

The Influence of Retirement on the Living
Arrangements of the Old People in China:
Evidence from the CHARLS Survey Data

by

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Abstract

Chinese population is aging fast and ensuring a sustainable source for the elder's caring services is increasingly important. As the governmental policy continue to change over the past decades, the caring responsibilities for the old people more and more rely on individual households. This paper will thus study factors that may affect the family's living arrangement decisions, which is a strong indicator for the source of caring services for the old. In particular, this paper examines the retirement effect of older couple on the family's decision for co-residence or close-residence with their adult children. The main finding is that, though there is no significant direct effect of retirement on co-residence, there is a positive indirect effect through the channel of household services. Particularly, if the old couple need to take care of their grandchildren, there is a higher possibility for them to co-reside with their adult children after retirement. This effect, however, is not significant for close-residence. Other findings include the association of higher education, better health status and higher income with higher possibility of co-residence or close-residence, which is in general, consistent with findings in past literature.

1. Introduction

China's population is aging fast. While the percentage of population over 65 years old took up 3.43% of the entire population back in 1965, this ratio has more than tripled and reached as high as 10.64% in 2017 (World Bank 2019) [Fig.1]. This increasingly aging population is bringing heavier burden for the Chinese society. On the one hand, the age dependency ratio (the ratio of older dependents (> 64) against the working-age population (15-64)) continues to increase to 14.84% in 2017 (World Bank 2019) while on the other hand, the fertility rate has remained as low as around 1.6% since 2017 (World Bank 2019) [Fig.2] after the continuous reinforcement of "one-child policy". As the baby-boomer generation in the 1960s slowly reaching an older age, the imbalanced demographic structure brings forth the following crucial question: "who will be responsible for taking care of the old?"

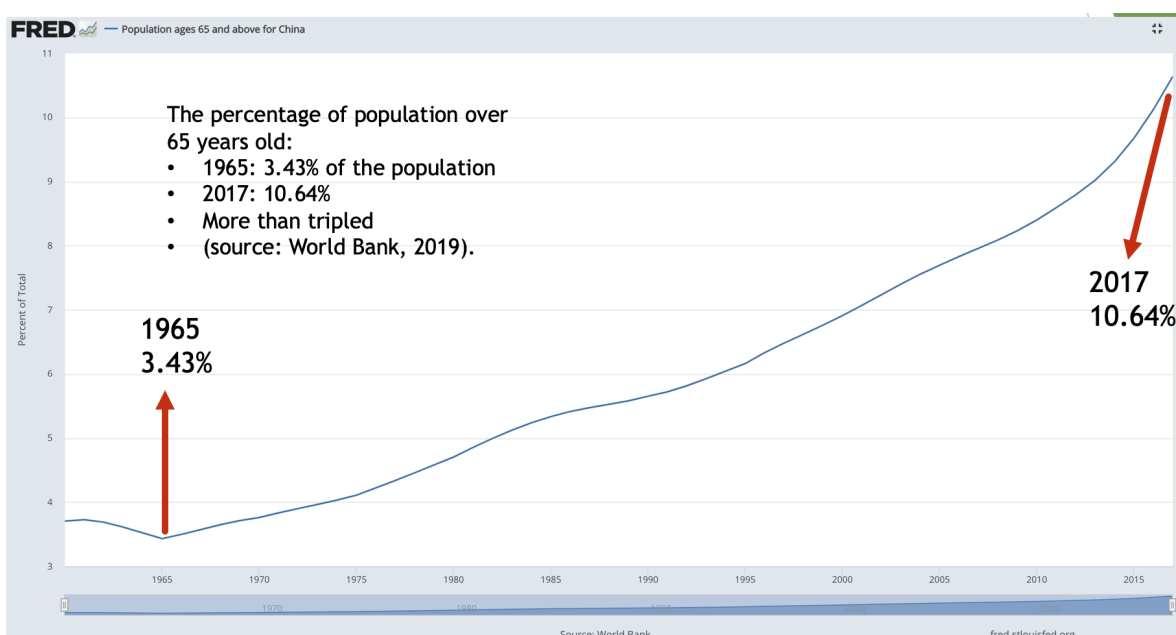


Fig.1 Population ages 65 and above for China, World Bank, retrieved from FRED

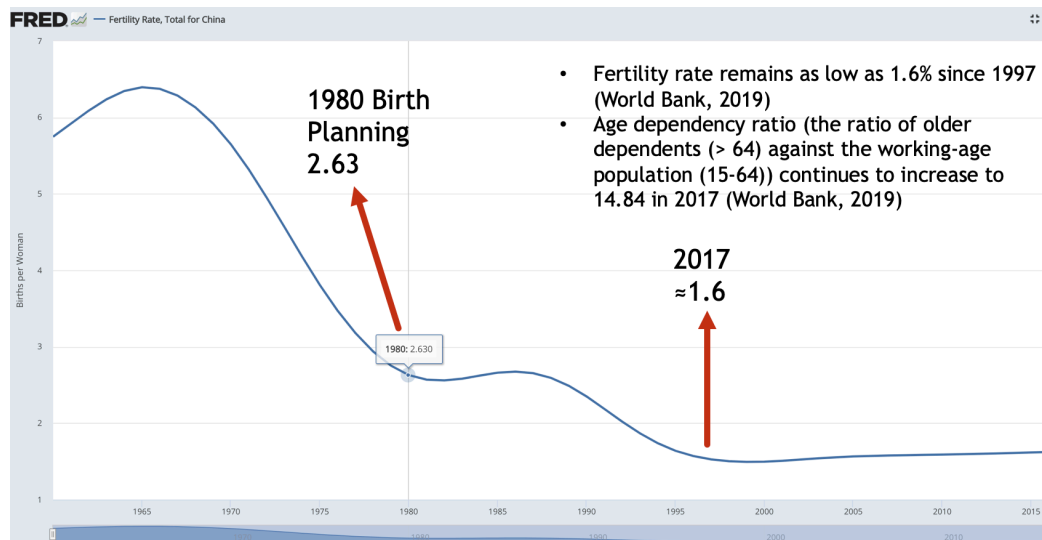


Fig.2 World Bank, Fertility Rate for China, World Bank, retrieved from FRED

Along with the demographic changes are the shift of government policies. Back in the 1980s, when Chinese government was promoting the “One-Child Policy”, they held out the slogan that “the government will take care of the old people”. All pension funds at that time came from enterprises and the government, not from individuals (《中华人民共和国劳动保险条例》1951). In the 1990s, however, Chinese government modified the slogan to “the government will *help* with the caring of the old”. Particularly, the 1991 governmental document, “Decision on the reform of the enterprise employee pension insurance system”(《关于企业职工养老保险制度改革的决定》1991), points out that individual workers need to pay 3% of their salary in order to receive pension benefits after retirement and this percentage is subject to upward adjustments along with the salary increase. However, such reform still could not cover the increasing pension funds deficits. In 1997, the State Council announced “Decision on establishing a unified basic pension system for enterprise employees”(《关于建立统一的企业职工基本养老保险制度的决定》1997) and officially promoted the establishment of individual accounts in combination with previous social pooling strategies. Since then, and especially after 2005, Chinese government has been continuously pushing for

the reform in order to establish a three-pillared “personal-enterprise-government” pension fund structure. Now, the slogan has been changed to: “individuals, not the government, should be responsible for the elder’s care”.

In addition to the funding constraints, the demographic structure of China and the historical background of “the planned economy” have decided that the population will “get old before getting rich”. The current reality is that there exists a huge mismatch of supply and demand for the caring services of the old people: while the cheap public nursing homes have an excessive demand for beds, expansive private nursing homes have an excessive supply. Such reality forces old people of China to rely on individual households (especially the care provided by children) and local communities for informal caring services. This situation therefore brings forth the significance of studying the decision dynamics within households and across generations regarding old people’s living arrangements.

Among the numerous measurements, “living arrangements” is an indicator that can best shed light on the source of the caring services the old people are receiving: whether from his/her spouse; from his/her children; or, in the case of hospitalization, formal care from institutions. In this study, due to the features of the China Health and Retirement Longitudinal Study (CHARLS) dataset, which contains very limited institutionalization data, the analysis will only focus on distinguishing between the first two living types. More specifically, I will look into the influence of the old people’s retirement status on the family’s decision of “whether the old couple live with their adult child”. By conducting this study, I wish to bring more understanding of the cross-generational decision-making dynamics within a household and potentially provide further insights for future policy making.

2. Literature Review

Numerous researches have been done in relation to living arrangements. The first topic central to the discussion is whether informal care provided by children can bring well-beings to the old people and substitute formal care. Previous researches have obtained mixed results (Greene, 1983; Pezzin et al., 1996; Lo Sasso and Johnson, 2002; Houtven and Norto, 2004; Charles and Sevak 2005; Bolin, Lindgren and Lundborg 2008; Bonsang 2009). For example, the Houtven and Norton paper found that while informal care acts as a substitution for long-term formal care (2004, 1161), it only has complementing effect for short-term formal services such as surgery (1171). Most of these researches adopt a two-part utilization model and use IV to control for endogenous effect between formal and informal care. In addition to the generally positive effects on physical well-beings of the old people, co-residence is also found to contribute positively to the mental well-being of the old people (X. Chen and Silverstein 2000; Silverstein, Cong and Li 2006). In any case, previous results have justified the significance of further researches on living arrangements.

So what factors may influence the family's co-residence decisions? The second central topic on living arrangement is thus dedicated to solving this question. Firstly, the heterogeneity of living choices across countries suggests some culture effects on this matter. While in the western countries old people feel more comfortable living independently or utilizing formal services from nursing homes or other institutions, the majority of Asian countries share the tradition of living together in an extended family with children as the primary care provider for the old (Maruja Milagros B 1995, 145). As a cultural explanation, Confucius' idea of filial piety has been widely found across Asian countries (Koyano 1996; Sung, K. T. 1998; Logan et al. 1998; Ikels 2004; Chappell 2007). Logan et al. argues that, co-residence, viewed as a signal for practicing filial piety, sacrifice children's well-beings more than that of the parents' and will decline as social modernization keeps up its pace and the external financial constraint relaxes (855). Such trend of fading family ties and increasing preference for independent living

were also spotted in other literature (Cheung et al. 2009; Lei et al. 2015; Cheng et al. 2017). For example, using the Chinese Longitudinal Healthy Longevity Survey (CLHLS) data and the exogenous New Rural Pension Scheme policy, Cheng et al. prove that relaxing financial constraints motivates decisions for more independent living, indicating privacy and independence as a normal good (186).

Secondly, intergenerational dynamics including family structures, children and parent characteristics and life course events such as marriages of children or the death of parent can also affect the co-residence decisions (Logan and Bian 1999; Feinian Chen 2005; Lei et al. 2015). Some key findings include: worse health status of the parents is associated with higher probability of co-residence (DaVanzo and Chan 1994; Liang et al. 2002; Zimmer 2005); the parents are more likely to co-reside with the child when the child has less salary (Costa 1997; Rosenzweig 2014); and there is an automatic division of responsibilities among children and children who live closer to their parents often provide less monetary transfers while children who live further away provide significantly more financial support (Chen, Leeson and Liu, 2017).

However, the majority of past studies focus only on the retired group of people, who are usually above 60 years old or the “the oldest old” group who are above 80. Limited researches have been dedicated to the group aged around 45 to 65 who are experiencing changing of their working status – namely retirement. According to the neoclassical household decision-making model (Becker 1981; Hoerger et al. 1996; Pezzin et al. 1996), which states that: $U = U(C, L, S, H(FC, IC; H_0); \tau)$, the household utility (U) is jointly decided by consumption (C), leisure (L), household services (S), the elderly parents’ health (H), and a taste parameter (τ), where H is a function of formal care (FC), informal care (IC) and the initial health status (H_0). A reasonable hypothesis is that after the retirement, besides a decrease of income for the old people, there is also a substantial increase of leisure time which may

influence the household decision making either directly or indirectly. For example, after the retirement, the old people may have more free time to provide household services; or the absence from work reduces the socializing component of daily life and the old people may change their taste and intend to maintain a closer relationship with their descendants. An initial guess of the relationship is that when old people retire from work, there will be a higher chance for them to co-reside with their adult children. Note that we are limiting our discussion to alive adult children only as the old couple need to take care of their non-adult children anyway.

In this paper, I will use multivariate logistical regression models on the aggregated household level to explore the effect of the number of retirees in a household on the family's living arrangements. Besides using co-residence as predictand, I also used "whether any adult children live near to the old couple" as the predictand to capture the diverse living arrangement options people have nowadays. In the following sections, I will further describe my empirical strategy, introduce the dataset; show empirical results and present further conclusions and discussions.

3. Empirical Strategy

To better capture the dynamics of each household, the analysis will be conducted on an aggregated household level. To match the different roles the husband and the wife play, each household observation put personal information of the husband on the left and information of the wife on the right. Besides individual information, the overall household data is placed at the end of each entry. This design thus restricts this analysis to households where neither the husband nor the wife's information is missing, in other words, only households with married couples.

The first co-residence predictand is a binary variable that has value one if the couple are co-residing with an adult child (≥ 18). Due to the wide range of living options people now

have, many households do not necessarily live in the same house/apartment as their children, but another household close by. Such arrangement resolves the conflicts between privacy and the convenience for caring for each other. Hence, to capture this living type, I include a second “close-residence” predictand. This binary variable has value one if there is an adult child living in the same or adjacent dwelling / courtyard as the old couple or in another household within the same village / neighborhood. By this definition, any co-residence case is automatically also a case of close-residence. Since the “closeness” defined here is quite strict, it is reasonable to assume that the transportation cost from the parents’ household to the child’s household is neglectable.

The key independent variables of interests are the number of retirees in the couple, whether the old couple take care of their grandchildren and the interaction terms between the aggregated household retirement status and grandchildren caring dummy. Additional control variables capture the education status, health status, total income and family structure of the household. An empirical model thus is of the following form:

$$\begin{aligned} \text{predictand} = & \beta_0 + \beta_1 hretire1 + \beta_2 hretire2 + \beta_3 hgkcare + \\ & \beta_4 hretire1 * hgkcare + \beta_5 hretire2 * hgkcare + \\ & \text{control variables} + \epsilon \end{aligned}$$

In this model, *hretire1* indicates whether exactly 1 person has retired; *hretire2* indicates whether both of the couple have retired; and *hgkcare* indicates whether the old couple take care of their grandchildren. Control terms include husband age, age gap between the husband and the wife, number of people in the couple that have received education from upper-secondary schools or above; number of people in the couple who have self-evaluated health status of good or above; whether the household locates in rural or urban areas; log of the CPI adjusted total income of the couple; number of adult children in the household and whether the household

have a child in college. In the next section, I will show how these variables are constructed in more details.

4. Data

This paper uses the survey data provided by the China Health and Retirement Longitudinal Study (CHARLS). CHARLS is a high-quality national representative longitudinal dataset tracking the information from the respondents in the following aspects: demographics, health status, healthcare and insurance, work and retirement, income and consumption, wealth, and family structure and transfers. After the pilot survey in Gansu and Zhejiang Province in 2008, the baseline survey (wave 1) was conducted in 2011, collecting data from 10,000 households and 17,500 individuals in 150 counties/districts and 450 villages/resident committees. The succeeding waves were conducted in year 2013, 2014 and 2015 respectively. In this study, I use data from the wave 1, 2 and 4 as well as the data from the harmonized CHARLS dataset (Zhao, Y et. al., 2012; the Gateway to Global Aging Data 2018).

CHARLS collects information from subjects who are over 45 years old. It also interviews the main respondent's partner/spouse regardless of the partner/spouse's age. This selection of age range thus brings abundant data regarding the changes of working status during this age window. For a household with two people, CHARLS interviews each of them for his or her personal information separately and the household representative will answer for household level information. This thus makes the personal information for both the husband and the wife more accurate.

The CHARLS survey data was collected using a pre-programmed software and the overall logic design of the survey is quite complicated. To facilitate researching, CHARLS combs through the underlying logics and provides a harmonized version of data that effectively

summarizes some of the key data collected in the survey. Harmonized CHARLS constructs variables in four levels: main respondents r (named as: rwxxx); spouse s of the main respondent (named as: swxxxx); information of the couple h (named as: hwxxx); and information of the whole household (named as: hhwxxx), where “w” specifies the wave in which the data got collected and “xxx” specifies the name of the variable. The majority of the variables are constructed in a way such that they are directly comparable with the variables in the Health and Retirement Study (NRS) in the US. The data structure of the harmonized dataset forms a wide panel, with each row representing one respondent. This paper uses household level data that basically follows the same structure as the harmonized dataset.

CHARLS collects data regarding the old people’s living arrangement decisions in multiple categories: (1) living independently with the spouse only; (2) living with one or more children; (3) living alone but with children living in the nearby community; (4) living alone and there are no children in the close community; (5) childless. For this study, as mentioned earlier, we will focus on whether the couple co-reside with any adult children and whether the couple live near to any adult children. I dropped all invariant observations which do not have any adult children. See Table 1 for a breakdown of these two types of living arrangements.

Table 1: Breakdown of co-residence and couples who live near to their adult children

Whether lvnr with any adult children	Whether co-reside with any adult children					
	No		Yes		Total	
	No.	%	No.	%	No.	%
no	1,279	57.6	0	0	1,279	38.4
yes	943	42.4	1,111	100.00	2,054	61.6
Total	2,222	100	1,111	100.00	3,333	100

CHALRS collects information of the respondents' labor force status in the following categories: (1) Agriculture work; (2) Non-agriculture employed; (3) Non-agriculture self-employment or family business; (4) unemployed; (5) retired and (6) Never work. Since "retirement" is not clearly defined for agricultural work and self-employment / family businesses, I dropped all observations unless both the husband and the wife have a work status of either "(2) Non-agriculture employed" or "(5) retired". If the labor force status is missing for the respondent and the respondent are receiving pension, then these respondents are also regarded as "retired". This step of cleaning causes a drastically decrease of the sample size, since 60% of the original sample were collected in rural areas with either the husband or the wife doing agricultural work.

To capture the household characteristics, control variables are constructed on an aggregated level. Table 2 shows the summary statistics for all the categorical variables used. To control education, *hedu* counts the number of people in the couple who have received upper secondary level education or above. Health situation of the household is captured by *hgoodhealth*, which indicates the number of people in the couple who have good health. The original CHARLS survey collects self-evaluated health status with 5 categories: (1) excellent; (2) very good; (3) good; (4) fair; (5) poor. Only respondents with rank of "good" and above are regarded as in "good health". Variable *hrural* describes whether the location of the household belongs to rural or urban areas according to the standards set by National Bureau of Statistics of the People's Republic of China. Variable *hgkcare* describes whether the couple spent time taking care of their grandchildren. From Table 2 we can see that co-residing couples are more likely to give care to grandchildren (61.5%). However, even when the old couple do not co-reside with adult children, 46.8% of the observations still give care to their grandchildren. Finally, the variable *collchild* indicates whether the couple currently have a child in college.

Table 2: Summary Statistics for Categorical Variables

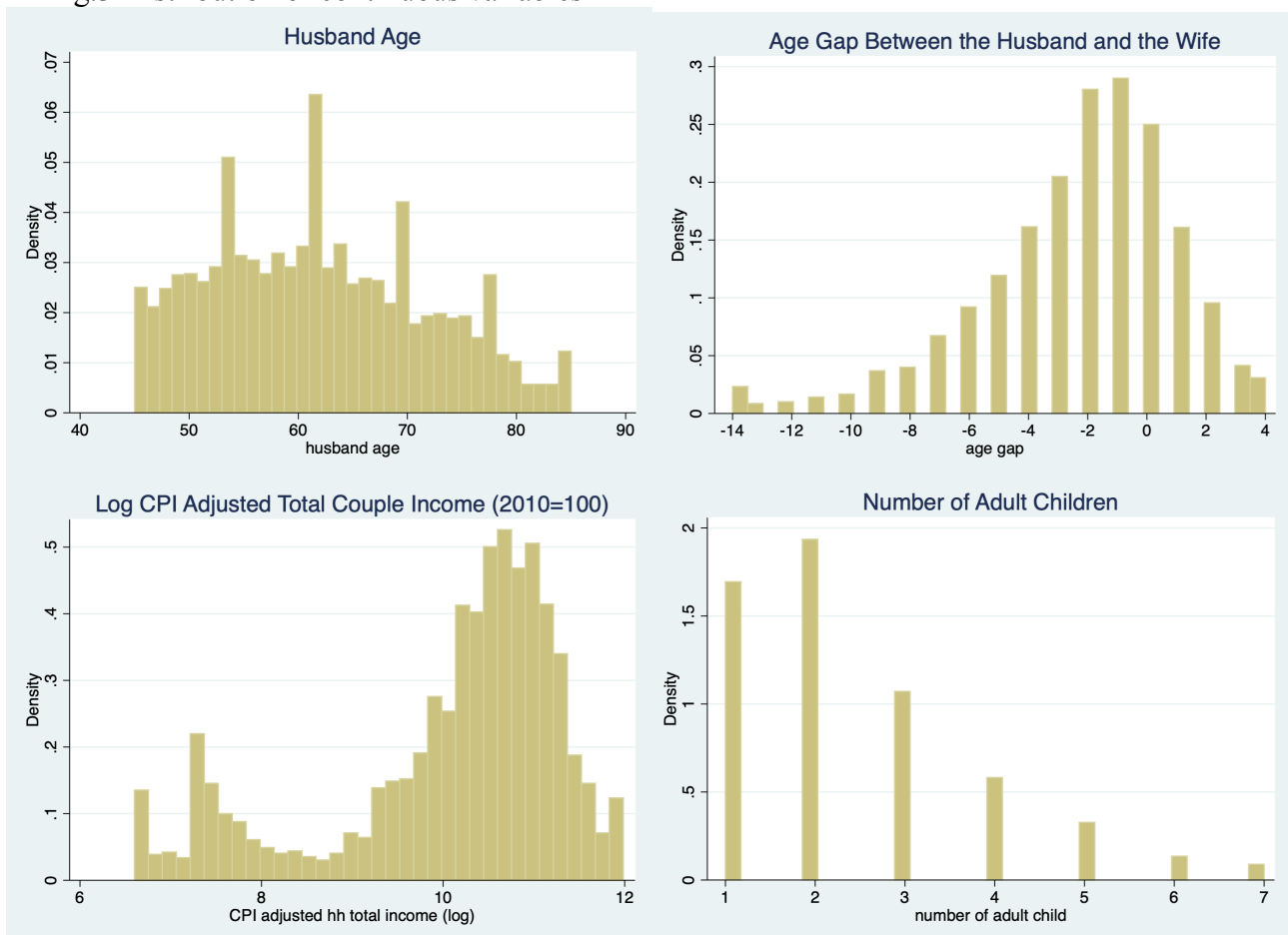
	Whether coreside with any adult children					
	no No.	yes No.	Total No.	no %	yes %	Total %
<i>hretire: number of people have retired</i>						
hretire=0:neither retired	245	171	416	11.0	15.4	12.5
hretire=1:one person retired	426	326	752	19.2	29.3	22.6
hretire=2:both retired	1551	614	2165	69.8	55.3	65.0
Total	2222	1111	3333	100.0	100.0	100.0
<i>hedu: number of people have education above secondary level</i>						
hedu=0:neither have high edu	1,449	779	2,228	65.3	70.2	66.9
hedu=1:only one has high edu	546	237	783	24.6	21.4	23.5
hedu=2:both have high edu	224	94	318	10.1	8.5	9.6
Total	2,219	1,110	3,329	100.0	100.0	100.0
<i>hgoodhealth: number of people have self-evaluated good health</i>						
hlth=0:neither have good health	991	593	1,584	56.8	55.5	56.3
hlth=1:one has good health	537	367	904	30.8	34.3	32.1
hlth=2:both have good health	216	109	325	12.4	10.2	11.6
Total	1,744	1,069	2,813	100.0	100.0	100.0
<i>hrural: hh location</i>						
urban	1,559	726	2,285	70.2	65.3	68.6
rural	663	385	1,048	29.8	34.7	31.4
Total	2,222	1,111	3,333	100.0	100.0	100.0
<i>hgkcare: whether give care to grandchildren</i>						
no care for grandchild	852	302	1,154	53.2	38.5	48.3
give care to grandchild	751	483	1,234	46.8	61.5	51.7
Total	1,603	785	2,388	100.0	100.0	100.0
<i>collchild: whether have child in college</i>						
no college child	1,876	889	2,765	85.7	82.2	84.6
have college child	312	192	504	14.3	17.8	15.4
Total	2,188	1,081	3,269	100.0	100.0	100.0

Table 3 shows the summary statistics for the continuous variables used. Husband age has mean 61.9, which is very close to the legally required retirement age of 60. CHALRS collects income data from various sources for each respondent. In this analysis, the couple's total income is first aggregated, adjusted using CPI of the year of survey with CPI2010=100, and the log value is taken upon that. For each of the continuous variable, 1% of the sample were dropped to eliminate the effect of outliers. The distributions of the continuous variables are shown in Fig.3.

Table 3: Summary Statistics for Continuous Variables

	count	mean	sd	min	max
Husband age	3842	61.90	9.85	45.00	85.00
Age gap between husband and wife	3842	-2.40	3.37	-14.00	4.00
Log of couple total income	3842	10.06	1.31	6.60	11.98
Number of adult children	3801	2.43	1.39	1.00	7.00
N	3842				

Fig.3 Distribution of continuous variables



5. Empirical Result

Table 4 shows a summary of the empirical result of the logistic regression. While the model (1) and model (2) use co-residence as the dependent variable, model (3) and model (4) use close-residence as dependent variable. In model (1) and model (3), the interaction terms between retirement and whether caring for grandchildren were not included whereas in model (2) and model (4) they are included.

From Table 4 we can see that when interaction terms are not included, the estimated coefficient for *hretire1* has a positive sign. This effect is not significant in the co-residence model, but mildly significant with level $p < 0.2$ for the close-residence model. However, when both of the couple retire, such effect turned negative. A possible explanation is that when both the husband and the wife are retired, they can better accompany each other, thus there is a tendency for them to live independently from their children.

Providing caring services for grandchildren has a significantly positive effect on co-residence or close-residence in model (1) and (3) when interaction terms were not added, but this effect gets absorbed when interaction terms are included in model (2) and (4). For model (2), all interaction terms have significant positive effects, indicating that when the old couple need to care for their grandchildren, the retirement will result in an increase of the likelihood for co-residence. Specifically, compared with $hretire=0$, when the first person retires, the odds ratio of co-residence is 1.65; but when the second person also retires, the odds ratio drops to 1.11, indicating a negative net effect of the second retiree on household co-residence. On the contrary, if the couple don't take care of grandchildren, when the first person has retired, the odds ratio for co-residence is 0.74; and when both people have retired, the odds ratio is 0.54. The above results show that the positive retirement effect on co-residence only occurs when the old couple need to take care of grandchildren. If the old couple do not have such obligations,

Table 4: Regression Result

	(1)	(2)	(3)	(4)
	whether co-reside with any adult children		whether lvnr with any adult children	
hretire=1:one person retired	0.0988 (0.603)	-0.299 (0.275)	0.310 ⁺ (0.110)	0.148 (0.593)
hretire=2:both retired	-0.254 (0.217)	-0.606 ^{**} (0.023)	-0.172 (0.410)	-0.215 (0.424)
whether care grandchildren	0.700 ^{***} (0.000)	0.0443 (0.888)	0.275 ^{***} (0.009)	0.137 (0.666)
husband age	-0.0318 ^{***} (0.001)	-0.0298 ^{***} (0.002)	0.0107 (0.269)	0.0106 (0.278)
age gap	-0.00962 (0.718)	-0.00834 (0.755)	0.0207 (0.462)	0.0210 (0.455)
age gap squared	-0.00132 (0.632)	-0.00137 (0.622)	-0.00215 (0.452)	-0.00207 (0.470)
hedu=1:only one has high edu	-0.159 (0.208)	-0.160 (0.207)	-0.112 (0.368)	-0.114 (0.359)
hedu=2:both have high edu	-0.489 ^{**} (0.032)	-0.493 ^{**} (0.031)	-0.547 ^{***} (0.007)	-0.544 ^{***} (0.007)
hlth=1:one has good health	0.0968 (0.362)	0.0991 (0.352)	0.195 [*] (0.079)	0.195 [*] (0.079)
hlth=2:both have good health	-0.413 ^{**} (0.019)	-0.386 ^{**} (0.028)	-0.348 ^{**} (0.032)	-0.338 ^{**} (0.037)
hh in rural areas	0.139 (0.214)	0.133 (0.235)	-0.0302 (0.802)	-0.0319 (0.791)
log CPI-adj hh total income	-0.107 ^{**} (0.011)	-0.111 ^{***} (0.009)	-0.158 ^{***} (0.000)	-0.158 ^{***} (0.000)
number of adult child	0.186 ^{***} (0.000)	0.185 ^{***} (0.000)	0.372 ^{***} (0.000)	0.371 ^{***} (0.000)
whether have child in college	-0.0967 (0.482)	-0.110 (0.426)	-0.540 ^{***} (0.000)	-0.542 ^{***} (0.000)
hretire=1 # care grandchildren		0.802 ^{**} (0.034)		0.297 (0.441)
hretire=2 # care grandchildren		0.714 ^{**} (0.036)		0.109 (0.751)
Constant	1.808 ^{***} (0.008)	2.034 ^{***} (0.003)	0.662 (0.344)	0.728 (0.303)
Observations	1995	1995	1995	1995
Pseudo R²	0.055	0.056	0.081	0.081

p-values in parentheses

⁺ *p* < 0.2, * *p* < 0.10, ** *p* < 0.05, *** *p* < 0.01

the retirement effect on co-residence is generally negative. No matter whether the couple need to care for grandchildren or not, the net effect of the second retiree is always negative. Similar effects of the interaction terms, however, are not observed for close-residence case in model (4).

In terms of the controlling variables, the findings mostly comply with the past literature. Across the four models, the control variables of education and health show similarly effects. For the couple who have received higher education or have better health status, it is generally less likely for them to either co-reside or live closely to their adult children. The effects are quite robust across different models and it is interesting to notice that such effects are more significant and of larger magnitude when both of the old couple possess the characteristics. For the case of education, when only one person in the couple has received higher education, it is possible that the other person still favors co-residence. However, when both people have higher education, it is more likely for the couple to reach an agreement thus a higher negative effect on co-residence and close-residence is shown when $hedu=2$. For the case of health status, when only one person of the couple is in bad health, the other person can still take care of him or her. But, when both of the couple are in bad health, they can only rely on their children for informal care support.

Across all four models, the logged total couple income has consistently negative on co-residence and close-residence, suggesting that independent living is a normal good, and there is a higher chance for independent living when the couple are not bounded by financial constraints. This is also consistent with the past literature. In model (1) and (2), *hrural* seems to suggest that households in rural areas have higher possibility for co-residence than households in urban areas, though this effect is not significant.

The family structure shows significant influence on the family's living decisions. First, the more adult children the couple have, the more likely for the household to co-reside or live

closely to each other. This effect is larger for the case of close-residence than the co-residence. This is generally because the amount of privacy that needs to be sacrificed is smaller when live closely than when co-residing. Second, if there are children still attending college in the household, it becomes less likely for the household to have co-residence or close-residence with adult children since students usually attend colleges away from their parents' home.

6. Conclusion and Discussions

Through the discussion of the results in the previous section, we can conclude that though the direct effects of retirement on the family's living choices are not significant, a significant positive effect on co-residence is observed through the channel of in-house services of caring for grandchildren. When the old couple need to care for grandchildren, retiring from work is associated with higher likelihood to co-reside with adult children: when the first person retires, the odds ratio of co-residence against $hretire=0$ is 1.65; and when the second person retires, the odds ratio against $hretire=0$ is 1.11. If the old couple do no need to care for grandchildren, both $hretire=1$ and $hretire=2$ only negatively affect co-residence, comparing with the base case that $hretire=0$. No matter whether need to care for grandchildren, the second retirement in the household always has a negative net effect if compared with $hretire=1$.

The interaction effects between retirement and caring for grandchildren are not significant in the case of close-residence, though the coefficients are all positively signed. This may be because it is quite necessary for the old couple to live with grandchildren in the same household in order to better take care of their daily life.

In addition to the retirement effect, other findings include the negative effects of higher education, better health status and higher income on the co-residence and close-residence. Among them, the negative effect of education and good health is most significant when both of the old couple are well educated or in good health.

However, there are still many limitations of the analysis. First, according to the retirement policy of China, males retire at the age of 60, females workers retire at the age of 50 and female leaders retire at 55. So, within a household, it is almost always the case that the wife will retire earlier than the husband (See Table 3 for an average age gap of 2.40). Meanwhile, certainly the first to retire and the second to retire will have different effects on the living arrangement decisions, it thus becomes almost impossible to measure the retirement effects of the husband and the wife separately as the variance of who being the first to retire is too small.

Second, the analysis only incorporates one kind of household service, which is caring for grandchildren. Household services can surely be of many other different forms, such as caring for parents/parents-in-law or conducting other regular housework. The weekly time spent on each service can also be an indicator for the respondent's devotion to the services. Though CHARLS indeed provides such data, it is much more scarcely collected than "whether caring for grandchildren" and is not sufficient for the analysis.

Third, the analysis is only limited to married couple and thus it is unclear whether different marital statuses of the couple could influence the household's living decisions. However, if we want to look into the effects of different marital statuses, we may need to reconstruct the data to be on individual level than on household level, but then some household level dynamics may be concealed.

Finally, CHARLS only collects data from respondents who are not institutionalized, so it is not possible to list the third type of living arrangement also into the analysis. Similar to previous researches which only focus on non-institutionalized living, such analysis of living arrangements is in essence, incomplete.

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