996:41) called this fertility trend "the two-child revolution". Although the majority of women during the Meiji (1868-1912) and early Taisho period (1912-1926) had four or more children, there was no uniformity in the number of children that couples had; but there was increasing uniformity in the number of children that couples had among women born in the early years of the Showa period (1926-1989).

As the economy experienced gradual but long stagnation, however, and the divorce rate mounted, women increasingly realized the fragility of this modern nuclear family. More of them postponed marriage to pursue higher education and jobs to help them to climb up the social ladder, to enjoy their freedom by using their time and money for leisure and hobbies, and to equip themselves to be self-supporting if their marriage failed. Between 1975 and 1995, the mean age at marriage increased from 24.5 to 27.7 years for women, and 27.6 to 30.7 years for men (Retherford et al. 2001). The office of Gender Equality in the Prime Minister's Office enacted the Basic Law for Gender Equality in 1999 to encourage companies, schools, and communities to provide equal opportunity for both men and women to participate in all kinds of social activities and to share responsibilities. The effectiveness of the Basic Law is, however, still questionable because there has been a discrepancy between the law and an unchanging environment due to conservative political elites who attempt to protect traditional family values that pressure women to marry and have children.

By 2003, Japan's TFR dropped to a record low of 1.29 (Figure 3). Sustained fertility decline in Japan is now lower than the replacement level of 2.1, or what demographers call the "the Second Demographic Transition" (van de Kaa 1987). This indicates that postwar social reform, especially the postwar education and family reform, restructured Japanese society to the point at which marriage has become an individual choice over a traditional responsibility to preserve the *ie*. The decline in arranged marriage, the increase in love marriage, the rapidly increasing

divorce rate, and the increasing prevalence of cohabitation and premarital sex (Ochiai 1996; Retherford et al. 2001) reflect the postmodernizing of Japanese society and families that emphasizes individuals over collectives. Marriage and childbearing became less appealing for women, especially for the highly educated, and increasing economic independence contributed to a further postponement of marriage and to permanent celibacy (Raymo 1998). These changes in patterns of marriage have made it harder for eldest sons to guarantee hands-on helpers to their elderly parents.

At the same time, economic modernization has helped to raise Japan's life expectancy at birth (LEB) to the highest in the world: 80 years for males and 87.5 for females (Figure 5). This achievement arose from an epidemiological transition—a shift from infectious to chronic diseases (such as cancer and cardiovascular disease) as the principle causes of death (Omran 1971). The rise in LEB in Japan from the early 1920s to the mid-1960s was largely due to a reduction in the proportion of deaths from infectious diseases (especially gastrointestinal disorders, tuberculosis, pneumonia, and bronchitis) that were particularly fatal to infants and the elderly. A main reason for the decline in fatalities from these diseases was the introduction of antibiotics (Mertens 1994). As a result of this trend, chronic degenerative diseases began to replace infectious diseases as causes of death (Martin 1989). The top three causes of death in Japan are now (in the following order) malignant neoplasm (cancer), cardiovascular (heart) disease, and cerebrovascular disease (stroke) (Tanaka and Johnson 2006).

Such a dramatic demographic transition in Japan, caused by postwar transformations in familial and medical institutions, led Japan to become the most long-lived nation in the world in 2005, having the longest life expectancy at birth, the largest portion of the population elderly (25 percent), and the smallest proportion 15 years and younger (13.6 percent) (Ota 2006). At the same time, more and more women began to express their frustrations over being expected to focus most of their energies on caregivng (Schoppa 2006). It brought the question of eldercare into public discourse. Children, especially the eldest son and his family, are persistently expected to repay the priceless obligations (*on*) they received from parents when they were young through providing care in their old age as well as to continue the name of the *ie* throughout generations.

These expectations have burdened women as primary caregivers for their families. The limited supply of childcare and eldercare services, however, along with tax and benefit rules subsidizing "dependent" housewives (*sengyō-shufu*) through providing them with pensions, tax credits, and other benefits, pushed women outside of the formal labor market and pulled them into the *ie*. These shifts supported the postwar economic expansion and growing capitalism of Japan (Schoppa 2006). Such a system of capitalism supported by patriarchal *ie* has come under pressure as a result of demographic and socioeconomic changes, such as the changing aspirations of women.

Conclusion

To understand the social organization of intergenerational caregiving in Japan, scholars must understand its historical transformation. Prior to the Meiji period, there was regional and class diversity in family life. There was no universal cultural ideal for women to take care of dependent elderly. As Japan moved from the Tokugawa to the Meiji period, the decline in mortality enabled more sons to survive to adulthood to continue the *ie*. It became more feasible for the national government to create legal pressures relegating women to the home to care for children and the dependent elderly in the privatized *ie*. Although the ethics of care moved from the public to the private sphere, and from the contextual to the universal, socioeconomic transformation enabled women to gain equal education and employment and enabled the elderly to live longer. Generational differences in residence, occupation, and education brought various conflicts and tensions in current Japanese society in determining to whom the morality of care should belong.

"Who should take care of the ever-increasing elderly in Japan?" became the major concern in the twenty-first-century Japan. Recent studies of aging and the family in Japan involve intensive discussions of care for the frail and dependent elderly, tossing the responsibility and burden between the public and the private spheres. Prior to the Meiji period, care was valued in public, which shifted to the private sphere to modernize, capitalize, and nationalize Japan within a short period. Rapidly decreasing fertility and ever-increasing numbers of elderly in postwar Japan

provoked intensive discussions of care, which brought back the issues of care to public awareness.

Throughout its history, care meant the caregiver's process and obligation of looking after someone weak and dependent, and care receivers were perceived as passive recipients. Today, owing to longevity and reduced disability among the elderly after the Second World War, more elderly have challenged such a pessimistic and passive view of care and they are coming to be seen as proactively choosing their opportunities to care and to be cared for by important people in their later life course, and the study of social integration in Japan becomes important to understand and promote healthy aging in Japan. It is within this historical and cultural context that Japan now faces the question of how to promote a harmonious integration (*wa*) and mutual dependency needs (*amae*) of its senior and junior generations in later life in the twenty-first century.

CHAPTER 3

THEORETICAL FRAMEWORK

Aging and Family in Japan in the Twenty-First Century:

Social Recognition of the Importance of Social Integration on Health

Introduction

Today, more elderly have challenged negative stereotypes toward them, and they are seen increasingly by scholars as proactively choosing their opportunities to care and be cared for by people important to them during their later life course. Reflecting such social recognition of the importance of social integration on healthy aging, research on social integration and health has emerged as an urgent and important issue of both public and scientific concern. This chapter first describes why studying social integration in later life became important in studying aging and the family. Second, theoretical frameworks explaining the relationship between social integration and health and empirical studies are reviewed. Finally, this chapter ends with three research questions based on the literature review of theoretical frameworks and previous studies of social integration and health.

Why Social Integration is Important in Studying Aging?

Japan became the nation with the greatest longevity in the world in 2005, having the longest life expectancy at birth (82 years in 2006), the largest portion of the elderly (25 percent), and the smallest proportion of the population 15 years and

younger (13.6 percent) (Ota 2006). Kaneda and Raymo (2003) reported that over the past few decades, the main source of increasing life expectancy shifted from reductions in mortality due to senility to cerebrovascular disease, and then to heart disease. Particularly, declines in mortality from cerebrovascular disease over the last three decades suggests socioeconomic and behavioral factors, including better housing and a more balanced diet, played an important role in achieving an increase in postwar life expectancy; improvements in medical treatment also contributed to the increase (Kaneda and Raymo 2003). Japan also experienced a steep fertility decline after the baby boom faded out in the early 1950s. In 1957, it was high. The Total Fertility Rate (TFR), the estimated average number of children born to a woman in a lifetime, based on the age-specific birth rates observed in a given year, was 4.54. However, ten years later, the TFR was 2.11, the replacement level. Ever-increasing numbers of elderly along with rapidly decreasing fertility in postwar Japan provoked intensive discussions about care, and brought those issues into public awareness. One of the most frequently asked questions about care brought to the public is, "Who is to take care of the ever-increasing numbers of elderly?"

The cultural superstructure defining the proper organization of eldercare has changed over the course of history, because of new interactions among demographic, economic, and political realities (see Chapter 2). In the Tokugawa period, various writings emphasized the moral importance of a man to care for the frail elderly as an important practice of filial piety. Such morality of care shifted to the private sphere and women's arena during the Meiji period in order to modernize, industrialize, and

nationalize Japan within a short period. Along with the legalization of the primogeniture, women, especially the wives of eldest sons, became the culturally idealized main caregivers of the dependent and frail elderly.

The major weakness of the previous literature on aging and family in Japan is that scholars often start with describing this *ie* system as the benchmark, assuming that the cultural underpinnings of the *ie* define the care of 'frail elderly' as 'women's work,' undertaken to preserve 'women's morality.' Many scholars discussed women's burden and responsibilities to care for the frail and dependent elderly in patriarchal Japanese society from the standpoint of caregivers. This resulted in an intensive focus on the discussion of eldercare as a persistent burden on women, while explicitly or implicitly categorizing care receivers as passive recipients. Such a "pessimistic" view of the elderly has been enhanced by the media and some specialists stressing the seriousness of the problems of old age (Koyano 1997). In such a context, since care has been perceived as a caregiver's responsibility and obligation for looking after someone weak and dependent, the elderly have too often been associated with burdens and problems, stereotyped as sickly, frail, and dependent.

The idea that older persons cannot maintain active participation in society and the economy appears to be more myth than reality. Increasing longevity also challenged the "elderly myth" and various studies showed reduced disability among the elderly. U.S. studies reported that the decline in morbidity, lower incidence of disability, higher rate of recovery, and significant improvement in ability to work at older ages

have accompanied the increase in longevity at older ages (Crimmins, Reynolds and Saito 1999; Crimmins, Saito and Reynolds 1997; Manton, Stallard and Corder 1995). Japan also experienced similar gains experienced in the U.S., with annual declines in disability and functional limitations ranging between 1.5 percent and 3.5 percent (Schoeni et al. 2005). Japan also experienced improvements in mortality that began largely in the 1970s (Schoeni et al. 2005). According to Schoeni et al. (2005), Japan experienced substantial decline in disability among the elderly over the past decade, reducing the number disabled being by about 1 million or 14 percent relative to what the numbers would have been if the disability prevalence remained the same; these reductions were experienced across economic and socio-demographic groups. These findings weakened the idea that Japanese elderly are dependent on women's morality located in the private sphere.

Owing to their longevity and reduced disability among the elderly, more Japanese elderly have challenged negative stereotypes. The elderly are seen increasingly by scholars as proactively choosing their opportunities to care and be cared for by important people in their later life course. Although the government remains criticized for heavily relying on families for filial care for the elderly, there have been increases in the quantity and quality of private and public care facilities, various social activities, and volunteering programs for the elderly provided by local governments and non-profit organizations. These facilities, programs, and activities aim to provide opportunities for the elderly to remain in the circle of harmonious integration (*wa*), where people can care for each other beyond the family. In

addition, since Japan has universal health coverage with set benefits including physician and hospital services, dental care, and prescription drugs, local programs to improve health and functioning, to postpone disability, and to promote recovery from morbidity have become, and will continue to be, crucial factors to stem the rise in government budgets (Schoeni et al. 2005).

Several reformations of the social security system have also changed the ability and the necessity of the elderly to care for themselves. Under the *ie* system, caring for the dependent elderly by family members was legitimized under the then-barely developed social security system (Thang 2000). Between 1965 and 1994, social security benefits, which encompass old-age pension schemes and medical plans, increased from six to sixteen percent of the national budget. Between 1981 and 1996, of elderly Japanese aged 60 and above, the proportion that received public pension benefits increased from 65 percent to 84 percent, and the proportion which reported their primary source of income to be their pension increased from 35 percent to 57 percent (Ogawa and Retherford 1997). However, to meet their budgets with ever-increasing numbers of elderly, this pension scheme was revised in the 1999 Pension Reform Act, which includes a 5 percent reduction in pension benefits, and an increase in the eligibility age from 60 to 65 years old (Oshio and Oishi 2004). Unlike the United States, Japan is reluctant or slow to rely on large-scale immigration to fill gaps in its labor force (Moffett 2005). Thus, for the government, enticing the elderly to keep active and to work longer before receiving retirement

benefits is considered a strategy to solve the labor shortage and to alleviate financial pressure to support the ever-increasing numbers of elderly.

In fact, in 2004, Japan passed a law that requires companies by 2013 to raise their retirement age to 65 from 60 or rehire their retiring workers (Moffett 2005). Maeda and Ishikawa (2000) reported that 78.9 percent of older men aged between 60 and 64 were working and 41.9 percent at age of 65 and above, which is far higher than for the United States, Denmark and Germany. According to the economist Atsushi Seike, the country's lower birth rate indicates the number of Japanese in their 20s will decline by 3.2 million over the next decade; however, extending everyone's working life until 65 will keep two million or more in the work force (Moffett 2005). Oshio and Oishi (2004) claimed that pension reform is expected to increase the average retirement age by about one year for men, which implies that more elderly will continue to stay in the labor force after official retirement at age of 60 or 65. In Japan, an elderly person's labor force participation is higher in rural areas than in urban areas. Forty-one percent of rural males were in labor force in 1999 as opposed to 32 percent of urban males. Similarly rural women showed higher labor force rates than urban women (Ogawa 2004). Since rural elderly workers tend to keep working until their health condition deteriorates, in contrast to urban elderly workers who are more likely to be in the highly organized labor market and thus expelled at an earlier age, the effect of pension reform on the elderly is expected to be greater for urban residents. These policy initiatives, to remain solvent, will benefit from public health policies aimed at extending the healthy life expectancy of elder adults in Japan.

Finally, although Japan experienced declines in disability similar to the U.S., Japanese society is often in contrast to, or lags behind, Western nations in terms of balanced gender roles in the labor market. Nevertheless, more than ten years of continuous recession and job insecurity have created greater pressures on women to supplement their husband's earnings in a significant way (Takeda et al. 2006). The Equal Employment Opportunity Law promulgated in 1986 and the Revised Equal Employment Opportunity Law in 1999 also emphasized and promoted equal opportunities for men and women (Mori et al. 2002). In such a context, postponement of marriage and low fertility partly reflect the revolt of women against cultural expectations that they be caregivers at home (Takeda et al. 2006). Therefore, not only has the increasing number of elderly Japanese challenged the myth that they are incapacitated and needy, but also the increasing number of women has challenged the myth of women's morality located in the privatized *ie*.

Reflecting these social and demographic changes and needs, increasing numbers of elderly have started to show their preference to remain independent in Japan. After the new Civil Code in 1946 replaced the *ie* system with the conjugal family system, industrialization, democratization, and urbanization increased the mobility of younger generations, which contributed to the nuclearization of the family (Thang 2000). Mass media also exposed Japan to Western ideas, including ways of looking at caregiving (Hashizume 2000). Although the proportion of the elderly living in three-generational households is still higher than in Western countries, "*sūpu no samenai kyori*" (a distance which does not allow the soup to get cold) became a

popularized metaphor as an ideal form of family-based support for the elderly (Kweon 1997). Social commentators and mass media suggested this ideal distance to reduce conflicting values between traditional family-based care for the elderly and postwar socio-demographic changes. Such popularized metaphor introduced by the media began to weaken the unquestioned romanticized image of *Daikazoku*, meaning a family with large number of members, in which the elderly are taken care by their offspring.

This "ideal distance" emphasizes familial love based on traditional intergenerational relationships within the family; however, it does not necessarily require intergenerational coresidence. Through fieldwork in an urban city in Japan, Kweon (1997) found familial love based on traditional intergenerational relationships within the family without coresidence. An elderly woman enjoyed her independence by joining in various social activities for the elderly, while enjoying her time by occasionally sharing family meals and exchanges of information. Kweon (1997: 372) interpreted this distance of "togetherness and separation" as a result of both generations trying to maintain a balance of independence and closeness. Thus, "ideal distance", in turn, challenges the stereotype of elderly Japanese as dependent, frail, and demanding of constant hands-on assistance. In fact, the number of older people living independently but close to their children in the same community appears to have increased in recent years (Maeda and Ishikawa 2000).

In Japan, only eight percent of the elderly aged 60 and over live alone compared to about 40 percent in the United States and Germany; it is one of the significant

differences between the lives of the elderly in Western nations and Japan (Maeda and Ishikawa 2000). However, if this ideal distance is taken into account, the difference between Japan and Western nations becomes much smaller. Indeed, in many Western nations, about half of older people are living separately from their children, but they live geographically close to them. Maeda and Ishikawa (2000) report that a higher percentage of elderly Japanese lives separately from their children in large metropolitan areas than in rural Japan, partly a result of the limited size of available houses in urban areas. They also claim that living arrangements of the Japanese elderly will change gradually and significantly in the future since the proportion of middle-aged people who prefer to live separately is greater than the older generation (Maeda and Ishikawa 2000).

Fieldwork in another urban city of Japan by Thang (2000) showed that increasingly local communities are creating space for the old and young to interact through community-based programs, which have prevented social isolation of the elderly (Maeda and Ishikawa 2000). Such communities enabled the elderly to gain emotional support beyond intergenerational coresidence and without being solely dependent on their family members. Based on fieldwork in a rural village in Japan, Traphagan (2004) found that older people were involved in activities at the community centers such as the tea ceremony and "gate ball" (similar to croquet) in order to avoid the onset of senility. He claimed that, to be a good elderly person in Japan, one needs to be a "socially engaged individual who is involved in activities that incorporate social interaction; failure to maintain activity and social involvement

invites loss of well-being" (Traphagan, 2004, p. 9). As Klinenberg (2002) claimed, the recognized source of longevity has broadened beyond just the maintenance of physical and mental vitality to include the social integration of older people with family, neighbors, and other friends. In such a context, social integration can be symbolized by, but should not be limited to, physical coresidence with younger generations of relatives.

Reflecting such social recognition of the importance of social integration on healthy aging, research on social integration and health has emerged as an urgent and important issue of scientific as well as public concern for promoting healthy aging in Japan as well as in other nations of the world.

Theoretical Framework: Understanding Social Integration – Multiple Role Theories

The classical sociologist who initiated the theoretical and empirical study of social integration and disintegration was Emile Durkheim (Berkman et al. 2000; Moen, Dempster-McClain and Williams 1989; Pillemer and Glasgow 2000). His major aim was to explain how individual pathology was a function of social dynamics, and his work showed how social integration can influence mortality (Berkman et al. 2000). In his famous theoretical and empirical study, *Suicide*, he found that suicide was related to an individual's integration in society, i.e., in institutions such as family and religion (Pillemer and Glasgow 2000). In his view, social integration was a strategy against modernizing forces, and he tied modern

urban life to increasing alienation and breakdown of social cohesion (Kushner and Sterk 2005). His study showed that suicide rates were higher for single, divorced, and widowed people than for married people, and suicide rates were higher for men without a wife and children than for men with a wife and children (Durkheim 1951). Durkheim also argued that the low rates of female suicide were reflective of men's subsumption in traditional gender roles (Kushner and Sterk 2005). Based on his gendered assumption that women were less involved in public life than men and thus less likely to obtain either the benefits or the costs of that involvement, women were more immune to suicide than men (Durkheim 1951; Kushner and Sterk 2005; Moen et al. 1989).

After Durkheim, there have been many theoretical and empirical developments to explain the positive relationships between social integration and health in later life, and the most traditional way of theoretically and empirically explaining this relationship is to take role involvement as an indicator of social integration (Wethington et al. 2000). To understand how roles influence health outcomes, two different explanations have been offered: the role strain perspective and the role enhancement perspective (Barnett and Hyde 2001; Barnett and Marshall 2001; Kikuzawa 2006; Moen et al. 1989; Wethington et al. 2000).

The role strain perspective argues that multiple roles could entail obligations that produce overload and strain, which in turn could lead to negative health outcomes, including psychological distress (Barnett, Marshall and Pleck 1992; Kandel, Davies and Raveis 1985; Voydanoff and Donnelly 1999). This perspective is based on

structural-functionalism and focuses on the analysis of social structure. In this perspective, social structures are viewed as made up of roles, which are the behavioral enactment of a position in a social system coupled with behavioral expectations and obligations (Goode 1960; Kikuzawa 2000). The role strain perspective assumes that individuals are actors playing assigned roles embedded in a position, which is predetermined by an institution (Goode 1960; Kikuzawa 2000). Merton (1968) used the concept, *status set*, to describe the complex positions assigned to individuals in various social systems. *Multiple roles* is a concept isomorphic with *status set* (Moen et al. 1989), defined as behavior that fulfills multiple positions under responsibility, expectation, and rights. The role strain perspective maintains that individuals engaged in complex positions are more likely to experience distracting and conflicting role obligations because they cannot fully play all the roles following the specific scripts written for each role (Goode 1960).

By contrast, the role enhancement perspective states that the greater the number of roles, the greater the level of social integration and connectedness (Moen et al. 1989). This perspective suggests that engaging in multiple roles, rather than fewer roles, leads to higher levels of physical and emotional health, because the accumulation of social identities or roles benefits individuals (Wethington et al. 2000). This perspective was developed from symbolic interactionists' critique of functionalist assumptions that individuals play roles in scripts written by the society. This perspective assumes an individual is not only as a role-player but also a willful actor who engages in role bargaining through interacting with others (Kikuzawa

2000). The role enhancement perspective emphasizes that holding multiple roles does not inevitably cause role conflict or role overload, but it can benefit the health of individuals by enhancing individual resources, social connections, prestige, emotional gratification, and social identity (Barnett and Marshall 2001; Chrouser and Ryff 2006). This perspective also emphasizes that an individual who occupies diverse roles can fall back on another relationship if she or he encounters difficulties in a particular role (Chrouser and Ryff 2006; Kikuzawa 2000).

Social Integration and Health of the Elderly: Role Enhancement or Role Strain

Previous studies supporting the role strain perspective targeted women in the childbearing ages or middle-aged women, not the elderly. These studies discussed how juggling their marriage, childbearing, and job caused poor mental health among female workers who are in the childbearing ages or middle-aged (Chandola et al. 2004; Matsui, Ohsawa and Onglatco 1995; Mori et al. 2002). In addition, earlier research on family roles on the well-being of the elderly were often restricted to an examination of having a spouse, parent, and job. In particular, studies focusing on why married individuals live longer and healthier lives than singles became very popular in past decades (Gove 1973; Horwitz, White and Howell-White 1996; Hu and Goldman 1990; Rodgers, Hummer and Nam 2000; Ross, Mirowsky and Goldsteen 1990; Zhang and Hayward 2006). These scholars argued that marriage increases social support and reduces unhealthful and risky behaviors such as failure to maintain an orderly life style, and their empirical studies showed that marriage

reduces causes of mortality such as tuberculosis, diabetes, and other infectious diseases, and promotes a healthful lifestyle (Horwitz et al. 1996; Rodgers et al. 2000). By contrast, the divorced and widowed have higher death rates from heart disease, stroke, pneumonia, many kinds of cancer, automobile accidents, homicide, suicide, and cirrhosis of the liver, which all are leading causes of death in the United States (Ross et al. 1990). A recent study by Zhang and Hayward (2006) also found the significant and positive influence of marriage on the physical well-being of a later life in the United States.

In Japan, Hu and Goldman (1990) studied the relationship between marital status and mortality and pointed out that a similar relationship can be seen not only in the U.S., but also in 16 industrialized nations that include one East Asian country, Japan. They found that the high mortality of Japanese singles is prominent compared to the mortality of singles in other countries. In the mid-1900s, the life expectancy of 20-year-old Japanese men or women who married would be as much as 15 years higher than that of 20-year old Japanese men and women who remained unmarried (Goldman, Takahashi and Hu 1995). In 1940, single women in Japan had a life expectancy between 17 and 22 years lower than the ages for single women in the United States, Finland, and France, and 17 years lower than the age for married Japanese women (Goldman 1993). In Japanese society, especially for the elderly, marriage is an "essential stage" in the transition to adulthood, and singles may face deprivations due to the general rejection of the single and divorced status in Japanese society (Goldman, 1993; Goldman, Takahashi, and Hu, 1995; Dixon, 1978;

Kumagai, 1984; Hamabata, 1990). The reason why married Japanese are healthier than unmarried Japanese could be also explained by selection, because an excess in mortality of singles could screen out potential spouses with mental or physical problems such as obesity, hypertension, and nicotine addiction (Goldman et al. 1995). However, these studies of marital status on the health of the elderly did not consider the effect of multiple roles on the well-being, as well as the effects of other family roles and roles beyond the family such as participation in social groups.

Recent studies of multiple roles on the well-being of the elderly emphasize the importance of social integration beyond the family, reflecting the criticism of the negative stereotype of the family as the major and the only source of social integration for the elderly. In examining the relationship between social integration and the well-being of the elderly, various scholars found evidence that the role enhancement perspective is more applicable to older adults than the role strain perspective (Adelmann 1994a, 1994b; Chrouser and Ryff 2006). They all claimed, based on their research with the elderly, that role accumulation not only enhances individual resources and identity but also deters social isolation and provides choices to those disengaged from particular responsibility (Adelmann 1994a; Choi et al. 2007; Chrouser and Ryff 2006; Moen et al. 1989; Moen, Dempster-McClain and Williams 1992; Rozario, Morrow-Howell and Hinterlong 2004).

For instance, Adelman (1994) found that occupying more rather than fewer roles leads to better subjective health, fewer chronic conditions, and fewer health disabilities for both elderly men and women in the United States. A recent study by

Barnett and Hyde (2001) found that more roles enhance the level of subjective health and lower levels of mental and physical health problems. Moen et al. (1989, 1992) found that holding multiple roles could be a mediating factor in the negative relationship between health and socioeconomic status, by maintaining or expanding networks of family members and friends. In particular, they found participation in volunteer activities as well as multiple roles showed a significant effect on health, although their sample was restricted to women (Moen et al. 1992). However, because most of the previous studies are based on Western contexts, little is known about these relationships in non-Western contexts (Cornman et al. 2003).

In East Asia, several studies support the applicability of the role enhancement perspective to understanding of the well-being of the elderly (Beckett et al. 2002; Cornman et al. 2003; Krause et al. 1999; Sugisawa, Liang and Liu 1994; Wu and Rudkin 2000). For instance, Beckett et al. (2002) found that poor health status is associated with low socioeconomic status, not having any living children, low participation in social activities, and limited networks of friends in Taiwan. Cornman et al. (2003) found that negative perceptions of social support are significantly related to lower levels of depression in Taiwan. Wu and Rudkin (2000) found that social integration plays an important role in reducing the negative effects of low socioeconomic status on health in Malaysia. Their study found that low socioeconomic status was associated with poor health for all three ethnic groups (Malay, Chinese, and Indian). However, they also found that this negative effect tends to be stronger for older people with less frequent contact with their adult

children than for older people with more frequent contact with their adult children (Wu and Rudkin 2000).

In Japan, Sugisawa et al. (1994) found that social participation, operationalized in terms of organizational attendance, showed a significant direct effect on mortality. Those with any degree of social participation had a risk of dying which was 68 percent of that for those who lacked social participation (Sugisawa et al. 1994). Findings of Krause et al. (1999) indicate that the elderly who provide assistance to others tend to rate their health more favorably than the elderly who are less involved in assisting others. These studies show the importance of social integration on the well-being of the elderly is not restricted to the family. However, they did not consider the effect of multiple roles on the health of the elderly.

Kikuzawa (2006) found that occupying more roles was associated with lower levels of depression for both American and Japanese men and women, and the benefits of each additional role were greater in the U.S. than in Japan. She concluded that this difference reflects the fact that "concentration of support resources in a particular social group (e.g., the family) is more likely in societies that emphasize collectivism, ... collectivism facilitates intimate interactions among group members while discouraging the members from outside the group" (Kikuzawa 2006:73). Her research refined the study of multiple roles on health by emphasizing the importance of cultural contexts, and it is one of few studies that focuses on the relationship between multiple roles and health in Japan. However, her study includes several

limitations in scope, many of which apply to the criticism of studies looking at the effects of multiple roles on the well-being of the elderly.

First, Kikuzawa's study is based on national data from 1987, when women began to remain in their jobs even after marrying and having children, a result of the Japanese Equal Employment Law of 1985 (Matsui et al. 1995). At the same time, Japan experienced economic growth in the 1970s and 1980s, which was supported by a gendered division of labor assigning women to be full-time housewives to support men. In other words, her study was carried out prior to decades of a long economic recession that steadily undermined traditional gender norms, even traditional living arrangements (Takeda et al. 2006). Her data, collected 20 years ago, is greatly limited in capturing the diversity of aging and the family in contemporary Japanese society.

Second, because her study focused on a comparison between the U.S. and Japan, rural and urban differences in social integration and health of Japan were ignored, although spatial inequality is considered an important factor influencing social integration and aging in Japan. Without considering spatial differences, characterizing Japan as a nation marked by collectivism made her analyses ambiguous.

Third, her study lacks measures that look at the quality of relationships such as satisfaction with the amount of contact with their children. Fourth, her study argued that accumulation of roles make the elderly more valuable and guarantee status security; but these studies did not consider role density – whether or not having more

children and grandchildren matters. Finally, Kikuzawa's study did not involve an analysis of time, i.e., whether or not (1) duration in roles such as marriage and employment matters, and (2) whether or not engaging in multiple roles contributes to better maintenance of physical and psychological health.

Finally and especially, an inability to incorporate the process of aging embedded in a broader context is considered by scholars a major weakness of her study, as well as previous studies looking at the effects of multiple roles on the well-being of the elderly. Such criticism was repeatedly pointed out as the importance of research on social integration and health increased in various fields, including public health, medicine, and psychology (Wethington et al. 2000). In such a context, the life course framework has emerged as an incorporating framework to advance research on social integration and health in later life.

Incorporating the Life Course Framework into the Study of Social Integration and Health

The life course framework is an approach to understand aging that emphasizes the prior life experiences in determining later life outcomes (Elder 1985; Quandagno 2005). This framework provides a important lens to view successful aging because it investigates pathways and how circumstances in early adulthood may affect social integration and health in the later life (Moen et al. 1992).

In studies of the life course, the concept of trajectory and transition are central themes (Elder 1985). Life trajectory can be described as linking states over

successive years such as a state of health. Each trajectory is marked by a sequence of life transitions such as changes in the state of health that are better or worse (Elder 1985). In examining life trajectory of health and transition to a better or worse state of health, a life course framework can go beyond the primary issue of multiple roles and health (Moen et al. 1992). The life course framework suggests that the connection between social integration and health can be viewed as a dynamic, interactive, and possibly cumulative process, in which multiple or individual roles previously or continuously occupied play out in diversity and density of social integration over the life course, thereby sustaining a state of well-being (Moen et al. 1992). For instance, Moen et al. (1992) found that American women occupying more roles in 1956 were in better health in 1986, controlling for background variables such as age and previous health, than were women occupying fewer roles. On role in particular, they found that being a member of a club organization significantly and positively influenced health. They concluded that both social integration (in the form of multiple roles) and health in later years reflect choices made and experiences undergone throughout adulthood (Moen et al. 1992).

The life course theory assumes that individuals are agents, planning their own life courses, but they build their own life courses as they relate to specific socio-historical opportunities and constraints (Walker, Allen and Connidis 2005). At the same time, the life course framework emphasizes the importance of the effects of broader contexts such as gendered context, historical context, and geographical context because individuals live their lives in such contexts, which produce

differences in roles, relationships, and resources in later life course (Elder 1985; Walker et al. 2005).

- **How does Gender Affect the Conditions between Social Integration and Health?**

Moen (2001) claims that men's and women's roles and resources are socially constructed because of the different life pathways that exist in society. In her view, socially constructed life pathways benefit men more than women since the expected life course - education, employment, and retirement – more closely characterizes the experience of men than women (Moen, 2001). Women who seek equality need to accommodate these life course transitions while performing housework and care work "traditionally" allocated to them (Moen 2001). Krause et al. (1998) found that elderly women tend to report more problems with fitness items, to have more symptoms of depression and to rate their health less favorably than elderly men do in Japan. Supporting Durkheim's discussion of women's lower likelihood than men of involvement in collective activities, Krause et al. (1998) argued that the subordinate status occupied by women in public roles might generate stress due to their disadvantaged status, and thereby exert an adverse effect on the health of women. However, I argue, since Japan has the most long-lived women in the world (Hashizume 2000; Takeda et al. 2006), socially constructed roles and resources in the later life course may rather benefit women more than men in the later life course.

In looking at social relations in later life, scholars have argued that women tend to have more social relationships than men, and that women's relationships tend to be

more intimate and involve a greater number of exchanges than men's (Antonucci and Akiyama 1995). In fact, women tend to receive more social support from the government and their relatives than men do in Japan. Compared to widowed or divorced men, widowed or divorced women can receive more financial protection from the government through widows' pensions in Japan (Ikeda et al. 2007). Such socially and culturally constructed roles and resources in later life influence mortality. Ikeda et al. (2007) found that the risk of mortality from cardiovascular disease, respiratory disease, external causes, and all causes were two to three times higher for never-married men than for married men. They also reported smaller but significantly higher mortality risks from all causes for never-married women: higher risk of mortality from cardiovascular disease, external causes, and all causes associated with divorce and widowhood for men, but not for women (Ikeda et al. 2007). Hence, women may be better protected than men from the processes such as widowhood in their later life course when it is placed in gendered context.

- **Does Age Influence the Relationship between Social Integration and Health?**

Historical context influences people in various stages of life by affecting the availability of resources from family members and their modes of assistance (Easterlin 1995; Hareven 1994, 1995). Easterlin (1995) argued that parents of baby-boomers will benefit more than parents of post baby-boomers, owing to the high fertility of the postwar generations during the baby boom period. In other words, parents of baby-boomers are more likely to have more children to provide social support in later life than parents of post baby-boomers (Pillemer and Glasgow 2000).

In Japan, the older elderly are expected to have more siblings, children, and grandchildren than the younger or future elderly, who are more likely to be influenced by a shrinking family size due to declining fertility in postwar Japan. The role enhancement perspective claims that role accumulation enhances one's self-conception and self-esteem (Kikuzawa 2006). Thus, the life course placed in historical context may benefit the older elderly more strongly than the younger elderly in Japan since not only are the former more likely to have grown up with more siblings and to live with children or grandchildren but also they are more likely to have more of these descendants, who enhance resources, emotional support, social connections, and social identity.

- **Does Rurality Ameliorate or Mitigate the Risks of Poor Health?**

The life course approach also recognizes the importance of geographical context because residential environment also shapes the context of individual's lives (Glasgow 2000, 2004; Thoits 1991, 1992; Wickrama et al. 1995). Previous studies in the United States showed that rural men and women are more likely to subscribe to traditional values and norms than urban men and women (Wickrama et al. 1995). Accordingly, while social bonds may be tighter among ruralites than urbanites, the greater poverty and fewer medical resources in non-metro U.S. counties, compared to metro counties, may overrule the greater health and lower mortality that should result from stronger social bonds (Hummer et al. 2004). According to Hummer et al. (2004), individuals in non-metro areas had 80 percent higher odds of non-coverage by any kind of health insurance and about 30 percent higher odds of Medicaid

coverage than those in metropolitan areas. Hummer et al. (2004) also reported that, although individuals in non-metro areas are more likely to be married and less likely to be never-married than those in metro areas, a higher level of poverty and lower level of education are prevalent in non-metro areas (Hummer et al. 2004).

As such, any analysis contrasting mortality rates must control for the economic disparities between non-metro and metro residents. For example, a study conducted by McLaughlin et al. (2001) found lower rates of mortality in non-metro U.S. counties than metro counties, despite substantial disadvantages associated with non-metro residence. McLaughlin et al. (2001) claimed that the greater homogeneity and the smaller differences in services and facilities in rural than urban areas reduce feelings of deprivation and lead to a smaller effect of income inequality on health in non-metro counties (McLaughlin, Stokes and Nonoyama 2001). These factors may symbolize and facilitate stronger social cohesion in non-metro America that would produce the lower (than metro) mortality rates observed by these researchers over several years using the 1990 U.S. census.

The associations among rurality, social integration, and mortality in the U.S. need updating (Glasgow 2004; Johnson 2004). For example, Glasgow (2004) argued that the scarcity and simplicity of social organizations in rural America offers fewer opportunities for formal social participation in clubs and voluntarism, and fewer public transportation services to travel to meetings than do those in urban America. A study conducted by Johnson (2004) found no non-metro/metro spatial pattern of the prevalence of disabling chronic diseases and disabilities. Obviously, whether

rural America offers a haven from medical risk through stronger social bonds remains an unanswered question. This question is hard to answer because of the substantial migration across nonmetro-metro boundaries by Americans over their life course.

In Japan, rural areas symbolically represent a place which embodies "traditional" Japan under the *ie* system. The rural elderly are more likely than the urban elderly to coreside with an eldest child (particularly, the eldest son) and his or her spouse and their children (Traphagan 2004). In addition, the rural elderly tend to work until their health condition deteriorates in contrast to the urban elderly, who are more likely to be employed in the highly organized labor market (Ogawa 2004) and thus encouraged out of it before their health condition deteriorates. Fukuda et al. (2005) found that the positive association among socioeconomic inequality and morbidity as well as mortality of the elderly was buffered by mutual dependency (*amae*) and harmonious integration (*wa*), especially in rural areas. And these findings are consistent with these of McLaughlin et al. (2001) for the U.S. Unfortunately, rural-urban differences in social integration and health have not been intensively studied in Japan. For that reason, I shall use rural-urban residence as an important "test" variable in this dissertation.

Statement of Questions

Previous studies suggest that having multiple roles is linked to better health of the elderly by preventing social isolation, increasing social connectedness to society, and

buffering stress. Incorporating the life course framework, the elderly who occupy not only diverse but also dense roles overtime may have better emotional and physical outcomes than those who do not. These effects are expected to differ by gender, residence, and age. However, we do not know whether the effect of multiple role occupancy is significant at any point of time in their life course, regardless of residence and gender. We do not know whether the effect of gender, residence, and age remain, even controlling for the effects of multiple roles and socioeconomic status. We also do not know whether social integration during the adult years such as marital duration and work duration promote both social integration and health in the later life course, and whether the number of particular roles matter. To summarize, I pose three research questions answerable from a national level longitudinal survey (wave 1 and wave 2) of elderly Japanese people.

Research Question 1: Did the elderly who occupied more roles have a greater likelihood to be healthy (fewer physical and mental problems) than those with fewer roles at the first interview? How do gender, age, and residence (rural vs. urban) influence the well-being of the elderly, controlling for the effects of other variables including a multiple roles variable and socioeconomic variables?

Research Question 2: Did a particular position/status (e.g., spouse or parent or grandparent) have a greater effect on health? Did the number of particular roles matter? How did gender, age, and residence (rural vs. urban) influence the well-

being of the elderly after the effects of other variables, including individual roles and socioeconomic variables, were controlled?

Research Question 3: Did the elderly, who had diverse roles at the first interview, have a greater likelihood to remain healthy at the second time of the interview than those who had fewer roles? Controlling for the effect of other variables, including a multiple roles variable and socioeconomic variables, did age, gender, and residence influence health outcomes?

CHAPTER 4

METHODOLOGY

Introduction

In the preceding chapter, I asked whether social integration, indicated by occupying multiple social roles (e.g. being a parent, grandparent, worker), produced better physical and mental health among elderly Japanese (Research Question 1), and whether a particular role or numbers of particular roles occupied (e.g. the number of social groups or social activities the elderly respondents join) have greater effects on health (Research Question 2). Since I posited that social integration contributes to good health, then greater integration (seen in the accumulation of more roles) ought to cause the maintenance of better health (Research Question 3). For all of these research questions, I asked how effects of social integration differ by gender, age, and residence (rural vs. urban). Answers to these questions require nationally representative longitudinal data with multiple indicators of social-role memberships and of physical and mental conditions. In this chapter, I describe both panels of the Nihon University Japanese Longitudinal Study of Aging (NUJLSOA), and explain the appropriateness of this two-year longitudinal data set to provide answers to my three questions. Then I shall discus the cross-sectional and longitudinal statistical techniques that I will use to explore answers to my three research questions; and present the measurements of the independent, dependent, and control variables that both panels afford.

Sample Description of the Nihon University Japanese Longitudinal Study of Aging

The data are from a two-wave panel study of a national sample of 6700 Japanese elderly aged 65 and over. This longitudinal survey, the Nihon University Japanese Longitudinal Study of Aging (NUJLSOA), provides panel data based on a nationally representative sample of the Japanese elderly that takes population size within regions and prefectures into account. The limitation of this data set is that currently only two waves (1999 and 2001) are available to the public. However, since few studies have examined the impact of multiple roles on health in Japan (Takeda et al. 2006), findings from this data set will provide a benchmark for future research on the dynamic relationship between social integration and health.

A major strength of the data set is that it is the most recent national-level survey of the Japanese elderly available to the public. Paired sample t-tests examining changes in the scores for physical, self-rated, and psychological health measures all showed that there were significant changes in scores between the first wave and the second wave (Table 1). Hence, its longitudinality allows for analyzing changes in health status of the elderly, which is another major strength of this data set. In addition, crucial to the purposes of my dissertation, the questionnaire allows me to assess the degree of a respondent's social integration according to the diversity of social positions or statuses the elderly respondent occupied, the duration of roles, and the numbers of individual roles (e.g., the role depth of parenthood is indicated by the number of one's children). For example, I can gauge role diversity from responses to

questions on whether the respondent has a spouse, children, grandchildren, a job, or a membership in an organization outside the family. It is possible to measure the density of a person's role as a parent or grandparent from the number of one's children or grandchildren, respectively. Because experience in a social role may be needed before its effect on health begins, it is advantageous that the data set allows me to control marital duration in months and total employment duration in years. The survey enables me to measure the frequency of contact with kin. The quality of one's relationship with children is shown by the respondents' reported satisfaction with amount of contact with them. In sum, the complex measures of social integration available in Wave 1 make the NUJLSOA an ideal data set for my dissertation.

Research Questions 1 and 2 ask whether social integration is related to better health at Wave 1 and to its maintenance until Wave 2. Thus, it is fortuitous that both waves afford measures of physical ability: Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs), mental health (depression measures), and self-rated health. As such, it is possible to assess the cross-sectional association between various dimensions of social integration and diverse indications of health at Wave 1 and between social integration at Wave 1 and the maintenance or loss of health over the next two years.

Finally, the NUJLSOA data set allows me to examine how age, gender, and rural-urban residence affect the relationship between social integration and health. It also

allows me to take into account the respondents' educational level and the combined income of the respondent and spouse.

Method of Sampling

The NUJLSOA survey data were collected using a multistage stratified sampling method based on three sources: the National Residents Registry System, the list of eligible voters, and a listing of all households developed by Central Research Services, Incorporated (CRS). The Registration system in Japan is considered to be constantly up-dated and universal due to a legal requirement to report any moves to local authorities within two weeks. The National Residents registry list is the most credible and updated source of information about respondents. In some municipalities, that did not allow access to this list, even for research purposes, the list of voters was used. The list of voters is made based on the National Residents Registry. Thus, it provides updated and accurate information. If municipalities did not allow access to either one of the lists, the list of housing units developed by CRS was used. The list of housing units is regarded as relatively accurate as it has been maintained for almost 50 years and is regularly used for national samples. CRS is a private and the most experienced firm in Japan conducting longitudinal surveys. It was organized in 1954 and has over 600 trained interviewers who do more than 250 surveys with over 300,000 interviews per year. CRS employed 331-trained interviewers to conduct this survey under the direction of the NUJLSOA.

The sampling was done by first stratifying the 47 prefectures throughout Japan into 11 regions. About 3000 municipalities were then stratified by population size within regions and prefectures, and 340 primary sampling units (PSUs) were selected based on a systematic sampling method. In 298 primary sampling units, sample members were selected from the National Residents Registry of Japan. In another 41 units, sample members were selected from the list of voters, and in one unit, sample members were selected from the list of housing units developed by CRS. The population 75 and over was over-sampled by a factor of two in order to keep sufficient numbers of "older" elderly in the longitudinal survey of the elderly. From each of the 340 PSUs, six to eleven people aged 65 to 74 were selected and eight to twelve people aged 75 and over were selected. For more information, please go to NUJLSOA website at www.usc.edu/dept/gero/CBPH/nujlsoa/.

Mainly two methods were used to encourage participation. First, newspaper articles advertised the forthcoming survey as an important task of a major University research group whose findings would be relevant to older people's lives. Second, respondents to the NUJLSOA were given a small incentive worth about US$ 10; two New Year's cards plus two other greeting cards were sent, and a summary of the results from the first interview by CRS. The original sample list of the first interview selected 6,700 respondents in October, 1999: 2,922 were between the ages of 65-74 and 3,788 were age 75 and above. Of the original list of respondents, 4,640 (69.3 percent) responded to the first wave collected in November and early December, 1999. Three months later, additional attempts were made to interview 710

respondents who were either absent, institutionalized, or who did not strongly refuse to participate in the first interview. This added 357 respondents and brought the overall response rate to 73.6 percent. Out of the 357 respondents, 49 were institutionalized during the November interview, and they were given a shorter form of the interview in March to reduce the burden. Among 4997 respondents, 498 (10 percent) elderly were represented by proxy interviewers. Proxy interviewers were used in the case of hospitalization (2.2 percent), institutionalization (0.5 percent), hearing difficulties (2.2 percent), speaking difficulties (0.7 percent), memory loss (1.0 percent), dementia (0.9 percent), psychological disorder (0.2 percent), physical illness or disability (2.2 percent), and other reasons unrelated to health (1.3 percent).

The second wave data were collected in November and December, 2001. The weighted sample of 4044 participants in the second wave represented a retention rate of 80.3 percent from the first wave. Three hundred twenty-seven elderly had passed away, and the rest were lost-to-follow up. Of 4044 participants, 415 (10.3 percent) elderly were represented by proxy interviewers. Proxy interviewers were again used in the case of hospitalization (2.4 percent), institutionalization (0.7 percent), hearing difficulties (1.8 percent), speaking difficulties (0.2 percent), memory loss (0.9 percent), dementia (1.2 percent), psychological disorder (0.2 percent), physical illness or disability (1.7 percent), and other reasons unrelated to health (1.1 percent). Doubtless, the usage of proxy respondents was an important reason for acceptable response rates to both waves.

Measures

- ***Independent variables: Social Integration***

Various scholars use role-based integration measures to assess participation in different types of social relationships (Adelmann 1994a; Brissette, Cohen and Seeman 2000; Chrouser and Ryff 2006; Kikuzawa 2006; Moen et al. 1989, 1992; Wethington et al. 2000). In these studies, social integration is conceptualized as "the number of social roles (types of social relationships) for which respondents report active participation" (Brissette et al. 2000: 56). These social positions or statuses become "social roles" when they occur in a system of interaction (e.g. parent, grandparent, worker). A limitation of my data set is that I have only one indicator of direct social interaction: the satisfaction of contacts with children. Thus, I use the terms "social role" and "social position" interchangeably.

Moen et al. (1989) created a variable, ROLES, which consists of a sum of different roles occupied by respondents at the time of the first interview. They used six roles: worker, church member, friend, neighbor, relative, and club or organization member. In Wethington et al.'s (2000) conceptual model, social support was grouped into two levels by following the number of positions held in a close network (family and friends) and the number of positions held in a meso-network (institutional membership and participation). In Kitazawa's study (2006), six roles (spouse, parent, grandparent, worker, friend, and voluntary organization member) were included as a measurement of multiple roles. In my research, I measured social integration as sum of five roles: spouse, parent, grandparent, worker, and social activity memberships.

These roles were dummy coded 1 for those currently occupying a particular role and 0 otherwise. Thus, scores of multiple roles ranged from 0 to 5. This is my indicator of role diversity.

In addition, in this study, the number of each role (e.g. the number of sons, daughters, the number of social groups and activities participated) was analyzed. I classified these into three dimensions: (1) family membership, (2) community friendship, and (3) institutional memberships. Since I represent each dimension by the total number of roles held, each number represents role depth.

(1) Family Membership: Roles in family were measured by variables indicating marital status, the number of children, and the number of grandchildren. In the first wave, 63.5 percent (3171) of respondents were married, and respondents had an average of 1.15 sons and 1.13 daughters. Those with stepchildren averaged 1.85. Respondents had 3.77 grandchildren, on average. Nine respondents (less than one percent) did not provide information about the number of grandchildren. In this case, since the number of missing cases is very small, the mean number of grandchildren, 3.77, was substituted. This is a method used by statisticians to deal with small numbers of missing cases, to retain enough cases in conducting categorical analyses.

In addition, respondents were asked: "How many are there in your household, including yourself?" In both waves, there was an average of three people in the household of respondents. I used this as another indicator of depth in familial roles.

(2) Community Friendship: Roles in community friendships were measured as the number of social statuses or positions occupied in the following social groups and

social activities: (1) respect for the age association, (2) women's club, (3) senior citizen's club, (4) educational or study group, (5) town association, (6) volunteer work (public service activities), (7) hobby club, and (8) sports club. In the first wave, on average, respondents participated in one social group or social activity. Forty-two respondents (less than one percent) did not provide information about the number of social groups and activities in which they participated. Since the number of missing cases is small, I substituted the mean (1.08) for missing data.

(3) Institutional Membership: Roles in institutional memberships were measured as current employment status. The respondents were asked: "Are you currently working?" In this study, those who were working were scored (1), and those who were not working were scored (0). In the first wave, 1249 (25.0 percent) respondents were working.

- ***Measuring durations of marriage and work***

Previous studies of social integration have ignored how long an incumbent engaged in a particular role. In this study, two measures of duration, total employment duration measured in years and marital duration measured in months, were included in analyses because we do not know whether longer employment and marital duration enhance an individual's degree of social integration. Indeed, the length of time spent in a social role may be more health - protective than the total number of social statuses or positions occupied. Alternatively, the significance of being employed or married could depend only on the duration in which a respondent occupied the role of worker or spouse, respectively.

Total lifetime employment was measured in years in the questionnaire. Almost ten percent (477 respondents) of respondents to the first wave of the survey had never worked; they were scored zero. Almost five percent (241 respondents) did not provide information regarding the total years of duration, although they had worked. In such cases, the mean duration of total employment, 32.56 years, was substituted.

Marital duration was computed as follows. Currently married respondents were asked the month and the year they married the current spouse. Currently widowed and divorced respondents were asked about the month and the year their marriage ended. For married respondents, marital duration in months was computed by subtracting the year they were born from the year they got married, and multiplying the remainder by 12 in order to convert this measure into months. Then the month they were born was subtracted from the month they married, and the remainder was added to this measure in order to compute the total duration of marriage expressed in months. Of 3180 married respondents, about seven percent (237 respondents) did not provide the month they got married. Adopting the assumption frequently made in life table calculations, I assumed that they married in June (six months). Of 3180 married respondents, about 4 percent (140 respondents) did not provide the year they got married. In such cases, I used the average duration of marriage for married respondents, 555.03 months.

For divorced or widowed respondents, marital duration in months was computed by subtracting the year they married from the year their marriage ended by death or separation from their spouse. The remainder was multiplied by 12 in order to convert

this measure to months. Then the month they married was subtracted from the month they were separated from the spouse, and the difference was added to this measure to compute the total duration of the most recent marriage expressed in months. Of 1723 divorced or widowed respondents, about 15 percent (265 respondents) only provided the year they got married or were separated from their spouse. For those people, I added six months to the duration of marriage expressed in months, taking the mid-year. Of 1723 divorced or widowed respondents, about 17 percent (289 respondents) did not provide information about the year and the month they got married and separated from a spouse. In such cases, the mean duration of marriage for divorced and widowed respondents, 426.46 months, was used. For never-married respondents, marital duration was 0 month. On average, respondents were married for 500 months (41.67 years).

- ***Measuring the quality of the relationship with their children including stepchildren***

Previous studies of social integration and aging have ignored the quality of people's relationships. In this study, the quality of the relationship with children was included in analyses because the number of children may not be health-enhancing if communication with them is infrequent and the elderly are unhappy with it. Respondents were asked whether they were satisfied with the amount of contact with their children for each child. Scoring "1" for those satisfied with the amount of contact for each child, I added up these scores. Then the rate of satisfaction with their contact with children was computed by dividing this sum by the total number of

children. Thus, this measure ranged from 0 to 1, and those who did not have children automatically received "0" for this measure. The mean of this measure was .57.

- ***Dependent Variables: Health Measures***

Physical Health Measures (ADL, IADL): High physical-functional capacity is an essential component for successful aging (Fujiwara et al. 2003; Rogers, Hummer and Nam 2000; Rowe and Kahn 1997; Shibata, Sugisawa and Wataname 2001). To assess the physical functioning of individuals, Katz and his colleagues developed an Activity of Daily Living (ADL) measure (Rogers et al. 2000), which includes the following seven items of difficulty: (1) bathing or showering; (2) dressing; (3) eating; (4) standing up from a bed or chair/sitting down on a chair; (5) walking around the house; (6) going outside; and (7) toileting. These activities are essential to daily life. Lawton, Brody, and Fillenbaum developed an Instrumental ADL (IADL) scale, which reflects activities adopted to one's social environment and to sustain an independent life in a community (Shibata et al. 2001). In other words, IADLs assess more complicated activities than ADLs, but may not be required as frequently as ADLs (Rogers et al. 2000). IADLs include the following seven items of difficulty: (1) preparing meals; (2) leaving home to purchase necessary items or medications; (3) taking care of financial matters; (4) using the telephone; (5) dusting, cleaning, and other light housework; (6) taking the bus or train to leave home; and (7) taking medication as prescribed. I scored one for each activity and a maximum score of seven on any of these ADL or IADL scales denotes greatest functional disability. The value of Cronbach's alpha, a coefficient of reliability, among seven ADL items

in Wave 1 was .923, among seven IADL items in Wave 1 was .935, and among the combined 14 ADL and IADL items in Wave 1 was .960.

Generally, studies show that those with greater functional limitations will have a higher risk of earlier mortality than those with few functional limitations (Rogers et al. 2000). In fact, this U.S. study showed that, among younger adults, those with one or two ADL-IADL limitations were over 40 percent more likely to die younger, and those with three or more limitations were over twice as likely to die younger compared to those with no limitation (Rogers et al. 2000). In Japan, several studies show that disability at any level of functional capacity is likely to shorten life expectancy (Ishizaki 2004; Shibata et al. 2001). Shibata et al. (2001) carried out comprehensive studies on aging and problems in the aging society of Koganei City, a western suburb of Tokyo, from 1976 through 1991, and found that disability in both ADLs and IADLs increased the odds of death at a younger age. Thus, ADLs and IADLs are important measures assessing disabilities that lead to a higher risk of premature mortality. Following Smith and Kington (1997), I combined scores on these two measures to create a maximum score of 14.

In the first wave, 83.1 percent of respondents were independent in all ADL and IADL items, and 81.1 percent of respondents were independent in all ADL and IADL items in the second wave. The highly skewed distribution of these measures was due to the high percentages of respondents with no difficulty performing ADLs and IADLs; that also is found in other studies targeting the elderly population in the United States and in Japan (Fredman et al. 1999; Rogers et al. 2000; Schoeni et al.

2005; Shibata et al. 2001). I compared the separate scores on ADLs and IADLs and the composite score for each respondent at Wave 1 and Wave 2 by means of a paired t-test (Table 1). Table 1 shows that, on average, respondents had less than one disability out of 14 ADL and IADL items of difficulty at the time of the first wave, and they had one physical disability out of 14 ADL or IADL items at the time of the second wave. The statistical significance test showed that the changes in scores between the two waves were significant (Table 1). However, considerable numbers of non-responses were found in the ADL and IADL measures, greatly reducing the sample size in the paired sample t-test (Table 1). To preclude excluding these respondents from the analyses and to further detect characteristics of these respondents if they were significantly different from others, I combined the measures of ADL and IADL items and trichotomized them: (1) no disability, (2) at least one disability, and (3) no response.

To view changes between two waves, the combined measure of ADL and IADL items in both waves was categorized into five measures: (1) fewer physical disabilities than at Wave 1, (2) more physical disabilities than at Wave 1, (3) continue to have some physical disability, (4) continue to have no physical disability, and (5) missing cases.

Self-Rated Health: Self-rated health is another indicator associated with health. This measure has several benefits relative to others. The measure can capture an individual's experience of a full array of illness, even symptoms of undiagnosed disease; and it can represent a person's complex judgment of health over time more

reliably than a medical diagnosis by others (Idler and Benyamini 1997). Many studies have found a significant and independent effect of self-rated health on mortality (Idler and Benyamini 1997; Ishizaki, Kai and Imanaka 2006). For example, based on the sample of elderly in Saku City, Nagano prefecture, Japan, Ishizaki et al. (2006) found, during a six-year interval, that having poor self-rated health was a significant predictor of mortality.

Questions asking respondents to rate their health differ from study to study (Ishizaki et al. 2006). In the NUJLSOA survey, an interviewer asked a respondent, "In general, how would you describe your state of health?" Respondents rated their overall health using five categories: very healthy; healthier than average; average health; somewhat unhealthy; and very unhealthy. This measure was scored one to five (1= very healthy, 2 = healthier than average, 3= average, 4 = somewhat unhealthy, 5 = very unhealthy). Thus, a higher score indicates poorer self-assessed health. The paired samples t-tests based on the score ranged from "1" (very healthy) to "5" (very unhealthy). Changes in self-rated health between the first and the second wave showed that there were significant differences in scores (Table 1). In this study, I grouped these scores into three categories: (1) better than average; (2) average; and (3) below average. Less than one percent of these samples (47 respondents) did not provide answers, and they were excluded from the analysis.

To view changes in self-rated health, self-rated health measures in both waves were compared and further categorized into six groups: (1) Respondents continued to rate their health better than average; (2) respondents continued to rate their health

average; (3) respondents continued to rate their health below average; (4) respondents rated their health better in wave 2 than wave 1; (5) respondents rated their health worse in wave 2 than wave 1; and (6) missing cases.

Psychological Health (CES-D Scale): To assess psychological health, a 12-question version of the Centers for Epidemiologic Studies Depression (CES-D) scale was used. This measure was developed to tap levels of depressive symptomatology and was designed to measure multiple dimensions of affective symptomatology (Callahan and Wolinsky 1994; Takeshita et al. 2002). The CES-D scale usually contains four clusters of items: depressive affect symptoms ("felt depressed" "felt sad"), somatic symptoms ("trouble sleeping" "didn't have much appetite", "trouble feeling motivated", "ordinary things felt troublesome), interpersonal difficulties ("felt lonely", "felt people were unfriendly" "felt hated by others") and positive affect ("felt happy", "felt like smiling", "future seemed bright"). In this study, positive affect was excluded since previous studies suggest that it is not a well-grounded factor for measuring depression in Japan (Kikuzawa 2006; Krause and Liang 1992). The value of Cronbach's alpha among nine negative items of CES_D measures in Wave 1 was .789.

Items in CES-D measures were scaled following Takeshita et al. (2002). No point, i.e., zero, was given to those who answered "rarely," one point for those who answered "sometimes", and two points for those who answered "often". A high score on any of these indicators denotes a greater degree of depression. Scores ranged from a theoretical low of "0" to a theoretical high of "18." The average score of CES-D in

the first wave was 1.432, and 1.452 in the second wave. The paired samples t-tests comparing changes in CES-D measure between the first and the second wave showed that there were significant differences in scores (Table 1). However, a considerable number of non-responses were found in the CES-D measures, which greatly reduced the sample size in the paired sample t-test (Table 1). To preclude excluding these respondents from the analysis if they were significantly different from others, I trichotomized the psychological health measure: (1) zero symptoms of depression; (2) at least one symptom of depression; and (3) no response.

To view changes in depression scales between waves, the CES-D measures in both waves were compared and further categorized into five: (1) fewer symptoms of depression than Wave 1; (2) more symptoms of depression than Wave 1; (3) continue to have some symptoms of depression; (4) continue to have no symptoms of depression; and (5) missing cases.

- ***Control Variables***

The major control variables are age, sex, and residence. In addition, education and income were included as indicators of socioeconomic variables. Previous studies found that these variables have positive effects on health in Japan (Fukuda, Nakamura and Takano 2005; Takagi, Silverstein and Crimmins 2007). Hence, controlling for these effects refines the process of examining the relationship between social integration and the well-being of the elderly.

Age: Age was measured as a continuous variable. It ranged 65 years to 99 years in the first wave. In the first wave, the mean age was 73 years, which became 75 years in the second wave; it was conducted two years after the first wave in 1999.

Sex: The variable, sex, was dichotomized. Men were coded (1) and women were coded (0).

Residence (Rural vs. Urban): The residence measure was obtained in response to the following question: "What type of community do you currently live in?" Respondents answered whether they currently live in an urban area ("0") or a rural area ("1").

Education: The measure of education was obtained in response to the following question in the first wave. "What was the last educational level completed (includes withdrawal before completion)?" Seven choices were provided: 1= junior high school (through ninth grade and primary school in the former school system); 2= high school (through twelfth grade and junior high school, schools for girls, and teacher schools in the former school system); 3= vocational school; 4 = junior college (includes technical institutes); 5= university; 6 = graduate school; and 7 = other. Following Takagi et al. (2007), education was recoded on 4-point scale: (1) junior high school; (2) high school; (3) vocational school or junior college; and (4) 4 year university or graduate school.

Income: Toward the end of the survey, respondents were asked: "Approximately how much do you and your spouse receive as income annually including bonuses before taxes?" Respondents chose their income from the following ordered

categories: (1) less than 500,000 yen; (2) 500,000 yen to 1 million; (3) 1 million to 1.5 million; (4) 1.5 million to 2 million; (5) 2 to 3 million; (6) 3 to 4 million; (7) 4 to 5 million; (8) 5 to 6 million; (9) 6 to 8 million; (10) 8 to 10 million; (11) 10 to 12 million; (12) 12 to 15 million; and (13) more than 15 million.

Statistical Procedures

Looking at descriptive statistics, I saw substantial numbers of "no response" (NA) and "do not know" (DK) in the health measures, especially for the second wave due to death and loss to follow-up. In addition, since proxy respondents did not provide answers for psychological health measures (CES scales), this resulted in a substantial number of non-responses in both waves. To preclude excluding these populations from the analyses, and to examine the relationship between multiple roles and health, multinominal logistic regression was selected to examine the three research questions. It allowed me to use "no valid response" as one response category.

Multinominal logistic regression is the extension of the logistic regression when dependent variables are categorical, but not restricted to being dichotomous. For example, instead of predicting dichotomous outcomes such as being disabled and non-disabled, I used three outcomes for the first wave: disabled, non-disabled, and non-response. As discussed above, I used three categories to measure depression at Wave 1, and five categories to measure changes in depression between 1999 and 2001. Similarly, I used three categories to score self-rated health in 1999 and five to score changes in this variable between the waves. For a comprehensive discussion of

the statistical theory undergirding the multinomial logistic regression and for examples of its application, the reader is referred to Agresti (1996) and Garson (2006).

In this chapter, I explained my research methodology, explaining the data set, measurements, and statistical methodology to answer three research questions raised in the previous chapter. In the next chapter, I present the findings for my first and second research questions.

CHAPTER 5

RESULT (1)

Cross-Sectional Analyses of the First Wave– Research Questions 1 and 2

This chapter reports findings from cross-sectional analyses of the first wave of the Nihon University Japanese Longitudinal Survey of Aging (NUJLSOA). The first two research questions I raised in the third chapter are discussed. For each research question, I looked at three health outcomes: physical health, self-assessed health, and psychological health. In addition, for each research question, controlling for such other variables as socioeconomic indicators, I sought to ascertain whether age, gender, and residence affected the relationship between social integration and the health of the elderly.

Multinomial logistic regression analyses were used to analyze the NUJLSOA data set because there were considerable numbers of missing cases due to "No Answer" (NA) and "Don't Know" (DK) responses on ADL, IADL, and depression scales. This statistical method allows me to include NA/DK responses into analyses, and that avoids introducing the biases of selectivity that might arise if those without valid responses differ systematically from those with valid responses.

Table 2 is illustrative. There we see that the addition of each role in the multiple-role variable reduced the odds of providing NA/DK responses on ADL or IADL scales rather than answering they had no physical disability by 15.7 percent (OR = .843, $p<.01$). Selection may be at work; those who are disability-free may be selected

into more social activities that broaden their number of roles and make them more conscious of their disability-free status (thus less likely to reply "Don't Know"). Since women had three times the risk of men to give invalid replies to items on the ADL or IADL scales rather than to report no disability, it is possible that women were more challenged in finding time to complete the survey questions on this section. Thus my study sample would have disproportionately omitted women rather than men if I had chosen a statistical method forcing me to discard cases with NA/DK replies to items on the disability scale. In the tables that follow, I report the odds ratios and standard errors for the NA/DK response; but for the purpose of parsimony, I discuss only the portions of the tables that provide answers to my research questions.

Research Question 1

Research Question 1: Did the elderly who had more roles have greater odds of being healthy (fewer physical and mental problems) than those who had fewer roles at the first interview? How did gender, age, and residence (rural vs. urban) influence the well-being of the elderly, controlling for the effects of other variables including a multiple roles variable and socioeconomic variables?

- **1 – A: Physical Disability (Table 2)**

Table 2 summarizes the results of a multinomial logistic regression that compares respondents in three response categories: (1) those with one or more physical disabilities on ADL or IADL scales; (2) respondents with at least one of the answers

on ADL or IADL scales missing; and (3) respondents with no physical disability on ADL and IADL scales. The last category is treated as the reference category.

As expected, Table 2 showed that controlling for the effects of other variables, the addition of each role membership counted in a multiple roles variable reduced the odds of worsening physical disability by 45.4 percent (OR = .546, $p < .001$). Holding the effect of other variables constant, the elderly who occupied diverse roles had a lower risk of physical disabilities than those who had fewer roles. This result implies that a positive effect of the multiple roles variable on physical health is significant at any age in the later life course, and it is significant regardless of gender and residence. This result supports the role enhancement perspective which argues that holding multiple roles leads to better physical well-being of the elderly and refutes the notion that multiple roles strain older people and cause deterioration in their health.

Every additional member living in the same household increased the odds of physical disability by 8.2 percent (OR= 1.082, $p<.01$). Brown et al. (2002) reported, based on their research of the elderly in Japan, that physical and mental conditions were measures of transitions in living arrangement. In other words, poor physical health triggers the creation of *Daikazoku*, a large extended family tied together through blood relationships, marriage, or adoption. Influenced by the *ie* tradition, dramatized by the media, the word often accompanies the nostalgic image that the elderly are respected and traditional values are passed down from generation to generation – virtues that the nuclear family does not offer. My findings support

Brown et al. (2002) and suggest that physical disabilities propel elderly people into living arrangements with several other relatives who can provide assistance rather than the traditional continuation of *Daikazoku* over generations.

In addition, every month of increase in marital duration slightly increased the odds of physical disability (OR = 1.001, p<.001), and each additional year of age increased the odds of physical disability by 11 percent (OR = 1.110, p<.001). Umberson et al. (2005) claimed that marital duration presumes that change in marital quality occurs because of increasing time spent married, possibly due to boredom or diminished compatibility. Thus, a longer marital duration may indicate poorer marital quality rather than cumulated emotional support ("*Aun no kokyū*" i.e. a highly communicative relationship developed over time as if two of married people were melted into one). However, since the net effects of age and marital duration are difficult to separate, the negative effect of marital duration could mean that older elderly are more likely to have physical disabilities than younger elderly. Failure to include variables measuring marital quality prevent investigation of how marital quality and marital duration influence physical disability of the elderly in Japan. This question must await future research.

As expected, Table 2 shows that, controlling for other variables, each higher level of education reduced the odds of disability by 19 percent (OR = .81, p< .01). This supports previous studies that showed a positive association between education and health (Ross and Wu 1995). The result suggests that the well educated are more likely to avoid disability than the less educated.

Finally, Table 2 shows that, compared to rural residents, urban residents were 28.5 percent less likely to have any disability (OR = .715, $p<.01$) rather than no disability. This result supports the findings of Ogawa (2004) who used the same data set but different statistical techniques to analyze rural-urban differentials in health conditions. Ogawa (2004) found that the rural elderly lived longer than the urban elderly, but the urban elderly enjoyed a longer duration of being free from physical disabilities than the rural elderly. In Japan, the urban elderly are more likely to be influenced by institutional factors such as retirement age because they are more likely to be in a highly organized labor market than are rural elderly (Ogawa 2004). In other words, the urban elderly are more likely to retire before their health deteriorates and may have more time to detect and recover from their health problems in early stages by going to see doctors than do the rural elderly. The reason could also be differences in the types of jobs the elderly hold in rural areas versus urban areas, since descriptive statistics showed that the rural elderly were more likely to be involved in jobs related to agriculture, forestry, or fishing than the urban elderly. These jobs not only encourage the rural elderly to work until their health deteriorates, but also may increase their risk of musculoskeletal injuries.

Japan began a universal health insurance system and the distribution of pensions beginning in April 1961, thus all Japanese citizens receive pensions. There are three types of pensions: (1) national pension (*kokumin nenkin*) for the self-employed; (2) employee pensions (*kosei nenkin*) for salaried persons; and (3) mutual aid pensions (*kyosai nenkin*) for civil servants (Ministry of Foreign Affairs 2007). A two-tier

pension system was established beginning in 1986 and the entire population is eligible to receive a national pension, to which employees' pensions and mutual aid pensions are added for people who are eligible (Ministry of Foreign Affairs 2007). Therefore, not only because the urban elderly are more likely to belong to a highly organized labor market, but also because they are more likely to receive second-tier payments, they are more likely to retire early, before their health conditions deteriorate, than are rural elderly.

Therefore, answering the first research question, the elderly who had more roles had greater odds of being physically healthy than those who had fewer roles at the time of the first interview. Both age and residence influenced the well-being of the elderly, controlling for the effects of other variables including a multiple roles variable and socioeconomic variables. Gender, however, did not show any significant effect on physical disability of the Japanese elderly (Table 2).

- **1 – B: Self-Assessed Health (Table 3)**

Table 3 summarizes the results of a multinomial logistic regression on self-rated health. It compares respondents who rated their health "better than average", respondents who rated their health "worse than average", and respondents who rated their health "average". The last group is treated as the reference category. For self-rated health outcomes, only .9 percent (47 respondents) provided NA/DK responses. Thus these respondents were excluded from the analyses.

Ceteris paribus, the addition of each role membership counted in the multiple roles variable increased the odds of rating one's health "better than average" rather

than "average" by 16.6 percent (OR = 1.166, p<.01). Moreover, the addition of each role membership counted in the multiple roles variable reduced the odds of people rating their health "worse than average" rater than "average" by 30.3 percent (OR = .697, p<.001). These results indicate that, occupying multiple roles not only increased the likelihood of people rating their health "better than average", but it also reduced the likelihood of people rating their health "worse than average". Such a positive effect of multiple roles on self-rated health was significant at any age in the later life course and it was significant regardless of gender and residence. Therefore, the findings support the role enhancement perspective and refute the roles strain perspective. Holding multiple roles leads to better self-rated health by the elderly, as well as to less disability of the elderly.

Ceteris paribus, every month of marital duration slightly lowered the odds of people rating their health "better than average" rather than "average" (OR = .999, p<.01) and raised the odds of rating their health "worse than average" rather than "average" (OR = 1.001, p<.05). As expected, each additional year of age reduced the odds of individuals rating their health "better than average" rather than "average" by 2.1 percent (OR = .979, p<.01), and increased the odds of rating their health "worse than average" rather than "average" by 1.3 percent (OR = 1.013, p<.05). Similar effects of age and marital duration were also found for physical disability (Table 2). Since age and marital duration are two different ways of measuring physiological aging, these outcomes are not surprising. Apparently, however, a long marriage, per se, is not a good solid indicator to measure marital satisfaction. Future studies need

to include variables that measure marital quality in order to look at the relationships among marital quality, marital duration, and the well-being of the elderly over the life course.

While education was unrelated to self-related health, income was related. A higher level of income increased the odds of rating one's health "better than average" rather than "average" by 4.2 percent (OR = 1.042, $p < .05$) and reduced the odds of people rating their health "worse than average" rather than "average" by 5.1 percent (OR = .949, $p < .05$). These results indicate that, although the positive effect of the multiple-roles variable on self-rated health was stronger than that of income, the latter variable played an important role in providing greater resources and financial security in the later life course and boosted the self-assessed health of the elderly. Contrary to my expectations, neither being a rural resident nor a woman improved one's perception of being healthy. Since self-rated health requires an evaluation of both physical and mental well-being, it is possible that greater access to incomes for elderly urban women advantaged them over their rural counterparts.

- **1 – C: Psychological Health (Table 4)**

Table 4 reports the multinomial logistic regression of predictor variables upon the depression scale scores, an indicator of psychological health. Ceteris paribus, for every social-role membership, the odds of having any symptom of depression fell 11.1 percent (OR = .889, $p < .001$) below that of having no symptoms. Therefore, the result supports the role enhancement perspective that multiple roles lead to a greater level of subjective health of the elderly. This result, consistent with those for

physical disability (Table 2) and self-rated health (Table 3), provides strong evidence that having multiple social roles promotes the health of elderly Japanese along several dimensions of health and refutes the notion that multiple roles strain older people and cause deterioration in their health.

The longer the marital duration, the greater the odds of having some symptom of depression rather than no symptoms (OR = 1.001, $p < .05$). This unfavorable effect of marital duration was also found for physical disability (Table 2) and self-rated health (Table 3). A further investigation using a different data set that includes rich information about marital quality is needed to further examine why longer marital duration negatively influences the well-being of the elderly. It could be due to boredom or due to the positive association between age and the duration of marriage.

The number of people living with the respondent reduced the latter's risk of reporting at least one depressive symptom rather than no symptoms (OR = .92, $p<.001$). This result indicates that, although physical disability increases the chance that the elderly will live with other family members (Table 2), the elderly are less likely to suffer depression in this context. This result indicates that living with other family members prevents social isolation and boosts the spirits of disabled older Japanese people.

As expected, Table 4 shows that each higher income level reduced the odds of having some symptoms of depression by 6.9 percent (OR = .931, $p <.001$). Similarly, a salutary effect of income on self-rated health was reported in Table 3. It appears

that a higher income provides financial security, which in turn positively influences health outcomes.

In contrast to its relationships to physical health outcomes (Table 2) and self-rated health outcomes (Table 3), gender showed significant effects on psychological health outcomes. To wit, women were 23.9 percent less likely than men to have any symptoms of depression (OR = .761, $p < .01$) rather than none. This finding supports those of previous studies on aging and the family which found that women, but not men, are better at maintaining and extending social networks (Antonucci and Akiyama 1995). Thus, women are less likely than men to feel isolated in the later life course. This finding also refutes Durkheim's gendered assumption that women are less involved in public life than men and thus less likely to obtain either the benefits or the costs of that involvement. The result from this study also reflects the fact that women tend to apply for and receive more social supports from the government and their relatives than men do in Japan (Ikeda et al. 2007). A socially constructed and gendered life course seems to protect the mental health of the female elderly more than the male elderly in Japan.

Finally, urban residence had adverse effects on psychological health outcomes (Table 4). Compared with the rural elderly, the urban elderly were 28.9 percent more likely to have some symptoms of depression (OR = 1.289, $p<.001$) rather than no symptoms. This result supports the finding of Fukuda et al. (2005) that urban residence offers a less supportive network than rural residence in Japan. Perhaps rural people are more willing to become familiar and helpful neighbors. That would

help rural elderly avoid social isolation and reduce stress in their daily lives. Another reason would be that intergenerational households are more common in the more traditional and less developed areas of Japan. Thus, the rural elderly are more likely to be in contexts where they can gain a variety of social statuses or positions within and beyond the family than the urban elderly.

Research Question 2

Research Question 2: Did particular roles have a greater effect on health? Did the number of particular roles matter? How did gender, age, and residence (rural vs. urban) influence the well-being of the elderly, ceteris paribus?

To answer the second research question, rather than including one variable that measured the effect of multiple roles, I included individual roles in the analyses. This way, I could analyze whether holding a greater number of the same social position (e.g. parent to a larger number of sons) matters in the degree of social integration and influences the well-being of the elderly. For example, instead of including dummy variables showing whether the respondent was a parent or grandparent, I included the number of sons, daughters, stepchildren, and grandchildren a person had as separate predictors of the health measures. In addition, each analysis was divided into four models (See Tables 5-A, 5-B, 6-A, 6-B, 7-A, and 7-B). The first model includes two categorical variables (marital status, work status); the second model adds residence (rural vs. urban); the third model adds gender to Model 1; and in the fourth model, both residence and gender were added to Model 1. A weakness of multinomial

logistic regression is that cells in the crosstab that look at the relationship between categorical independent variables and a categorical dependent variable should not be small. Since the last model includes all of four categorical variables, one or two cells were not zero cells, but contained fewer cases than five, as indicated in notes to Table 5-A, Table 5-B, Table 7-A, and Table 7-B. Therefore, categorical variables were not entered all at once, but were entered one-by-one into analyses.

- **2 – A: Physical Disability (Table 5-A)**

Compared to respondents who were working at the time of the interview, respondents who were not working had three times the odds of having at least one disability on ADL or IADL scales rather than no physical disability (OR = 3.0, $p<.001$; Table 5-A). Controlling for other variables, additional participation in social activities and social groups reduced the risk of physical disability by 50 percent (OR = .5, $p<.001$). This result is consistent with that of a U.S. study which found that being a member of a social group or organization appeared to be especially salutary (Moen et al. 1992). These results imply that having extrafamial roles is important. Perhaps healthy elderly people are more likely to remain in the labor force and to participate in more social activities and social groups than are unhealthy people. As Moen et al. (1992) claim, the pathways to successful aging appear to be a cumulative process which reflects choices and experiences throughout early and middle adulthood.

Unexpectedly, the data in Table 5–A showed that having more daughters (not sons) increased the risk of physical disability by 16 percent (OR = 1.16, $p<.05$).

However, I argue that this result may reflect a statistical interaction between the number of daughters and rural residence. For example, running the independent sample t-tests among respondents who have at least one child, I found no significant difference in the average number of children between those who had daughters only and sons only (1.91 daughters for respondents with no sons vs. 1.82 sons for respondents with no daughters). Restricting the analysis to urban residents, there was also no significant difference between the two groups (1.85 daughters vs. 1.77 sons). However, restricting the analysis to rural residents, there was a significant difference between the two groups (2.10 daughters vs. 1.88 sons), which implies that rural respondents had a longer childbearing period than urban respondents. The older the age at childbirth, the more likely the child is to be a daughter (Shryock and Siegel 1976). Thus, the total number of daughters may be a proxy for late childbearing and the social disadvantages that may be associated with it in rural areas. Further studies looking at rural-urban differentials in birth intervals are necessary to examine the possibility of biological factors.

Another possible interpretation of the association between residence, the number of own daughters, and physical health is that, reflecting the *ie* system, the daughter is the one who will leave her *ie* and become a member of her husband's *ie*. Because of such a patriarchal tradition persistently influencing Japanese society, parents of daughters are often cautious not to let their own daughters feel embarrassed in the new *ie* and to be welcomed in the new *ie*. For example, parents of daughters often buy furniture and formal clothes for their daughters when they get married. In

various regions, parents of daughters prepare for a traditional festival of their grandchildren by purchasing dolls and kimonos. In Japan, parents of daughters take care of them when they give birth. Daughters spend a month at their parents' house before and after they give birth. Since sons tend to remain a member of the original *ie*, parents of sons may not need to worry about such a matter. A very popular Japanese television family drama called, *Watarusekenwa oni bakari*, is a story of elderly parents worrying about their five daughters in their new *ie* and supporting them by listening to their daughters conflicts and soothing them. Such worries often caused the old parents depression and physical tiredness. This result opens doors for future studies since many studies have until now focused on the tension between a mother-in-law and a daughter-in-law but have ignored the relationship between the number of daughters (not daughters-in-law) and the health status of the elderly. Especially needed are qualitative studies that look at the quality of the relationship between elderly parents and the sex of children to find how the number of sons or of daughters benefits or disadvantages the well-being of the elderly.

Greater satisfaction with the level of contact with their children, including stepchildren, reduced the risk of physical disability by 50 percent (OR = .50, $p<.001$) relative to reporting no disability. On the other hand, having a greater number of members living in the same household did not show a significant effect on the physical well-being of the elderly (Table 5-A). Descriptive statistics showed that the association between respondents' satisfaction with the level of contact with their children and the number of household members was significant but negative

(Pearson's R = -.294). This indicates that the positive effect of the level of contact with their children on the health of the elderly is not due to living with more people in the same household. Living with more people could cause a financial burden, whereas being satisfied with the amount of the contact with children positively influences health outcomes regardless of coresidence. In addition, having a greater number of sons and stepchildren did not show a significant effect on the physical well-being of the elderly (Table 5-A). Therefore, looking at individual roles, and controlling for the effects of other variables, I find that the quality of the relationship with children is more important to maintaining the physical well-being of the elderly in the later life course than how many children they have and how many people are living in the same household.

Looking at other variables, the data in Table 4-A showed that additional age measured in years increased the odds of physical disability by 11 percent (OR = 1.11, $p<.001$) and a higher education level reduced the odds of physical disability by 15 percent (OR = .85, $p<.05$). These results indicate that the chance of morbidity increased as one became older. However, this probability was reduced or postponed if one had a higher level of education. As previous studies claim, education positively influences health outcomes by increasing knowledge to avoid unhealthy behaviors and to live healthy lifestyles.

- **2 – B : Self-Rated Health (Table 6-A, Table 6-B)**

Table 6-A and Table 6-B summarizes the result of the multinomial logistic regression on self-rated health. Table 6-A compared respondents who rated their

health "better than average" to respondents who rated their health "average" (the reference group). Table 6-B compares respondents who rated their health "worse than average" and those who rated their health "average", the reference group.

Table 6-A and Table 6–B show that, among five roles (spouse, parent, grandparent, worker, social activity member), only two variables - work status and the number of social activities and social groups - were significant. Table 6-A shows that, controlling for the effect of other variables, compared to respondents who were working at the time of the interview, respondents who were not working were about 35 percent less likely to rate their health "better than average" rather than "average"(OR = .65, $p<.001$). Table 6-B shows that, holding other variables constant, compared to respondents who were working at the time of the first wave of interviews, respondents who were not working had 2.3 times the same odds of rating their health "worse than average" rather than "average" (OR = 2.3, $p<.001$). Table 6–A shows that additional participation in social activities and social groups greatly increased the odds of rating their health "better than average" rather than "average" by 11 percent (OR = 1.113, $p<.001$). Table 6–B shows that additional participation in social activities and social groups reduced the odds of people rating their health "worse than average" rather than "average" by 23 percent (OR = .77, $p<.001$). Similar results were also found for physical disability outcomes (Table 5-A). Therefore, holding other variables constant, not only engaging in work roles but also engaging in diverse community roles beyond the family are important for the elderly

to rate their health "better than average" and to avoid rating it "worse than average" rather than "average".

Table 6-B shows that a greater level of satisfaction with the amount of contact with children, including stepchildren, reduced the odds of rating one's health "worse than average" rather than "average" by 32 percent (OR = .68, $p<.01$). Moreover, Table 6-B shows each additional member living in the same household reduced the odds of rating one's health "worse than average" rather than "average" by 4 percent (OR = .96, $p<.01$). These results indicate that, living with more family members and having good relationships with children are important factors that prevent the elderly from rating their health "worse than average". Therefore, these results suggest that, not only holding individual roles beyond family membership, but also maintaining frequent and satisfactory family relations contributed to better self-rated health by the elderly than by those holding fewer individual roles beyond family membership.

As expected, Table 6-A shows that age had a significant effect on self-rated health. Controlling for the effect of other variables, each additional year in age reduced the odds of rating one's health "better than average" rather than "average" by 2 percent (OR = .976, $p<.01$). Because Table 5-A shows a negative effect of age on physical disability of the elderly, it seems that the chance of rating oneself above average in health and disability-free declines with advancing age, possibility due to the biological consequences of aging.

As expected, Table 6-B shows that income had a significant effect on self-rated health. A higher level of income reduced the odds of rating one's health "worse than

average" over "average" by 4.1 percent (OR = .959, p<.05). This result indicates that financial resources may be used to postpone physical deterioration due to aging.

Finally, Table 6-A shows that, compared to male elderly respondents, female elderly respondents were about 24 percent more likely to rate their health "better than average" rather than "average" (OR = 1.24, p<.05). This result reflects the fact that women tend to receive more social support from the government and their relatives than men do in Japan (Ikeda et al. 2007). In other words, gendered later life course benefits women more than men in Japan, which may contribute to the longer life expectancy of women in Japan.

Although rural people were more likely than urbanites to report being disabled rather than disability-free (Table 2), rural people did not differ from urbanites in self-rated health. Since self-assessed health reflects both physical and psychological health conditions, the negative effect of rural context on physical well-being and the positive effect of rural context on mental health may cancel the total effect of rurality on self-rated health.

- **3 – A: Psychological Health (Table 7-A)**

I shall now interpret the results in the multinomial logistic regression comparing the odds of reporting any symptoms of depression to people reporting that they have no symptoms, the reference category (Table 7-A). Among five roles (spouse, parent, grandparent, worker, and social activity member), two variables – spouse and worker status – showed a significant effect and in the direction I expected. Table 7-A shows, controlling for the effect of other variables, compared to married respondents,

respondents who were not married (divorced, widowed, never-married) were about 50 percent more likely to have at least one symptom of depression rather than no symptoms (OR = 1.5, $p<.001$). Compared to respondents who were working at the time of the interview, respondents who were not working were about 35 percent more likely to have at least one symptom of depression rather than no symptom (OR = 1.35, $p<.01$). In contrast to physical health and self-rated health outcomes (Table 5-A and Table 6-A), greater participation in community activities and social groups did not have a significant positive effect on depression. This result indicates that having a spouse and a job were important in being physically and mentally healthy, perhaps through reducing social isolation.

As expected, a higher level of income reduced the risk of depression by five percent (OR = .95, $p<.01$; Table 7-A). On the other hand, a higher level of education increased the risk of depression by 11 percent (OR = 1.11, $p<.05$; Table 7-A). Compared with Table 5-A, education had a positive influence on physical well-being on the elderly, but it had a negative effect on psychological well-being of the elderly (Table 7-A). These results suggest that, socioeconomic variables have more complex effects on the well-being of the elderly than I expected. The possible interpretation is that higher education increases the experience of felt responsibilities and burdens of the added number of social roles characteristic of better educated people in Japan.

Each additional member living in the same household reduced the odds of depression by nine percent (Table 7-A). Compared to rural respondents, urban respondents were about 30 percent more likely to have at least one symptom of

depression rather than no symptom (OR =1.302, p<.001; Table 7-A). These results suggest that socially isolated elderly in the household and in the community were more likely to feel depressed than the elderly surrounded by more people they knew in the household and in the community.

Finally, a longer duration of marriage increased the odds of depression by 0.1 percent (OR = 1.001, p<.001; Table 7-A). Since variables regarding marital quality were not included in this data set, my ability to investigate further how marital duration is related to marital quality is limited. However, it is interesting to notice that being married lowered the odds of having some symptoms of depression rather than no symptom whereas being married longer slightly increased the odds of having some symptoms of depression rather than having no symptom. It is possible that longer marriage increased boredom with the spouse. Although the focus on this research is to look at effects of multiple roles on health, the exclusion of variables measuring marital quality is a limitation of this data set.

Summary

Cross-sectional analyses of the first wave of the NUJLSOA supported the role enhancement perspective, but not the role strain perspective. The answer to the first research question is, the elderly who had more roles measured by a multiple-role variable had a greater likelihood to be healthy than those who had few roles at the time of the first interview. As previous studies of the role enhancement perspective suggest, engaging in diverse roles is associated with higher levels of physical and

emotional health because the accumulation of social identities or roles benefits individuals.

Controlling for other variables including a multiple roles variable and socioeconomic variables, residence had a significant effect on physical and psychological health, but not on self-rated health. It is interesting to notice that urban residence reduced the risk of physical disability whereas it increased the risk of depression. Controlling for other variables, age had a significant negative effect on physical health and self-rated health, but not on psychological health. Controlling for other variables, gender only had a significant effect on psychological health. Therefore, age, gender, and residence all had significant effects on health outcomes controlling for the effect of other variables including a multiple role variable and socioeconomic variables. However, how these three variables influenced the health outcomes was more complicated than previously studied.

Looking at individual roles, I see that not all individual roles had a significant influence on health. Although diversity of roles contributed to making the elderly feel more valuable and secure, role density – having more sons, daughters, stepchildren, and grandchildren – did not positively influence the well-being of the elderly. This result suggests that, as the role enhancement perspective emphasizes, holding diverse roles benefits the health of individuals by enhancing individual resources, social connections, prestige, emotional gratification, and social identity (Barnett and Marshall 2001; Chrouser and Ryff 2006). In terms of participation in social groups and social activities, role density had a significant positive influence on

physical health and self-assessed health outcomes, but did not have a similar effect on psychological health outcomes. These results suggest that, rather than role depth, role breadth is more important for the elderly in Japan. For reasons that deserve exploration in future research, such breadth provides them with a greater support network, even if their relationships become stressful (Chrouser and Ryff 2006; Kikuzawa 2000).

CHAPTER 6

RESULT (2)

Longitudinal Analyses of NUJLSOA Data Set – Research Question 3

This chapter analyzes the data to provide an answer to my third research question by looking at changes in health conditions between the first wave and the second wave of the Nihon University Japanese Longitudinal Survey of Aging (NUJLSOA) data set. First, the effects of independent variables including a multiple-roles variable, age, gender, residence, and socioeconomic status on changes in three types of health outcomes – physical health, self-rated health, and psychological health – were analyzed. For statistical analyses, multinomial logistic regressions were used because there were sizable numbers of missing cases due to "No Answer" (NA) and "Don't Know" (DK) responses on health outcomes, death, or the inability to locate the respondents at the second wave.

Table 8 is illustrative. There we see that respondents for whom I could not calculate a disability score at Wave 2 differed from those who were disability-free at the time of both waves: the former were more than twice as likely to be women. Perhaps because men have an earlier average age at death than women, men may be more likely to avoid answering "don't know" to questions on disability. Since women had 2.3 times the risk of men not to have valid replies to items on the ADL or IADL scales rather than to report freedom from disability at the time of both Waves, my study sample would have disproportionately omitted women rather than

men if I had chosen a statistical method forcing me to discard cases with NA/DK replies. Therefore, the results of this chapter not only contribute to our understanding of social integration and health over time, but also minimize the biases that would beset my conclusions because of sample attrition. The longitudinal analyses below are initial steps to understand how social integration might retard age-related declines in health among elderly Japanese. In the tables that follow, I report the odds ratios and standard errors for the NA/DK response; but in the interest of parsimony, I discuss only the portions of the tables that provide answers to my third set of research questions.

The limitation of the multinomial logistic regressions is that it requires having at least five observations in each cell of the cross-tabulations among categorical dependent and independent variables. Five is a rule of thumb often used to validate cross-tabulation analyses. I collapsed categories of independent and dependent variables as necessary to assure a large enough number of cases in each cell to produce statistical power. However, there are some subcategories of change in health conditions that have fewer than five observations due to the short time interval (two years) between the waves. Future waves will increase the duration of observation since Wave 1 and remedy the problem of sparse observations in a few cells. Until future waves become available in the public domain, I present what we can learn from Wave 2.

Research Question 3

Research Question 3: Did the elderly, who had diverse roles at the first interview, have a greater likelihood to remain healthy at the second interview? Controlling for the effect of other variables, including a multiple roles variable and socioeconomic variables, did age, gender, and residence influence health outcomes?

- **3 – A: Physical Disability (Table 8)**

Table 8 presents the result of the multinomial logistic regression, examining the factors that change the odds that a respondent will transition from having at least one disability to freedom from disability at Wave 2 [first three columns; being disability-free to disabled at Wave 2 (cols. 4-6); from having some disability at the time of both waves (cols. 7-9); and from having incalculable disability due to missing data at one or both waves (cols. 10-12); versus being disability-free at the time of both waves (the reference group)].

Greater integration, conceptualized as social positions in a system of interaction and measured as a sum of five roles (spouse, parent, grandparent, worker, and voluntary organization member), contributed to the maintenance of better physical health. Each role occupied in a different category of social-group membership had no effect on the reduction of disability between the waves (OR = .793, not significant). Yet, the addition of every role membership, i.e., increasing role diversity, reduced the odds of the onset of physical disability by the second wave rather than maintaining no physical disability at both waves by 17.9 percent (OR = .821, $p<.05$). Ceteris paribus, each role membership at Wave 1 reduced the risk of continuing to

have some physical disability at both waves rather than none at both waves by 51.1 percent (OR = .489, p<.001). These results support the role enhancement perspective and the life course perspective that occupancy of diverse roles (role breadth) delays the odds of physical disability. Holding diverse roles not only enables the elderly to be healthy, but enables the elderly to be continuously healthy. These results mean that the answer to Research Question 3 is affirmative.

Looking at other variables, age showed a significant effect on the maintenance or change in physical health outcomes. Table 8 shows that, controlling for other variables, the older respondents were, the more likely they were to have some physical disability at the second wave rather than to have no physical disability at the time of both waves (OR = 1.107, p<.001). Controlling for other variables, the older the respondents were, the more likely they were to have some physical disability over time rather than to have no physical disability over time (OR = 1.127, p<.001). Table 8 also shows that, controlling for the effect of other variables, additional age measured in years increased the odds of going from disabled to disability-free between the first and the second wave (OR = 1.059, p<.01). This result indicates that, even among elderly people, recovery from disability is possible and is likely a reason why Japan is the most long-lived society in the world. This result refutes the stereotypical simple assumption that age increases morbidity.

Table 8 shows that a higher level of education reduced the risk of progressing from being disability-free at Wave 1 to having some disability at Wave 2 rather than remaining disability-free (OR = .751, p<.05). Table 8 also shows that a higher level

of education reduced the risk of recovering completely from disability rather than having no physical disability at both waves (OR = .618, $p<.01$). These results indicate that, a higher education level contributed to a person remaining physically healthy over time, but it also reduced the risk of having physical disability at the time of the second wave. Education enables one to acquire, understand, and act upon health-related information.

Another socioeconomic variable, income, also showed a significant effect on physical health outcome. Table 8 shows that, controlling for other variables, a higher income level reduced the risk of having some physical disability rather than having no physical disability by 8 percent (OR = .917, $p<.05$). As expected, socioeconomic variables positively contributed to the maintenance or improvement of physical well-being of the elderly in Japan.

A greater satisfaction with the level of contact with children, including stepchildren, also positively contributed to the physical well-being of the elderly over time. A higher level of satisfaction with the frequency of contact with children reduced the odds of progressing from a disability-free to a disabled status rather than staying disability-free at the time of both waves by 37.1 percent (OR = .629, $p<.05$). However, a longer duration of marriage slightly increased the odds of having some physical disability rather than having no disability over time (OR = 1.001, $p<.01$). Longer marriage could induce either boredom or happiness; thus additional variables are required to examine the relationship between marital quality and health conditions over time. Finally, duration of working was unrelated to changes in health

between the waves. This result suggests that holding diverse social roles is more important than holding one social position for a longer period of time.

Compared with rural residence, urban residence reduced the odds of increasing physical disability at the second wave rather than having no physical disability at the time of both waves by 28.1 percent (OR = .719, $p<.05$; Table 8). In other words, the urban elderly were more likely to remain healthy over time than were the rural elderly. This result is consistent with the cross-sectional result which showed that urban residents were less likely to have physical disability compared to rural residents. The reasons for this finding include differences in types of jobs and pension systems between rural areas and urban areas. Living in urban areas may allow the elderly to have more access to formal health-care services that can retard progression into disability. Recently, an article appeared in the New York Times which indicated that urban centers like Tokyo are thriving, whereas rural regions are experiencing empty downtowns and factories due to a changing economic environment such as globalization of the market and the government's deep cuts in public work projects to liberate the private sector and shrink the government (Fackler 2007). Depopulation in rural areas has caused problems including unequal access to sufficient funds to provide needed health and social services, educational opportunities, and the lack of good jobs (Thompson 2003). Such problematic population politics may have disadvantaged the elderly in rural areas. I used the information about residence of respondents from the first wave. Since only 2.4 percent (81 elderly respondents) changed their residence between waves, we must

wait for future waves to accumulate enough cases to examine how changes in residence influence the well-being of the elderly.

- **3 – B: Self-Rated Health (Table 9)**

Table 9 summarizes the results of the multinomial logistic regression, examining if diverse social integration at Wave 1 promoted improved self-rated health at the second Wave (cols. 7-9) or its deterioration (cols. 10-12) rather than maintenance of better-than-average self-rated health (the reference group).

As expected, greater integration, seen in the accumulation of diverse roles, contributed to the maintenance of better self-assessed health. Table 9 shows that, having diverse roles reduced the odds of people rating their health average at both waves rather than rating their health better than average at both waves (the reference category) by 23.6 percent (OR = .764, $p<.001$). Having diverse roles also reduced the odds of rating their health worse than average at both waves rather than rating their health better than average at both waves (OR =.557, $p<.001$). Since multiple roles contributed to the maintenance of better self-rated health at the time of both waves, having diverse roles also reduced the odds of rating their health better at the time of the second wave rather than rating their health better than average at the time of both waves by 24.6 percent (OR = .754, $p<.001$). It also reduced the odds of people rating their health better than average at the first wave rather than better than average at both waves by 16.8 percent (OR = .832, $p<.01$). These results support the role enhancement perspective and the life course perspective that diverse role occupancy

helps people maintain better health conditions and delays changes in their life trajectory of health.

Looking at other variables, Table 9 shows that a higher education level had a similar effect with the multiple roles variable, although the positive effect of the multiple roles variable on self-rated health was stronger than a higher level of education. A higher level of education reduced the odds of rating their health worse than average at both waves rather than rating their health better than average at both waves by 19.4 percent (OR = .806, $p<.01$). It also reduced the odds of rating their health average at both waves rather than rating their health better than average at both waves by 19.7 percent (OR = .803, $p<.01$). Since higher education level contributed to the maintenance of better self-rated health over time, the elderly with higher education were less likely to change their self-rated health over time. A higher education level reduced the odds of rating their health better at the second wave rather than better than average at both waves by 12.2 percent (OR = .878, $p<.05$). It also reduced the odds of rating their health better at the first wave rather than "better than average" over time by 19.8 percent (OR =. 802, $p<.01$). A higher education enables the preservation of better-than-average self-rated health because it enables one to acquire, understand, and act on information to that end.

Higher income contributed to better maintenance of self-rated health over time. Having a higher income level reduced the odds of people rating their health worse than average at both waves rather than rating their health better than average at both waves by 10.8 percent (OR = .892, $p<.001$). Having a higher income contributed to

provide financial security to the elderly; this in turn positively influenced their self-rated health. Thus, although the effects of socioeconomic variables were weaker than a multiple roles variable, they contributed to the maintenance of better self-rated health over time.

Age influenced self-rated health in the opposite direction compared to a multiple roles variable and education. Table 9 shows that additional age measured in years, increased the odds of people rating their health worse than average at both waves rather than better than average at both waves by 4.1 percent (OR = 1.041, $p<.001$). It also increased the odds of people rating their health better at the first wave rather than better than average at both waves by 4.3 percent (OR = 1.043, $p<.001$). These results suggest that becoming older increased the likelihood of individuals downgrading their self-rated health over time as well as increasing the likelihood of people continuing to rate their self-rated health worse than average over time. However, Table 9 also shows that additional age increased the odds of people rating their health better at the second wave rather than better than average at both waves by 2.1% (OR = 1.021, $p<.001$). These results suggest a perception of recovery is possible but less frequent than the perception of worsening health.

Finally, marital duration slightly, but negatively, influenced self-rated health over time. Table 9 shows that longer marital duration measured in months slightly increased the odds of people rating their health average at the time of both waves rather than rating their health better than average at the time of both waves (OR = 1.002, $p<.001$). Longer marital duration also slightly increased the odds of people

rating their health worse than average at both waves rather than rating their health better than average at both waves (OR = 1.002, p<.001). Longer marital duration also slightly increased the odds of people rating their health better at the second wave rather than better than average at both waves (OR = 1.001, p<.05). These results imply that marital quality has complex effects on health rather than a simple accumulation of effect with time. Since this data set does not include variables measuring marital quality, future studies are necessary. It is possible that longer marriage does not increase marital quality or happiness, but rather increases boredom and discontent (Umberson et al. 2005).

- **3 – C: Psychological Health (Table 10)**

Table 10 summarizes the results of the multinomial logistic regression, examining changes in the depression scale between the waves. Consistent with the salubrious effect of having many diverse roles, I find that those who had more roles were 15.4 percent less likely (OR = .846, p<.01) than those with fewer roles to remain depressed between the two waves than to remain free of depression. In addition, respondents who lived in a household with more residents had much lower chances of experiencing the onset of depressive symptomatology between the waves or of maintaining depressive symptomatology rather than remaining free of depressive symptoms (OR = .905 and .863, p<.001, respectively). These results are consistent with the result of my cross-sectional analysis, which showed that multiple roles reduced the risk of having more symptoms of depression, controlling for the effects of other variables. These results answer Research Question 3 affirmatively.

The control variable also mattered. A higher income level reduced the odds of continuing to have some symptoms of depression rather than continuing to have no symptoms of depression by 5.7 percent (OR = .943, $p<.05$). This result suggests that, although the positive effect on mental health is weaker than a multiple roles variable, financial security is important in maintaining better mental health over time for the elderly in Japan. A higher income level also enables the elderly to spend more money on leisure and transportations.

Age influenced the mental health of the elderly in the opposite direction compared with a multiple roles variable and income. Table 10 shows that, controlling for other variables, additional age measured in years increased the odds of continuing to have some symptoms of depression rather than continuing to have no symptoms of depression by 2.1 percent (OR = 1.021, $p<.05$). It also increased the odds of an onset of depression rather than having no symptoms of depression over time by 3 percent (OR = 1.030, $p<.01$). This result suggests that the risk of depression rises with age, perhaps in response to increasing disability. Alternatively, Umberson et al. (2005) found that older respondents are less likely to be emotionally resilient because more experiences gained over the life course often lead to less conflicts in human relationships.

Finally, Table 10 indicates that controlling for other variables, residence and gender influenced the psychological well-being of the elderly over time. Controlling for the effect of other variables, compared with men, women were less likely to continue having any symptoms of depression rather than continuing without

symptoms of depression by 36.8 percent (OR = .632, p<001). Controlling for the effects of other variables, compared with men, women were less likely to report an increase in symptoms of depression over time rather than to maintain no symptoms of depression by 34.2 percent (OR = .658, p<.01). This result suggests that the gendered life course in late life may benefit women more than men in Japan. As previous studies suggested, women are better at maintaining and extending social networks than men in the late life course (Antonucci and Akiyama 1995) and women are more likely to be socially protected than men in the later life course (Ikeda et al. 2007). This finding also refutes Durkheim's gendered assumption that women are less likely to obtain either the benefits or the costs of that involvement, especially considering the later life course of the elderly in Japan.

Residence showed inverse effects on psychological health compared with physical health. This result was consistent with my cross-sectional analyses of multiple roles and health (Chapter 5). Compared with rural residents, urban residents were 37.6 percent more likely to continue having some symptoms of depression rather than continuing to have no symptoms of depression (OR = 1.376, p<.01). Again, this result supports those of Fukuda et al. (2005), who found that urban residence provided a less supportive social network than rural residence in Japan. This result suggests that not only is occupying diverse roles important for the well-being of the elderly over time, but also being in a context where neighbors can support the elderly is important. In 2003, 19.3 percent of the elderly lived alone in major cities compared to 10.3 percent in rural areas (Ministry of Health Labour and

Welfare 2003). The number of solitary deaths (*kodokushi*) increases as the number of the elderly living alone increases. Although there is a system of care for the elderly, ten years after the Great Hansin Earthquake that hit Kobe city in 1995, the number of *kodokushi* totaled 560, of which 32 were suicides; 11 of these were discovered over a month later, and one was found after a year (Shiozaki 2005). Thus, supportive communities and neighborhoods become more important for the elderly to avoid social isolation, especially in urban areas.

Summary

To summarize, longitudinal analyses of the first wave and the second wave of NUJLSOA, the results presented in this chapter support the role enhancement perspective. The answer to the third research question is that the elderly who had diverse roles at the time of the first interview were more likely to remain healthy at the time of the second interview. This statement was supported for all health measures including physical health, self-rated health, and psychological health outcomes. As previous studies of the role enhancement perspective emphasize (Wethington et al. 2000), occupying multiple roles leads to higher levels of physical and emotional health than do fewer roles. These results also support Traphagan's claim that, to be a good elderly person in Japan, one needs to be a socially integrated individual who engages in activities that involve social interaction. Failure to maintain social involvement invites a deterioration of health in late life (Traphagan 2004).

In addition, supporting the life course perspective, a prior positive experience, measured by a multiple roles variable at the first wave, positively influenced the life trajectory of health at the time of the second wave. The elderly with diverse roles were less likely to experience transitions to better or worse health conditions at the time of the second wave than were the elderly with fewer roles because they were more likely to remain healthy over time. As Moen et al. (1992) claim, successful aging is a cumulative process, and social integration during the adult years appears to promote both social integration and health in the later life course.

The effects of age, gender, and residence on changes in health between waves remained, after controlling for other variables. However, how these three variables influenced the well-being of the elderly was by far more complicated than previously reported. In particular, it is interesting to notice that, compared to rural residents, urban residents had a lower risk of having some physical disability at the time of the first wave (Chapter 5) or of becoming disabled by the time of the second wave (Table 8). Urban residence increased the risk of having depressive symptoms at the first wave rather than no symptoms (Chapter 5) and of remaining depressed rather than undepressed across the waves (Table 10). Residence, however, did not influence changes in self-rated health (Table 9). The disadvantage faced by rural residents may reflect the selective effects of mortality. That is, rural Japanese survive to older ages than urban Japanese and thus are exposed for a longer time to the risk of living with nonfatal but disabling conditions (e.g., arthritis). The advantage enjoyed by rural

Japanese of avoiding depression longer than urban Japanese may stem from what I argue is a cause of their greater longevity.

Gender influenced changes in psychological health, but not physical disability and self-rated health (Table 10). In the United States, women have worse self-rated health than men but are less likely than men to die at each age (Case and Paxon 2005). In Japan, the results showed that elderly women were less depressed than elderly men were, and perhaps for this reason, on average, Japanese women live longer than Japanese men do. My study suggests that the life course in late life is gendered and benefits women more than men in Japan.

The average life span of Japanese women grew .29 years from 2005 levels and became 85.81 years, maintaining the top position in the world for 22 years consecutively (Kyodo News 2007). Although Japanese men do not live the longest in the world, they lived 79 years on average in 2006, growing .44 years from 2005 levels and rising back to the second position from the fourth position in 2007 (Kyodo News 2007). Faster growth of the life expectancy at birth for men than women and a shrinking gap in life expectancy between men and women could be a reason for insignificant differences in self-rated health and physical disability by gender. Continuous efforts to maintain the mental health of female elderly in Japan may be a reason why Japanese women live the longest in the world and still live longer than Japanese men do.

The cross-sectional findings (Chapter 5) and longitudinal results (Chapter 6) not only provide policy implications to promote healthy aging, but also show limitations

in the current data set that are answerable in future studies with future waves or a new data set with more variables. These will be discussed in the next chapter.

CHAPTER 7

CONCLUSION

Aging in Japan in the Twenty-First Century

This chapter summarizes my dissertation, discusses the policy implications of the findings of this study, and calls for future research on aging based on the findings and limitations of this research. First, I briefly summarize historical changes in the understanding of aging and families in Japan, and then discuss how my findings from cross-sectional and longitudinal analyses of the Nihon University Japanese Longitudinal Study of Aging (NUJLSOA) to expand knowledge of aging in Japan, and how our understanding will transform in the twenty-first century. Then, based on my findings, I discuss implications, including government policies to promote healthy aging. Finally, I will discuss how future studies can extend the findings and overcome the limitations from this study.

Summary of My Dissertation

Scholars have discussed aging in Japan as a result of the demographic, cultural, and economic transformations after World War II that changed the balance of intergenerational caregiving (Asai and Kameoka 2005; Maeda 2004; Ogawa and Retherford 1993; Retherford et al. 1996). The major problem in some of this literature is the historical starting point scholars choose.

Intergenerational mutual care in Japan developed in the context of various factors, including cultural ideals, centralization of the civil state, and the family unit called the *ie*. Prior to the Meiji period, there were regional and class diversity in family life and no cultural ideal for women to take care of the dependent elderly. In the Tokugawa period, care was often emphasized as men's morality in the public sphere because the Tokugawa shogunate emphasized the Confucian ideology of filial piety. As Japan moved from the Tokugawa to the Meiji period, it became more feasible for the national government to create legal pressures on women to stay at home to care for the children and the dependent elderly in the privatized *ie*.

Many scholars start with this patriarchal *ie* system (the system of primogeniture legally recognized in the Meiji Civil Code in 1898) as the benchmark against which to gauge the continuity, uniqueness, and change of eldercare during the twentieth century (Asai and Kameoka 2005; Long and Harris 2000). This resulted in many scholars assuming that the cultural underpinnings of the *ie* defined the care of 'frail elderly' as 'women's work' undertaken to preserve 'women's morality'. In such a context, the discussion of elder care is heavily focused on the burdens of women, explicitly or implicitly categorizing care receivers as passive recipients of care. Since care has been pessimistically perceived as a caregiver's responsibility and obligation for looking after someone weak and dependent, the elderly have too often been associated with burdens and problems, and stereotyped as sickly, frail, and dependent.

Owing to longevity and reduced disability among the elderly after the Second World War, more elderly challenged the restricted and pessimistic definition of care from middle-aged women to dependent and frail elderly. The elderly are seen increasingly as proactively choosing their opportunities to care and be cared for by important people beyond the family in their later life course. Such social recognition has broadened studies of aging beyond just the maintenance of physical and mental vitality to include the social integration of older people with family, friends, and communities. In this context, research on social integration and health has emerged as an urgent and important issue of scientific as well as of public concern for promoting healthy aging in Japan, as well as in other countries of the world.

- **The Influence of Social Integration on Health**

The most traditional way of theoretically and empirically explaining the relationship between social integration and the well-being of the elderly is to take role involvement as an indicator of social integration. Two different explanations are the role strain perspective and the role enhancement perspective. Previous studies found evidence that the role enhancement perspective is more applicable to older adults than the role strain perspective. For the elderly who have been through various life events such as marriage, childrearing, and deaths of their parents, holding diverse roles benefits their well-being by increasing individual resources, social connections, and social identity, as well as by providing more "chairs" that the elderly can fall back on. The benefits exceed the costs to their well-being arising from more role conflict or role overload that comes with more diverse roles. Incorporating the life

course framework that emphasizes the importance of prior experiences in determining later health outcomes, plus the importance of various contexts influencing the late life course, I developed three research questions to study the relationship between social integration and health of the elderly in Japan.

Both cross-sectional and longitudinal analyses of the two waves of the NUJLSOA supported the role enhancement perspective, not the role strain perspective. The elderly who occupied diverse roles had a greater likelihood to be healthy than those who occupied few roles at the first interview (Research Question 1). This result was consistent for all three health measures: physical disability; psychological health; and self-rated health. Holding diverse roles benefited the well-being of the elderly, controlling for age, gender, residence and socioeconomic variables. For the elderly who went through various life events such as marriage, childrearing, and deaths of their parents, rather than increasing role conflict or role overload, occupying diverse roles was more likely to benefit their well-being by enhancing individual resources, social connections, and social identity, as well as by providing more "chairs" that the elderly can fall back on.

Looking at the individual role and role density in the first wave, I found that certain roles had a significant influence on health (Research Question 2). Although a diversity of roles contributed to the elderly's feelings of value and security, "density" in a given role – shown by having more sons, daughters, stepchildren (parental role), and grandchildren (grandparental role) – did not positively influence the well-being of the elderly. Perhaps the reason is that this data set is missing information about the

quality of the relationships for each of these four categories of relations. However, a greater participation in social activities and groups showed a significant influence on the well-being of the elderly in the first wave. This result implies that Japanese elderly who proactively choose their opportunities to care and be cared for by important people beyond the family remain healthier than those with fewer extrafamilial memberships. This result is also consistent with the findings of a U.S. study which showed that being a member of a social organization appeared to be especially salutary (Moen et al. 1992).

Supporting the life course perspective, prior positive experience measured by a multiple roles variable at the first wave positively influenced the life trajectory of health at the second wave. The elderly who occupied diverse roles at the first time of the interview had a greater likelihood to remain healthy at the second time of the interview (Research Question 3). The elderly with diverse roles were less likely to experience transitions to worse health outcomes because the effect of multiple roles on health lingered, and they were more likely to remain healthy over time. This result suggests that successful aging is a cumulative process, and that the life course framework is a useful frame to capture the relationship between social integration earlier in life and health in later years.

- **The Influence of Residence on Health**

Residence showed complex effects on health outcomes. The rural elderly were more likely to have a disability than were the urban elderly. However, the rural elderly were less likely to feel depressed than the urban elderly. Since self-rated

health takes into account the opposing effects of physical and psychological well-being of the elderly, residence did not show a significant net effect on self-rated health. These findings suggest that a greater homogeneity in rural areas benefited the mental health of the rural elderly, whereas unequal access to health and social services due to depopulation in rural areas disadvantaged the physical well-being of the rural elderly. Alternatively, perhaps the longer survival of the rural elderly exposes them to a higher risk of developing a nonfatal but disabling disease that results in physical disability (e.g., arthritis) than it does for the urban elderly. Future research including more consecutive waves of the NUJLSOA should explore how residence (rural/urban) and health statuses at Wave 1 are related to the progression into worse health or death at later waves. My dissertation has demonstrated the usefulness of multinomial logistic regressions in this exploration.

Such complex results of rural and urban differentials on health outcomes have also been found in U.S. studies. As in Japan, rural Americans have a higher rate of disability than their urban counterparts (Hummer et al. 2004), but they die at older ages than their urban counterparts (McLaughlin et al. 2007). This may be due to selective outmigration of rural Americans to urban places where they die more quickly than the rural people they leave behind. Future research in Japan and the U.S. is needed to find whether selective outmigration is the reason why the rural elderly in both nations appear to live longer than their urban counterparts.

- **The Influence of Gender on Health**

Elderly women were less likely to be depressed and more likely to remain mentally healthier than their male peers. These results suggest that the later life course benefits women more than men in Japan, although women may be more likely to suffer from role conflicts until they finish raising children and taking care of parents. As previous studies suggest, women are better at maintaining and extending social networks among and beyond family members, which could be a reason why Japanese women live longer than do Japanese men. Networks women have built in their family and in their community over their life course have a positive effect in the later life course relative to the networks men have built in their work place because the latter social network is more likely to disappear after their retirement.

These findings indicate the importance of government policies to provide opportunities for the elderly, especially elderly men, to extend and to remain in a circle of harmonious integration (*wa*) where people can care for each other beyond the family, particularly in urban areas.

Policy Implications

- **Discovering *ikigai* ("purpose of life")**

Analyses of the first wave of the NUJLSOA showed that greater participation in social activities and social groups had a significant relationship with all the health outcomes. Both cross-sectional and longitudinal analyses of the data suggest that the elderly who occupy more diverse roles remain healthier than those who are more

socially isolated. Thus, the first policy implication from the findings of this study is to improve and increase programs, facilities, and policies to enhance the *ikigai* (生きがい) of the elderly.

For the elderly to discover their *ikigai*, there are many unique facilities in Japan. For example, according to Senuma (2006), there are 50,000 courses for the elderly taught at universities and schools. If 100 people, on average, participate in one course, there will be 5,000,000 elderly learning at school or through the media. A long history of high literacy rates across social classes beginning in the Edo period may have influenced the popularity of these facilities for the elderly. However, the problem or the challenge Japanese society faces is that, although there are many elderly willing to take courses, the number of these facilities has not caught up with the increasing number of the elderly. Since many colleges and universities in Japan will continue to lose students due to low fertility rates since the Second World War, developing life-long education programs at colleges and universities is an effective way to increase students and diversity at colleges and universities in Japan. Developing life-long education programs at colleges and universities will also increase opportunities for extending intergenerational networks between the elderly and young adults. In addition, the government should develop programs to fund elderly students because many of them could not obtain higher education due to wars. Thus, not only increasing educational facilities and programs for the elderly but also funding their tuition will boost their enrollment. To promote healthy aging,

such governmental funding to support the elderly is as necessary as developing day care services, rehabilitation facilities, and nursing homes for the elderly.

- **Revitalizing rural villages**

Depopulation became a major problem for many small villages in Japan as fertility rates have declined in the postwar era (Knight 2003; Thompson 2003). The deficiency of funds to provide needed health and social services is a symptom of the negative long-term effects of depopulation (Thompson 2003).

Recently, some rural municipalities have found a way to repopulate. Across Japan, some rural municipalities have established assisted living facilities that include special housing, customized medical facilities, and home helpers for older adults(Knight 2003). In developing these facilities in rural areas, both the national government and the rural municipality must listen to the voices of local people, who may fear that the rural village will become a dumping ground for the elderly. While popular in the United States, assisted living centers are new to Japan and may be resisted by Japanese people as same as nursing homes or hospitals. Thus, in developing assisted living facilities in rural areas, local people need to be involved in order to understand benefits of welcoming these elderly in rural areas. The elderly moving to rural areas can be great contributors to enhance social integration in rural areas by increasing new elderly friends for the rural elderly and by increasing budgets to develop educational, recreational, and medical facilities for the elderly in rural areas. At the same time, it is important to improve security systems for the rural

elderly living alone as well as for local municipalities to support the grass-roots movements to repopulate the village.

- **Finding a way to reduce *kodokushi* (solitary deaths)**

The number of *kodokushi* (孤独死) increases as the number of the elderly living alone increases, especially in urban areas. Issues regarding *kodokushi* became a vivid problem when the Great Hansin Earthquake hit Kobe city in Hyogo on January 17, 1995 (Shinozaki, Nishikawa and Deguchi 2005; Shiozaki 2005). Although there are no comprehensive data showing the number of *kodokushi*, Professor Ueno, who totaled the number based on newspaper accounts, estimated that over 200 *kodokushi* were lost in Hyogo (Shinozaki et al. 2005). Men were twice as likely as women to die of *kodokushi*, and middle-aged males (55-64 years old) constituted over 40 percent of those who died alone (Shinozaki et al. 2005). Such tragedy taught everyone that residential areas could be either supportive or risky environments for older adults. Japan and other nations have the possibility of encountering earthquakes, and all nations in the world have the possibility of natural disaster such as storms and heat waves.

In fact, a great heat wave struck in July 1995 in the city of Chicago; and people, especially people living alone, died solitary deaths (Klinenberg 2002). The ethnic and racial differences in mortality also taught everyone about urban life. The actual death numbers for African Americans and whites were almost identical. However, when the differences in size and age composition of African Americans and Whites were taken into account, the Chicago Public Health Department found that the

black/white mortality ratio was 1.5 to 1 (Klinenberg 2002). Latinos, representing about 25 percent of the city population, accounted for only two percent of the heat-related deaths (Klinenberg 2002).

Natural disasters such as the Great Hansin Earth Quake and heat wave can hit any place in the world, and people who are vulnerable to these problems are often the elderly, especially the elderly living alone in urban areas. Findings from my dissertation research suggest that, not only in rural areas, but also in urban areas, building a better community, which enables the maintenance or extension of social networks beyond the family, provides important grounds to promote healthy aging. Thus, it is necessary for national governments and local municipalities to support the grass-roots movements to build a better community to prepare for natural disasters. Developing programs and building facilities where people from the community can gather and chat, cleaning the community together to avoid crimes and to improve neighborhood networks, and improving the security system of houses for the elderly living alone should be developed by national governments, local municipalities, and local people before it is too late.

Implications for Future Research

Since only the first two waves of the NUJLSOA survey (1999 and 2001) were available at this time, there were too few cases of mortality for me to analyze the relationship of death to social integration, and to examine how this relationship

differs by age, gender, and residence. There were also too few cases to examine whether changes in the number of roles or the loss of role diversity might influence the relationship between social integration and health. Further waves in this data set will enable me to test hypotheses regarding social integration and mortality. Since the elderly in both waves are relatively healthy on average, the passage of more time since Wave 1 will yield more deaths and may reveal whether having a larger number of sons or daughters enhances longevity beyond the fact of being a parent. To understand how the quality of relationships influences the well-being of the elderly over the life course, qualitative studies are also necessary to understand differences in the relationships the elderly have with their sons and daughters as well as with their marital partners.

Further comparative studies looking at morbidity and mortality between the urban and rural areas are necessary to examine whether the urban elderly live longer than rural elderly, despite the findings from this study that the urban elderly are more likely to be disability-free. If headaches, arthritis, and vision problems are much worse for rural than urban elderly, the rural elderly could plausibly be more likely to report themselves as disabled. Future studies should look at specific health problems to understand rural-urban differentials in aging. Further comparative studies looking at morbidity and mortality between men and women are also necessary to understand how the effects of gender change as elderly respondents become older. Although my dissertation research could not find any significant effects of gender on physical disability or self-rated health of the elderly, further waves available in the future may

discover significant gender differences in the relationship between social integration and those dimensions of health.

I used multinomial logistic regressions to analyze the data set, and this statistical approach limited the number of categorical variables that I could use as predictors of health measures. A promising predictor of social integration being examined by scholars at Nihon University is living arrangements. These studies will show whether elderly people in three-generation households are healthier and more integrated than those in two-generation households.

I also realized possible cultural limitations in using IADL items to assess physical health of the Japanese elderly because some of the items (e.g. preparing meals, taking care of financial matters, and dusting and cleaning the house) could be gender specific. Looking at descriptive statistics, I saw no noticeable differences between the elderly men and the elderly women in answering "Do not perform" to the question whether they take care of financial matters (5.9 percent for men vs. 4.4 percent for women) and to the question whether they dust, clean up, and do other light housework (3.0 percent for men vs. 1.2 percent for women). However, there was a noticeable difference between elderly men and elderly women in answering "Do not perform" to the question whether they prepare own meals (20.7 percent for men vs. 6.1 percent for women) although the majority of both men and women answered that they have no problems in preparing their own meals (72.1 percent for men and 85.3 percent for women). Future studies using further waves should examine the cultural appropriateness of using measures of disability developed in

Western nations and should pay special attention to gender differences in answering IADL items.

Theoretically, my dissertation research supported the role enhancement perspective rather than the role strain perspective. My dissertation research also found that the later life course benefited women more than men, and it refuted Durkheim's assumption that women are less involved in public life than men and thus less likely to obtain either the benefits or the costs of that involvement. Women's higher educational attainment and longer involvement in the labor force in contemporary Japan than in 19th century Europe may have increased the benefits and lowered the costs of role involvement. Thus, to theoretically advance the study of social integration and health, future examinations of the NUJLSOA should seek whether women's educational attainment and duration of formal employment increase across the waves and are associated with social-role diversification and improving health. In addition, as discussed in the theoretical framework, previous studies have looked at the role enhancement perspective and the role strain perspective as two competing perspectives. However, it is possible that occupying diverse roles may become a positive or negative factor depending on different phrases of the life course. To theoretically advance the study of social integration and health, it is necessary to incorporate the life course framework so that future studies can examine whether the role strain perspective or the role enhancement is supported in different phrase of the life course.

Future studies should also involve data sets of other nations to understand the relationship between social integration and health in the later life course and to examine how this relationship changes with age, gender, and residence. Qualitative studies of the elderly in vulnerable circumstances – men, older, living alone, low education level and income, and poor social networks – are necessary to make them visible to the society and bring their voice to public. Enriching the study of social integration and health with further waves, as well as with data sets from other nations, enable us to globally promote healthy aging in the twenty-first century.

To conclude, the culture of care was historically diverse, neither strictly nor naturally assigned to women in the private sphere. The culture of care became private and "women's work" after the Meiji Period; however, it has reentered the public sphere owing to the longevity and reduced disability among the elderly. The responder to the needs of the elderly should consider both the care receiver's and caregiver's viewpoints. In discussing the culture of care in the future, it is important to avoid stereotypical assumptions that the elderly are frail and dependent. Intergenerational mutual care in Japan developed as a result of the demographic, cultural, and economic transformations, and it will continue to transform in response to cultural, demographic, political changes. In thinking of intergenerational mutual care in the future, instead of focusing on drawing boundaries between men and women, public and private, independence and dependence, scholars and policy makers must realize and accept a fluid situation and to understand social integration

embedded in period-specific cultural, political, economical, and geographical contexts.

APPENDICES

Figure 1

Map of Japan

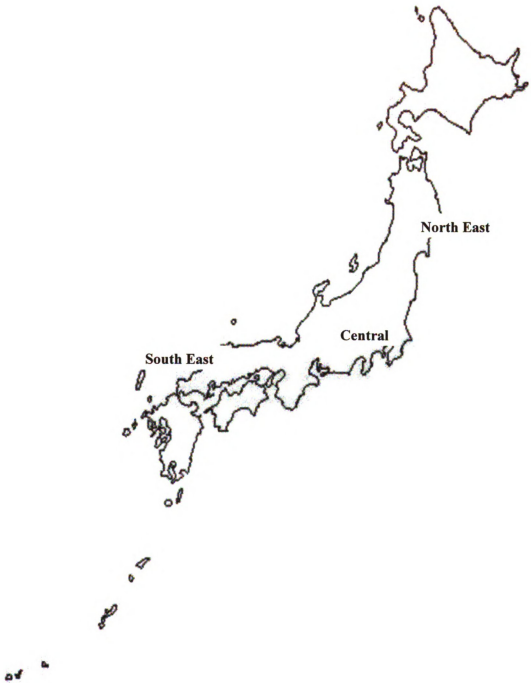
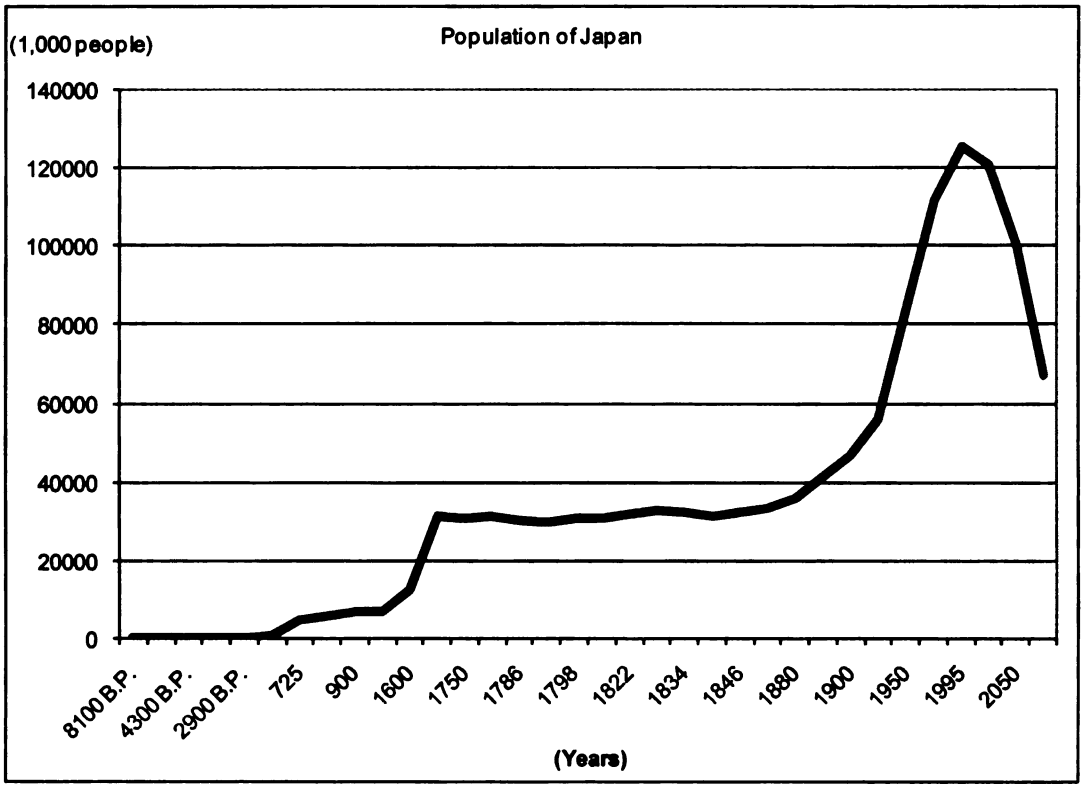


Figure 2

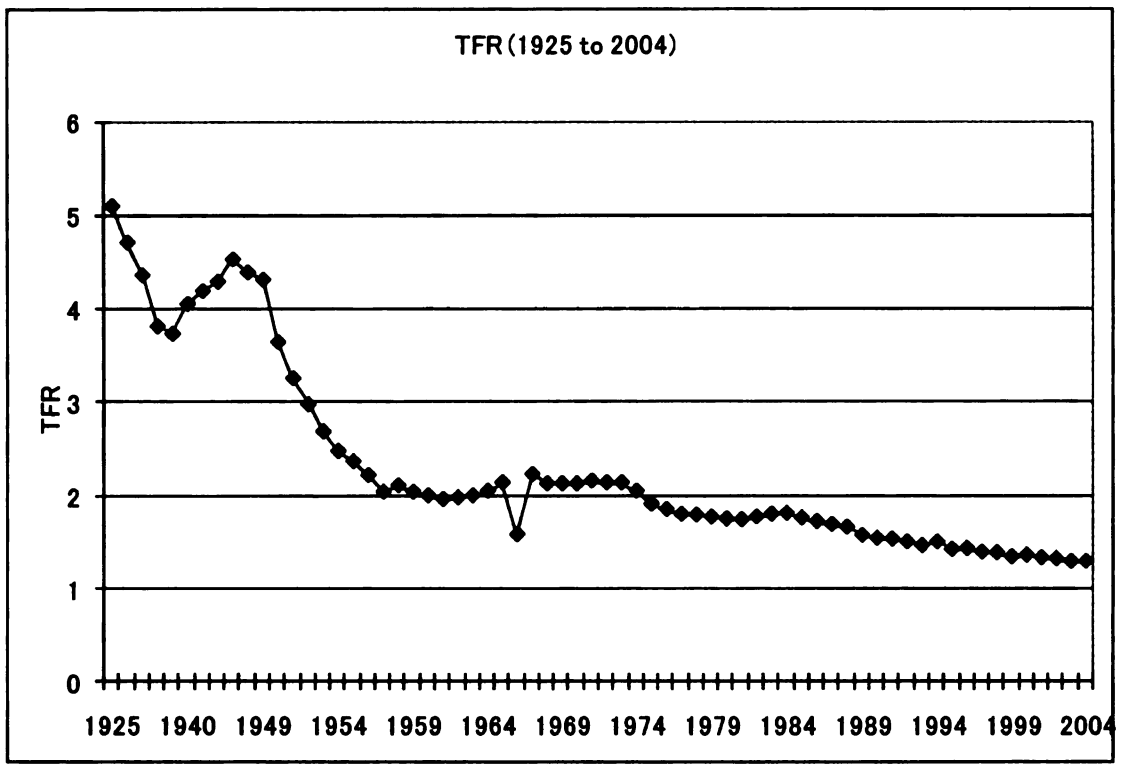
Population of Japan



Source: Kito, Hiroshi. *Jinko Kara Yomu Nihon No Rekishi (Demographic Analysis of Japanese History)*. 7 ed. Tokyo: Kodan-sha, 2001.

Figure 3

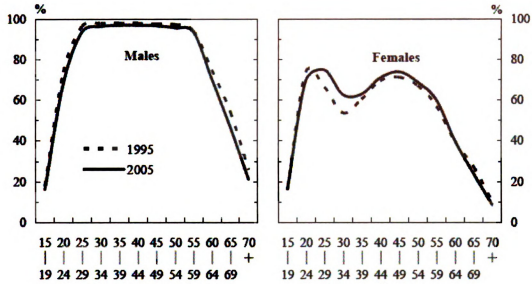
Total Fertility Rate (TFR), 1925 to 2004



Source: National Institute of Population and Social Security Research 2006

Figure 4

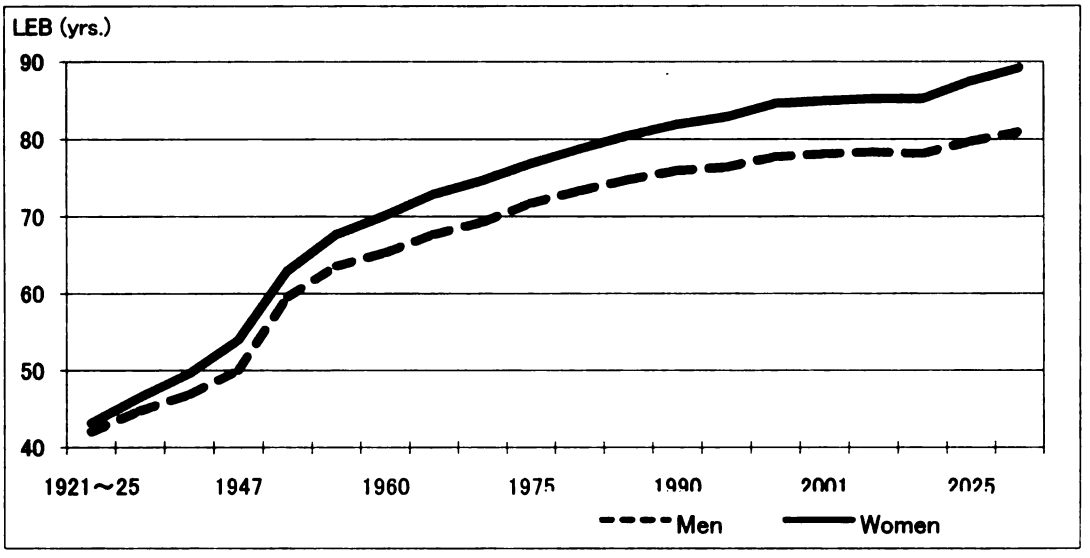
Labor Force Participation Rate by Sex



Source: Figure 12.1 taken from Chapter 12 Labor in Statistical Handbook of Japan, Statistics Bureau & Statistical Research and Training Institute, Ministry of International Affairs and Communications. Available on-line [http://www.stat.go.jp/english/data/handbook/pdf/c12cont.pdf] (accessed on November 1, 2006)

Figure 5

Life Expectancy at Birth for Japanese Men and Women



Source: National Institute of Population and Social Security Research 2006

Table 1
Paired-Sample t-tests of dependent variables

	Time 1		Time 2				
Variable	**M**	**(SD)**	**M**	**(SD)**	***df***	**t**	**Sig.**
Self-Rated Health	2.8358	1.10	2.8820	1.09	4004	-2.611	.009
Psychological Health (CES-D Scale[1])	1.2772	2.07	1.3966	2.32	2869	-2.587	.010
Physical Health (ADL + IADL)	.7244	2.47	1.0394	3.02	2948	-8.360	.000
ADL[2]	.3181	1.19	.4728	1.46	3908	-8.249	.000
IADL[3]	.4197	1.38	.5861	1.65	2991	-8.075	.000

[1] Depression measures (CES-D) include nine items: **1** Didn't have much appetite, **2** Felt depressed, **3** Ordinary things felt troublesome, **4** Trouble sleeping, **5** Felt lonely, **6** People seem unfriendly, **7** Felt sad, **8** Felt hated by others, **9** Trouble feeling motivated. Two points was given to anyone who OFTEN found these items to be true during the past week. A point was given to anyone who SOMETIMES found these items to be true during the past week. No point was given to anyone who RARELY felt these items to be true in the past week. The score ranged from a theoretical low "0" to a theoretical high of "14."

[2] ADL measures include seven items: **1** Bathing or showering problems, **2** Dressing, **3** Eating, **4** Standing up from a bed or chair/sitting down on a chair, **5** Walking (around the house), **6** Going outside (leaving the house), **7** Toileting. A point was given to anyone who answered who had trouble with one of these items. The possible range is "0" (no difficulty performing IADL items) and "7" (difficulty in performing ADL items).

[3] IADL measures include seven items: **1** Preparing meals, **2** Leaving home to purchase necessary items or medication, **3** Taking care of financial matters (paying utility or newspaper bills), **4** Using the telephone, **5** Dusting, cleaning, and other light housework, **6** Taking the bus or train to leave home, **7** Taking medication as prescribed. A point was given to anyone who answered who had trouble with one of these items. The possible range is "0" (no difficulty performing IADL items) and "1" (difficulty in performing IALD items).

Table 2: Multinomial Logistic Regression Comparing (1) Respondents with one or more disability on ADL or IADL scales, (2) Respondents with at least one of the answer on ADL and IADL scale missing, and (3) Respondents with no physical disability (Reference Category)

	One or more disability			No answer		
Variable	**OR**	**SE**	**Df**	**OR**	**SE**	**df**
Breadth of Social Integration						
Multiple Roles	.546***	.057	1	.843**	.053	1
			0			0
Duration			1			1
Marital Duration	1.001**	.000	1	1.000	.000	1
Total duration of working	.996	.003	1	1.002	.003	1
Satisfaction						
Level of contact with children	.937	.139	1	.997	.129	1
Living Arrangement						
Number of members living together in the Household	1.082**	.027	1	1.223***	.024	1
Control Variables						
Education	.810**	.070	1	.828**	.057	1
Income	.987	.026	1	.971	.023	1
Age	1.110***	.007	1	1.089***	.007	1
Residence (Urban)	.715**	.098	1	.846	.089	1
(Reference: Rural)	.	.	0	.	.	0
Sex (Female)	1.216	.113	1	3.061***	.101	1
(Reference: Male)	.	.	0	.		0

Likelihood ratio chi-square = 970.864; degrees of freedom = 20; n = 4884 (valid cases).

Notes: OR = odds ratio; SE=standard error. The reference category is respondents with no physical disability

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

Residence and Sex are categorical (dichotomous) independent variables. One of the values is set to zero because it is redundant.

Table 3: Multinomial Logistic Regression Comparing (1) Respondents who rated their health better than average, (2) Respondents who rated their health worse than average, and (3) Respondents who rated their health average (Reference Category)

Variable	Better than average			Worse than average		
	OR	SE	df	OR	SE	df
Breadth of Social Integration						
Multiple Roles	1.166**	.046	1	.697***	.046	1
			0			0
Duration			1			1
Marital Duration	.999**	.000	1	1.001*	.000	1
Total duration of working	1.003	.002	1	.999	.002	1
Satisfaction						
Level of contact with children	.931	.112	1	1.009	.111	1
Living Arrangement						
Number of members living together in the household	.986	.022	1	1.012	.022	1
Control Variables						
Education	1.091	.046	1	.944	.051	1
Income	1.042*	.019	1	.949*	.020	1
Age	.979**	.006	1	1.013*	.006	1
Residence (Urban)	.963	.078	1	.976	.079	1
(Reference: Rural)	.	.	0	.	.	0
Sex (Female)	1.135	.085	1	1.131	.087	1
(Reference: Male)	.	.	0	.		0

Likelihood ratio chi-square = 390.030; degrees of freedom = 20; n = 4879 (valid cases).

Notes: OR = odds ratio; SE=standard error. The reference category is respondents who rated their health average

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

Residence and Sex are categorical (dichotomous) independent variables. One of the values is set to zero because it is redundant.

Table 4: Multinomial Logistic Regression Comparing (1) Respondents with one or more scores on depression scale, and (2) Respondents with at least one ore more missing scores on depression scale, and (3) Respondents with zero score on depression scale (Reference Category)

Variable	One or more scores on depression			No Answer		
	OR	SE	df	OR	SE	df
Breadth of Social Integration						
Multiple Roles	.889**	.042	1	.702***	.052	1
			0			0
Duration			1			1
Marital Duration	1.001*	.000	1	1.001	.000	1
Total duration of working	.995*	.002	1	.993**	.003	1
Satisfaction						
Level of contact with children	.935	.104	1	.528***	.128	1
Living Arrangement						
Number of members living together in the Household	.920***	.021	1	1.044	.025	1
Control Variables						
Education	1.086	.043	1	.873*	.061	1
Income	.931***	.018	1	.985	.023	1
Age	1.007	.006	1	1.072***	.007	1
Residence (Urban)	1.289***	.073	1	.976	.090	1
(Reference: Rural)	.	.	0	.	.	0
Sex (Female)	.761**	.079	1	1.256*	.101	1
(Reference: Male)	.	.	0	.	.	0

Likelihood ratio chi-square = 524.199; degrees of freedom = 20; n = 4884 (valid cases).

Notes: OR = odds ratio; SE=standard error. The reference category is respondents with zero score on depression scale

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

Residence and Sex are categorical (dichotomous) independent variables. One of the values is set to zero because it is redundant.

Table 5-A: Multinomial Logistic Regression Models Comparing (1) Respondents with one or more disabilities on ADL or IADL scales and (2) Respondents with no physical disability (Reference Category)

	Model 1			Model 2			Model 3			Model 4*		
Variable	OR	SE	df	OR	SE	df	OR	SE	df	OR	SE	df
Family Membership												
Marital status: Not Married	.899	.126	1	.886	.128	1	.889	.134	1	.876	.135	1
(Reference: Married)			0			0			0			0
Marital Duration	1.000	.000	1	.999	.000	1	1.000	.000	1	.1000	.000	1
Number of sons	1.106	.072	1	1.093	.073	1	1.108	.072	1	1.094	.073	1
Number of daughters	1.167*	.075	1	1.164*	.076	1	1.166*	.075	1	1.163*	.076	1
Number of step children	.988	.082	1	.973	.083	1	.992	.082	1	.977	.083	1
Satisfaction w/ children	.492***	.146	1	.508***	.146	1	.490***	.146	1	.505***	.147	1
Number of grandchildren	.992	.026	1	.990	.027	1	.991	.026	1	.989	.027	1
Number of members living together in the household	1.006	.028	1	.985	.029	1	1.005	.028	1	.984	.029	1
Institutional Membership												
Work Status: Not Working	3.036***	.161	1	3.191***	.162	1	3.024***	.161	1	3.176***	.163	1
(Reference: Working)	.	.	0	.	.	0	.	.	0	.	.	0
Total duration of working	1.001	.003	1	1.000	.003	1	1.001	.003	1	1.000	.003	1
Community Membership												
Social activities/groups	.540***	.052	1	.530***	.053	1	.540***	.052	1	.530***	.053	1
Control variables												
Education	.820**	.068	1	.857*	.070	1	.822**	.069	1	.858*	.070	1
Income	.980	.027	1	.987	.027	1	.980	.027	1	.988	.027	1
Age	1.115***	.008	1	1.116***	.008	1	1.115***	.008	1	1.117***	.008	1
Residence (Urban)				.671***	.100	1				.671***	.100	1
(Reference: Rural)				.	.	0				.	.	0
Sex (Female)							1.002	.121	1	1.005	.122	1
(Reference: Male)							.	.	0	.	.	0

Likelihood ratio chi-square = 1027.624; degree of freedom (df) = 28; n= 4996 (Model 1). Likelihood ratio chi-square = 1004.973, df = 30; n= 4884 (Model 2). Likelihood ratio chi-square = 1147.699, df = 30, n= 4996 (Model 3). Likelihood ratio chi-square = 1125.918, df= 32, n=4884 (Model 4).
Notes: OR = odds ratio; SE=standard error; *p<.05; **<.01; ***p<.001. The reference category is respondents with no physical disability.
*Running crosstab with dependent variable and categorical independent variables, there are no zero cells. But there are two cells smaller than five.

Table 5-B: Multinomial Logistic Regression Models Comparing (1) Respondents with at least one of the answer on ADL and IADL scales missing and (2) Respondents with no physical disability (Reference Category)

	Model 1			Model 2			Model 3			Model 4*		
Variable	OR	SE	df	OR	SE	Df	OR	SE	df	OR	SE	df
Family Membership												
Marital Status: Not Married	.726**	.115	1	.708**	.119	1	1.116	.122	1	1.097	.126	1
(Reference: Married)	.	.	0	.	.	0	.	.	0	.	.	0
Marital Duration	1.000	.000	1	1.000	.000	1	1.000	.000	1	.1000	.000	1
Number of sons	.961	.067	1	1.044	.067	1	.959	.067	1	1.043	.068	1
Number of daughters	.955	.069	1	1.040	.069	1	.948	.070	1	1.034	.070	1
Number of step children	.947	.077	1	.923	.077	1	.951	.078	1	.928	.078	1
Satisfaction w/ children	.694**	.135	1	.841	.140	1	.674**	.136	1	.818	.141	1
Number of grandchildren	1.032	.025	1	1.026	.025	1	1.047	.025	1	1.040	.025	1
Number of members living together in the household	1.159***	.024	1	1.176***	.025	1	1.168***	.024	1	1.185***	.025	1
Institutional Membership												
Work Status: Not Working	1.330**	.104	1	1.284*	.105	1	1.297*	.105	1	1.255*	.107	1
(Reference: Working)	.	.	0	.	.	0	.	.	0	.	.	0
Total duration of working	1.016***	.002	1	1.015***	.003	1	1.004	.003	1	1.003	.003	1
Community Membership												
Social activities/groups	.820***	.034	1	.833***	.035	1	.818***	.035	1	.831***	.035	1
Control variables												
Education	.840**	.056	1	.873*	.058	1	.810***	.056	1	.846	.058	1
Income	1.005	.022	1	.999	.023	1	.986	.023	1	.980	.024	1
Age	1.096***	.008	1	1.092***	.008	1	1.092***	.008	1	1.089***	.008	1
Residence (Urban)				.870	.089	1				.831*	.090	1
(Reference: Rural)				.	.	0				.	.	0
Sex (Female)							2.963***	.105	1	3.070***	.108	1
(Reference: Male)							.	.	0	.	.	0

Likelihood ratio chi-square = 1027.624; degree of freedom (df) = 28; n= 4996 (Model 1). Likelihood ratio chi-square = 1004.973, df = 30; n= 4884 (Model 2). Likelihood ratio chi-square = 1147.699, df = 30, n= 4996 (Model 3). Likelihood ratio chi-square = 1125.918, df= 32, n=4884 (Model 4).
Notes: OR = odds ratio; SE=standard error; *p<.05; **<.01; ***p<.001. The reference category is respondents with no physical disability.
* Running crosstab with dependent variable and categorical independent variables, there are no zero cells, but there are two cells smaller than five.

Table 6-A: Multinomial Logistic Regression Models Comparing (1) Respondents who rated their health better than average and (2) Respondents who rated their health average (Reference Category)

	Model 1			Model 2			Model 3			Model 4		
Variable	OR	SE	df	OR	SE	df	OR	SE	df	OR	SE	df
Family Membership												
Marital Status: Not Married	1.008	.102	1	1.037	.102	1	1.088	.106	1	1.117	.107	1
(Reference: Married)	.	.	0	.	.	0	.	.	0	.	.	0
Marital Duration	1.000	.000	1	1.000	.000	1	1.000	.000	1	1.000	.000	1
Number of sons	1.017	.058	1	1.024	.059	1	1.015	.058	1	1.022	.059	1
Number of daughters	1.019	.061	1	1.009	.061	1	1.016	.061	1	1.005	.061	1
Number of step children	1.018	.068	1	1.020	.068	1	1.018	.068	1	1.021	.068	1
Satisfaction w/ children	1.028	.121	1	1.024	.122	1	1.026	.121	1	1.022	.122	1
Number of grandchildren	.987	.023	1	.989	.023	1	.990	.023	1	.992	.023	1
Number of members living together in the household	1.000	.023	1	1.001	.023	1	1.001	.023	1	1.001	.023	1
Institutional Membership												
Work Status: Not working	.657***	.087	1	.656***	.088	1	.652***	.087	1	.652***	.088	1
(Reference: Working)	.	.	0	.	.	0	.	.	0	.	.	0
Total duration of working	1.002	.002	1	1.002	.002	1	.999	.002	1	.999	.003	1
Community Membership												
Social activities/groups	1.113***	.027	1	1.113***	.027	1	.1.115***	.027	1	1.114***	.027	1
Control variables												
Education	1.081	.045	1	1.096*	.046	1	1.073	.045	1	1.087	.047	1
Income	1.037	.019	1	1.037	.019	1	1.034	.019	1	1.035	.019	1
Age	.977**	.007	1	.978**	.007	1	.976**	.007	1	.977**	.007	1
Residence (Rural)				1.008	.079	1				1.000	.079	1
(Reference: Urban)				.	.	0				.	.	0
Sex (Female)							1.242*	.089	1	1.238*	.089	1
(Reference: Male)							.	.	0	.	.	0

Likelihood ratio chi-square = 596.604; degree of freedom (df) = 28; n= 4949 (Model 1). Likelihood ratio chi-square = 554.126; df =30; n=4879 (Model 2). Likelihood ratio chi-square = 575.772; df = 30; n = 4949 (Model 3). Likelihood ratio chi-square = 560.035; df = 32; n = 4879 (Model 4).

Notes: OR = odds ratio; SE=standard error. The reference category is respondents who rated their health average. *p<.05; **<.01; ***p<.001

Marital Status, Work Status, Residence, and Sex are categorical independent variables. One of the values is set to zero because it is redundant

Table 6-B: Multinomial Logistic Regression Models Comparing (1) Respondents who rated their health worse than average and (2) Respondents who rated their health average (Reference Category)

	Model 1			Model 2			Model 3			Model 4		
Variable	OR	SE	df	OR	SE	df	OR	SE	df	OR	SE	df
Family Membership												
Marital Status: Not Married	1.017	.100	1	1.051	.101	1	1.038	.105	1	1.072	.106	1
(Reference: Married)	.	.	0	.	.	0	.	.	0	.	.	0
Marital Duration	1.000	.000	1	1.000	.000	1	1.000	.000	1	1.000	.000	1
Number of sons	.992	.058	1	.994	.059	1	.992	.058	1	.993	.059	1
Number of daughters	1.035	.061	1	1.029	.061	1	1.034	.061	1	1.028	.061	1
Number of step children	.991	.067	1	.990	.067	1	.991	.067	1	.990	.067	1
Satisfaction w/ children	.672**	.117	1	.683**	.118	1	.672**	.117	1	.683**	.118	1
Number of grandchildren	1.026	.022	1	.1.028	.022	1	1.027	.022	1	1.029	.022	1
Number of members living together in the household	.955*	.023	1	.954*	.023	1	.955*	.023	1	.954*	.023	1
Institutional Membership												
Work Status: Not working	2.348***	.105	1	2.315***	.106	1	2.343***	.105	1	2.311***	.106	1
(Reference: Working)	.	.	0	.	.	0	.	.	0	.	.	0
Total duration of working	1.003	.002	1	1.003	.002	1	1.002	.002	1	1.002	.002	1
Community Membership												
Social activities/groups	.765***	.033	1	.764***	.033	1	.765***	.033	1	765***	.033	1
Control variables												
Education	.961	.050	1	.974	.051	1	.959	.050	1	.972	.051	1
Income	.959*	.021	1	.960	.021	1	.958*	.021	1	.960	.021	1
Age	1.010	.007	1	1.010	.007	1	1.010	.007	1	1.010	.007	1
Residence (Rural)				.958	.080	1				.956	.080	1
(Reference: Urban)				.	.	0				.	.	0
Sex (Female)							1.061	.091	1	1.058	.092	1
(Reference: Male)							.	.	0	.	.	0

Likelihood ratio chi-square = 596.604; degree of freedom (df) = 28; n= 4949 (Model 1). Likelihood ratio chi-square = 554.126; df =30; n=4879 (Model 2). Likelihood ratio chi-square = 575.772; df = 30; n = 4949 (Model 3). Likelihood ratio chi-square = 560.035; df = 32; n = 4879 (Model 4).

Notes: OR = odds ratio; SE=standard error. The reference category is respondents who rated their health average. *p<.05; **<.01; ***p<.001

Marital Status, Work Status, Residence, and Sex are categorical independent variables. One of the values is set to zero because it is redundant

Table 7-A: Multinomial Logistic Regression Models Comparing (1) Respondents with one or more scores on depression scale and (2) Respondents with zero score on depression scale (Reference Category)

	Model 1			Model 2			Model 3			Model 4*		
Variable	OR	SE	df	OR	SE	df	OR	SE	df	OR	SE	Df
Family Membership												
Marital Status: Not Married	1.563***	.092	1	1.546***	.093	1	1.472***	.097	1	1.447***	.097	1
(Reference: Married)	.	.	0	.	.	0	.	.	0	.	.	0
Marital Duration	1.001**	.000	1	1.001**	.000	1	1.001**	.000	1	1.001**	.000	1
Number of sons	1.031	.054	1	1.033	.054	1	1.032	.054	1	1.035	.054	1
Number of daughters	1.058	.056	1	1.057	.057	1	1.060	.056	1	1.059	.057	1
Number of step children	.939	.063	1	.931	.063	1	.938	.063	1	.930	.063	1
Satisfaction w/ children	.858	.111	1	.843	.112	1	.861	.111	1	.846	.112	1
Number of grandchildren	1.017	.021	1	1.026	.021	1	1.014	.021	1	1.024	.021	1
Number of members living together in the household	.907***	.021	1	.912***	.022	1	.906***	.021	1	.911***	.022	1
Institutional Membership												
Work Status: Not working	1.359***	.083	1	1.327**	.084	1	1.366***	.083	1	1.333**	.084	1
(Reference: Working)	.	.	0	.	.	0	.	.	0	.	.	0
Total duration of working	.993***	.002	1	.993**	.002	1	.995*	.002	1	.996	.002	1
Community Membership												
Social activities/groups	.996	.025	1	1.005	.025	1	.995	.025	1	1.004	.025	1
Control variables												
Education	1.118**	.042	1	1.087	.043	1	1.126**	.042	1	1.095*	.043	1
Income	.950**	.018	1	.945**	.018	1	.952**	.018	1	.947**	.018	1
Age	.997	.007	1	.996	.007	1	.997	.007	1	.997	.007	1
Residence (Urban)				1.290***	.073	1				1.302***	.073	1
(Reference: Rural)				.	.	0				.	.	0
Sex (Female)							.841*	.082	1	.821*	.083	1
(Reference: Male)							.	.	0	.	.	0

Likelihood ratio chi-square = 685.224; degree of freedom (df) = 28; n= 4996 (Model 1). Likelihood ratio chi-square = 638.753; df =30; n=4884 (Model 2). Likelihood ratio chi-square = 694.205; df = 30; n = 4996 (Model 3). Likelihood ratio chi-square = 649.469; df = 32; n = 4884 (Model 4).

Notes: OR = odds ratio; SE=standard error; *p<.05; **<.01; ***p<.001. The reference category is respondents with zero score on depression scale

* Running crosstab with dependent variable and categorical independent variables, there are no zero cells. But there is one cell smaller than five.

Table 7-B: Multinomial Logistic Regression Models Comparing (1) Respondents with at least one or more missing scores on depression scale and (2) Respondents with zero score on depression scale (Reference Category)

	Model 1			Model 2			Model 3			Model 4*		
Variable	OR	SE	df	OR	SE	df	OR	SE	df	OR	SE	Df
Family Membership												
Marital Status: Not Married	.910	.119	1	.863	.122	1	.955	.125	1	.906	.128	1
(Reference: Married)	.	.	0	.	.	0	.	.	0	.	.	0
Marital Duration	1.000	.000	1	1.000	.000	1	1.000	.000	1	1.000	.000	1
Number of sons	1.046	.067	1	1.101	.068	1	1.045	.067	1	1.100	.068	1
Number of daughters	1.175*	.069	1	1.249**	.070	1	1.174*	.069	1	1.249**	.070	1
Number of step children	.968	.077	1	.959	.077	1	.969	.077	1	.960	.077	1
Satisfaction w/ children	.298***	.136	1	.331***	.139	1	.298***	.136	1	.330***	.139	1
Number of grandchildren	.999	.025	1	.999	.025	1	1.000	.025	1	1.000	.025	1
Number of members living together in the household	.977	.025	1	.983	.026	1	.977	.025	1	.984	.026	1
Institutional Membership												
Work Status: Not working	1.498***	.114	1	1.412**	.116	1	1.500***	.114	1	1.415**	.116	1
(Reference: Working)	.	.	0	.	.	0	.	.	0	.	.	0
Total duration of working	.995	.002	1	.994*	.003	1	.994*	.003	1	.993*	.003	1
Community Membership												
Social activities/groups	.678***	.041	1	.681***	.041	1	.677***	.041	1	.680***	.042	1
Control variables												
Education	.893	.059	1	.913	.061	1	.888*	.059	1	.909	.061	1
Income	.996	.023	1	.986	.024	1	.994	.024	1	.984	.024	1
Age	1.077***	.008	1	1.075***	.008	1	1.076***	.008	1	1.075***	.008	1
Residence (Urban)				.959	.092	1				.955	.092	1
(Reference: Rural)				.	.	0				.	.	0
Sex (Female)							1.135	.105	1	1.142	.107	1
(Reference: Male)							.	.	0	.	.	0

Likelihood ratio chi-square = 685.224; degree of freedom (df) = 28; n= 4996 (Model 1). Likelihood ratio chi-square = 638.753; df =30; n=4884 (Model 2). Likelihood ratio chi-square = 694.205; df = 30; n = 4996 (Model 3). Likelihood ratio chi-square = 649.469; df = 32; n = 4884 (Model 4).
Notes: OR = odds ratio; SE=standard error; *p<.05; **<.01; ***p<.001. The reference category is respondents with zero score on depression scale.
* Running crosstab with dependent variable and categorical independent variables, there are no zero cells. But there is one cell which are smaller than five.

Table 8

Multinomial Logistic Regression Models Comparing (1) Respondents had at least one disability in wave 1 but zero disability in wave 2, (2) Respondents had zero disability in wave 1, but at least one disability in wave 2, (3) Respondents having at least one disability on both wave 1 and wave 2, (4) Respondents with at least one of the answer on ADL and IADL scales missing, and (5) Respondents having zero disability on wave 1 and wave 2 (Reference group).

	At least one → Zero			Zero → At least one			Same-Some Disability			No Answer/ Missing		
Variable	OR	SE	df	OR	SE	df	OR	SE	df	OR	SE	df
Breadth of Social Integration												
Multiple Roles	.793	.130	1	.821*	.092	1	.489***	.083	1	.797***	.042	1
Duration												
Marital Duration	1.001	.001	1	1.001	.001	1	1.001**	.000	1	1.000	.000	1
Total duration of working	.995	.006	1	1.004	.004	1	1.000	.004	1	.997	.002	1
Satisfaction												
Contact with children	1.137	.320	1	.629*	.222	1	.873	.203	1	.963	.103	1
Living Arrangement												
Number of members living together in the household	1.098	.060	1	.947	.046	1	1.051	.041	1	1.118***	.020	1
Control Variables												
Education	.618**	.182	1	.751*	.123	1	.935	.097	1	.861**	.044	1
Income	1.032	.054	1	.940	.042	1	.917*	.039	1	.973	.018	1
Age	1.059**	.018	1	1.107***	.012	1	1.127***	.011	1	1.090***	.006	1
Residence (Urban)	.705	.215	1	.719*	.158	1	.762	.144	1	.944	.072	1
(Reference: Rural)	.	.	0	.	.	0	.	.	0	.	.	0
Sex (Female)	.774	.255	1	.770	.184	1	1.075	.169	1	2.307***	.080	1
(Reference: Male)	.	.	0	.	.	0	.	.	0	.	.	0

Likelihood ratio chi-square = 874.638; degree of freedom = 40; n = 4884 respondents (valid cases).

Notes: OR = odds ratio; SE=standard error; *p<.05; **<.01; ***p<.001. The reference category is respondents having zero disability in both wave 1 and wave 2

Table 9

Multinomial Logistic Regression Models Comparing (1) Respondents rated their health average in wave 1 and wave 2, (2) Respondents rated their health below average in wave 1 and wave 2, (3) Respondents who rated their health better in wave 2, (4) Respondents who rated health better in wave 1, and (5) Respondents whose answer of self-rated health was missing, and (6) Respondents rated their health better than average in wave 1 and wave 2 (Reference Group)

	Same (Average)			Same (Below Average)			Better in Wave 2			Better in Wave 1			Missing		
Variable	OR	SE	df	OR	SE	df	OR	SE	df	OR	SE	df	OR	SE	df
Breadth of Social Integration															
Multiple Roles	.764***	.069	1	.557***	.072	1	.754***	.067	1	.832**	.067	1	.600***	.067	1
Duration															
Marital Duration	1.002**	.000	1	1.002***	.000	1	1.001*	.000	1	1.001	.000	1	1.001***	.000	1
Duration of working	.998	.004	1	.992*	.004	1	.997	.004	1	.998	.004	1	.990**	004	1
Satisfaction															
Level of contact with children	1.052	.172	1	.877	.176	1	.989	.167	1	.891	.164	1	.925	.165	1
Living Arrangement															
Number of members in the household	.983	.033	1	.973	.035	1	1.005	.032	1	.947	.032	1	.965	.032	1
Control Variables															
Education	.803**	.068	1	.806**	.075	1	.878*	.065	1	.802**	.065	1	.824**	.066	1
Income	.992	.028	1	.892***	.031	1	.973	.027	1	1.001	.027	1	.950	028	1
Age	1.018	.010	1	1.041***	.010	1	1.021*	.010	1	1.043***	.009	1	1.061***	.009	1
Residence (Urban)	1.003	.117	1	.961	.123	1	.935	.114	1	1.006	.113	1	1.235	.116	1
(Reference: Rural)	.	.	0	.	.	0	.	.	0	.	.	0	.	.	0
Sex (Female)	.923	.126	1	1.071	.135	1	.815	.123	1	1.019	.122	1	1.259	.126	1
(Reference: Male)	.	.	0	.	.	0	.	.	0	.	.	0	.	.	0

Likelihood ratio chi-square = 430.190; degree of freedom = 40; n = 4884 (valid cases).

Notes: OR = odds ratio; SE=standard error; *p<.05; **<.01; ***p<.001.

The reference category is respondents rated their health better than average in both wave 1 and wave 2.

Table 10

Multinomial Logistic Regression Models Comparing (1) Respondents with one or more scores on depression scale in wave 1, but zero score in wave 2, (2) Respondents with zero score on depression scale in wave 1, but one or more scores in wave 2, (3) Respondents with one or more scores on depression scale in both wave 1 and wave 2, (4) Respondents with one or more scores on depression scale missing, and (5) Respondents with zero score on depression scale in both waves (Reference group).

	At least one → Zero			Zero → At least one			Same-Some Depression			No Answer/ Missing		
Variable	OR	SE	df	OR	SE	df	OR	SE	df	OR	SE	Df
Breadth of Social Integration												
Multiple Roles	.933	.071	1	.941	.072	1	.846**	.062	1	.724***	.051	1
Duration												
Marital Duration	1.000	.000	1	1.000	.000	1	1.001	.000	1	1.000	.000	1
Total duration of working	.996	.004	1	1.000	.004	1	.994	.003	1	.993**	.003	1
Satisfaction												
Level of contact with children	1.020	.180	1	.864	.179	1	.914	.156	1	.703**	.127	1
Living Arrangement												
Number of members living together in the household	.932*	.035	1	.905**	.035	1	.863***	.031	1	.949*	.024	1
Control Variables												
Education	1.127	.072	1	1.086	.072	1	1.118	.064	1	.984	.054	1
Income	.960	.029	1	1.005	.029	1	.943*	.026	1	.951*	.021	1
Age	1.014	.010	1	1.030**	.010	1	1.021*	.009	1	1.073***	.007	1
Residence (Urban)	1.186	.122	1	1.016	.122	1	1.376**	.108	1	1.189	.086	1
(Reference: Rural)	.	.	0	.	.	0	.	.	0	.	.	0
Sex (Female)	.658**	.132	1	.825	.132	1	.632***	.117	1	1.122	.095	1
(Reference: Male)	.	.	0	.	.	0	.	.	0	.	.	0

Likelihood ratio chi-square = 509.306; degree of freedom = 40; n = 4884 (valid cases).

Notes: OR = odds ratio; SE=standard error; *p<.05; **<.01; ***p<.001. The reference category is respondents having zero score on depression scale in both wave 1 and wave 2. Residence and Sex are categorical (dichotomous) independent variables. One of the values is set to zero because it is redundant

Japanese Vocabulary	
amae (甘え)	to ask for reliance on the indulgence or the goodwill of one another (Chapter 1)
bosei (母性)	motherhood (Chapter 2)
bunmei kaika (文明開化)	enlightenment and civilization (Chapter 2)
dekasegi (出稼ぎ)	to migrate to other places of Japan to supplement their income (Chapter 2)
emaki (絵巻)	picture scrolls (Chapter 2)
Fukoku Kyohei (富国強兵)	one of the slogans in the Meiji period indicating to enrich the country and strengthen the military
eta (穢多)	pariahs of society, outcaste (Chapter 2)
goke (後家)	widow (Chapter 2)
ie (家)	the traditional stem family (Chapter 1)
ie seido (家制度)	the system of primogeniture legally recognized in the Meiji Civil Code in 1898 (Chapter 2)
ikigai (生きがい)	purpose of life (Chapter 7)
kazoku (家族)	a term invented in the nineteenth century to deal the Western idea of the nuclear family in Japan (Chapter 2)
kodokushi (孤独死)	solitary deaths (Chapter 7)
kogiroku (孝義録)	the popular moral writings describing the importance of filial care of the elderly (Chapter 2)
koseki (戸籍)	birth certificate, a household registrar (Chapter 2)
kotobuki taisha (寿退社)	women leaving jobs due to marriage (Chapter 2)
mabiki (間引き)	abortion and infanticide, especially when too many children were conceived or born (Chapter 2)
Meiji iroha karuta (明治いろはかるた)	a sort of traditional and popular Japanese card game utilizing proverbs (Chapter 1)
mokkan (木簡)	wooden tablets (Chapter 2)
Oite futatabi chigo ni naru (老いて二度児になる).	popular saying means that people become a child again as they become the old (Chapter 2)

Oitewa ko ni shitagae (老いては子に従え)	One of proverbs in Meiji iroha karuta teaching to obey your children when you are old (Chapter 1)
on (恩)	limitless obligations (Chapter 2)
ōtoji (大刀自)	grand toji, managed productive enterprises within their independent residences (Chapter 2)
oyabun and kobun (親分子分)	the lord-vassal relationship (Chapter 2)
seisai (正妻)	lawful wife (Chapter 2)
sengyō-shufu (専業主婦)	full-time homemakers (Chapter 2)
ubasute-yama (姥捨て山)	
Umeyo, fuyaseyo (産めよ殖やせよ)	the mountains described in old tales where the young left the elderly due to financial difficulties and burden of care work (Chapter 2)
shasekishū (沙石集),	one of the slogans in the Meiji period indicating, to give birth and increase the population
shufu (主婦)	collection of Buddhist tales (Chapter 2)
shumon aratame-chō (宗門改帳)	housewife (Chapter 2)
setsuwa (説話)	religious and household registration established to suppress Christianity (Chapter 2)
terakoya (寺子屋)	old tales (Chapter 2)
	popular folk schools in the Tokugawa period (Chapter 2)
toji (刀自)	matron, mistress, housekeeper played a major role in rural society, managing agricultural enterprises and supervising labor (Chapter 2)
wa (和)	in the circle of harmonious integration
zekke (絶家)	extinction of a family lineage

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