Living Arrangements of Widowed Oldest Old Women, China: Who are they living with?*

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Abstract:

According to the fifth national Chinese census in 2000, ten percent of the Chinese population are elderly (those aged 60 or above). Of the elderly, eight percent are oldest old (those aged 80 or above). Of the oldest old, women account for over 60 percent, and eighty-three percent are widowed. Focusing on the widowed oldest old women, my question is, after losing their spouses, who are these women living with, and furthermore, who are taking care of them physically and emotionally? Based on data from the 1998 Chinese Longitudinal Healthy Longevity Survey (CLHLS), my analysis shows a substantial proportion of widowed oldest old women are not living with their families despite Chinese traditions and the efforts of the Chinese government to encourage family care. Firstly, the results support the traditional demographic explanation that availability of the kin increases the possibility for the widowed oldest old women to live with families other than live alone or in an institution. Secondly, however, the economic explanation failed to apply to the widowed oldest old women in China. Thirdly, the cultural explanation play, although not a key one, a significant role in determining the living arrangements of these women. Last but not least, health is also closely associated with the widow oldest old women's living arrangements in China.

I. INTRODUCTION

Entering the twenty-first century, the Chinese population is aging dramatically. According to the fifth national Chinese census in 2000, ten percent of Chinese population are elderly (those aged 60 or above). Of the elderly, eight percent are oldest old (those aged 80 or above). Benefiting from the longer life expectancy compared to their male counterparts, women account for over 60 percent of the oldest old. Furthermore, about eighty-three percent of the Chinese oldest old women are widowed. Born at the beginning of the twentieth century, Chinese oldest old women have only rarely held a job, which means very few of them have pensions. If their husbands die, the oldest old women lose their primary economic as well as emotional supporter. The widowed oldest old women, therefore, are a vulnerable group in China. Accordingly, special attention and assistance is required to meet their needs.

Due to the accelerating aging of the Chinese population, the number of widowed oldest old women will reach its apex over the next fifty year. Widowed oldest old women are confronting severe ageing issues, including daily living, economic and emotional support, medical care etc. It is known that living arrangements are highly related with the support elderly receive, which is a good, albeit not a perfect, proxy for the actual sharing of resources within households (Goldstein et al., 1983; De Vos & Holden, 1988). In terms of availability, coresidence with offspring substantially increases the probability of receiving instrumental (assistance in conducting daily tasks) and financial support from children; since it is convenient for coresident children to provide regular assistance around the house because they are immediately present (Zimmer & Kwong, 2003).

Furthermore, living arrangements are highly associated with mortality. Gordon and Rosenthal (1995) found in their study that unmarried persons had higher severity of illness at admission to hospital, indicating that living alone delays contact to health services and thereby increases the risk of death. Lund et al. (2002) pointed out that elderly living alone will experience significantly increased mortality compared to those living with somebody. In a study of elderly people (70-95 year olds), Lund et al. (2001) found an increased mortality among 75+ year old women continuously living alone compared to women continuously living with somebody, which wasn't found either among men or among 70-74 year old women. Consequently, aware of the living arrangements of the widowed oldest old women will help both academic scholars and policy makers understanding who they are living with, who is taking care of them, and therefore make policies accordingly.

It's well known that in Asian society it's the children who are responsible for the care of the elderly parents. According to a research in the mid-1990s, the percentage of adults aged 60 years and older who lived with any of their children was 68 per cent in Taiwan, 70 per cent in the Thailand, and 85 per cent in Singapore (Knodel & Ofstedal, 2002). In China, the government is actively promoting the importance of children's

responsibility to their elderly parents, which has even been codified by law (Du & Wu, 1998). As a consequence, if all the elderly in China co-reside with their children, the issue would be very simple. However, while most widowed oldest old women live with their children, still a large proportion are living alone or in institutions, which will be explicitly elaborated in late section.

Here, my main concerns are: What are the widowed oldest old women's living arrangements? Who are they living with? What factors are playing roles in deciding their living arrangements? For those who live apart from their families, why do they do so? Are they forced to do so or do they do it voluntarily? Finally, what are their lives like if living apart from their families?

Before turning to the empirical data, I first discuss the contributions, lessons, and the limitations of previous researches. Then, an introduction on the data, method and variables employed in the analysis is given. After that, I present the results concerning the living arrangements of widowed oldest old women. Last, I provide a brief discussion and conclusion of the research's implication.

II. THEORETICAL BACKGROUND

An abundant amount of research has been done on the living arrangements of the elderly. Previous research has offered three explanations – demographic, socio-economic as well as cultural norms – for elderly people's living arrangements (Kramarow, 1995).

Demographic Explanation

Demographic explanation holds that demographic transition, primarily a decline in fertility, has lowered the number of available children with whom elderly people can reside (Kramarow, 1995). The results of Thomas & Wister's (1984) research indicated that fertility is the major determinant of whether or not older women live alone. Kramarow (1995) found a negative relationship between numbers of children and the probability of living alone in old age, and confirmed that availability of kin members are determinant of elderly persons' living arrangements. Guo (1996) pointed out that the existence of living children had a significant effect on the elder women's living arrangements.

Other demographic characteristics such as gender, age, marital status, family size and family composition etc. are important determinants of the elderly's living arrangements as well (Thomas & Wister, 1984; Wolf & Soldo, 1988; Kramarow, 1995; Guo, 1996; Guo, 2002). Thomas & Wister (1984) pointed out that age also has some effect on living arrangements, albeit only a weaker predictor. Guo (1996) suggested that the elder women's living arrangements are also influenced by marital status, age, regions of residence, years of schooling and other factors. Guo (2002) further

examined the living arrangements of oldest old and reached similar conclusions: Whether the oldest old cohabit with descendants is determined by their demographic characteristics, such as age, region of residence, previous occupation and marital status, especially gender and the number of children ever born. Additionally, Wolf & Soldo (1988) concluded that it is not so much a family's size but its composition that determines whether an elderly unmarried woman lives alone, with her children, with siblings or parents, or with others.

Socio-economic Explanation

The alternative economic explanation is that rising income levels have enabled the elderly to "purchase" more privacy in the form of living alone (Michael et al., 1980; Thomas & Wister, 1984; Kramarow, 1995). Michael et al. (1980) proposed that income was a principal determinant of the propensity to live alone among the elderly widows. In 1995, the results of Kramarow supported the suggestion of Michael et al. (1980) that a threshold level of income among the elderly contributed to increases in living alone. On the contrary, Thomas & Wister (1984) argued that although financial resources increase the likelihood of living alone, income was not found to have a strong effect, questioning the proposition that living alone is primarily the result of an "economic demand for privacy" proposed by Michael et al. (1980).

Except income, other socio-economic variables, measured as economic resources, housing, region of residence, year of schooling, previous occupation, etc., is also associated with oldest olds' living arrangements (Michael et al., 1980; Mutchler & Burr, 1991; Du & Wu, 1998; Du, 1998; Guo, 2002). Michael et al. (1980) found besides income, other variables found to influence the living arrangement of the widows include geographic mobility, education etc. Mutchler & Burr (1991) found that economic resources are important in the process of choosing household living arrangements, and to enter an institution albeit a less central role. Du & Wu (1998) pointed out that the elderly counting their economic resource on their children or other relatives are more likely to live in three-generation family with their children, whereas those who financially depend on social security or supplements generally are more likely to live alone. Housing is also a crucial factor in affecting the elderly's living arrangements. Du (1998) addressed the availability of housing increased the probability that adult children may live separately from their elder parents, and vice versa. In terms of the region of residence, Guo (2002) suggested that in contrast to rural residents, urban residences were positively related to oldest olds' not cohabitating with descendants.

Cultural Explanation

A cultural explanation associates the increase in living alone with cultural changes such as the rise of individualism and the decline in family-centered values (Kramarow, 1995). Thomas & Wister (1984) pointed out that tastes and preferences (indicated by

cultural differences) appeared to affect household status independently of economic factors. Because of the difficulties of measuring culture, the scholars usually use race or ethnicity as a proxy and actually found association existed between race and living arrangements (Michael et al., 1980; Kramarow, 1995; Thomas & Wister, 1984). Some researches however doubted the previous value-based interpretations of racial difference in the living arrangements of the elderly (Wolf & Soldo, 1988).

Consequently, China's unique culture is also crucial in explaining the living arrangements of the elderly (Du, 1998). As a traditionally patrilineal country, in which male children have privileges in both an economically and ceremonially productive sense, the son also take the responsibility to take care of elder parents. Hence, people are holding the notion that bearing a son will secure their later life in the future. This notion, however, has changed as the tremendous socio-economic changes in contemporary China. Basically, the changing norms in China consequently lead to the change of people's preference and behavior, including the elderly's living arrangements (Du, 1998). Moreover, because of the tension with the in-laws, the widows or widowers may prefer living separately to with their daughter- or son-in-laws (Du, 1998).

In a sum, the demographic, socioeconomic and cultural explanations talked above open broad insights to look at the living arrangements of the widowed oldest old women. Firstly, the decline of fertility decreased the number of available children to live with, therefore lowered the probability for the elderly people living with their children. Secondly, rising income enabled the elderly to live alone to purchase more privacy. Thirdly, cultural changes such as the change of taste and preference, rise of individualism and the decline of family commitment etc. are associated with the increase in living alone. However, besides these three explanations, there is one thing missed: health. Macunovich et al. (1995) pointed out that elderly widow's living arrangements are determined principally by their health or functional abilities.

Additionally, some areas have been ignored by the scholars for a long time. Firstly, while a lot of researches have discussed the living arrangements of the elderly, seldom of them focused on the oldest old. Because of the decline of mortality and the increase of life expectancy, more and more people will live more than eighty years. Because of specific ageing problem accompanying the advance age, the living arrangements of the oldest old are undoubtedly different from that of the elderly's.

Secondly, because of the gender differentials existed in mortality and life expectancy, the oldest old women will account for a large proportion of the oldest old population, hence calls more attention. Generally, the older the age is, the less likely a woman is to re-marry after her marriage dissolution. As a result, woman will generally experience longer widowhood than their male counterparts. Besides the problem accompanying the advance age, the depression associated with widowhood increase the vulnerability of the widowed oldest old woman. Therefore, closely examining the

living arrangements of the widowed oldest old will call more care on this vulnerable group of widowed oldest old woman.

Thirdly, apparently, previous researches limited the living arrangements primarily on household living arrangements, seldom including institutionalization. Considering the oldest old who may need special medical care, institutionalization will be a better choice for both the oldest old and their family members. Especially, as the aging of population, there will be out-numbered of the elderly population who no longer can be fully taken care of by their family members because of the decline of the fertility. As the development of the social security system, institution will be another alternative choice equal to other household living arrangements for the elderly.

Last but not the least, while extensive researches on living arrangements of the elderly have been done in developed countries, little is done in developing countries. Basically, this research gap is caused by the incomplete data on the one hand, and the difficulties in collecting data on the other hand. As the social-economic development in the past years, China as the most populous country in the world, is confronting severe aging problem. Hence, it is not only possible to do extensive research on living arrangements of the oldest old in China, but necessary. Fortunately, a national survey targeting oldest old, the Chinese Longitudinal Healthy Longevity Survey (CLHLS) make these researches possible. Concerning to the survey, more details are given in the data section.

Hypotheses

Here, I'm interested in the living arrangements of the widowed oldest old women. As I have discussed above, they are a vulnerable group of the elderly population. The three explanations discussed above provide a framework for structuring the empirical work and interpreting the results. Accordingly, I propose the following testable hypotheses:

> *Hypotheses 1: The decreasing availability of offspring will lower the possibility to live with family members, hence increase the widowed oldest old women's probability to live alone or live in an institution.*
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> *Hypotheses 2: Previously having a non-agricultural work, the widowed oldest old women will have more income other than merely depending on her children or other relatives, which therefore means more ability to "purchase" the privacy in form of living alone. But what's the mechanism of economic resource on living an institution is hard to predict.*
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> *Hypotheses 3: Undoubtedly, the cultural norm is changing as the time goes. Therefore, the change of the culture concerning to the widowhood in China, will influence the widowed oldest old women's living arrangement.*

III. DATA, METHOD & VARIABLES

Data

Data for my analysis comes from 1998 baseline data of the Chinese Longitudinal Healthy Longevity Survey (CLHLS). The CLHLS was firstly conducted in 1998, with two follow-ups conducted in 2000 and 2002, respectively. The first survey (CLHLS 1998) interviewed 9,073 oldest old in half of randomly selected counties and cities in 22 of China's 31 provinces. The survey areas covered 985 million persons, representing about 85 per cent of Chinese population, and the response rate is 98 percent (Zeng et al., 2001).

In the randomly selected counties or cities, all centenarians (aged 100 and above) who voluntarily agreed to participate in the survey are interviewed. For each centenarian, one octogenarian (aged 80-89) and one nonagenarian (aged 90-99) living nearby, with per-specific age and sex, were matched and interviewed as well. To try to have approximately equal number of male and female octogenarians and nonagenarians at each age from 80 to 99, the survey over-sampled male oldest old persons. In short, the survey over-sampled extremely old persons such as centenarians and nonagenarians, and male oldest old persons, given the fact that there are fewer persons at more advanced ages, and fewer males than females (Zeng et al., 2001; Zeng et al., 2002; Zeng et al., 2003). As a consequence, adjusted weights are computed so that the survey data represents the entire population of oldest old[1] (Zeng et al., 2001). All descriptive statistics presented in this paper are based on weight data.

Careful evaluations of the 1998 baseline survey indicate that beyond the issue of age reporting overall data quality is generally good (Zeng et al, 2001; Zeng et al, 2002). After logically checking the age of the respondent[2], the adjusted true age is given in the dataset. As a consequent, excluding those who are younger than 80 per se, I got 8,959 respondents. Of them, 5,392 are female which account for three-fifths, whereas 3,567 are male accounting for the left two-fifths. Table 1 gives the distribution of Chinese oldest old by gender and marital status. Strikingly, 94 percent of female are widowed, contrast to only 62 percent of male. Put together, the widowed oldest old account for over 80 percent of the respondents. Further, one-third male are current married, whereas merely 5 percent of oldest old women have a spouse currently. Because of the universality of marriage and discouragement of marriage dissolution, in total only 3 percent of oldest old divorced, separated or never married, with 5 percent for male, 2 percent for female. That is to say, the commonest reason of marital dissolution among the Chinese oldest old is the spouse's death.

Method

Because the analysis mainly focus on the living arrangements of the widowed oldest

old women, excluding the data of those who are male and are not widowed, I get the final analysis sample with 5,042 respondents. Of the widowed oldest old women, 10.9 and 4.5 percent live alone and in the institution respectively, and 84.6 percent live with their families (including children, grandchildren or other relatives). To find out the factors influencing the living arrangements of widowed oldest old women, I will employ a multi-nominal logit model. The dependent variable is living arrangements defined as three categories: living with families, living alone or living in an institution. Independent variables will include demographic, socio-economic, and cultural variables, as well as health variables (See Table2, for the descriptive information on the explanatory variables).

Variables

1) Demographic Variables. Age and number of living children are two demographic variables. The mean age of the widowed oldest old women of the analysis is 94, with 29 per cent aged 80-89, 33 per cent aged 90-99 and 38 per cent older than 100 years. Concerning to the number of living children, on average, the widowed women have 3.51 living children, with 1.73 sons and 1.78 daughters. To look at if there is son preference exist, I also construct a children's gender composition variable, with 1 represents having no child, 2 having son only, 3 having daughter only and 4 having both son and daughter. The results reveal only 12 per cent of widowed oldest old women don't have any kid, while 61 per cent have both son and daughter. Basically, this result is in accord with the China's high fertility rate in the past.

2) Socio-economic Variables. Region of residence, previous occupation, year of schooling and primary economic resource are three socio-economic variables used in my analysis. Because of the dramatic difference between urban and rural area in China, I include the region of residence, with 1 indicates urban resident, 0 rural resident.

Based on the question on the primary occupation before age 60 in the survey, I construct a three-category variable, with 1 represents housework, 2 agricultural work (including agriculture, forest, husbandry and fishery etc), and 3 non-agricultural work (including professional technician, administrative official, industrial or commercial worker, or military service, etc.). 32 per cent of widowed oldest old women are housewife, doing housework. For those having a job, only 11 per cent of the job is non-agricultural work, contrast to 57 per cent of the job is agriculture-related.

When asked about year of schooling, about ninety per cent of the widowed oldest old women have never been to school. As a result, instead of treating the year of schooling as a continuous variable, I contrast a dummy variable: if having any schooling or not, with 1 represents yes, 0 no. Apparently, the education attainment of this group of women is extremely low.

Additionally, economic resources play an important role in living arrangements. Based on the question on the primary economic resource, I construct a kin support dummy with 1 represent kin support (including spouse[3], children, grandchildren or other relatives), 0 non-kin support (including pension, local government or community, or own incoming, etc). As a result, I found that the primary economic resource of the widowed oldest women is kin (87% vs. 13%). In other words, the widowed oldest old women are economically depending on their kin.

3) Cultural Variables. According to previous researches, I include ethnicity as a proxy of culture. Basically, 92 per cent of the widowed oldest old women are Han. The reason is that the survey was primarily conducted in Han's regions, and therefore few ethnic minority people are interviewed in the survey. Additionally, having 55 ethnicity minority groups in China, undoubtedly there exist different traditions within these minority groups as well. As a consequence, I doubt ethnicity can be a good proxy to Chinese culture therefore.

Complementarily, I include widowhood and number of marriages as cultural variables as well. Because of the discouragement of women's re-marriage in China, on average the widow oldest old women have been widowed for 33.26 years, a very striking result. In other word, for those live up to eighty years old, about one-third of their lives are passed without husband.

Concerning to the number of marriage, on average, the widow oldest old women have married for 1.12 times. Substantially, of the widowed women's marriages, nine-tenths are first-marriage. Even though considering the marriage at very young age at the beginning of the twentieth century China, it's still surprising that the oldest old women are experiencing such long widowhoods.

4) Health Variables. Besides the main explanatory variables, I also include two health variables: activities of daily life (ADL) and self-reported health as control variable. In the questionnaire, respondents are asked to answer whether they need assistance on six activities of daily living: bathing, dressing, toileting, transporting, continence, and feeding. I construct the ADL variable by summing the answer to these six questions. Therefore, the ADL variable ranges from 6 to 18, with 6 indicated no assistance needed at any of six activities, 18 indicated assistance needed at all six.

Additionally, self-reported health is also included as a proxy to the health. For better interpretation, I reverse the original code of the variable ranging from 1 to 5, with 1 indicates very bad, 5 very good. On average, rank of the widowed oldest old women's self-report health is more than just so so (3.30).

IV. RESULTS

Using living with families as reference group, the result of multinomial regression is

presented in Table3.

Demographic variables

Firstly, being aged over 100 years rather than aged 80-89 is associated with a 0.771 decrease in the log odds of widowed oldest old women to live alone rather than live with families, and a 1.924 decrease in the log odds for them to live in an institution rather than live with families, holding all the other variables constant. Being aged 90-99 rather than aged 80-89 is associated with a 0.713 decrease in the log odds of the widowed oldest old women to live alone rather than live with families, whereas there is no statistical difference between living alone and living with families. Explicitly, the basic idea is the more advance the age is, the less likely the widowed oldest old are to live alone or in an institution. It can be easily inferred from the results that because of weakness related with age, it becomes very hard for widowed oldest old women to live alone. Living with someone is the best solution for having someone take care of them and meet their special needs. But the reason why they don't want to live in the institution is hard to say.

Concerning to number of living children, additional one more child is associated with 0.254 increases in the log odds of the widowed oldest old women to live alone rather than live with families, holding all other variables constant. This result is conflict with the kin availability theory, which proposed that there is a negative relationship between numbers of children and the probability of living alone in old age. I assume two tentative explanations can explain the conflict. On the one hand, care rotation of the elderly parents is very popularly applied in China. The basic mechanism is that the elderly parents reside with neither of the children, but children take care of the parents (including cooking, washing clothes, cleaning the house, etc.) in turn. This is an alternative way for the siblings to share the responsibility to take care of the elderly parents. On the other hand, even though the elderly live separately, the children usually lived close to their parents, so that they can take care of their daily life.

The results regarding to the children's gender composition doesn't confirm the son preference and son responsibility assumption. There is no significant difference between those having no child and those having son only on the living arrangements of widowed oldest old women. However, having daughter only rather than having no child is associated with 0.843 decreases in the log odds of the widowed oldest old to live alone rather than live with families, holding all the other variables constant. Specifically, with the absence of son, it's the daughters who are taking responsibility to take care of their widowed mother, rather than let them live alone. Similarly, no significant effect is found between living in an institution and with families for the children's gender composition variable. Additionally, considering the possible bias of the living children, I also altered the number of living children and their gender composition with the number of children ever born and their gender composition in the model and re-estimated the model. The results revealed no big difference. Hence, I

only presented the result using living children here.

Socioeconomic Variables

Now turning to socioeconomic variables, the results reveal that living in urban area rather than in rural area is associated with 0.382 decrease of log odds for the widowed oldest old women to live alone rather than live with families, whereas is associated with 1.598 increase of log odds for them to live in an institution rather than live with families, holding all the other variables constant. This result is not surprising, considering the more housing constrain and institutions availability in urban area than rural area.

Concerning to the previous occupation, having a non-agricultural job rather than doing housework is associated with 1.501 decreases of log odds for the widowed oldest old women to live in an institution rather than live with families, holding all the other variables constant. Except that, all the other related coefficients are not statistically significant. The possible reason maybe that non-agricultural is related with better economic situation, so that the children are more willing to take care of the widowed mother, or that the widowed women are capable to hire some people moving into her home to take care of her.

Not surprisingly, the coefficients of schooling are not statistically significant. But it does not deny the effects of education on the living arrangements. The conclusion we can draw is that schooling is not a good proxy for education attainment in my analysis, because very few widowed oldest old women ever having any schooling in the survey.

Lastly, economically depending on kin rather than on non-kin is associated with 1.418 decreases of log odds for the widowed oldest old women to live alone rather than live with families, and with 3.062 decrease of log odds for them to live in an institution rather than live with families, holding all the other variables constant. Apparently, the availability of kin support increases the possibility for the elderly to live with kin per se, which to some extent confirm the kin availability theory.

Cultural Variables

The coefficients for the ethnicity variable are not statistically significant. As having discussed previously, ethnicity variable may be not a good proxy for culture. On the other hand, the heterogeneity within the ethnical minorities lowers the representative efficiency of ethnicity as a cultural variable per se.

The coefficients for widowhood and the square of widowhood reveal there is a curvilinear relationship between widowhood and living alone contrast to living with families. Because of the unique culture related to widowhood, more researches need to be done to find out the underlying cultural meaning of the widowhood.

Last, concerning to the number of marriage, an additional marriage is associated with 0.8181 increase of the log odds for the widowed oldest old women to live alone rather than live with families although the coefficient only got marginally significant, and 1.359 increase of the log odds for them to live in an institution than live with families, holding all the other variables constant. Apparently, it's not hard to infer that because of the remarriage, the women may have more children. Meanwhile, it also leads to the tension between her own-children and her step-children concerning to the responsibility to take care of the widowed mother. Living in an institution may be the best solution to solve the conflict between the own- and step-children. Therefore, remarriage lower the widowed oldest old women's possibility to live with their families. In other words, the re-marriage actually decreases her available kin with whom she can reside.

Health Variables

Last but not the least, we turn to the health variables. An additional score of the ADL is associated with 0.269 decreases of the log odds for the widowed oldest old women to live alone rather than live with families, and 0.166 increase of the log odds for them to live in an institution rather than live with families, holding all the other variables constant. It's not hard to understand this result. Because of the increased functional inabilities, it's impossible for the widowed oldest old women to live alone and take care of themselves. As a consequence, the widowed oldest old women choose to live with families or live in an institution so that someone can take care of them and are around when they need any help.

However, the effect of the self-reported health is not evident. My guess is that self-reported health may be the consequence of the living arrangements, rather than the cause. Therefore, more researches are needed to exam the causality between the self-reported health and living arrangements.

V. CONCLUSION & DISCUSSION

With this analysis, I expect to find out with whom the widowed oldest old women are living with, and what factors causes them not to live with their families in China, especially, those living alone or in the institutions. My result reveals that while most widowed oldest old women lived with families, those who live alone or in an institution deserve more attention. Concerning to the factors, I examined three explanations: demographic, socioeconomic and cultural. Additionally, I also include health as control variables.

The results of the multinomial logistic regression reveal that age is negatively related to living alone and living in an institution. Although the number of living children positively related to living alone and in an institution, I doubted that association is a

spurious one. The later results confirm my doubts and positively support the kin availability theory. Secondly, the results fail to provide support to the socioeconomic explanation. It seems that the widowed oldest old women in China didn't have enough income to reach the income threshold so that they can purchase their privacy in the form of living alone. I assume that it won't happen even for the next twenty years, considering the historical events experienced by the elderly who are entering the oldest old population. Last but not the least, my results confirmed the cultural effects on the living arrangements of the widowed oldest old women, just indicated by the cultural variables – widowhood and number of marriage – included in the model. But because of the measurement issue, more researches still needed to do to know more about its mechanism.

Despite all these achievements, my analysis was weakened for its failing taking the children's characteristics into account on explaining the living arrangements of the widowed oldest old women. Frankenberg et al. (2002) emphasized that while some of the results support the interpretation that co-residence provides support for parents as they age, the needs of children also play an important role in the decision to co-reside. Also, Pezzin & Schone (1999) indicated that both parent's and daughter's characteristics matter in the choice of intergenerational living arrangement. On the other hand, the cultural explanation are not convincing mainly because of the measurement issue. Even though China had and is experiencing tremendous social and economic change, the cultural effect on elderly living arrangements will persist longer than expected. Therefore, further studies are needed to explore the mechanism of culture.

In a sum, I'm intending to provide the theoretical foundation for Chinese policy makers to pay close attention to establish social security system. As the increase of the elderly population especially the oldest old, we should not count merely on the grown-up children to support so large amount of the elderly parents. The government should work out some means to lessen the children's economic and psychological burden, like constructing more institutions or communities, encouraging the younger elderly to take care of the older and the weaker elderly. In an all, before the amount of oldest old increase to its apex, social scientists, social workers and policy makers should do something.

NOTE

1. The method for computing the age-sex and rural-urban specific weights are presented in Appendix A of Yi Zeng et al. (2001)'s article.
2. Except asking the respondent's Chinese zodiac, the enumerator also asked the respondent's birthday in year and month both in solar and lunar calendar directly. Besides, the enumerator also checked respondent's birthday in the household registration book after the interview.
3. After the death of the spouse, the widow can receive the pension or other

allowances used to give to her husband.

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Table1. Distribution by Gender and Marital status, Chinese oldest old, 1998

Marital Status	Gender		
	Male	Female	Total
Married	33 (1,174)	5 (263)	16 (1,437)
Widowed	62 (2,198)	94 (5,042)	81 (7,240)
Divorced, Separated, or Never Married	5 (195)	2 (87)	3 (282)
Missing	0 (5)	0 (3)	0 (8)
Total N	100 (3,567)	100 (5,392)	100 (8,959)

Data source: 1998 Chinese Longitudinal Healthy Longevity Survey (CLHLS).

Table2. Means and Standard Deviations of Dependent and Independent Variables, CLHLS*, 1998

Variables	Min	Max	Mean	S.D.	N
Dependent variable					
Living arrangements					
Living with families	0	1	.84	.36	4,265
Living alone	0	1	.11	.31	550
Living in the institution	0	1	.05	.21	227
Demographic Variables					
Age	80	115	94.24	7.51	5,042
Age group					
80-89	0	1	0.29	0.46	1,489
90-99	0	1	0.33	0.47	1,651
100+	0	1	0.38	0.48	1,902
No. of children ever born	0	11	3.51	2.47	5,042
No. of living children	0	9	2.06	1.80	5,042
0	0	1	0.24	0.43	1,234
1	0	1	0.20	0.40	1,006
2	0	1	0.19	0.39	970
3	0	1	0.15	0.36	774
4+	0	1	0.21	0.41	1,058
No. of living sons	0	9	1.73	1.58	5,042
No. of living daughters	0	11	1.78	1.60	5,042
Children's gender composition					
No Child	0	1	0.24	0.43	1,234
Son only	0	1	0.14	0.34	694
Daughter only	0	1	0.25	0.43	1,271
Both son and daughter	0	1	0.37	0.48	1,843
Socioeconomic Variables					
Urban	0	1	0.35	0.48	5,042
Previous Occupation					
Housework	0	1	0.32	0.46	1,573
Agricultural Work	0	1	0.57	0.49	2,849
Non-agricultural Work	0	1	0.11	0.32	563
Schooling	0	1	0.12	0.32	5,006
Kin support	0	1	0.87	0.33	4,982
Cultural Variables					
Han	0	1	0.92	0.27	5,037
Widowhood	0	85	33.26	17.97	4,540
No. of marriages	1	4	1.12	0.35	5,038
First marriage	0	1	0.89	0.31	5,038

Health Variables					
Activities of daily life (ADL)	6	18	7.94	2.97	5,025
Self-reported health	1	5	3.30	1.08	5,042

* Here, I code those answer "other" in the survey to missing, considering only small proportion.

Data source: 1998 Chinese Longitudinal Healthy Longevity Survey (CLHLS).

Table3. Estimated Multinomial Logistic Coefficients in Predicting the Living Arrangements among the Widowed Oldest Old Woman, China, 1998 (N=4,279)

Independent Variables	Living alone			Living in an institution		
	b	*S.E.*	*p*	*b*	*S.E.*	*p*
Demographic Variables						
Age group						
80-89	-	-	-			
90-99	-0.112	0.146	0.442	-0.713	0.243	0.003
100+	-0.771	0.198	0.000	-1.924	0.376	0.000
No. of living children	0.254	0.062	0.000	-0.178	0.179	0.319
Children's gender composition						
No Child	-	-	-	-	-	-
Son only	-0.389	0.301	0.197	0.429	0.497	0.388
Daughter only	-0.843	0.282	0.003	-0.353	0.475	0.457
Both son and daughter	-0.591	0.328	0.071	-0.653	0.608	0.283
Socioeconomic Variables						
Urban	-0.382	0.184	0.037	1.598	0.328	0.000
Previous Occupation						
Housework	-	-	-	-	-	-
Agricultural Work	-0.139	0.188	0.460	0.108	0.282	0.701
Non-agricultural Work	-0.169	0.287	0.555	-1.501	0.411	0.000
Schooling	0.299	0.231	0.195	0.391	0.307	0.203
Kin support	-1.418	0.225	0.000	-3.062	0.296	0.000
Cultural Variables						
Han	0.108	0.321	0.737	-0.185	0.575	0.747
Widowhood	-0.046	0.017	0.006	-0.021	0.026	0.417
Square of widowhood	0.001	0.000	0.004	0.000	0.000	0.264
No. of marriages	0.818	0.430	0.057	1.359	0.470	0.004
First marriage	0.421	0.584	0.470	1.566	0.689	0.023
Health Variables						
Activities of daily life (ADL)	-0.269	0.078	0.001	0.166	0.050	0.001
Self-reported health	-0.108	0.090	0.228	0.099	0.117	0.399
Intercept	0.832	1.272	0.513	-4.656	1.507	0.002

* Living with families is the reference category.