Living Arrangements of the Elderly in China and Consequences for their Emotional Well-being

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ABSTRACT

We study the living arrangements and consequences for emotional well-being of the elderly using data from a national probability sample survey conducted in 2010, part of the *China Family Panel Studies*: 14,960 households were included and information was collected for each family member. We study 7,015 people in the sample age 60+. We find that, compared to living independently with one's spouse, elderly respondents living with grown children are less happy, have less life satisfaction, and are more depressed, especially when the spouse is not sharing the household. The negative effects largely disappear when there also are grandchildren in the household although widows and widowers remain more prone to depression. Elderly people living in "generation-skipping" families suffer the same fate as living with adult children but no grandchildren—they are less happy and more depressed and, when not sharing responsibilities with a spouse, less satisfied with life than independent elderly couples. Finally, living alone or living with other relatives results in a significant degradation of emotional health. But the very small fraction of elderly respondents living with non-relatives enjoy the greatest happiness and the least depression.

INTRODUCTION

Due to a combination of increases in longevity and the one child policy, which has

dramatically slowed population replacement, China's population is aging very rapidly (Banister

1992; Chen and Liu 2009) and will age even more rapidly in the future (United Nations 2002,

cited by Zeng and Wang 2003:98). Thus, China will soon have the largest population of elderly

people in the world.

Traditionally, old age security in China was managed mainly via co-residence with an

adult child, nominally the eldest son, who continued to live in the parental household, or nearby,

even after marriage and the appearance of children (Davis-Friedmann 1983:34-35; Whyte

2003:5). Even when new nuclear households were formed, elderly parents often moved to the

home of one of their children when it became difficult for them to care for themselves or when

they were widowed[1] (Korinek, Zimmer, and Gu 2011). This pattern was particularly pronounced

in rural China—which, until recently, included the bulk of the population—since there was

(Chow 1991; see also Lee and Xiao 1998) and is (Cai et al. 2012) essentially no state support for

the elderly in rural areas . To be sure, some (e.g., Levy 1949) have suggested that the elderly-

parent-plus-adult-child household pattern was more the norm than the rule, at least since the

middle of the 20th century. However, Cartier (1995:320) reports that as late as 1982 nearly 75%

of elderly Chinese lived with their adult children.

This no longer the case. Due to a combination of increased urbanization; changes in

housing stock—the replacement of *hutongs* (dwellings arranged around courtyards and housing

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[1] We use the term "widows" to refer to both females and males, both because it is the appropriate collective
term for those of both sexes who have lost a spouse and because the existing evidence for China shows no gender
differences in the psychological consequences of widowhood (Li et al. 2005).

multiple, often related, families) with high rise apartments containing small units suitable only

for nuclear families; and increased migration, which results in many adults living a great

distance away from their parents, the proportion of elderly Chinese living with their adult

children has declined substantially between 1982 and 2010 and the proportion living with their

spouse and no one else has increased concomitantly (Zeng and Wang 2003). Specifically, Zeng

and Wang showed from analysis of 1982, 1990, and 2000 census data that the percentage of men

age 65+ living with children declined from 68% to 60% and the percentage living only with a

spouse increased from 17% to 29%; the corresponding percentages for women were 74% to 69%

and 11% to 19% (2003, Table 2).[2] This trend has continued through 2010. In the data analyzed

here the percentage of men age 65+ living with children declined to 33% and for women to 42%

while the proportion of men living only with a spouse increased to 43% and for women to 30%.

In addition, as internal labor migration has increased, many children have been left behind or

sent back to live with grandparents by parents too busy to care for their children or lacking

access to education or suitable housing for their children (Zeng and Wang 2003:104; Silverstein,

Cong, and Li 2006). Thus, over the past 20 years or so, a new form of household has emerged,

the "generation-skipping" household consisting of grandparent(s) and one or more non-adult

grandchildren but no members of the middle generation.

     The concern of this paper is how the living arrangements of elderly Chinese affect their

emotional well-being. While the effect of living arrangements on the well-being of the elderly in

China has received considerable attention by researchers, our understanding is as yet incomplete.

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[2] Interestingly, as Zeng and Wang (2003:105,112) show, the proportion of 3-generation households increased between 1982 and 1990. However, this is due to the decline in the birthrate, which results in fewer children living in independent households, and the increase in longevity, which results in more elderly per adult child.

One difficulty is that researchers use a variety of classifications of living arrangements, often simply one specific category against all others, which makes comparisons across studies difficult (e.g., Chen and Silverstein 2000; Silverstein et al. 2006; Liu and Guo 2008; Sun et al. 2011; Ye and Chen 2014). In what follows, we explicitly contrast all pairs of living arrangements. Because we have data only on the non-institutionalized population, we do not consider the institutionalized elderly, who in any event constitute only a tiny fraction (less than 0.4%) of the elderly population (Zeng and Wang 2003:106 [Table 2]).

What has been firmly established is that living alone is an undesirable condition. Those who live alone are less satisfied with life (Wang, Chen, and Han 2013:5[Table 3]), more depressed (Sun et al. 2011), and have lower overall psychological well-being (Chen and Short 2008:17[Table 4]; Wang, Chen, and Han 2013:5[Table 3]) than those who live with others.[3] This outcome may be due in part to the fact that those who live alone are usually widowed (in our data, 76% of those who live alone are widowed—92% among women and 57% among men; interestingly 23% of men live alone have never married, compared to only 1% of women who live alone, which reflects the fact that for women in China marriage is nearly universal). Widows who live alone have a double disadvantage—they must cope with the loss of a spouse, which is known to increase the risk of depression (Li et al. 2005), as well as the lack of other companionship.

What is as yet unclear is whether living with children or grandchildren promotes or undercuts emotional well-being. The best evidence comes from the ongoing study of the Oldest

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[3] Our claims are specific to China. Some U.S. studies show that living alone increases the likelihood of psychological well-being (e.g., Michael et al. 2001). On the other hand, a meta-analysis of 25 studies from various nations by Hu et al. (2012) concludes that, on average, living alone increases the risk of depression.

Old (Zeng et al. 2002), a nationally representative panel survey, with an initial survey of people age 80+ in 1998 and new waves approximately every two years. In 2002 the survey was expanded to include people age 65-79 (Zeng and Vaupel 2004). Still, the available evidence to date comes from analysis of the oldest old population, those age 80 or more. Since 88% of the population age 60 or older is less than age 80 (computations from our data), results from the original oldest-old sample can hardly be taken as typical of elderly Chinese. Still, these results are suggestive and we report them here. Wang, Chen, and Han (2013) studied life satisfaction (using a single item scale) and emotional well-being (the propensity to look on the bright side of things, to feel anxious or fearful, to feel lonely or isolated, to feel that the older you get the more useless you are, and to be as happy now as when younger, which they combined into a single scale) and found that married couples living with children and married couples living independently did not differ significantly with respect to either measure. Chen and Short (2008, Table 5) studied the same population and used the same measures, except that they combined them into two 3-category measures: positive well-being (the quality of life now, the propensity to look on the bright side of things, the propensity to be as happy as when younger); and negative well-being (the propensity to feel fearful, lonely, or useless). They found no significant differences between those living with their spouse but not with a child, those living with a child but not with a spouse, and those living with both a child and a spouse. Several studies (Chen and Silverstein 2000; Silverstein et al. 2006; Liu and Guo 2008) find that living with children is beneficial, but they fail to distinguish between elderly couples living independently and elderly people living alone.

To date there has been to our knowledge only one study focusing on the consequences for the elderly of living in "generation-skipping" households, that is, with grandchildren but not with children. Silverstein et al. (2006) showed that grandparents in generation-skipping households were less depressed than other elderly people in their sample, especially when remittances were sent back by parents who had gone out for work. But their data were restricted to a sample of elderly people from rural townships within Chaohu City, a primarily agricultural city in central Anhui Province with high rates of temporary out-migration of adults for work. Given the specificity of the sample, it is not at all clear whether their results would hold for China in general.

In our analysis (described in detail below) we distinguish 10 categories of living arrangements, which enables us to assess the effect of various combinations—elderly living with spouse, with spouse and grown children, with spouse, children, and grandchildren, and so on.

There are two competing hypotheses regarding the effect of living with grown children. The *family support hypothesis* posits a benefit of living with children on the ground that such arrangements facilitate material support (financial support and aid in daily life) and minimize loneliness and isolation, which may be a problem not only for those who live alone but also for elderly couples living independently. This is consistent with the claim of Davis-Friedmann (1983:49) that, at least until the 1980s, "Life-long interdependence remains the preferred parent-child relationship among both young and old." For a contrasting view, see Logan, Bian, and Bian (1998), who find, using data from Tianjin and Shanghai, that both older and younger respondents prefer that the old people live separately. The *family conflict hypothesis* posits that the irritations of family life may undercut any advantages of social interaction, even if material

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support is enhanced. Such irritations may be particularly pronounced when an elderly person or couple live with a son because then the primary caregiver is likely to be a daughter-in-law and mother-in-law/daughter-in-law conflicts are legendary in many cultures, not least China[4] (Wolf 1968:869-870).[5] Thus, we expect that those who live with their daughters, who are a small but non-trivial fraction of the elderly (over 10% of those living with a grown child in rural areas and over 20% in urban areas [Zeng and Wang 2003:111]), will be emotionally better off than those who live with their sons and that this gap will be more pronounced for elderly women than for elderly men.

It often has been claimed that elderly Chinese value close relations with their children and their children's families. As Silverstein et al. note (2006:S257-S258)

> ...what is distinctive about Chinese grandparents is that their contributions take place within a cultural system of filial piety. In a society that emphasizes collective family goals over individual goals, the contributions of grandparents to the welfare of their children's families fulfill a cultural mandate and are highly valued.... Such provisions allow grandparents to command greater respect from younger generations and to better secure claims to filial piety, which in turn enhances their sense of purpose and self-worth within the family....

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[4] Nobel Laureate Mo Yan's novel, *Big Breasts and Wide Hips* (2004), gives a vivid depiction of a mother-in-law/daughter-in-law conflict which ends with the daughter-in-law murdering her senile mother-in-law.

[5] Davis-Friedman (1983:72-73) suggests that mothers-in-law are often critical of their co-resident son's bride, who, especially in rural areas because of village exogamy, is inherently a newcomer to an established household and community and is unfamiliar with family routines. While mothers-in-law may try to minimize conflict in recognition that eventually the power relationship will shift, with the older woman becoming dependent on the younger, many do not have the foresight or the will to do so.

(See also Strom et al. 1999; Yan 2003; Mjelde-Mossey, Chi, and Lou 2005.) Insofar as this is so, living in households with both grown children and grandchildren should enhance emotional well-being compared to other living arrangements. Whether living in generation-skipping households also enhances emotional well-being is more problematic, because whatever benefit is derived from interaction with grandchildren and from contributing to the collective well-being of the family may be offset by the burden of caring for them. Moreover, in China as elsewhere, adolescent children can be difficult (Jessor et al. 2003). Thus, we might well expect differences in the feelings of the grandparents depending on the age of the child.

Finally, we expect to replicate the widely observed negative consequences of living alone for the emotional well-being of the elderly due to the psychological costs of social isolation.

DATA, VARIABLES, AND ANALYTIC STRATEGY

Data

The data used in this analysis are from the 2010 wave of the *China Family Panel Studies*, a (nearly) national multi-stage probability sample of Chinese families.[6] In the 2010 wave, 14,960 households were included in the sample and interviews were conducted with all family members age 10 or older, resulting in a total sample of 57,115. Our sample is restricted to 7,038 people age 60 and over who responded to the adult questionnaire (see Table 2). We further restrict the sample to 7,015 by excluding the 23 elderly respondents living with children under age 16 to ensure that those living with children are living with adult children.[7]

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[6] Six provinces (Tibet, Qinghai, Xinjiang, Ningxia, Inner Mongolia, and Hainan) were excluded from the sample to reduce costs, but together they make up only 5% of the population (Xie 2012:14).

[7] Of the 23 excluded elderly, 14 had both children under age 16 and children age 16 or older in the household. Clearly, these are people who had children late in life.

The choice of age 60 as the cutoff point for defining the elderly population reflects the nominal retirement age for male workers (for women it is age 50 for ordinary workers and 55 for civil servants [Wikipedia 2013]). Davis-Friedmann (1983:3) asserts that "Age 60 ... marks a ... universally accepted point in time for entry into the oldest generation, and among those who have celebrated this birthday there are few who still identify themselves as middle-aged." To be sure, the Chinese National Bureau of Statistics defines old age as beginning at age 65, as indicated by the fact that since 1982 separate statistics have been presented for this age group. Still, we think the nominal retirement age is the optimal cutting point. This follows conventional practice when an upper age limit is imposed in population surveys. For example, many U.S. studies restrict samples to those no older than 64.

Details of the sample design are given in Xie, Qiu, and Lü (2012). Here it suffices to note that six strata were initially specified: four provinces (Gansu, Guangdong, Henan, and Liaoning) and a provincial-level city (Shanghai) were each treated as separate strata and a sixth stratum consisted of the remaining 20 provinces sampled. Within each of the four single-province strata, 16 counties were chosen at random but with probability proportional to size (PPS); however, in Shanghai 32 townships (which in urban areas are known as "streets"—*jiedao*) were chosen PPS as the first stage. Within the 20-province stratum, 80 counties were chosen PPS. Within each county four villages or neighborhoods were chosen PPS; for Shanghai, two villages or neighborhoods were chosen PPS within each *jiedao*. Within each village/neighborhood, 25 households were chosen at random. Because of the multistage design, it is necessary to take account of the resulting clustering of the sample; we specify the village/neighborhood as the cluster variable. In addition, we weight the data using "post-

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stratification adjustment weights" for the adult sample, which take account of the differential

sampling rates implied by the sample design, a correction for differential non-response rates, and

a final adjustment to replicate the age-by-sex distribution of the 2010 census (Lü and Xie, 2012).

Since several variables used in our analysis have missing data, including a family income

variable (592 missing values) and a measure of closeness to children (1,362 missing values,

including those without living children), we imputed all missing values using Stata 13's multiple

imputation (-mi-) procedures,[8] carrying out 10 imputations, and conducted our analysis using

-mi- procedures (StataCorp 2013). Our analysis is based on 7,015 completed cases.

The legitimacy of multiple imputation turns on the plausibility of the assumption that

missing values for the variables to be imputed are "missing at random" (MAR) (Rubin 1987;

Little and Rubin 2002)—that is, that net of predictors of these variables included in a model

there is no correlation between the true value of the variable and the likelihood that the value is

missing in the data set. This is a bit problematic with respect to family income since those in

high income families might be concerned about information being shared with the tax

authorities. But since the variable refers to family rather than individual income, this is unlikely

to be an important concern on the part of respondents. Moreover, despite vivid newspaper

accounts about the Chinese *nouveau riche*, they represent only a tiny fraction of China's

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[8] Specifically, we imputed happiness, life satisfaction, family income, closeness to children, instrumental exchanges with children, health status, and years of schooling from depression score, type of residential arrangement (coded as a set of dummy variables), gender, age, whether housing is inadequate, the number of people in the household, urban vs. rural residence, agricultural vs. non-agricultural registration, local registration, number of productive adults (age 18-59) in the household, number of productive age males in the household, mean age of household adults (age 18+), members, mean years of schooling of household adults, a 3-category typology of labor migration/remittances, a 3-category region-of-residence variable, whether the respondent had any of several physical limitations, whether currently married, whether currently widowed, whether the family owned any businesses, the number of words the respondent could correctly read, the number of living children of the respondent, and interactions between gender and whether married and between gender and whether widowed, using Stata 13's -chained- specification.

population and are known to be resistant to being interviewed and hence are unlikely to be found in survey samples. The large amount of missing data on the "closeness to children" variable also is problematic. Of the 1,362 missing values, 182 are due to the fact that the respondent has no living children. However, the remainder are troublesome. One possibility is that people who are not close to their children are less likely to answer the "closeness" question because of the discomfort involved in admitting to themselves (and to the interviewer) that, against strong norms, they are not close to their children. Although no direct assessment of this conjecture is possible, it is possible to carry out a partial indirect test—if those who failed to respond to the closeness questions are significantly less happy and satisfied and more depressed than otherwise comparable people who did respond, we have a basis for suspecting that the missing data on the "closeness" reflect a lack of closeness to children, given that—as we will see below—closeness to children is positively associated with happiness and satisfaction and negatively associated with depression. To assess this possibility, we added a dummy variable to the set of variables in Table 4, coded 1 if a response to the "closeness" variable was missing and coded 0 otherwise. We also imputed missing values for the "closeness" variable. Given this, the coefficients associated with the dummy variables for missingness on "closeness" can be interpreted as the expected difference with respect to happiness, life satisfaction, and depression between those missing information on closeness and others. It turns out that those missing information on closeness are *more* happy and satisfied than expected, not less. They also are less depressed, although the coefficient for depression is not significant. From these results we conclude that the hypothesis that those who are not close to their children are less likely to respond to the

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closeness question is unlikely. Since we have no other hypotheses regarding the possibility that

the closeness variable is not MAR, we treat it as MAR and impute the missing cases.

Analytic strategy

The analysis we conduct here can be divided into three parts. Our first task is to describe

the distribution of non-institutional living arrangements experienced by the elderly population.

Second, we study the determinants of living arrangements, about which relatively little is known.

Third, we consider the consequences of living arrangements for the emotional well-being of the

elderly. For each of these tasks, we first introduce the variables studied and the models

estimated and then discuss the results. Descriptive statistics for all variables used in the analysis

are shown in Tables 1 and 2.

DISTRIBUTION OF LIVING ARRANGEMENTS OF THE ELDERLY

In our introductory discussion we noted that the living arrangements of the elderly in

China have been changing rapidly as China has urbanized, the urban housing stock has become

increasingly dominated by small apartments designed for nuclear families, and internal migration

has increased. However, until now there has been no definitive assessment of the contemporary

living patterns of the elderly or of trends in these patterns over time.

Table 2 provides such estimates for 2010. In constructing the table, we classified our

elderly respondents on the basis of the focal relationships identified in each line of the table. The

first category consists of married[9] couples living together but without children or grandchildren

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[9] We also include cohabiting partners in the married category, but in contemporary China—especially among the elderly—such couples constitute only a tiny fraction of the population. In our data, 0.1% were cohabiting, compared to 76% who were currently married.

—although there could be other relatives or non-relatives in the household as well.[10] This is the reference category for the models shown below. The guiding principle in constructing our typology was to be able to distinguish the presence of a spouse, a grown child (or children, including in-laws), and a grandchild or children. To make these distinctions, and also distinguish between people living with other relatives, people living with non-relatives, and people living alone, requires 10 categories. We tried to reduce the number of categories by testing the significance of differences between pairs of coefficients when studying the effect of living arrangements on emotional outcomes (e.g., contrasting Category 2 with Category 5 to assess whether living with a spouse mattered among those living with grown children but without grandchildren), but concluded that there were too many instances in which corresponding coefficients were significantly different to warrant combining categories.

Since 17% of elderly respondents identified in the household questionnaire failed to respond to the adult questionnaire, it is important to assess whether the respondents constitute an unbiased subset of all elderly adults. Lacking adequate data on the personal characteristics of non-respondents, we resorted to the simple expedient of comparing the distribution of living arrangements among the elderly counted as household members with the distribution of elderly respondents to the adult questionnaire. Inspection of the right and left panels of Table 2 makes it clear that there is relatively little difference between the distributions (the indexes of dissimilarity, Δ, are, respectively, 4.4, 9.5, and 7.6 for rural, urban and all respondents). We thus

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[10] The likelihood of other relatives or non-relatives in the household is very low. Only 1% of the elderly in categories 1-7 of Table 2 live in such situations and the highest percentage (in Category 3) is only 2.1.

are comfortable treating the sample of respondents as representative of non-institutionalized elderly people in China.

From the left-hand column of the table, it is evident that 65% of the elderly population continue to live with their spouses and that of these fewer than half (40%) live with grown children or grandchildren. The tendency to live with a spouse but not with children or grandchildren is somewhat more common among the urban elderly than among the rural elderly (42% vs. 35%) and the tendency to live with grandchildren, whether in 3-generation or generation-skipping households, is somewhat more common among the rural elderly (35% vs. 27%); there are no other rural-urban differences of note.   It also is evident that even in rural China, the 3-generation household is no longer dominant—if it ever was: 28% of the rural elderly live in 3-generation households, as do 22% of the urban elderly. Interestingly, rural-urban differences are more pronounced in the left-hand panel than in the right-hand panel, where—with the exception of the propensity for couples to live independently (Category 1)—they essentially disappear. This probably reflects rural-urban differences in the living arrangements of the oldest old, who were disproportionately unlikely to respond to the adult questionnaire due to higher rates of physical infirmity and cognitive impairment.

Much has been made (e.g. China Youth Research Center 2006; Guo 2008; Chan 2009:9) of an increasing propensity to send children to live with their grandparent(s). The claim is that when two parents both go out for work, it is difficult to care for their children due to inadequate housing, inadequate supervision, and difficulties in arranging suitable schooling (Liang and Chen 2007; Chan and Buckingham 2008; Liang, Guo, and Duan 2008). Similarly, young professionals may lack the time to care for their children. Thus, they send them to live with

grandparents, who presumably are happy to take on the task of caring for grandchildren. In the third section of the paper, we study whether this last claim is correct. For now, we simply note that "generation-skipping" households are quite uncommon; only about 6% of the elderly live in such households and most (81%) of these are households in which both grandparents are present. Finally, very few people live with other relatives or non-relatives but about 17% live alone.

DETERMINANTS OF LIVING ARRANGEMENTS OF THE ELDERLY

As we noted in the previous section, multiple generation families traditionally were the norm in China. As they aged, parents expected to continue to live with their grown children or, more precisely, their grown sons. Below we will focus on those living with adult children and will explore the consequences of living with, say, a daughter vs. a daughter-in-law. But for now we consider the factors affecting the 10 living arrangements we already have distinguished. There are several possibilities:

Age. We might expect that as people get older they become more dependent on others, which would create an incentive for them to move in with their adult children.

Female gender. Since, as elsewhere, women have the main responsibility for household chores, elderly widowers may be less capable of caring for themselves (or others) on an everyday basis, and hence may be particularly unlikely to live alone or in generation-skipping households in which they have the responsibility for not-yet-adult children. However, because, in China as elsewhere, women tend to outlive men (Population Reference Bureau 2011), we would expect widows to be more likely than widowers to live with children or grandchildren or both; because of the way the gender variable is coded (male = 0, female = 1), this implies positive gender coefficients for Categories 5-7.

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Number of children. All else equal, we would expect that the larger the number of children the more likely elderly people are to live with one of their children. There are two reasons to expect this. First, the larger the number of children, the greater the likelihood that one of them will be a son, who will fulfil the traditional responsibility of oldest sons to care for their elderly parents. Second, even when this is not possible for whatever reason, the more children the greater the likelihood that at least one of the children will be in a position either to take in their elderly parents or to remain at home.

Health status. Given China's weak social security system, especially in rural areas, we expect that those in poor health will be more likely than those in good health to live with their adult children. We measure health status by the respondent's report of how healthy s/he is on a 5-point scale which includes the response categories 1 "Healthy," 2 "Fair," 3 "Relatively unhealthy," 4 "Unhealthy," and 5 "Very unhealthy." We reversed the coding of this variable so that 5 is the most healthy response and 1 is the least healthy response.

No physical limitations. Our respondents were asked five questions regarding ordinary physical capabilities: Can you touch the base of your neck with both hands? Can you touch your lower lumbar spine with both hands? Can you stand up immediately after sitting on a chair for a while? Can you pick up a book from the ground? How many steps does it take for you *to walk* around a full circular rotation? If respondents were unable to accomplish any of these tasks, including not being able to walk in a circle, they were scored as having physical limitations. This variable was scored 1 for those with no physical limitations and was scored 0 for those with physical limitations. Our expectation is that those with physical limitations will be more likely to live with an adult child in order to receive care.

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Urban residence. Both because of traditional norms and because of the greater suitability of housing, we expect those in rural areas to be more likely to live with their adult children and also to be more likely to live with their grandchildren when they don't live with their children. This implies negative coefficients of urban residence for living-status categories 2-7.

Education (years of schooling). Given that education is well known to enhance personal resourcefulness (Mirowsky and Ross 2003), we would expect education to be positively associated with living alone and living with non-family members and negatively associated with living with adult children.

Income. The higher the household income, the greater the likelihood that elderly people will live with their adult children, simply because the higher the resource level the easier it is to support extra people in the household. Here we assume that elderly parents bring little or no income to the household so that household income is properly treated as a determinant of living arrangements rather than as a consequence. We measure household income as the natural log of the total family income divided by the number of people in the household.

Marital status. Because we use co-residence with a spouse as one of the variables used to construct our living-arrangements typology and because few elderly married couples live apart (less than 5%), we cannot include marital status as a separate variable in our analysis but simply note the effect of various predictor variables on the relative likelihood of outcomes that differ only with respect to the presence or absence of a co-resident spouse. We explored the possibility of distinguishing between widows and others not currently married, but abandoned this attempt

since the combination of the never married and the divorced constituted only about 2% of our sample, in contrast to the 22% who were widows or widowers.

Results. Table 3 shows the results of a multinomial logit analysis of the determinants of living arrangements. Category 1 (living with a spouse but not with children or grandchildren) is the reference category. Thus, the coefficients in the table represent the effect of a unit difference in each independent variable on the log odds of each type of living arrangement relative to living independently with one's spouse. Inspecting the coefficients in the table, it is evident that, in general, living arrangements of the elderly are not well predicted by the set of variables we have considered, although specific variables do appear to affect particular arrangements. (Note that coefficients significant at the .05 level are bolded and their cells are shaded to make it easier to identify any patterns in the table.)

In general, aging has a strong negative effect on the likelihood of living with grandchildren, presumably because as the elderly age their grandchildren grow up and move away from the parental (or grandparental) home. Every 10 years of age decreases the odds of living with one's spouse in a 3-generation household (Category 3) relative to living independently with one's spouse by nearly a third (precisely $.295 = 1 - (e^{-.035})^{10}$) and decreases the likelihood of living in a generation-skipping household with a spouse (Category 4) by about half (precisely $.498 = 1 - (e^{-.069})^{10}$); oddly, age has no effect on the likelihood of living in a generation-skipping household without a spouse (Category 7). By contrast, each 10 years of age dramatically increases—by a factor of nearly six—the odds of living with a grown child but neither a spouse nor grandchildren (Category 5)—precisely $5.70 = (e^{.174})^{10}$; increases by a factor of nearly three the odds of living with a grown child and grandchildren but no spouse (Category

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6)—precisely $2.75 = (e^{.101})^{10}$; and increases by a factor more than two the odds of living alone (Category 10)—precisely, $2.32 = (e^{.084})^{10}$. These effects are straightforward consequences of the propensity for widowhood to increase with age.[11] Interestingly, the odds of living with non-relatives appear to increase as rapidly as the odds of living alone, but since this category is extremely small the result is not significant.

The effect of gender mainly reflects the propensity for women to outlive their husbands: women are far more likely than men to live with children and/or grandchildren but not a spouse. Specifically, they are about twice as likely as men to be in Category 7, generation-skipping households (the precise odds are $2.15 = e^{.764}$); about thee times as likely to be in Category 6, 3-generation households; and about four times as likely to be in Category 5, living with a grown child. They also are more likely to live alone. Interestingly, they are much less likely than men to live with other relatives.

Contrary to our expectations the number of living children does not increase the likelihood of living with a grown child. Indeed, for three categories (2: living with a spouse and grown child; 5: living with a grown child but not a spouse; and 10: living alone), the coefficients are significantly negative. The negative coefficients are not a simple matter of socioeconomic status since we have controlled for the respondent's education and family income. Perhaps our initial expectation was naive. The Chinese have an expression, "*San ge heshang mei shui chi,*" which means, in effect, that everybody's business is nobody's business. Perhaps the more

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[11] To be sure, not all those living without a spouse are widowed, although most are: 90% in Category 5, 89% in Category 6, and 76% in Category 10. Of the non-widowed, most are married but living apart from their spouse for a variety of reasons. Only 1.7% of our elderly sample have never married and only 1% have divorced. Even among those living alone, only 11.4% have never married and 5.7% have divorced.

children, the less likely children are to feel a personal obligation to care for their parents and the more likely they are to find reasons why the responsibility should be borne by their siblings.

Also contrary to our expectations, neither health status nor the absence of physical limitations has a systematic effect on living arrangements. While *post hoc* explanations could be invented for the significant coefficients, they would be of little help. The effect of urban residence also is not very systematic, although the two significant coefficients and the marginally significant coefficient are all negative, as predicted.

There does seem to be a characteristic feature of 3-generation households (Categories 3 and 6) and also of 2-generation households involving a widowed elderly person (Category 5): all three living arrangements are more common among poorly educated elderly people who live in higher income households. It may be that what we have here are relatively affluent families that maintain traditional values, and perhaps traditional housing, as reflected both in the level of education of our elderly respondents and in their living arrangements.

DETERMINANTS OF EMOTIONAL WELL-BEING OF THE ELDERLY

We now turn to consideration of factors affecting the emotional well-being of the elderly, with particular attention focused on the effects of the living arrangements we have been studying. We consider three measures of emotional well-being.

Happiness is measured by a 1-5 scale. Respondents were given a scale:

<div align="center">Very unhappy--1--2--3--4--5--Very happy</div>

and asked to indicate the point on the scale that corresponded to their answer to the question "How happy are you"?

Life satisfaction also is measured on a 1-5 scale. Respondents were given a scale:

Very unsatisfied--1--2--3--4--5--Very satisfied

and asked to indicate the point on the scale that corresponded to their answer to the question

"How satisfied are you with your life?"

Depression. We constructed a scale consisting of six items adapted from the widely used

CES-D scale (Radloff 1977), which has been validated for studies of Chinese adults (Lai 1995;

Boey 1999; Lin 1989). For each item, respondents were asked how often they felt this way

during the past month: almost every day, two or three times a week, two or three times a month,

once a month, or never. The response categories were scored from 1 ("never") to 5 ("almost

every day"). Here are the six items, which are translated from the Chinese and are shown in

English in Institute of Social Science Survey (2010):

1. Feel depressed and cannot cheer up

2. Feel nervous

3. Feel agitated or upset and cannot remain calm

4. Feel hopeless about the future

5. Feel that everything is difficult

6. Think life is meaningless

The scale was constructed by computing the mean score across items[12] on the 1-5 frequency

scale for each respondent. The resulting scale is highly reliable: Cronbach's Alpha = .87.

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[12] Means were computed for each person for whom we had non-missing data on at least four of the six items.

As noted in the introduction, we consider two competing hypotheses—the *family support hypothesis*, which posits that those living in 2- or 3-generation households will be happier, more satisfied with life, and less depressed than those living independently with a spouse; and the *family conflict hypothesis*, which posits that those living independently with a spouse will be happier. Of course, both arrangements should be better, from the point of view of emotional well-being, than living alone, which in China is regarded as a very undesirable condition.

In addition to our living arrangements typology, we explore the role of a number of factors that we expect to affect emotional well-being

Gender. Women are known to be more prone to depression than men (Mirowsky 1996; Prince et al. 1999; Chen et al. 2005; Castro-Costa et al. 2007), to be less happy (Pinquart and Sörensen 2001), and to have less satisfaction with life (Pinquart and Sörensen 2001). Given, that as we have shown, there are gender differences in living arrangements, it is necessary to control gender when assessing the net effect of living arrangements.

Education. Years of schooling should improve all aspects of emotional well-being, on the ground that education engenders efficacy and the ability to cope with adversity (Mirowsky and Ross 2003). For the same reason, we would expect a positive effect of vocabulary knowledge, which can be understood as a measure of intellectual competence net of years of

schooling. Our measure of vocabulary is the number of words correctly read out loud from a list

of 34 words the respondent was shown. (Since Chinese is an ideographic language, it is not

possible to guess at the pronunciation of a word from features of the character(s) representing the

word; each word must be memorized in the same way that arabic numerals must be memorized.)

Living child. This measure is scored 1 if the respondent has any living children and is

scored 0 otherwise. Our assumption is that having living children promotes emotional well-

being. This is particularly true given that almost all Chinese have children, which means that not

having any living children at the time of the interview is generally due to the death of a child or

children.

Health. We expect both (subjectively reported) better health and the absence of physical

limitations to have positive effects on all three emotional well-being measures.

Urban residence. We expect urban residence to contribute to emotional well-being,

both because life is generally easier in urban areas, with more labor-saving devices, and because

urban areas are likely to be less isolating due to higher population density and easier

transportation.

Family income. We expect poverty to negatively affect emotional well-being because

poverty increases anxiety, increases practical difficulties in life, and makes it difficult to afford

things that bring pleasure. The negative effects of poverty on emotional well-being have been

clearly documented in many nations (Lynch, Kaplan, and Shema 1997; Patel et al. 1999; Lorant

et al. 2003; Patel and Kleinman 2003; Lund et al. 2010). We measure poverty by the natural log

of family income. Logging the income variable has the effect of accentuating differences at the

bottom of the income distribution and flattening them at the top, which is what we want since the

evidence suggests that the effect of income on emotional well-being pertains mainly to those in

extreme poverty.

Inadequate housing should have effects similar to poverty, by reducing comfort and

increasing household tensions. It also is known that household crowding increases stress (Evans

2003).

Feelings of **closeness to children** should increase emotional well-being. Respondents

were asked how close over the past six months their relationship was with each of their children,

with response categories 1 "Not close at all," 2 "Not very close," 3 "Fair," 4 "Close," and 5

"Very close." We averaged responses across all children of each respondent. For those without

children, and also those with children who failed to respond to the closeness question(s), we

imputed scores. The imputed scores for those without children can be taken as the level of

closeness to children we would expect if they had children.

Instrumental exchanges with children. Elderly respondents were asked whether they

had engaged in any of the following activities with their children over the past six months (with

a yes or no response to each item): 1 "Gave them economic help," 2 "They gave you economic

help," 3 "You did housework for them," 4 "They did housework for you," 5 "You helped them

take care of their children," 6 "They took care of you," 7 "You helped them with financial

management," 8 "They helped you with financial management." We formed a scale of

instrumental exchanges simply by adding the positive responses. Our scale thus ranges from 0-

8. For those without children, and those who failed to respond, we imputed scores just as we did

for the "closeness to children" variable. We expect instrumental exchanges to be positively

associated with the emotional well-being of the elderly because they reduce social isolation and

give the elderly a greater sense of being valued, appreciated, and loved.

Results

Table 4 shows, for each outcome, estimates for two models—a model assessing the effect

of living arrangements only, and a model assessing the effect of living arrangements when the

other determinants discussed above are controlled.[13] In order to be able to contrast the effect of

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[13] We initially estimated a "seemingly unrelated regression" model (using Stata's -sureg- command). But this command is not implemented for -mi- procedures. Thus, we estimated separate models using our imputed data. The main advantage of seemingly unrelated regression is that it provides estimates of correlations among residuals. In our data (based on cases for which we had complete information for all variables in Model 2 of Table 4), the correlation between the residuals for happiness and satisfaction was approximately .5 and the other two correlations were approximately .25 in absolute value. Thus, it appears that at least to some extent the same unmeasured factors

each pair of living arrangements, in Table 5 we show p-values for the significance of the difference between each pair of coefficients. The p-values for Model 1 (without controls) are shown above the diagonal in each panel while the p-values for Model 2 (with controls) are shown below the diagonal. To make the pattern of results easier to grasp, we have bolded all p-values significant at or beyond the .05 level and have shaded the cells.

These results are striking. First, it is clear that Chinese elders fare best when they live independently with their spouse. They are happier, more satisfied with life, and less depressed than in almost all other situations. There are only two exceptions.

First, those in 3-generation families do not differ significantly from independent elderly couples in their emotional well-being, except that the widowed in such families (Category 6) are more depressed.[14] Clearly, the presence of grandchildren mitigates the negative effects of living with adult children. Note that living with grown children but not grandchildren is associated with less happiness and satisfaction and more depression regardless of whether one's spouse is present, but when no individual factors are controlled the effects are significantly stronger among the widowed, as can be seen in from the comparison of Categories 2 and 5 in Table 5;

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affect all three indicators of emotional well-being.

[14] As pointed out in note 11, those living with children and/or grandchildren but without a spouse are almost all widows—about 90%; so widowhood clearly drives any differences in outcomes between Categories 2 and 5, 3 and 6, and 4 and 7.

with controls the effects remain stronger among the widowed but the differences are no longer significant.

The benefits of grandchild do not extend to generation-skipping households. Those living with a spouse and grandchildren (Category 4) are less happy and, when other factors are controlled, more depressed than those living independently, and those living with grandchildren but not a spouse (Category 7) are even less happy and more depressed and also are less satisfied. Here, however, the differences between Categories 4 and 7 are not significant, except for the greater depression of those in Category 7 when no other factors are controlled. As noted in the introductory section, we posited that elderly people in generation-skipping households that included adolescent children might be even less happy and satisfied and more depressed than those living with younger children. This turns out not to be the case. If anything, the presence of adolescents (those age 12-15 and those age 16-17) promotes emotional well-being rather than undercutting it, perhaps because older children contribute more and demand less than younger children. However, the results are rather weak and only sometimes significant.

As expected, those who live alone (Category 10) are less happy and more depressed than those living with a spouse regardless of whether children or grandchildren also are present (Categories 1-4). They are also less happy and more depressed than widows living in 3-

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generation households (Category 6). However, they are no less happy, no less satisfied, and no more depressed than widows living in generation-skipping households (Category 7).

Finally, the tiny fraction (6/10ths of 1%) who live with non-relatives appear to be even happier and less depressed (but no more satisfied) than those who live independently with their spouse. We have no explanation for this outcome, which holds even when individual level determinants of emotional well-being are controlled. We considered the possibility that those living with non-relatives were more likely to be employed or to hold particularly high status jobs. But neither explanation can account for the difference: they are slightly more likely to be employed but hold lower status jobs on average than do other elderly. Thus, we have no explanation to offer except the somewhat cynical view that you can choose your friends but not your relatives and that relatives are often trouble.

Effects of control variables. We now turn to the effects of attributes other than living arrangements. On the whole, these control variables behave about as expected and help to explain why the effects of living arrangements sometimes are reduced when individual characteristics are controlled.

Men are less likely to be depressed than are women. This is not simply a reflection of the greater likelihood that women are widowed since the effect is net of living arrangements, which, as we have noted, include the distinction between living or not living with a spouse.

Those with one or more living children are happier, more satisfied, and less depressed than those with no living children.

Those who regard themselves as healthier are happier, more satisfied, and less depressed. However, the absence of physical limitations is not associated with happiness or satisfaction, but does protect against depression.

Those who live in urban environments are happier and less depressed but not significantly more satisfied.

Those with greater cognitive capacity, as measured by vocabulary knowledge net of education, are happier, more satisfied, and less depressed; but years of schooling does not behave as expected—education is not significantly associated with happiness or depression and, contrary to expectations, reduces life satisfaction. These results probably reflect the high correlation between years of schooling and vocabulary knowledge (.72).

Those in more comfortable circumstances, as measured by family income, are happier, more satisfied, and less depressed; and those with inadequate housing are more depressed but not significantly less happy or satisfied.

Finally, as expected, those who feel close to their children are happier, more satisfied, and less depressed. Those who report more helping exchanges with their children are happier and more satisfied but no less depressed than those who report fewer exchanges.

The effect of type of parent-child relationship on emotional well-being

At the outset we suggested that certain intergenerational relationships are particularly fraught with difficulty—the classic case being the relationship between a mother-in-law and her daughter-in-law. Tables 6-8 explore the effects of living in intergenerational relationships with various categories of children and children-in-law. As can be seen in the right-hand panel of Table 2, 41% of our elderly respondents live with a child or child-in-law. As would be expected from traditional norms, by far the most prevalent arrangement, which includes about 60% of the elderly who live with the next generation, is for an elderly couple or individual to live with a son and his wife (Table 6). Interestingly, the next most prevalent arrangement is to live with a son who has no spouse present. The remaining relationships tend to be much less common, each

including less than 10% of those in 2-generation households. Still, it is of interest to explore the consequences of the entire range of relationships for the emotional well-being of the elderly.

We do this for women only, since we know from preliminary analysis, not presented here, that in general men's emotional health is not much affected by the nature of the intergenerational relationship. For women, by contrast, the effects are sometimes quite large.

The coefficients in Table 7 show the expected level of emotional well-being for women in each of the seven relationships we have distinguished. We have ordered the categories with respect to the average happiness of our elderly women when no other factors are controlled and to facilitate interpretation have transformed the coefficients to express them as deviations from the (weighted) mean level of happiness; employing such transformed coefficients is sometimes known as Multiple Classification Analysis, MCA (Andrews et al. 1973; Treiman 2009:164-166). Table 8 gives the p-values for the significance of the difference between each pair of coefficients in Table 7.

First, let us consider the effect of intergenerational relationships on happiness. Inspecting the coefficients in Tables 7 and 8 it is evident that elderly women are happiest when they live with their married daughters or with both a son and daughter at least one of whom is married. They are significantly less happy when they live with a son and his wife (and probably

also children without spouses, although—almost certainly because of the very small number of

women in this relationship—the coefficients are not significant). Still worse is living with only a

daughter, worse yet is living with only a daughter-in-law, and worst of all is living with only a

son. Introducing controls moderates but does not fundamentally alter the pattern of relative

happiness.

Our conjecture is that the observed pattern arises from a combination of two features of

family life: (1) women get on better with their daughters than with their daughters-in-law, and

stress is likely to be particularly great when the son is not present, which accounts for the greater

unhappiness of women living with their daughter-in-law only than of women living with their

son and daughter-in-law. (2) Even adult children are burdensome, probably demanding too

much and helping too little, with sons worse in this respect than daughters. In the absence of a

spouse of the child, it is easy to slip back into a no longer appropriate mother-child relationship

with resentments building up on both sides, the adult child chafing at being infantilized and the

elderly mother feeling unappreciated. It is notable that when an elderly woman lives with only a

son (or sons)—the least happy of all intergenerational relationships—the son is usually

unmarried: in our data only 22% are married (with 87% of their wives absent because they have

gone out for work); half have never married; 23% are divorced; and 5% are widowed. They are

not particularly young, age 41 on average, which is similar to the age of adult children in other

multiple-generational family relationships. So the tensions that arise are not due to young men

chafing at a family relationship they are ready to leave but rather to ongoing tensions between

mothers and sons, perhaps exacerbated by the sons' own lack of success in finding or keeping a

wife.

Life satisfaction is greatest among women living with a married daughter and is lowest

among those living with unmarried adult children, presumably because a parent's task is not

complete until all the children are married.

Elderly women living with a daughter-in-law but no son (almost always because the son

is away working) suffer substantially more depression than any other group, even when other

determinants of depression are controlled. We conjecture that this results from inherent tensions

between mothers-in-law and daughters-in-law that are not mitigated when the son is absent.

SUMMARY AND CONCLUSIONS

We have carried out the first comprehensive study of the effect of living arrangements on

the elderly in China, using data from a nearly national probability sample of those age 60 and

older conducted in 2010. Previous analysis has been restricted to the oldest old (those age 80+),

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who constitute only 12% of the elderly population, or to samples of selected populations, such as the rural elderly in particular locales.

We found that living independently with one's spouse is the preferred arrangement from the point of view of emotional well-being, measured by happiness, life satisfaction, and depression. But living in 3-generation families, with adult children and also with grandchildren is about equally beneficial except that widows in such arrangements tend to suffer greater depression than elderly couples living independently. By contrast, the emotional well-being of the elderly is compromised by living in 2-generation households—whether with an adult child but no grandchildren or with a grandchild but not an adult child. Presumably this is for different reasons—there may be more conflict in 2-generation adult-only households but there may be a greater burden on the elderly in generation-skipping households. Unfortunately, our data do not permit us to analyze either conflicts or burdens. Our one indirect test—that the presence of teenagers in generation-skipping households would negatively affect emotional well-being—did not come out as expected; indeed, if anything the presence of teenagers increased emotional well-being. Our final point about both types of two generation households—adult-only households and generation-skipping households—is that the strain on emotional well-being is exacerbated by the absence of a spouse, which almost always is the result of widowhood.

As expected, neither living with other relatives nor living alone is a desirable state. Both groups are particularly unhappy, dissatisfied with life, and depressed, although those who live with other relatives are even less satisfied than those who live alone. By contrast, the tiny fraction of those who live with non-relatives are, if anything, emotionally better off even than those living independently with their spouse.

When we subdivide those living with an adult child on the basis of the kind of intergenerational relationship and study effects on the emotional well-being of elderly women it turns out that it is most desirable to live with a married daughter and least desirable to live with an unmarried son, except that depression is even greater when living with a daughter-in-law only than when living with an unmarried son. For elderly men, the type of intergenerational relationship makes little difference.

Given that the fraction of the elderly living independently with a spouse is increasing due to demographic changes, changes in migration patterns, and changes in housing stock, it is reassuring that this condition is fully as desirable as living in a 3-generation household and more desirable than virtually any other condition. Thus, in contrast to many other changes in Chinese society, the trend in living arrangements on the whole does not portend increasing trouble, although the increasing likelihood of generation-skipping households is not helpful to the elderly

in such households. Interestingly, the cost is borne primarily by the elderly since in another

paper (Ren and Treiman 2013) we have shown that on the whole children do not suffer

emotionally from living in generation-skipping households.

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Table 1.   Correlations, means, and standard deviations for the variables used in the analysis,[a] Chinese adults age 60+ in 2010.

Correlations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Happiness	1.00																
2. Life satisfaction	.56	1.00															
3. Depression	-.37	-.32	1.00														
4. Age	-.04	-.05	.11	1.00													
5. Female	-.02	-.04	.13	.06	1.00												
6. Currently married	.09	.06	-.14	-.37	-.19	1.00											
7. Any living children	.10	.08	-.07	-.02	.10	.14	1.00										
8. No. of living children	.04	.04	.08	.28	.14	-.02	.38	1.00									
9. Health	.25	.22	-.40	-.09	-.12	.05	.04	-.07	1.00								
10. No physical limits	.12	.09	-.26	-.19	-.11	.12	-.00	-.04	.28	1.00							
11. Urban residence	.19	.08	-.18	-.02	.02	.04	.01	-.16	.15	.10	1.00						
12. Years of schooling	.12	.08	-.19	-.20	-.26	.20	.02	-.20	.12	.14	.27	1.00					
13. Vocabulary	.16	.12	-.24	-.22	-.34	.20	.01	-.20	.16	.20	.32	.72	1.00				
14. ln(fam. income)	.16	.13	-.14	-.08	-.03	.02	.02	-.14	.10	.07	.26	.22	.27	1.00			
15. Inadequate housing	-.04	-.02	.06	.04	.02	-.04	-.02	.02	-.03	-.05	-.05	-.07	-.07	-.07	1.00		
16. Closeness to children	.29	.24	-.16	-.08	.03	.08	.07	-.01	.10	.06	.15	.13	.14	.14	-.03	1.00	
17. Helping exchanges	.09	.10	.00	.04	.03	-.05	.06	.06	-.02	-.03	.03	.05	.05	.10	.06	.14	1.00
Mean	3.79	3.62	1.59	69.3	.50	.70	.96	3.12	3.70	.86	.43	2.94	9.68	7.85	.16	4.03	1.40
Standard deviation	1.05	1.04	.74	7.4	.50	.46	.18	1.57	1.19	.34	.49	4.12	10.5	2.37	.37	.76	1.25

[a] All coefficients are weighted by the final weights for adults ("post enumeration strata adjustment weights"). See text for details. Since Stata's -mi- procedures do not permit estimation of correlations or standard deviations, we have simply estimated these coefficients across all 10 imputations.

Table 2.   Percentage distribution of living arrangements of the elderly (age 60+) in China in 2010.

	Household sample[a]			Person sample		
	Rural	Urban	Total	Rural	Urban	Total
1. Living with a spouse but not with grown children (or children-in-law) or grandchildren	35.2	42.1	39.0	34.9	39.3	36.8
2. Living with a spouse and grown child (or child-in-law) but no grandchildren	6.6	7.2	6.9	5.8	6.9	6.3
3. Living with a spouse, grown child (or child-in-law), and grandchildren	15.7	13.3	14.4	16.1	17.6	16.8
4. Living with a spouse and grandchildren but not with any grown children or children-in-law	6.4	3.2	4.7	7.9	5.2	6.8
5. Living with a grown child (or child-in-law) but no grandchildren and no spouse	5.7	4.8	5.2	6.3	4.8	5.6
6. Living with a grown child (or child-in-law) and grandchildren but not with a spouse	12.1	9.0	10.4	13.4	11.5	12.6
7. Living with grandchildren but not with any grown children or children-in-law or a spouse	1.1	1.1	1.1	1.4	1.5	1.5
8. Living with other relatives who are not spouse, grown children or children in-law, or grandchildren	1.3	.9	1.1	1.5	.7	1.2
9. Living with non-relatives	.6	.2	.4	.4	.5	.4
10. Living alone	15.3	18.2	16.9	12.1	12.0	12.1
Total	100.1	100.0	100.0	99.8	100.0	100.1
N[b]	3,866	4,611	8,477	4,021	3,017	7,038

[a] These distributions are based on responses to two questionnaires—a family household questionnaire and a questionnaire for all adults residing in the selected family households. The left-hand set is derived from the family roster in the family household questionnaire and hence includes some individuals who did not respond to the adult questionnaire. The right-hand set is derived from responses to the adult questionnaire.

[b] Percentages are calculated from weighted data, but the unweighted N's are shown to indicate the true sample sizes. The left panel is weighted by the final household weights. The right panel is weighted by the final adult weights.

Table 3. Logit coefficients from a multinomial regression model predicting living arrangements of the elderly (age 60+) in China in 2010 (N = 7,015).

	Category of the dependent variable: living arrangements[a]								
	2[b]	3	4	5	6	7	8	9	10
Age	-.012 (.435)[c]	**-.035** (.000)	**-.069** (.000)	**.174** (.000)	**.101** (.000)	-.009 (.672)	.006 (.866)	.084 (.239)	**.084** (.000)
Female	-.118 (.258)	**-.193** (.007)	-.122 (.254)	**1.38** (.000)	**1.07** (.000)	**.764** (.033)	**-.788** (.047)	-.120 (.888)	**.318** (.025)
Number of children	**-.170** (.005)	.078 (.079)	.083 (.166)	**-.144** (.038)	-.041 (.390)	**-.042** (.680)	-.323 (.069)	-.424 (.259)	**-.303** (.000)
Health status (1 - 5 scale; 5 is best)	-.030 (.626)	.008 (.853)	.013 (.857)	-.013 (.861)	**.127** (.024)	-.001 (.996)	-.118 (.523)	**.636** (.047)	-.011 (.872)
No physical limitations	-.022 (.934)	-.072 (.678)	**.629** (.028)	**-.545** (.047)	-.084 (.655)	.302 (.531)	.163 (.800)	1.12 (.138)	-.095 (.610)
Urban residence	-.104 (.612)	-.056 (.708)	**-.600** (.011)	-.403 (.064)	**-.449** (.012)	.027 (.938)	**-1.01** (.008)	-.003 (.997)	-.062 (.704)
Years of schooling	-.012 (.519)	**-.043** (.004)	.005 (.848)	**-.132** (.000)	**-.080** (.000)	**-.130** (.010)	-.057 (.165)	-.167 (.199)	**-.061** (.002)
ln(per person family income)	.081 (.087)	**.145** (.000)	.053 (.194)	**.155** (.004)	**.203** (.000)	.083 (.149)	.073 (.308)	.019 (.863)	-.035 (.262)
Constant	-.832 (.472)	.485 (.491)	1.91 (.110)	-15.2 (.000)	-10.3 (.000)	-3.53 (.054)	- 2.67 (.263)	-12.5 (.003)	-5.63 (.000)

[a] The categories of the dependent variable are those shown in Table 2.

[b] The omitted category of the dependent variable is "living with spouse but not with grown children or grandchildren."

[c] Coefficients significant at the .05 level or beyond, except for constants, are shown in bold face and their cells are shaded.

[d] The never married, divorced, and widowed are regarded as "not currently married." But "currently married" does include partners sharing living quarters. In China, such arrangements are very uncommon, especially among the elderly. Never marrying or divorcing also are uncommon, together totaling about 2% of our sample.

Table 4. Coefficients of Regression Models of Emotional Outcomes, by Type of Living Arrangement, Chinese Adults age 60+ in 2010 (N = 7,015; p-values in parentheses; coefficients with p-values ≤ .05, except for constants, are shaded and boldfaced).

	Happiness		Life satisfaction		Depression	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Constant	3.86 (.000)	1.23 (.000)	3.69 (.000)	1.47 (.000)	1.49 (.000)	3.13 (.000)
Living arrangements (the omitted category is "Living with one's spouse but no child or grandchild")						
2. Living with spouse and grown child but not a grandchild	**-.107** (.045)	**-.131** (.009)	**-.193** (.000)	**-.228** (.000)	**.135** (.000)	**.141** (.000)
3. Living with spouse, grown child, and a grandchild	.069 (.059)	.023 (.516)	.002 (.964)	-.067 (.062)	.036 (.162)	.042 (.076)
4. Living with spouse, grand-child, but no grown children.	**-.133** (.010)	**-.096** (.049)	-.058 (.258)	-.058 (.250)	.058 (.111)	**.071** (.029)
5. Living with a grown child but not with spouse or grandchild	**-.332** (.000)	**-.228** (.000)	**-.395** (.000)	**-.332** (.000)	**.395** (.000)	**.186** (.000)
6. Living with a grown child and grandchild but not spouse	.044 (.282)	.035 (.377)	.053 (.183)	.012 (.769)	**.169** (.000)	**.099** (.000)
7. Living with a grandchild but not spouse or grown children	**-.332** (.001)	**-.214** (.029)	**-.266** (.010)	-.177 (.077)	**.260** (.000)	**.170** (.010)
8. Living with other relatives (not mentioned above)	**-.257** (.047)	-.034 (.777)	**-.617** (.000)	**-.496** (.000)	**.334** (.000)	**.219** (.008)
9. Living with non-relatives	.355 (.063)	**.377** (.040)	-.016 (.932)	-.010 (.959)	**-.295** (.029)	**-.240** (.049)
10. Living alone	**-.429** (.000)	**-.249** (.000)	**-.273** (.000)	**-.125** (.002)	**.280** (.000)	**.167** (.000)
Joint significance	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
Female		.027 (.297)		-.032 (.216)		**.067** (.000)
One or more children still alive		**.339** (.000)		**.282** (.000)		**-.176** (.000)

(continued)

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Table 4. (continued)

	Happiness		Life satisfaction		Depression	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Health status (1-5 scale; 5 is best)		**.170** (.000)		**.155** (.000)		**-.199** (.000)
No physical limitations		.067 (.061)		.038 (.300)		**-.267** (.000)
Urban residence		**.204** (.000)		-.012 (.639)		**-.096** (.000)
Years of schooling		-.0055 (.167)		**-.0092** (.026)		-.0019 (.477)
Vocabulary knowledge (range: 0-32)		**.0058** (.000)		**.0049** (.004)		**-.0061** (.000)
ln(per person family income)		**.026** (.000)		**.030** (.000)		**-.012** (.002)
Inadequate housing		-.053 (.103)		-.017 (.611)		**.046** (.035)
Closeness to Children (1-5 scale; 5 is closest)		**.298** (.000)		**.254** (.000)		**-.078** (.000)
Instrumental exchanges with children (0-8 scale; 8 is high)		**.041** (.000)		**.059** (.000)		.004 (.587)

Table 5. Significance of Differences between Living Arrangements Categories in Table 4 (p-values); without Controls above the Diagonal, with Controls below the Diagonal.

	1	2	3	4	5	6	7	8	9	10
Happiness										
1. Spouse only	-	**.045**	.059	**.010**	**.000**	.282	**.001**	**.047**	.063	**.000**
2. Spouse, child	**.009**	-	**.002**	.707	**.002**	**.013**	**.046**	.273	**.019**	**.000**
3. Spouse, child, g-child	.516	**.004**	-	**.000**	**.000**	.580	**.000**	**.013**	.138	**.000**
4. Spouse, grandchild	**.049**	.585	**.025**	-	**.005**	**.003**	.076	.361	**.013**	**.000**
5. Child	**.000**	.154	**.000**	**.049**	-	**.000**	.999	.592	**.001**	.127
6. Child, grandchild	.377	**.004**	.771	**.021**	**.000**	-	**.000**	**.023**	.107	**.000**
7. Grandchild	**.029**	.436	**.017**	.264	.891	**.013**	-	.648	**.001**	.367
8. Other relatives	.777	.451	.642	.628	.136	.576	.240	-	**.008**	.196
9. Non-relatives	**.040**	**.007**	.055	**.011**	**.001**	.066	**.004**	.056	-	**.000**
10. Live alone	**.000**	**.041**	**.000**	**.007**	.728	**.000**	.726	.083	**.001**	-
Life satisfaction										
1. Spouse only	-	**.000**	.964	.258	**.000**	.183	**.010**	**.000**	.932	**.000**
2. Spouse, child	**.000**	-	**.001**	**.047**	**.005**	**.000**	.516	**.002**	.364	.188
3. Spouse, child, g-child	.062	**.003**	-	.286	**.000**	.258	**.011**	**.000**	.926	**.000**
4. Spouse, grandchild	.250	**.009**	.868	-	**.000**	.057	.062	**.000**	.829	**.000**
5. Child	**.000**	.140	**.000**	**.000**	-	**.000**	.260	.109	.054	.056
6. Child, grandchild	.769	**.000**	.077	.231	**.000**	-	**.003**	**.000**	.717	**.000**
7. Grandchild	.077	.634	.278	.268	.153	.066	-	**.031**	.243	.950
8. Other relatives	**.000**	**.042**	**.001**	**.001**	.222	**.000**	**.041**	-	**.008**	**.009**
9. Non-relatives	.959	.255	.763	.802	.094	.909	.424	**.027**	-	.181
10. Live alone	**.002**	.081	.213	.246	**.001**	**.006**	.617	**.003**	.539	-

(continued)

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Table 5 (continued)

	1	2	3	4	5	6	7	8	9	10
Depression										
1. Spouse only	-	**.000**	.162	.111	**.000**	**.000**	**.000**	**.000**	.029	**.000**
2. Spouse, child	**.000**	-	**.015**	.112	**.000**	.429	.120	**.041**	**.002**	**.001**
3. Spouse, child, g-child	.076	**.007**	-	.577	**.000**	**.000**	**.003**	**.001**	**.015**	**.000**
4. Spouse, grandchild	**.029**	.110	.413	-	**.000**	**.008**	**.011**	**.004**	**.011**	**.000**
5. Child	**.000**	.322	**.000**	**.014**	-	**.000**	.095	.535	**.000**	**.010**
6. Child, grandchild	**.000**	.280	.053	.468	**.028**	-	.233	.079	**.001**	**.002**
7. Grandchild	**.010**	.681	.057	.165	.825	.296	-	.521	**.000**	.786
8. Other relatives	**.008**	.366	**.034**	.088	.706	.155	.635	-	**.000**	.568
9. Non-relatives	**.049**	**.002**	**.022**	**.013**	**.001**	**.006**	**.003**	**.002**	-	**.000**
10. Live alone	**.000**	.502	**.000**	**.013**	.642	**.040**	.964	.534	**.001**	-

Table 6. Percentage Distribution of Intergenerational Relationships among Elderly Chinese (Age 60+) Who Live with an Adult Child or Child-in-law (N = 3,441).

Intergenerational relationship	% distribution	
	Males	Females
Son only	17.0	16.1
Son and son's wife	59.2	62.9
Daughter only	7.3	5.8
Daughter and daughter's husband	5.7	6.7
Son and daughter	1.9	0.6
Son, daughter, and their spouse(s)	3.3	2.2
Daughter-in-law only	5.7	5.6
Total	100.1	99.9
N	(1,639)	(1,802)

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Table 7. MCA Coefficients for Effect of Type of Intergenerational Relationship with Co-residents on Emotional Well-being, Chinese Women Age 60+ (N = 1,802).

	Happiness		Life satisfaction		Depression	
	Model 1[a]	Model 2	Model 1	Model 2	Model 1	Model 2
Son and daughter and their spouse(s)	.453	.371	.102	.032	-.182	-.028
Daughter and daughter's husband	.408	.221	.451	.280	-.134	.040
Son and son's wife	.093	.087	.073	.068	-.054	-.052
Son and daughter	.078	-.168	-.191	-.386	-.244	-.066
Daughter only	-.078	-.120	-.308	-.322	-.065	-.003
Daughter-in-law only	-.349	-.195	-.218	-.077	.393	.283
Son only	-.448	-.364	-.293	-.229	.188	.094

[a] Model 1 is without controls. Model 2 includes as controls the same control variables as in Table 4 except for whether there are any living children, since the elderly women analyzed in this table all have living children. While in principle those living with a daughter-in-law only could be doing so as the result of the death of a son, there are no such cases in our sample.

Table 8. Significance of Differences between Intergenerational Relationship Categories in Table 7 (p-values); without Controls above the Diagonal, with Controls below the Diagonal.

	1	2	3	4	5	6	7
Happiness							
1. Son and daughter and their spouse(s)	-	.813	**.030**	.287	**.007**	**.000**	**.000**
2. Daughter and daughter's husband	.406	-	**.002**	.312	**.000**	**.000**	**.000**
3. Son and son's wife	.073	.160	-	.961	.131	**.000**	**.000**
4. Son and daughter	.108	.212	.396	-	.637	.194	.098
5. Daughter only	**.009**	**.016**	.064	.881	-	.073	**.003**
6. Daughter-in-law only	**.002**	**.002**	**.006**	.930	.616	-	.407
7. Son only	**.000**	**.000**	**.000**	.516	**.048**	.143	-
Life satisfaction							
1. Son and daughter and their spouse(s)	-	.078	.871	.429	**.048**	.116	**.031**
2. Daughter and daughter's husband	.198	-	**.000**	.061	**.000**	**.000**	**.000**
3. Son and son's wife	.830	**.039**	-	.422	**.002**	**.010**	**.000**
4. Son and daughter	.241	**.045**	.155	-	.736	.937	.760
5. Daughter only	.079	**.000**	**.002**	.849	-	.575	.908
6. Daughter-in-law only	.586	**.014**	.188	.359	.132	-	.551
7. Son only	.143	**.000**	**.000**	.626	.491	.217	-
Depression							
1. Son and daughter and their spouse(s)	-	.737	.313	.816	.424	**.000**	**.005**
2. Daughter and daughter's husband	.602	-	.297	.656	.517	**.000**	**.000**
3. Son and son's wife	.835	.185	-	.427	.894	**.000**	**.000**
4. Son and daughter	.874	.637	.947	-	.474	**.011**	.075
5. Daughter only	.848	.660	.509	.778	-	**.000**	**.005**
6. Daughter-in-law only	**.020**	**.013**	**.000**	.125	**.005**	-	**.025**
7. Son only	.308	.489	**.002**	.464	.239	**.023**	-