

**Gender Differences in Depression among Japanese Elderly: the
Impact of Informal Social Support and Residency Status on
Elderly Well-being**

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INTRODUCTION

The rapid aging of the population of the developed world has resulted in concerns over the viability of current social welfare and health care practices. The workforce is shrinking relative to the population over the age of 65, leaving the generations born during the post World War Two baby boom in both the East and West uncertain as to the continuing support provided by the state and private sectors.

Japan has recently entered negative growth. The nation's fertility rate--about 1.3 births per woman-- and the immigration cap of 2 percent per year virtually guarantee a shrinking labor force (National Institute of Population and Social Security Research, Japan 2006). In light of this fact the government has considered raising the age of retirement. Even still, elderly dependency on the working age population is expected to increase dramatically in the coming decades as the baby-boom generation nears retirement. Moreover, increases in longevity mean that the proportion of severely disabled people will rise in comparison to the total population (Harwood, Sayer and Hirshfeld 2004).

These population trends make analyses of the correlates of elderly well being a top priority of social policy research. Depression has been utilized by many past studies on aging (Bookwala and Shulz 2000; Sugihara et al. 2004; Sugisawa et al. 2002) as an indicator of the general well-being of the elderly population. As Japan becomes proportionately grayer, depression among the elderly becomes an increasingly valid measure of society's ability to handle structural changes. Overall, depression tends to increase with age and is associated with many aspects of daily living, such as the quality of kin relationships and access to social support. Since Japanese families have

historically followed a stem structure, the assumption has been made that family, particularly wives and female children, will be on hand to provide critical support for mentally ill and physically incapacitated elderly.

Three developments cast doubt on the potential of coresidence with family to enhance elderly emotional well being. Urban lifestyles have resulted in the disintegration of the extended, coresiding family. Many studies, especially those written in the English language, which examine trends in East Asian elderly care, begin by highlighting the multigenerational structure of Asian families. There is considerable opposition to traditional filial norms among modern Japanese elderly as well as their adult children (Izuhara 2000). Preferences appear to be shifting towards a nuclear family structure. If stem families are no longer the ideal, one can posit that the future will see increasing numbers of elderly Japanese living independently (Ogawa and Retherford 1993). Finally, rising levels of female labor force participation despite a persistent rice paper ceiling (Brinton 1988) mean that the traditional caretakers of elderly family members are increasingly absent from the household. To date, only a handful of studies have examined the correlates of changing residency patterns and how they may impact overall well-being.

Although the structure of the Japanese family is undergoing changes, gender roles within the household continue to be based on traditional notions of male and female labor. Eldest sons feel the pressure to assume financial responsibility for their parents' households, while women provide considerable emotional and instrumental care for family members (Izuhara 2002; Nonoyama 2000; Therborn 2004). Not only are women more likely than men to be caregivers during their lifetimes, but due to their relatively

longer lifespans, they are also more likely to require support from someone other than spouses. The International Longevity Center of Japan reports that over 80 percent of informal family caregivers are women (ILCC 2007). In addition, since elderly women may continue to provide care for spouses and children, while also requiring a degree of emotional and physical support, it is clear that depression may be experienced differently by men and women.

This paper utilizes data from the first wave of the Nihon University Longitudinal Study of Aging to examine the correlates of self-reported depression levels of the elderly, with a specific focus on the roles played by health, coresidence and informal social support from family, friends and community organizations. In particular, this research seeks to pinpoint how different household configurations and patterns of social support contribute to differences in depression levels of the elderly.

Elderly care looms as one of the critical issues for the developed world in the 20th Century. Demographic changes in birth rates, migration patterns and overall structural changes in industrialized economies have meant adjustments for families. However, women are more likely to live into old age than men, becoming the primary recipients of care as well as facing the burden of family caretaking. The experience of the sample of Japanese elderly selected for this study will contribute to existing knowledge on the needs of the elderly population and serve as guidance for future policy.

LITERATURE REVIEW

Gender Differences in Depression among the Elderly

Depression is an indicator of health and can be utilized as a measure of the quality of everyday life (Koizumi et al. 2005; Okamoto and Tanaka 2004; Sugisawa et al. 2002; Sugihara et al. 2004). In the literature, instrumental support refers to the physical aspects of providing care such as bathing, changing clothes, paying bills and preparing meals, while emotional support refers to more invisible aspects of care such as providing company and conversation. In general, depression has been negatively associated with instrumental and emotional support and positively associated with age and physical pain when instrumental support is lacking (Koizumi et. al 2005). This point implies an interaction among age, physical health, the receipt of care and depression. It also underscores the importance of instrumental support and the proximity of people who provide such care to the elderly.

There is evidence that depression levels vary by gender—women may experience more burden and stress in their daily lives because of the caregiving role than men and are more likely to experience the loss of a spouse (Kendig et al. 1999; Marks, Lambert and Choi 2002). Female life expectancy in Japan is about seven years longer than male life expectancy—85.6 years versus 78.6 years. In addition, the family support ratio (number of women per elderly person) is expected to decline from 1.30 women per elderly person in 1990 to 0.65 by 2010. Therefore, the number of households without caregivers younger than 60 is increasing, weakening the traditional female-centered family support system (Ogawa and Matsukura 2005). At the same time, men who are

thrust into the caregiving role are less likely to receive the support of family and peers, due to traditional notions of caregiving as a female role (Harris and Long 1999).

Social scientists concerned with family dynamics and work have long discussed the division of household and salaried labor as being inherently gendered. “Doing gender” (West and Zimmerman 1987) involves living up to normative conceptions of male and female roles as well as challenging those same notions through individual behavior. Japanese women have entered the salaried workforce in increasing numbers. Although women’s total labor force participation has fluctuated between 46% and 49% since 1980, participation among women between the ages of 30 and 50 has increased from 46% to 70% since that time (IPSS 2006). However, significant barriers towards promotion and entrenched notions of household roles mean that gender still plays a large part in determining the daily activities of men and women (Brinton 1988; Kamo 2003). Although more middle-aged and elderly women are employed than in the past, expectations remain that women act as caretakers for the family.

Depression can be attributed to disparate social and environmental factors among men and women. In particular, household composition can significantly correlate with elderly mental health. Coresidence should reduce depression among the elderly. However, since men and women face different expectations concerning household roles, the nature and intensity of housework may interact with quality of relationships within the household to affect self-reported depression (Kendig et al 1999; West and Zimmerman 1987; Yoshinori 2003). Women may feel increased pressure to accept a nurturing role and undertake those tasks associated with the organization of a household. Since, traditionally, men’s greatest sphere of control lies in external working

environments, they are less likely than women to experience stress associated with the loss of the role of household manager. Essentially, elderly women are more likely than elderly men to find themselves in a compromised position as head of household when a son or daughter-in-law shares the same living space.

In terms of intergenerational support for the elderly, coresidence with sons and daughters may have different effects on elderly men and women. Expectations remain that eldest sons will inherit both the family household and caretaking of their elderly parents. However, the role of primary caregiver frequently falls on the daughter-in-law, while the son is occupied with financial concerns (Izuhara 2002). Although parents frequently coreside with sons, they may rely on their daughters for emotional support. Izuhara (2000), in a series of qualitative interviews with elderly, Japanese women, found that many mothers expressed a preference for living with daughters, whom they indicated as emotional confidants, as opposed to sons. The more traditional caregiver/care-recipient relationship, as found between parents and daughters-in-law (Therborn 2004), is more likely to be characterized by a struggle for power or control of the household, resulting in increased depression for both the care recipient and caregiver (Izuhara 2000; Jenike 2003). It comes as little surprise that some modern Japanese women reject the obligation to coreside with a spouse's parents, regarding it as "little more than a transaction related to inheritance" (Traphagan 2003).

Finally, elderly women who outlive their spouses are likely to find themselves in the role of both caregiver and care recipient in their lifetimes. At the same time, husbands who find themselves in a position to give care to an elderly spouse may be forced to undergo overall larger lifestyle changes than their partners, being less

accustomed to a traditionally female, nurturing role. Men faced with such lifestyle changes may be overwhelmed with their new responsibilities and unable to count on support from family members and the community (Harris, Long and Fuji 1998). Elderly male caregivers may thus have some disadvantage compared to their female counterparts in enlisting support from their communities, and subsequently, experience high depression levels. However, overall men can expect a significant gender advantage in terms of receiving care from wives and adult family members throughout their lives, improving their well-being in relation to their female counterparts.

Widowed, divorced and never-married elderly women have an increased risk of mortality over married women, while divorced men also experience such risk, as compared to their married counterparts. Iwasaki and colleagues (2002) found that single (never-married) women experienced the greatest mortality risk when lacking contact with close kin, while the most significant risk factor for mortality among men was lack of participation in activities. They also stated that although women tend to have more extensive social networks, men may need a lower threshold of social support to experience health gains.

Okamoto and Tanaka (2004) found that good subjective health was significantly associated with social support among men, but not among women. In addition, although men may experience greater overall health benefits from marriage than women, there is a noteworthy difference in terms of economic advantage between married, widowed and divorced women and never married women (Iwasaki et al. 2002).

It is also crucial to mention that higher levels of education have been found to reduce the effect of gender on intergenerational dependency (Ha et al. 2006). Higher

education might help older adults to move away from gender roles that render an individual less capable of independent living (in terms of financial and emotional dependence), making adjustment to life as a widow/widower easier.

In general, changes in coresidency and household structure have been found to significantly affect levels of depression, loneliness and stress experienced by the elderly (Misa 2000, 2002; Jenike 2003; Kalmijn 2007). Both women and men can expect their mental and physical health to be impacted by the proximity of new household members and shifts in the pattern of exchange between generations. In addition, women are more likely than men to feel the impact of a lack of instrumental and emotional support from family (Koizumi et al. 2005). In many cases this can be explained by the onset of depression at the loss of a spouse. A larger proportion of women than men must adjust their living arrangements at the time of a spouse's death. At the same time, older women are more likely than men to have expressive ties and support from both family and friends that could help mitigate depression (Spitze and Logan 1990).

Social ties have an additional positive impact on mental health, in terms of coresidency as well as social contact with non-co-residing family and friends. Sugisawa and colleagues (2002) argued that the presence of spouses significantly mitigate instances of depression in the elderly. They also found a negative association between having adult children and depression, although one must keep in mind that children may act as substitutes for deceased spouses. Finally, the effect of contact with friends and organizations was less salient. Sugisawa and colleagues found that there was a slight negative association between depression levels and contact with friends, neighbors and

relatives among men and women. However, the relationship with elderly citizens' involvement in community organizations was not significant.

While spouses may be the first line of defense against depression, the preceding evidence makes it clear that household structure and gender also play a part in determining emotional well-being of the elderly. Co-residence alone does not prevent depression as transitions in household living arrangements may negatively impact elderly health. Women will experience such transitions differently than men due to the fact that gender largely dictates spheres of influence within the home.

Social Support and Informal Care for the Elderly

Social support, in terms of emotional and instrumental care elderly received from family, friends and community, affects overall well-being. Direct effects include having someone on hand to converse with on a daily basis, provide emergency medical care, provide transportation and help clothe, bathe and feed the elderly care recipient. Indirect effects may involve regular interactions with kin who provide contact points with extended family, having strong emotional ties with household members and having help with housework and finances.

The quality and degree of support for the elderly, in terms of emotional and physical care received, varies by residency status. North American studies have found that elderly dependency is often the result of a physical or mental disability that prevents the ailing individual from living alone (Burr and Mutchler 2007). Elderly parents are also more likely to live with children when there are several children in the family. It must be noted that the direction of exchange is just as likely to be from the parent to child as child to parent (Spitze and Logan 1990). Although elderly parents may live with adult

children and their families, they may retain many of the responsibilities of a head of household. Adult children frequently live with parents until marriage and may receive economic benefits, in terms of financial support as well as property inheritance, in exchange for providing emotional and physical care to elderly parents (Misa 2002). It follows that feelings of depression expressed by elderly co-residing with children may be related to loss of control over the household or an inability to live up to preconceived notions of their roles as mothers and fathers. The loss of a spouse or living in a child's home as opposed to the elderly respondent's own home may precipitate feelings of depression due to a reversal in family roles towards parent-child dependency.

The availability of kin, in terms of physical distance and household size, may also determine the breadth of an individual's sphere of social support, as elderly in need of care may benefit from a relative acting as a point of contact between their household and local organizations (Snider 1981). At the same time, widowed parents have been found to receive more support from family than married parents. In the case of married couples, spouses exist as the primary means of support for both men and women. Overall, husbands are more likely to benefit from spousal care—in part due to wives intervening to solicit emotional and instrumental support from other relatives. However, parents of highly educated children may have less contact with their offspring than parents of less educated children, although educated children tend to provide more support, albeit from a distance (Kalmijn 2007). Thus is it critical to distinguish instances of social contact and proximity of kin from actual reports of received care and support.

The literature on Japan highlights the relationships between elderly care recipients and caregivers as having both positive and negative effects on the physical and emotional

well-being of the elderly. Studies have found that the absence of relationships with spouses, married children and grandchildren have a significant effect on survival (Cornell 1992; Iwasaki et al. 2002). Spouses exist as the primary support for the elderly, while children often perform instrumental and emotional support for parents upon the death of the spouse. At the same time, studies have documented combative relationships between the elderly and their primary caregivers (Traphagan 2003; Jenike 2003). Relationships between parents and children may not live up to idealized notions of reciprocal care. When interactions between elderly and their children are strained, often due to a physical or mental impairment on the part of the parent, both care recipient and caregiver are likely to experience increased levels of anxiety and depression (Bookwala and Schulz 2000; Sugihara et al. 2004). Poor physical or mental health among dependent elderly can negatively impact family relationships, which in turn exacerbates depression levels.

Although many Japanese live alone for decades in old age, in many cases support will eventually rest with adult children living in the same household (Kendig et al. 1999; Therborn 2004). Coresidence in Japan has been attributed to norms of filial piety, originating in Confucian ideology and written as law during the Meiji period (1868-1912) (Izuhara 2000; Ogawa and Retherford 1993; Takagi and Silverstein 2006; Therborn 2004). In contrast to the West where family relationships are more horizontal, Japanese families are characterized by vertical relationships, with contact between generations occurring in the household (Sugisawa et al. 2002). In Japan's traditional *Ie* (household) system, elderly parents live with the family of the eldest son. Property is passed on directly to the son and the daughter-in-law, *yome*, enters the household as primary

caretaker of the family (Nonoyama 2000). The Meiji codes were abolished during the American occupation of Japan and the system of patrilineal inheritance disappeared from written law. However, the norm of the stem family, with the eldest son inheriting both property and responsibility for the care of the parents, has remained the ideological underpinning of family existence.

However, recent studies have argued that preferences among Japanese are shifting away from coresidency, raising questions as to how this may impact elderly in need of care. Although the intergenerational family system makes practical sense as individuals' primary means of social support (Cornell 1992), for many it is no longer the ideal. In Japan, upon entering adulthood many have chosen to migrate to urban areas where land is expensive and space is a constraint on having a large family (Heinrich 1998). Today, many elderly parents express a desire to live independently and do not wish to burden the younger generation. Confucian norms may still exist at a superficial level, but they may only be called upon to keep up public appearances (Izuhara 2002). The generational contract is becoming more ambiguous. Lengthening lifespans mean that children often purchase homes before inheriting them and financially independent women may prefer not to live with their parents-in-law (Izuhara 2000).

Coresidency has been declining for decades in Japan and will continue in this direction (Raymo and Kaneda 2003; Ogawa and Retherford 1997). Raymo and Kaneda (2003) found that coresidence is highest among the widowed, highlighting the fact that women live longer than men and should be at the crux of discussions concerning elderly health. In the same study, the authors found that home ownership, educational attainment and region of residence were the primary predictors of intergenerational coresidence.

Although coresidence is correlated with elderly depression and overall well-being, the direction of the relationship differs by context. It is important to note the possible effects of the implementation of public Long Term Care Insurance (LTCI) in 2000 and the use of services through its predecessor, the Gold Plan. Although this paper will primarily investigate informal care provided by family and communities, both the LTCI and Gold Plan were designed to provide in-house care services—an aspect of the plans intended to reduce the burden experienced by families with incapacitated elderly members. In the case of the LTCI, the need for such care is decided by a specialist assigned to individual cases (Ozawa and Nakayama 2005). Although the positive affects of the LTCI plan on elderly health have yet to be assessed, the use of in-home services may reduce stress among coresiding family members, particularly between daughters-in-law and their elderly care recipients (Takagi 2003).

HYPOTHESES

The extant literature describes the Japanese household as transitioning from coresidence between eldest sons' families and parents to a scenario in which elderly parents make choices concerning coresidency and care based on emotional ties with their children and other close relatives (Ogawa and Retherford 1997; Izuhara 2000; Izuhara 2002; Jenike 2003). Women are more likely to coreside with children and receive care from children and close relatives than are men; men are more likely to receive care from their spouses (Iwasaki et al. 2002). Men can expect greater support from wives and relatives throughout their lives and may need less social support overall to experience positive health benefits (Iwasaki et al. 2002; Koizumi et al. 2005). Elderly women are

more at risk for depression, facing expectations to be primary caregivers and more likely than men to experience the loss of a spouse. In addition, since women are more likely to be widowed, they are also more likely to experience care provided by a daughter-in-law, as opposed to a spouse or other family member.

Based on these findings I expect that women will report higher levels of depression than men overall. There will be significant correlations between depression and coresiding with a son's family for women, but not for men.

Isolation will be positively correlated with depression for both men and women. Elderly who are widowed or live alone will experience higher levels of depression than those who are married and divorced. Finally, strong affective ties with children will be negatively associated with depression, regardless of gender. This relationship will become apparent by focusing on emotional care and family contact. This is particularly true in the case of elderly who experience physical pain or report being in poor physical health.

Demographic factors such as age, educational attainment, urban/rural residency and size of household will be correlated with depression. Age will have a positive correlation, while educational attainment and household size will have negative correlations. Urban residency will result in higher depressive symptoms. Urban residency implies fewer extended households and greater physical distance between the elderly, their families and other community contacts.

DATA

The analysis relies on data from the Nihon University Japanese Longitudinal Study of Aging (NUJLSOA) Wave One. The NUJLSOA is a four wave longitudinal survey conducted in 1999, 2000, 2003 and 2006. Data from the first two waves are available in English, while the third and fourth waves are not yet publicly available. The survey was administered throughout Japan by a multi-stage, stratified, cluster method and is representative of the Japanese population over the age of 65. Since respondents between the ages of 75 to 85 were over sampled, weights were developed for use with the survey. Respondents were asked to answer questions concerning mental and physical health, demographic background and items designed to collect information on family and social networks (NUJLSOA Website 2007). The survey utilized a 12 item version of the Center for Epidemiologic Studies' Depression Scale (CES-D). Although the validity of the CES-D in cross-cultural and ethnic studies has been called into question, the scale has been previously adapted for Japanese respondents and found to have high reliability (Shima et al. 1985).

The sample size for the NUJLSOA, Wave 1 was 4997 without weighting. After eliminating proxy responses, applying the necessary weights and adjusting for missing data, the sample size was 5609. 2466 were men, while 3143 were women.

MEASURES

Dependent Variable-Depression

The dependent variable for this study, "depression," is an index of 11 items concerning respondents' mental health that are based on the short version of the CES-D.

Responses to the Japanese scale are coded as 1 “rarely”, 2 “sometimes”, and 3 “often.” Items assessing positive affect were reverse coded so that higher values indicate higher levels of depression. Sample items include “The people around me seemed unfriendly,” “I’ve had trouble sleeping,” and “The future seemed bright.” The NUJLSOA version of questions comprising the CES-D contain a “Don’t Know” category, which the survey designers intended as a last option for interviewers who could not illicit a committed response from respondents. For the purposes of this research “don’t know” responses were coded as missing. One positive effect item, “The future seemed bright” was dropped due its disproportionately large number of missing responses (16%). Reliability for the scale created from these items was moderate to high ($\alpha=.68$).

Independent Variables

The reference category for the regression models are married, coresiding men. For this reason, several key variables concerning social support include living alone, being divorced or separated, never having married and status as a widow/widower. Dichotomous variables were created for analysis for categories labeled “single,” and “widowed.” The category “single” incorporated being separated, divorced and never married (1=separated, divorced, never married; 0=married, widowed). Status as widow or widower was similarly coded (1=widowed; 0=married, divorced, separated, never married).

Next, items concerning contact with family members and involvement in community organizations were used to measure isolation among elderly respondents. One item measures frequency of meetings between parents, children and their spouses. These responses were converted into a summary scale. Then, a question asking

respondents about phone contact with family (ordinal variables describing frequencies per week, month and year) were converted into a scale similar to the previous item.

Although, the NUJLSOA does not contain questions concerning the quality of respondents' relationships with family members, several items ask if respondents feel positive about the amount of contact with different family members. Unfortunately, a large number of missing responses (over 90%) rendered these questions unreliable for analysis. For this reason, no variables describing quality of family relationships or satisfaction with family relationships were included in the analysis.

Finally, 11 items describing participation in various clubs (1=participate; 0=do not participate), organizations and community activities were summarized in a scale, with higher numbers indicating increased participation.

The well-being of the elderly may, in general, reflect their household roles, and more specifically, the amount of power they wield in the home (Izuhara 2000, 2002; Jenike 2003). Several dichotomous variables were created to capture status as a head of household, or whether sons or daughters are heads of households (1=head of household; 0=not head of household). An additional variable was created to indicate home ownership (1=homeowner; 0=not home owner).

In terms of informal care, several variables were created to indicate both providing care to a family member and receiving care. Dichotomous variables (1=provided care; 0=did not provide care) were created to measure having acted as the primary caretaker of a spouse, parent or parent-in-law. The NUJLSOA questionnaire does not contain an item that captures caregiving at the moment of the survey. Instead several questions measure having been the primary caregiver of an elderly family

member during that person's lifetime. A second set of variables captures the type of support and care received from children in multigenerational households. These variables measure instrumental care (shopping, dressing, cleaning) and emotional care (presence of a confidant). Dichotomous variables were created for the receipt of both emotional and instrumental support from coresiding children (Receive Support=1; Do not receive support =0).

Although the Long Term Care Insurance plan was not implemented at the time of the wave one survey, respondents had access to home care under the previous Gold Plan. An index measuring usage of in-home care was computed based on responses to six items about the type of service utilized under the Gold Plan.

Elderly who are physically incapacitated are more likely to require informal family care, and may be more depressed as a result of their physical inadequacies. For this reason, another scale was created based on the sum of negative responses to 7 items capturing difficulty in performing activities of daily living, such as using the telephone, going to the bathroom and dressing oneself.

Another variable was computed based on positive responses to 15 items capturing chronic physical conditions such as heart disease, back pain and respiratory illness. A scale was computed based on these responses. Finally, answers to one survey question measuring overall perceptions of health were included as the independent variable "subjective health." Responses were coded 1 to 5, with higher responses indicating worse perceptions of health.

Demographic Variables

Several demographic variables were also chosen due to their probable correlation with depressive symptoms. These were age, urban residency, educational attainment, income and household size. All models in the subsequent analysis controlled for gender.

Interaction Terms

Interaction terms were created to account for the gender differences in depression. These variables captured being female and living alone, living in a son's household, giving care to a spouse, receiving instrumental and emotional care, having difficulties with activities of daily living, having a chronic condition, subjective state of health, income, urban residence, community group participation, family visits and phone contact with family.

ANALYSIS

The descriptive statistics of the variables used in this study present a general picture of the situation of average Japanese elderly (See Table A1 in Appendix). On average the sample was married, female and about 73 years old. The majority lived in urban areas and in households consisting of about 3 people. Most had never completed high school and earned about 2 million yen (a little over \$20,000) in annual income. Although about half of elderly respondents claimed themselves or their spouses to be heads of households, most were home owners.

More had been primary caregivers for a parent (.27) than a spouse (.14) at some point in their lives and only a few claimed to coreside with children for instrumental (.11) or emotional support (.10). A few elderly also claimed to use state-sponsored care

services (The Gold Plan prior to 2000). Most elderly reported at least 1 aspect of daily living that posed a problem for their daily routine and a few claimed to suffer from a chronic condition or debilitating illness (.25 average out of a maximum score of 7). However, most elderly felt themselves to be of average to better than average health.

Table 1 Gender Differences in Means and Standard Deviations of Study Variables

Variable	Women N=3143		Men N=2466	
	M	SD	M	SD
Depression Score***	15.38	2.68	14.99	2.22
Lives Alone***	0.18	0.38	0.06	0.23
Married***	0.48	0.5	0.87	0.34
Widowed***	0.47	0.5	0.11	0.32
Single***	0.05	0.22	0.02	0.13
Household Size	3.23	1.86	3.22	1.76
Head Household***	0.27	0.44	0.91	0.29
Son Head House***	0.4	0.49	0.02	0.15
Daughter Head House***	0.33	0.47	0.02	0.15
Home Owner	0.88	0.33	0.9	0.3
Gave Care Spouse***	0.2	0.4	0.06	0.24
Gave Care Parent/Parent-In-Law***	0.35	0.48	0.17	0.38
Receive Instrum Care Child***	0.13	0.34	0.08	0.27
Receive Emotional Care Child***	0.12	0.32	0.07	0.26
Gold Plan***	0.17	0.63	0.11	0.52
Frequency of Visits Children	12.45	10.13	12.93	9.72
Family Contact Phone**	12.81	10.3	13.54	10.14
Community Participation	1.18	1.29	1.18	1.29
ADL***	0.23	0.89	0.13	0.71
Chronic Condition**	1.58	1.45	1.48	1.28
Subjective Health***	2.87	1.05	2.67	1.09
Income***	4.26	2.21	5.55	2.23
Educational Attainment***	1.49	0.77	1.81	1.27
Age***	73.33	5.94	72.38	5.77
Urban Residence	0.59	0.49	0.61	0.49

*Gender difference significant at $p < .05$

**Gender difference significant at $p < .01$

***Gender difference significant at $p < .001$

After running independent samples T tests for the study variables by gender, a more nuanced picture of the elderly Japanese population took shape. All differences between genders were significant except household size, status as homeowner, frequency of children's visits and participation in community groups. As hypothesized, women scored slightly higher on the depression scale than men (mean score of 15.38 versus 14.99), were slightly older (73 versus 72) and were more likely to live alone (.18 versus .06). Most men were married, while this was the case with only about half of the women in the sample (.87 versus .48).

In terms of social and economic capital, men scored significantly higher than women. Men reported more annual income than women (about 5 million Yen versus 4 Million Yen; a 10 thousand dollar difference). They were also slightly more educated, although the majority of sample respondents were not high school graduates. Men were more likely than women to be the heads of their households (.91 versus .27). As hypothesized, women were more likely than men to reside in a house where their son or daughter was the head of household. This may have further implications for gender differences in depression in the regression analysis.

Concerning health and caregiving, more women than men both gave and received care at some point in their lives. This was true of both instrumental and emotional care. Women were also more likely to take advantage of state-sponsored home care under the Gold Plan. Women reported more chronic conditions than men (1.58 versus 1.48), and greater difficulty with activities of daily living (0.23 versus 0.13). They also felt that their health was slightly worse than men, on average (2.87 versus 2.67).

These findings remain consistent with past studies that found women to be more likely to coreside with children and seek care from their children than men (Iwasaki et al. 2001). The results also agree with literature that suggests that living into old age, isolation and worse health contribute to greater levels of depression among women (Sugisawa et al. 2002). In addition, the loss of head of household status as a factor among women, which is almost non-existent among men (.27 female heads of households versus .91 male heads of households), may contribute to depression (Izuhara 2000).

RESULTS

Two models were created to determine associations among the independent variables selected for the study and elderly depression. The baseline model represented all survey respondents. The second model included interaction terms intended to account for gender differences.

Before regressing the depression index on the independent variables, a correlation matrix was run to identify variables that displayed high multicollinearity. None of the independent variables were found to have strong correlations with the depression index. Not surprisingly, correlations were higher and significant between the interactions terms and female. There was also a very strong linear association between the interaction terms for talking with family on the phone and visiting family. Since the variable capturing family visits was not found to be significantly different between men and women, the interaction term was not included in the regression models. Since removing the other interaction terms from the second model did not improve the model fit, they remained in the analysis.

**Table 3: OLS Regression Predicting Depression among Japanese Elderly
Unstandardized and Standardized (Beta) Coefficients (N=5609)**

	Base Model	Beta	Gender Comparison Model	Beta
(Constant)	13.765***		14.264***	
Lives Alone	.458**	.062**	.761**	.104
Widowed	-.006	-.001	-.036	-.007
Single	.046	.004	.102	.008
Household Size	-.088**	-.064	-.084**	-.061**
Head Household	-.213	-.043	-.164	-.033
Son Head House	-.075	-.012	-.150	-.025
Daughter Head House	-.007	-.001	-6.46E-005	.000
Home Owner	.277*	.036*	.307**	.040**
Gave Care spouse	.407***	.058***	.413	.058
Gave Care Parent/Parent-In-Law	-.033	-.006	-.027	-.336
Receive Instrum Care Child	.419**	.051**	.156	.019
Receive Emotional Care Child	-.577***	-.068***	-.720**	-.085
Gold Plan	.083	.020	.086	.021
Family Contact Visits	-.004	-.015	-.005	-.018
Family Contact Phone	-.010	-.042	-.021**	-.086**
Community Participation	-.085**	-.045**	-.003	-.083
ADL	.291***	.091***	.505***	.158***
Chronic Condition	.130***	.073***	.064	.036
Subjective Health	.508***	.220***	.363***	.157***
Income	-.106***	-.099***	-.112***	-.105***
Educational Attainment	-.057	-.024	-.050	-.021
Age	.009	.020	.009	.021
Urban Residence	.246**	.048**	.173	.034
Female	-.140	.118	-1.13***	-.227***
Lives Alone X Female			-.384	-.047
Son HH X Female			.073	.012
Gave Care Spouse X Female			-.048	-.006
Receive Instrum Care Child X Female			.366	.037
Receive Emotional Care Child X Female			.235	.023
ADL X Female			-.330**	-.084**
Chronic Condition X Female			.104	.057
Subjective Health X Female			.262***	.173***
Income X Female			.016	.017
Education X Female			-.037	-.014
Urban Residence X Female			.134	.026
Community Participation X Female			-.134*	-.061*
Family Contact Phone X Female			.018**	.073**
Adjusted R Square		.146		.153^

*p<.05; **p<.01; ***p<.001; ^Differences between models significant (p<.001)

The results of OLS regression in the base model illuminate several key predictors of depression among Japanese elderly. As hypothesized, living alone was significantly correlated with increased depression ($p < .01$, $b = .458$). Although none of the head of household variables proved to be significant, home owners experienced a .277 category increase over non-homeowners in depression, all else held constant. This fact contradicts my hypothesis that owning one's own home should contribute to a sense of mastery and increased well-being. In addition, those who received instrumental care from a coresiding child experience increased levels of depression ($p < .01$, $b = .419$) over those who did not, all else remaining constant. This fact stands in stark contrast to the fact that receipt of emotional care from a coresiding child resulted in decreased levels of depression over those who did not report such care ($p < .001$, $b = -.577$), all else constant. This information suggests that instrumental care, in the form of helping with finances as well as normal activities of everyday life, reflects a loss of ability on the part of the elderly to control his or her home environment. Emotional support from one's children, on the other hand, contributes to a person's general sense of well-being, lessening depression.

Other variables that were significantly associated with increased depression in the baseline model were having acted as primary caregiver for a spouse ($p < .001$, $b = .407$), and all three variables capturing general health. Not surprisingly, admitted difficulties in performing activities of daily living ($p < .001$) and the presence of a sickness or chronic condition ($p < .001$) were significantly and positively correlated with depression. In addition, poor subjective health represented the strongest, positive correlation with

depression in the baseline model ($p < .001$, $B = .220$). As subjective health worsens by one interval, depression increases by about half an interval, all else held constant.

Finally, as hypothesized, both income ($p < .001$) and urban residence ($p < .01$) were significantly correlated with depression. As expected, increased income results in lower levels of depression, while residing in an urban area contributes to depression. Overall, the baseline model predicts a small to moderate amount of the variation in depression ($R^2 = .146$). Surprisingly, age was not significantly correlated with depression. This may reflect the overall advanced age of survey participants (mean age = 72.91). One would expect age to be significant when younger cohorts are included in the analysis.

The gender differences model complicates the relationship among depression and the independent variables. Several variables that were significantly correlated with depression in the baseline model, were no longer significant in the gender differences model. These variables included giving care to a spouse, receiving instrumental care from a co-residing child, participating in community groups, suffering from a chronic condition and urban residence. This may have occurred due to the addition of twelve interaction terms to the second model, resulting in high multicollinearity among many of the variables. At the same time, several independent variables became significant in the second model. These were phone contact with family ($p < .01$) and female ($p < .001$). In addition, the variable for female becomes the largest predictor of variation in depression in the second model ($B = -.227$). The negative coefficient ($b = -1.13$) is counterintuitive, indicating that females experience reduced levels of depression over men, but it must be interpreted in tandem with the interaction terms

In the gender differences model, living alone ($p < .01$), being a homeowner ($p < .01$), having difficulty with activities of daily living ($p < .001$), and subjective health ($p < .001$) were all positively associated with increased depression. The variable capturing respondents' subjective self-assessment of health remained a strong predictor of depression in the second model ($B = .157$). In addition, the interaction terms for female subjective health ($p < .001$) as well as female, family phone contact ($p < .01$) were significant and associated with increased levels of depression. However, the results indicate that women who report poor subjective health are less depressed than men. For example, a one unit increase in poor subjective health results in a .97 unit decrease in depression among elderly women while elderly men experience a .363 unit increase, all else constant. This result contradicts the overall higher mean depression of women over men in the sample (15.99 versus 14.38). This may reflect a gender difference in the expression of poor health and emotional states between men and women. Poor physical health and pain may have a greater impact on the mental health of men than women.

Overall the two models account for a small to moderate amount of the variation in depression, with the gender differences model representing a slight improvement over the first model (adjusted R square improves from .146 to .153). The differences between the two models are significant ($p < .001$).

DISCUSSION

Although some evidence from the analyses support several of the research hypotheses outlined in this paper, the regression models contained a few surprises. First, although women reported a higher mean level of depression than men (15.38 versus 14.99; $p < .001$), the gender differences model demonstrated that women who reported

health problems were less depressed than their male counterparts who reported health problems. It seems that poor health has a greater impact on the mental state of men than women.

My hypothesis that isolation, captured through the variable “living alone,” would result in greater depression among men and women proved to be true in both regression models. However, there were no significant correlations between status as widow/widower and depression as well as being single and depression. As predicted, urban residence, as an indicator of greater isolation, increased depression in the first model, but lost significance in the second after adding the female interaction terms. This suggests that there may be multicollinearity among these variables. An additional explanation could be that the effect of urban residence on depression may be due to intervening variables such as gender, health status and community contact.

I found no support for the hypothesis that coresidence with daughters should result in decreased levels of depression among women, while coresidence with sons would have the opposite effect. However, status as a homeowner counter-intuitively increased depression levels for both men and women. At the same time, household size had a mitigating effect.

As expected, having given care to a spouse was positively associated with depression, although the effect disappeared in the gender comparison model. In addition, receipt of instrumental care increased depression, perhaps as a result of loss of control. This result lends support to theories of family conflict and solidarity (Grundy and Henretta 2006). The receipt of emotional care, as predicted, reduced depression among both elderly men and women.

CONCLUSIONS

Overall, health and gender were the most important predictors of depression in the regression analysis. While age was not a significant factor, other demographic variables such as income and urban residence were. Age might be a crucial predictor of depression in studies that incorporate younger birth cohorts—however this data only collected information on elderly over the age of 70. As a result, health status relative to others of similar age accounted for more of the variation in depression among men and women.

This research suffers from two major limitations. The first is that these results reflect an analysis of cross-sectional data. Expressions of mental health depend on current physical states of health as well as the contexts of daily interactions and living. Adding another wave to the analysis would make it possible to explore the relationships between emotional well-being and changing health as well as understand shifting environmental effects. Second, the NUJLSOA survey does not include items that measure the quality of family relationships. Since the data available concerning feelings about frequency of family contact were also unusable, little can be inferred about the effect of kin relationships on depression. These facts necessitate incorporating other means of assessing social support into the analysis.

Finally, this research would benefit from a substantive investigation of the impact of socio-economic factors on well-being. Although education was not significant in predicting depression (this can be attributed to the low educational attainment of the sample), income and status as homeowner did. These two variables represent crucial differences in the power wielded by men and women within their homes. These factors may also illuminate how elderly well-being is related to class background. Adding

retirement income and benefits as well as total family income as separate variables to the analysis, might create a more nuanced picture of household dynamics and clarify the relationship between economic necessity and coresidency.

In conclusion, this research has identified significant differences between elderly Japanese men and women in their reported levels of depression. However, in order to accurately portray the roles that families and household dynamics play in the well being of the elderly a greater emphasis needs to be placed on affective ties among family members of the elderly. As Japanese society continues to age, access to public care may become more problematic and a greater burden will be placed on families to support their parents and grandparents. The amount and quality of support received from family members is critical to understanding both elderly health outcomes and the nature of shifting family and gender roles.

APPENDIX

Table A1 Means and Standard Deviations for Study Variables

N=5609

Variable	M	SD
Depression Score	15.21	2.5
Lives Alone	0.12	0.32
Married	0.65	0.48
Widowed	0.31	0.46
Single	0.04	0.19
Household Size	3.22	1.82
Head Household	0.55	0.5
Son Head House	0.24	0.42
Daughter Head House	0.2	0.4
Home Owner	0.89	0.31
Gave Care spouse	0.14	0.35
Gave Care Parent/Parent-In-Law	0.27	0.44
Receive Instrum Care Child	0.11	0.31
Receive Emotional Care Child	0.1	0.3
Gold Plan	0.15	0.59
Frequency of Visits Children	12.65	9.95
Family Contact		
Phone	13.13	10.24
Community Participation	1.18	1.29
ADL	0.18	0.81
Chronic Condition	1.53	1.38
Subjective Health	2.79	1.07
Income	4.85	2.31
Educational Attainment	1.63	1.03
Age	72.91	5.88
Urban Residence	0.6	0.49
Female	0.56	0.5

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