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Research Article

Socioeconomic development and Chinese young adults' propensity to live alone: An extended replication study

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Research Article

Socioeconomic development and Chinese young adults' propensity to live alone: An extended replication study

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Abstract

BACKGROUND

The proportion of young adults living alone has increased remarkably in China. This study seeks to assess current patterns and influencing factors in this phenomenon by replicating Cheung and Yeung's (2021) study, which highlighted the compositional and contextual effects on young adults' propensity to live alone.

METHODS

We analyzed 265,060 young adults aged 20–35 from the Seventh National Population Census Microdata (2020), nested within 315 prefectures. Two-level random-intercept logistic regression models were employed to examine the effects of socioeconomic development and individual factors on living alone separately for men and women.

RESULTS

The association between prefecture-level development and living alone remains positive in China as of 2020. However, the probability of living alone in less-developed areas is unexpectedly higher than that in middle-developed areas. Further, the curvilinear association between prefecture-level development and living alone is weak after controlling for migration status. Single people and short-term migrants (< 5 years migration) are most likely to live alone. In underdeveloped areas, increased short-term migration and highly educated young adults may be the strong forces behind the increased probability of one-person households.

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CONTRIBUTION

We extend the effect of migration duration and education on the rise of young one-person households in China and highlight the contributions of short-term migration and higher education to the growth of one-person households in underdeveloped areas. We believe the clear prevalence of one-person households should be considered an indicator of the second demographic transition.

1. Introduction

The prevalence of one-person households is growing rapidly worldwide, and it has become the dominant household type in some developed countries. According to official statistics, in 2021, one-person households already accounted for more than a third of European households; in Sweden, Finland, and Denmark, this figure even reached 50.1%, 46.7%, and 46.1%, respectively (Eurostat 2023). In the same year, one-person households accounted for 33.4% of general households in South Korea, which is expected to rise to 39.6% by 2050 (Statistics Korea 2022). In 2020, one-person households accounted for 38.0% of private households in Japan (Statistics Bureau of Japan 2021). In China, the number of one-person households reached 125 million in 2020 (25.4% of all households), representing a 19 percentage-point increase over the last 30 years (China Population Census Yearbook 2020). It is estimated that nearly 88% of new one-person households will appear in emerging and developing countries between 2021 and 2040 (Euromonitor International 2022). Thus, understanding the nature of one-person households in China may help us understand the phenomenon in other developing economies.

Existing research has largely focused on older adults living alone as a result of increased life expectancy and childlessness (Guilmoto and Loenzien 2015; Park and Choi 2015; Reher and Requena 2018). However, it has recently become increasingly common for young adults to live alone, and research has begun to examine the drivers and underlying issues behind this trend (Esteve et al. 2020; Ho 2015; Ronald 2017; Stone, Berrington, and Falkingham 2011; Vitali 2010; Zhou 2017). Young adulthood is often the first period in the family life cycle marked by the initiation of family formation behaviors, such as cohabitation, marriage, and childbearing (Smock and Schwartz 2020). Understanding household formation and transition necessitates studying young adults. Moreover, young adulthood is a vulnerable stage in the life course. During this stage, individuals transition from dependent minors to autonomous adults, facing tremendous developmental tasks and challenges that shape their later life (Rosenthal 2023). The remarkable rise in young one-person households is the subject of a burgeoning literature that encompasses research on the trends, antecedents, and consequences of it, such as

socioeconomic and policy conditions, housing consumption, family and marriage norms, health and well-being (Brown 2022; Esteve et al. 2020; Ho 2015; Ronald 2017). Examining the drivers behind young adults living alone is crucial for obtaining a comprehensive picture of family transition and youth development.

According to official data provided by the National Bureau of Statistics of China, in 2020, there were 31.88 million young adults aged 20–34 living in one-person households, accounting for approximately 11% of all members of this age group. Cheung and Yeung (2021) highlight the positive correlation between socioeconomic development and living alone among young adults; they find that the correlation in developed regions is explained by the concentration of internal migrants rather than a rise in the number of single people. This finding points to the nature of the geographical concentration of young adults living alone and is of great importance for effective government policymaking. However, as they mention, given the data used in their study (taken from the 2005 1% National Population Sample Survey data), their results may be limited in explaining patterns of young one-person households in China at present. It is unclear whether the relationship between socioeconomic development and living alone remains the same, and whether the interaction effects of individual-level factors and macro-level socioeconomic development on the probability of living alone have changed. Following Cheung and Yeung's (2021) analytical strategy, we replicated and extended their study using the 2020 National Population Census Microdata and tested two-level random-intercept logistic regression models to answer the questions outlined above.

2. Young adults living alone in the Chinese context

The study of young adults living alone in China is important due to the country's unique cultural attributions and policy reforms since the 1970s, which may influence the demographic characteristics and living arrangements of young adults born during this period. This section discusses the Chinese cultural, demographic, and institutional background regarding shifting household structures as context for the rise in young adults living alone.

Stepping into the twenty-first century, the Chinese family has begun its journey similar to the second demographic transition, including a delayed age of first marriage, a declining marriage rate, and an increasing divorce rate (Li, Fan, and Song 2020; Yu and Xie 2022). In 2020, the average age of a first marriage in China was 29.38 years for men and 27.95 years for women, according to official figures. Chinese young adults, especially those with higher education, are waiting longer to marry. China's education policy has made an important contribution to this trend, particularly through the nine-year compulsory education policy implemented since 1985 and the college expansion

policy since 1999 (Xiao and Liu 2023). The expansion in education has improved women's education over the past decades and postponed their marriage (Yang, Jiang, and Sánchez-Barricarte 2022). Additionally, the cultural preference for sons, combined with the one-child policy, has resulted in an abnormal sex ratio at birth in China since the early 1980s. The sex ratio imbalance and the surplus of males have led to a marriage squeeze (Jiang, Feldman, and Li 2014), partly explaining the increasing prevalence of solo living among Chinese young adults (Xiao and Liu 2023).

Simultaneously, the family planning campaign and the one-child policy have promoted the evolution of household structures toward a more modern style (Li, Fan, and Song 2020) and inspired the emergence of individualism. Since the early 1970s, the family planning campaign, with the implementation of the 'later, longer, and fewer' regulation, has led to a rapid decline in fertility and great changes in kinship structure (Zhao and Chen 2008). The implementation of the one-child policy in 1979 has directly reduced family size (Cai and Feng 2021) and provided the context for the emergence of increasingly nuanced and complex forms of individualism (Kim, Brown, and Fong 2017; Song and Ji 2020). As household sizes shrink, the transmission of collectivistic cultures between generations tends to diminish, and Chinese culture has become more individualistic (Ogihara 2023). Kim, Brown, and Fong (2017) note that the generation born after the one-child policy was encouraged by their parents to develop a competitive, ambitious sense of individualism to achieve upward mobility and success in China. In the individualistic context, family preferences and functions are reshaped, leading to diverse living arrangements (Ronald 2017; Song and Ji 2020), such as a decline in multigenerational co-residence. For young adults, family life is becoming a relative option rather than an absolute one (Esteve et al. 2020). Young adults with stronger individualistic values are more likely to live alone.

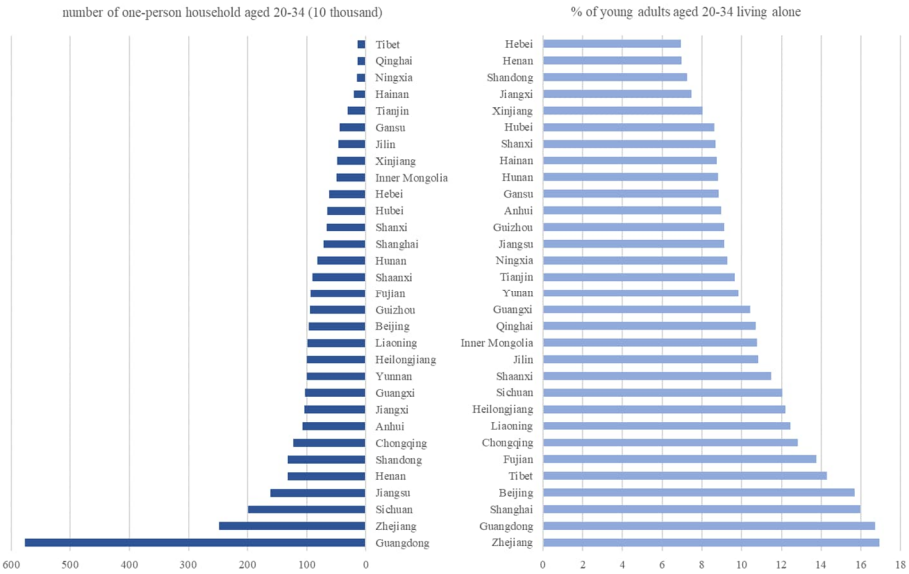
Another striking feature of China's institutional change is the transfer of rural surplus labor to the urban sector. In the trend toward nuclear families and smaller households, the geographical separation of family members creates more one-person households (Li, Fan, and Song 2020). Regions with a high proportion of inflow population are more likely to form smaller households because migrants usually move alone (Fan, Sun, and Zheng 2011). This is especially true for Chinese young adults, whose solo migration is a means of propelling themselves upward into the middle class rather than toward marriage. Young adults typically have a strong desire for autonomy, independence, and self-actualization (Brannen and Nilsen 2005). Amid population mobility and urbanization, more Chinese young singles are taking advantage of the available opportunities for upward mobility, working diligently, and living alone in the cities, forming a distinct group known as 'empty-nest youth.' 'Urban migrants' and 'living alone' are the dual identities that demographic and institutional changes have

conferred on empty-nest youth, reflecting that living alone has become an increasingly common stage in the family life cycle.

Living alone is not just a reflection of cultures and values but is also associated with technological and economic development. Urban development makes living and eating alone easier through the availability of small apartments in the housing market, one-person meals in the catering market, and internet personals (Klinenberg 2012; Ronald 2017). In China, the convenient takeaway and courier industry provides the basic conditions and services for young adults to live alone. An essential argument of family modernization theory is that technological and economic developments are decisive factors in household change. In addition to urban–rural differences in households, Li, Fan, and Song (2020) indicate that the better the rate of development, the more likely the region is to experience a rapid household transition. Previous studies highlight socioeconomic conditions as key drivers for young adults to live alone (Cheung and Yeung 2021; Ronald 2017; Vitali 2010; Zhou 2017). Socioeconomic development in China is uneven; accordingly, we find regional imbalances in the numbers and percentages of young adults living alone by province. As shown in the left panel of Figure 1, the more-developed regions, such as Guangdong, Zhejiang, Sichuan, and Jiangsu, rank in the top four in terms of the number of one-person households of young adults aged 20–34. Guangdong, in particular, leads the way with 5.76 million young adults living alone. Contrastingly, the less-developed regions of Tibet, Qinghai, and Ningxia have the smallest numbers of young adults living alone (their combined number is not even one-tenth that of Guangdong Province), as these regions have much smaller populations than the more-developed regions. In the right panel of Figure 1, the four more-developed provinces (Zhejiang, Guangdong, Shanghai, and Beijing) also have the highest percentage of young adults living alone, at approximately 16%. Tibet follows with 14% of young adults living alone. In other western provinces with lower socioeconomic development levels, such as Inner Mongolia, Qinghai, and Guangxi, this percentage is close to the national average. Interestingly, the moderately developed provinces (such as Shandong, Hebei, and Henan) have the lowest percentages. Thus, the correlation between socioeconomic development level and the probability of young adults living alone does not appear to be straightforward, which demands further exploration. Since the 21st century, great changes in the macroeconomic environment and the New-Type Urbanization Plan have attracted migrants to move to less-developed provinces in central and western China (Wang and Chen 2023). Furthermore, the size and proportion of the migrant population with tertiary education are gradually increasing (Duan et al. 2022). Previous literature has identified that migration status (as well as marital status and education level) potentially explains the rise in one-person households (Klinenberg 2012; Liu et al. 2020; Stone, Berrington, and Falkingham 2011); thus, it is worth discussing

whether the growth of migrants and highly educated laborers in less-developed areas has contributed to the increasing probability of living alone in these areas.

Figure 1: Numbers and percentages of one-person households aged 20–34 in China, by provinces



Source: Authors' calculations based on China Population Census Yearbook (2020).

3. Literature review and hypotheses

3.1 Individual factors in young adults living alone

The rise of one-person households reflects various trends (affecting different groups); these include increased life expectancy, reduced number of children, delayed marriage, increased home leaving, and education (Esteve et al. 2020; Park and Choi 2015; Stone, Berrington, and Falkingham 2011). As for young people, the literature has identified three plausible individual factors related to their propensity to live alone.

The first is related to their marital behavior. The delay in first marriages is a global trend, with an increasing number of young adults unwilling to marry before the age of 30

(Chen and Zhang 2022; Yang and Du 2021), which is responsible for the increasing number of young and middle-aged adults living alone over time (Klinenberg 2012; Park and Choi 2015). In addition to young adults who have never married or are divorced or widowed without children also have a greater tendency to live alone if they do not move back in with their parents (Cheung and Yeung 2021). In Japan, changes in marital behavior explain all the increases in one-person households for young men and three-quarters of the increases for women between 1985 and 2010 (Raymo 2015). Guilmoto and Loenzien (2015) find similar results in Vietnam. Intuitively, living alone is related to decreasing marriage trends during the second demographic transition (Lesthaeghe 2014). Based on the discussion above, we derived the first hypothesis:

H1: Singles have a higher propensity to live alone than nonsingles.

In modern societies, accelerated population mobility has become a second factor contributing to the increase in and earlier emergence of one-person households. Young adults are generally moving from rural to urban areas or from less-developed to more-developed cities to seek economic opportunities and career development prospects. Young migrants who move mainly for economic (rather than marital) reasons are more likely to live alone. In Vietnam, not including widowed locals, young single migrants, and adult migrants who have never married accounted for a large proportion of one-person households (Guilmoto and Loenzien 2015). Cheung and Yeung (2015) examine the trend in China and conclude that internal migration largely explains the changing spatial distributions of one-person households. This may also be due to more families living apart, given increasing population mobility and greater choice in work arrangements (Levin 2004). For example, some young couples live and work in two different cities and meet on weekends or holidays (when the census is taken, they are counted as two one-person households). Thus, family ties can now be maintained through means other than co-residence, such as frequent visits or phone calls (Esteve et al. 2020). Furthermore, the internet and social media have eliminated distance as a barrier to social and family contact and made living alone more feasible (Liu et al. 2020).

Despite the general increase in living alone, there are reasons to suggest the trend may decline. For example, in some Western countries, poor job prospects, greater financial challenges, and increasing housing costs may mean some young adults are unable to maintain their residential independence and move back to co-reside with their parents (Stone, Berrington, and Falkingham 2013). Liu et al. (2020) find that the rate of departure from living alone decreases as its duration increases. Thus, the association between the propensity to live alone and the duration since young adults left home (i.e., migration duration) is worthy of discussion. It has not been examined in Cheung and Yeung's (2021) research. The second and third hypotheses were as follows:

H2: Young migrants have a higher propensity to live alone than local young adults.

H3: The longer the migration duration, the lower the propensity of migrants to live alone.

The third factor related to young adults living alone is education; findings in this regard have been multifaceted. Notably, education has a strong and positive impact on living alone in most societies (McGarry and Schoeni 2000; Reher and Requena 2018; Stone, Berrington, and Falkingham 2011); higher-educated people tend to have more material resources and may also have a higher divorce rate. Living alone may be more accepted and valued in a highly educated milieu (Cheung and Yeung 2021). However, Park and Choi (2015) find that single young adults with lower education were more likely to live alone than their more-educated counterparts in South Korea. Similarly, Liu et al. (2020) find that in Canada, middle-aged women with a medium level of education were more likely to continue living alone. Considering that educational attainment is related to family background, young adults from disadvantaged families may be forced to live independently with little or no support from families (Park and Choi 2015). As we have noted above, China's education policy improved young adults' education years and postponed their marriage, which led to an increase in solo living. Meanwhile, the expansion in education encourages individualist lifestyles among highly educated people. To a large extent, whether having higher education or not determines a young adult's propensity to live alone through employment status, income level, social networks, and the spouse selection criteria (Xiao and Liu 2023). However, despite the rapid increase in the number of college graduates in the past two decades in China, the compositional effect of education on living alone has been little examined. Considering the Chinese context, we proposed the fourth hypothesis:

H4: Young adults with higher education have a higher propensity to live alone than those without.

Importantly, the effects of individual-level characteristics on living alone can vary by gender and age. As women have a higher life expectancy than men, living alone is more frequent among elderly women. However, gender differences in living alone among young adults are more complex and depend on various factors, such as labor force participation, education, and marital status (Park and Choi 2015). The relative differences in living alone by gender are far higher among young adults than at any other age (Esteve et al. 2020). Thereby, we analyzed our data separately for male and female subsamples to present more detailed findings.

3.2 Macro-level development and young adults living alone

Reduced family sizes and increasing one-person households are quintessential outcomes of macro-level development processes such as modernization, economic growth, changing roles of women in society, and ideational change (Esteve et al. 2020; Ruggles 2009). Previous research indicates that macro-level development directly and indirectly affects the propensity to live alone.

Development increases individual wealth and advances technology, which makes living alone more accessible and attractive (Klinenberg 2012). Living alone is generally more expensive; it is only possible if young adults can afford to rent or buy properties independently. Consequently, we see a higher proportion of one-person households in more-developed regions and urban areas (Yeung and Cheung 2015). Furthermore, technological progress in household goods and services, communication, and transportation contribute to the growth of one-person households by making it easier to live alone and reducing dependence on other household members (Liu et al. 2020). Based on the discussion above, we derived the fifth hypothesis:

H5a: There is a positive relationship between prefecture-level socioeconomic development and young adults' propensity for living alone.

Once individual factors are controlled for, we expect that the positive relationship between prefecture-level socioeconomic development and young adults' propensity for living alone will still exist:

H5b: There is a positive contextual effect of prefecture-level development on living alone, even when controlling for individual-level factors.

Socioeconomic factors can influence the choice of living alone by either impeding or facilitating residential independence in different areas. We expect the positive macro-level effects to be conditional and stronger among certain groups of young adults. As discussed above, past literature shows how the positive relationship between socioeconomic development and young adults' propensity to live alone can be indirectly explained by changes in marital behavior and the concentration of migrants (Guilmoto and Loenzien 2015; Yeung and Cheung 2015). Socioeconomic development is closely related to the declining marriage rate and increasing divorce rate; it also attracts many young workers from less-developed areas to seek work opportunities (Cheung and Yeung 2021). Socioeconomic development has made it easier and more acceptable for young singles or migrants to eat alone, have fun alone, and, certainly, live alone (Klinenberg 2012; Ronald 2017). Specifically, we expect that young singles and migrants would be

more responsive to socioeconomic development in choosing to live alone than married or local young adults.

H6a: The positive effect of prefecture-level development on living alone is stronger for single adults than for nonsingle adults.

H6b: The positive effect of prefecture-level development on living alone is stronger for young migrant adults than for young nonmigrant adults.

Regional heterogeneity occurs due to the presence of regional nontraded commodities, which exacerbates interregional differences in the cost of living (Saracoğlu and Roe 2019). Living alone is strongly associated with economic independence. Regional differences in the cost of living may lead to regional differences in the economic independence of young adults, which are perceived differently by young adults with varying education attainments. Generally, the economic advantages associated with higher education are greater in less-developed regions. Greater education opportunities are another key outcome of socioeconomic development. However, education-related differences in the propensity to live alone are shaped by living costs and cultural and policy contexts. Studies in the United States and South Korea have shown the opposite relationship between education and living alone (McGarry and Schoeni 2000; Park and Choi 2015). From a cost-of-living perspective, socioeconomic development can discourage young adults from living alone. While migration and higher education provide objective and subjective incentives for young adults to live alone, faced with higher living costs in developed regions (especially housing costs), they may have to give up solo living and return to family life or shared accommodation (Choi 2023). The adjustment of living arrangements by young adults may be an important reflection of the economic situation and a key strategy for avoiding poverty (Matsudaira 2016). Therefore, we expect young migrants with longer migrant durations will be less responsive to the level of socioeconomic development in living alone, and the positive effect of prefecture-level development on living alone will be weaker for young adults with higher education.

H6c: The positive effect of prefecture-level development on living alone is weaker for young migrant adults with longer migrant durations.

H6d: The positive effect of prefecture-level development on living alone is weaker for young adults with higher education than for those without.

3.3 The present study: An extended replication

In explaining the concentration of young one-person households in developed areas in China, Cheung and Yeung (2021) find a strong positive curvilinear correlation between context-level development and living alone and highlight the relative importance of internal migration over singlehood. We followed their analytical strategy and hoped to remedy the limitations with their dataset (their data ended in 2005) to verify whether their conclusions still hold today, and extended their analysis in other ways, as described below.

First, although the subjects of this and Cheung and Yeung's (2021) study were young adults aged 20–35, they belong to different generations due to the different datasets used. The young adults in Cheung and Yeung's (2021) study were born between 1970 and 1985, whereas the young adults in this study were born between 1985 and 2000. Young adults in this study are more sensitive to institutional and cultural changes, as well as the potential impact on their propensity to live alone, as they are the generation fully exposed to the family planning campaign and the one-child policy.

Second, we almost exactly replicated their study from sample inclusion and exclusion criteria, variable setting, index construction, and model selection to results presentation; however, we based our analysis on the latest 2020 National Population Census Microdata. Thus, we analyzed the current patterns of young adults living alone in China and compared our findings about the cross-level effect of socioeconomic development and individual determinants on the propensity to live alone with those of Cheung and Yeung (2021).

Third, we extended the discussion about the effect of migrant status on living alone. Unlike Cheung and Yeung's focus on *hukou* status (i.e., the household registration system specific to China), we analyzed migration status according to the statistical definition of migration in China (explained below). Although living alone is associated with migration, we know little about the probability of living alone according to different migration durations. Thus, we divided migrants into three subgroups according to their migration durations and calculated their average marginal effects (AMEs) on the probabilities of living alone, with nonmigrants as the control group.

Finally, we added a discussion of the main effect of young adults' education level and its interaction effect with socioeconomic development on the propensity to live alone.

4. Data and methods

4.1 Sample

To compensate for the limitations of Cheung and Yeung's (2021) dataset, we applied for access to the Seventh National Population Census Microdata (2020) to replicate their study. The microdata is obtained from a systematic sampling of census long-form data on a household basis, with a sample population of 0.98 per 1,000 of the national population. Thus, this data offers a good representation of China's current demographic structure. In this study, we excluded people who lived in collective households (i.e., dormitories, retirement housing, prisons, hospitals, and other communal living) and included young adults aged between 20 and 35 in the family households. A total of 265,060 subjects (134,883 men and 130,177 women) who were nested within 315 prefecture-level units (prefecture-level cities, prefectures, or leagues) were analyzed in this study.

4.2 Variables and measures

The dependent variable in this study, whether the young adult lived alone, was dichotomous (yes = 1, no = 0). A young adult living in a one-person household was considered to live alone.

The contextual independent variable was prefecture-level socioeconomic development. To keep our findings comparable to those of Cheung and Yeung (2021), we used the same socioeconomic development index (SED index) to measure this variable. The SED index included the following six indicators: average housing conditions (indicating the availability of an elevator, gas or electric cooking facilities, tap water, kitchen, flushable toilet, and shower facilities; scores range from 0 to 6), percentage of college graduates, percentage of nonagricultural employment, percentage of migrants, urbanization rate, and logged GDP per capita (all indicators were measured at the prefecture level). The prefecture-level GDP per capita data were obtained from the China City Statistical Yearbook. The other indicators were derived by aggregating the individual-level information from the 2020 census microdata. Then, we constructed the SED index based on principal component analysis and rescaled it to fit a scale from 0 to 10. This analysis indicated that the prefecture-level variables in the index could be loaded onto a single dimension explaining about 68.28% of the variance (Cronbach's alpha = 0.787). According to the SED index, we stratified the 315 prefectures into five categories: least-developed prefectures (SED < 2), less-developed prefectures (SED ≥ 2 and < 4),

middle-developed prefectures (SED ≥ 4 and < 6), more-developed prefectures (SED ≥ 6 and < 8), and most-developed prefectures (SED ≥ 8).

For the compositional independent variables, we used the same six individual factors in our analysis as Cheung and Yeung (2021) but differed in that we provided a more detailed classification of migration status based on its duration. The individual-level variables are the following: age (in years), education level (under college = 0, college or above = 1), employment status (unemployed = 0, employed = 1), ethnicity (Han = 0, ethnic minority = 1), being single (nonsingle = 0, single = 1), migration status (nonmigrant = 0, short-term migrant [less than 5 years of migration] = 1, mid-term migrant [5–10 years of migration] = 2, long-term migrant [over 10 years of migration] = 3). Nonsingles are those with a spouse in a legal or de facto marital relationship. Singles include young adults who have never been married or are divorced or widowed. According to the statistical definition of migration in China, migrants are people living in a particular prefecture for more than 6 months without a local *hukou* (household registration status). Locals and nonlocals temporarily residing in the prefecture (for less than 6 months) are included as nonmigrants.

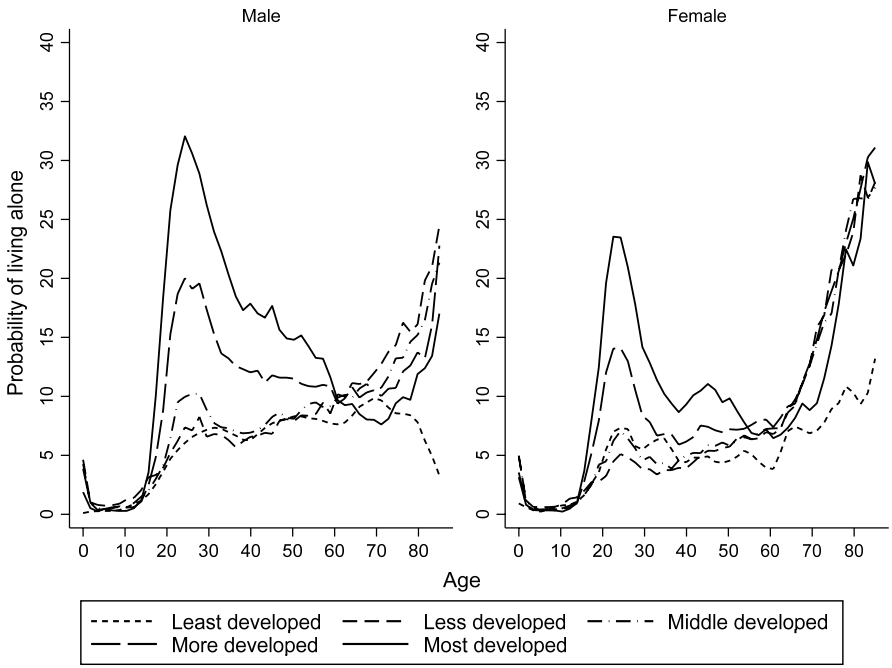
4.3 Statistical analysis

To examine whether the relationship between the SED index and the propensity of living alone remained positive among young adults and whether it was conditional on certain young groups, we followed Cheung and Yeung's (2021) analytical strategy and tested two-level random-intercept logistic regression models for male and female subsamples separately. In model 1, only the SED index and its squared term were included. In model 2, we added the subjects' individual factors (age, ethnicity, education, employment status, single status, and migration status). In model 3, we added the interaction terms between the SED index and all individual variables. In addition to the logit coefficients, Akaike information criterion (AIC) and Bayesian information criterion (BIC) were presented to show the model performances. Intraclass correlation coefficient (ICC) was presented to show prefecture-level clustering in the probability of living alone. Meanwhile, we showed the AMEs and adjusted probability of independent variables (SED index, single status, migration status, and education level) at each integer value of the SED index to explain the average predicted probability for the entire sample and subgroups with different characteristics in different developmental contexts.

5. Results

The contexts in which people choose to live alone can vary considerably across regions and age groups. Figure 2 clearly shows that for young and middle-aged adults (ages 20–60), the probability of living alone varies across developmental contexts within China for both men and women. Especially for young adults aged 20 to 35, the probability of living alone was much higher in the most-developed and more-developed prefectures than in the middle-developed, less-developed, and least-developed prefectures.

Figure 2: Local smooth polynomial of the percentage of living alone on age in different socioeconomic development levels (2020), by gender



Source: Authors' calculations based on the Seventh National Population Census Microdata (2020).

5.1 Descriptive statistics

Table 1 shows the percentage of young adults living alone and sociodemographic factors according to different socioeconomic development levels. The percentage of young adults living alone in 2020 was 6.76%–26.14% for men and 6.52%–15.98% for women across different socioeconomic development levels; these figures are much higher than those in 2005, which were 2.62%–11.33% for men and 1.17%–8.07% for women (Cheung and Yeung 2021). The percentage of young adults living alone in the most-developed prefectures was still the highest, but the percentage of young adults living alone in the least-developed prefectures was not the lowest. Specifically, the results show that the percentage of young men living alone was slightly higher in the least-developed (6.76%) than in the less-developed prefectures (6.70%). For young women, the percentage of those living alone in the least-developed prefectures (6.52%) was higher than in the less-developed (4.02%) and even middle-developed prefectures (5.12%). Consistent with the results of Cheung and Yeung (2021), members of ethnic minorities were clustered in the least-developed prefectures (40.58% for men and 42.17% for women). Unlike Cheung and Yeung's (2021) results, the employment level in 2020 was lower in the least-developed prefectures and higher in the most-developed prefectures for both male and female samples. This may be the result of economic stimulus and recovery since the great recession in the most-developed prefectures. The percentage of single young adults varied little at different development levels (over 40% for men and about 30% for women) but was slightly more prevalent in the most-developed prefectures. However, the percentage of young migrants in the most-developed prefectures was approximately 60 percentage points higher than in the least-developed prefectures. Turning to education level, the percentage of college-educated young adults was higher in the most-developed prefectures (51.49% and 58.20% for men and women, respectively) than in the least-developed prefectures (23.17% and 24.89% for men and women, respectively).

Table 1: Percentage of living alone and sociodemographic factors in different socioeconomic development levels by gender (adults aged 20 to 35, 2020)

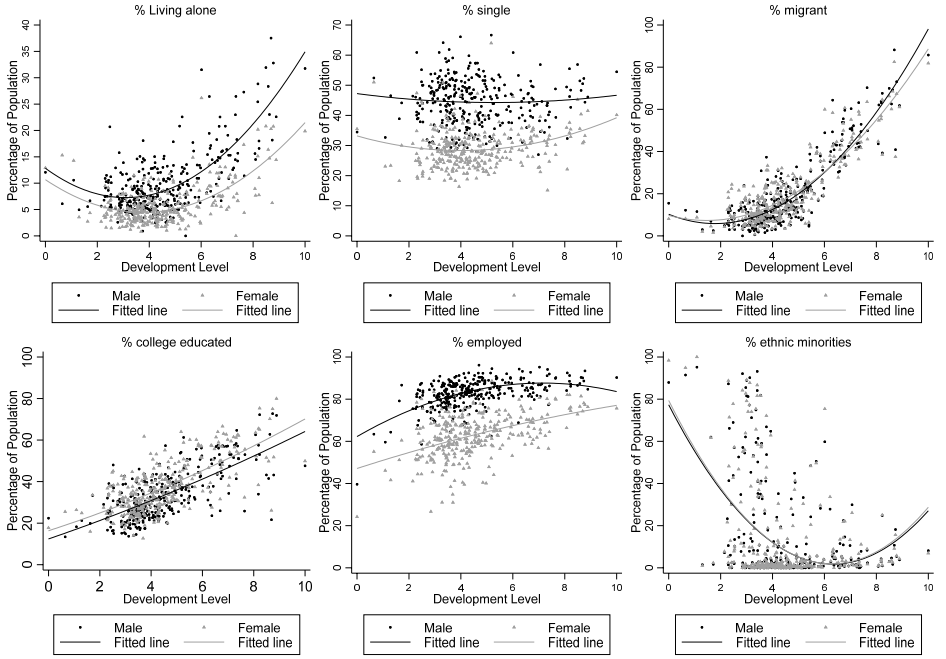
Socioeconomic development level	Living alone (%)	College educated (%)	Employed (%)	Ethnic minority (%)	Single (%)	Migrant (%)
	Male					
Least developed	6.76	23.17	71.62	40.58	42.24	6.43
Less developed	6.70	24.88	81.94	13.45	44.29	7.98
Middle developed	8.48	35.02	85.07	4.13	43.25	17.72
More developed	16.53	47.06	86.26	4.74	43.07	46.83
Most developed	26.14	51.49	88.70	4.57	49.20	68.09
	Female					
Least developed	6.52	24.89	49.78	42.17	27.72	4.24
Less developed	4.02	28.25	60.2	13.42	27.95	10.29
Middle developed	5.12	38.67	64.77	4.16	28.67	18.95
More developed	9.66	52.61	69.41	5.15	31.03	43.44
Most developed	15.98	58.20	76.44	4.33	37.39	64.20

Source: Authors' calculations based on the Seventh National Population Census Microdata (2020).

5.2 Bivariate relationship between the SED index and individual variables

Figure 3 shows scatterplots with fitted lines that visualize the bivariate relationship between the SED index and the percentage of young adults living alone, single status, migrant status, college-educated residents, employed population, and ethnic minorities for the 315 prefectures. The relationship between the SED index and the percentage of young adults living alone was positive and curvilinear, and stronger among the male sample. The relationship between the SED index and single status was positive though weak. There were positive relationships between the SED index and the percentage of migrants, college-educated residents, and employed people. Finally, the relationship between the SED index and the percentage of ethnic minorities was negative and curvilinear.

Figure 3: Relationship between prefecture-level percentage of living alone and sociodemographic factors in different socioeconomic development levels by gender (adults aged 20 to 35, 2020)



Source: Authors' calculations based on the Seventh National Population Census Microdata (2020).

5.3 Two-level random-intercept model

To examine the association between living alone and individual-level and prefecture-level variables, we conducted two-level random-intercept logistic regression models. The results are reported in Table 2 for the male and female subsamples, respectively.

Model 1 shows the association between the unadjusted probability of living alone and socioeconomic development level. When not controlling for the individual-level variables, the SED index was positively associated with living alone in a curvilinear manner. In model 2, we added all the individual-level variables. All the individual-level factors were positively related to living alone for young male and female samples. The SED index maintained its positive curvilinear correlation with living alone.

In model 3, we added interaction terms of the SED index and each individual-level variable to examine their main and interaction effects on living alone. In the main effect, the association patterns between most variables and living alone were similar to that of previous models, except for ethnic minorities and long-term migrants. For both men and women, ethnic grouping (Han versus minority) was not related to the propensity to live alone. Meanwhile, there was no difference in the propensity to live alone between nonmigrants and long-term migrants. Cheung and Yeung (2021) find that single and migrant statuses were positively associated with living alone, and their association positively interacted with the SED index. In this study, we found similar results in the interaction effect of single status and the SED index. The difference in the propensity to live alone between single and married young adults is greater in prefectures with a higher SED index. When we further analyzed migration status, compared to nonmigrants, only mid-term and long-term migrants positively interacted with the SED index. This indicates that there was no difference in the propensity to live alone between nonmigrants and short-term migrants across different development contexts. Meanwhile, the difference in the propensity to live alone between nonmigrants and mid- and long-term migrants was greater in prefectures with a higher SED index.

The AIC and BIC values were the lowest in model 3, indicating that model 3 is more informative than the previous models. The ICC values in model 3 were 0.023 and 0.028 for male and female subsamples, respectively, indicating low levels of prefecture-level clustering in the probability of living alone.

Table 2: Results from two-level random-intercept logistic regression models (adults aged 20 to 35, 2020)

Variable	Male			Female		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
SED index	–0.221	–0.231	–0.269	–0.345	–0.336	–0.226
	(0.074)	(0.064)	(0.075)	(0.083)	(0.073)	(0.088)
	0.003	0.000	0.000	0.000	0.000	0.011
SED index(squared)	0.044	0.029	0.028	0.052	0.036	0.035
	(0.007)	(0.006)	(0.006)	(0.008)	(0.007)	(0.007)
	0.000	0.000	0.000	0.000	0.000	0.000
Age		0.082	0.082		0.086	0.111
		(0.003)	(0.008)		(0.003)	(0.010)
		0.000	0.000		0.000	0.000
Employed		0.430	0.313		0.559	0.543
		(0.029)	(0.084)		(0.029)	(0.087)
		0.000	0.000		0.000	0.000
Ethnic minority		0.017	–0.062		0.095	0.174
		(0.038)	(0.100)		(0.047)	(0.124)
		0.665	0.539		0.044	0.161
Single		1.739	1.409		2.056	1.578
		(0.023)	(0.069)		(0.029)	(0.088)
		0.000	0.000		0.000	0.000

Table 2: (Continued)

Variable	Male			Female		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Short-term migrant		1.783	1.718		1.682	1.685
		(0.024)	(0.081)		(0.029)	(0.094)
		0.000	0.000		0.000	0.000
Mid-term migrant		1.360	0.875		1.111	0.686
		(0.033)	(0.131)		(0.043)	(0.163)
		0.000	0.000		0.000	0.000
Long-term migrant		0.897	0.123		0.682	0.037
		(0.039)	(0.164)		(0.053)	(0.215)
		0.000	0.454		0.000	0.864
College or above		0.156	0.569		0.213	0.692
		(0.019)	(0.061)		(0.025)	(0.077)
		0.000	0.000		0.000	0.000
SED index × Age			0.000			–0.004
			(0.001)			(0.002)
			0.868			0.007
SED index × Employed			0.020			0.002
			(0.014)			(0.014)
			0.135			0.880
SED index × Ethnic minority			0.013			–0.015
			(0.016)			(0.020)
			0.435			0.478
SED index × Single			0.054			0.078
			(0.011)			(0.014)
			0.000			0.000
SED index × Short-term migrant			0.011			–0.002
			(0.013)			(0.015)
			0.408			0.871
SED index × Mid-term migrant			0.070			0.059
			(0.019)			(0.023)
			0.000			0.010
SED index × Long-term migrant			0.109			0.090
			(0.023)			(0.029)
			0.000			0.002
SED index × College or above			–0.066			–0.077
			(0.009)			(0.012)
			0.000			0.000
Constant	–2.363	–6.137	–5.905	–2.583	–6.513	–7.163
	(0.184)	(0.180)	(0.294)	(0.206)	(0.208)	(0.361)
	0.000	0.000	0.000	0.000	0.000	0.000
Var(constant)	0.132	0.080	0.079	0.164	0.099	0.098
	(0.015)	(0.011)	(0.011)	(0.019)	(0.014)	(0.014)
	0.000	0.000	0.000	0.000	0.000	0.000
ICC	0.039	0.024	0.023	0.047	0.029	0.028
AIC	93,279.93	80,799.33	80,704.15	64,060.97	53,726.71	53,635.36
BIC	93,319.18	80,917.08	80,900.40	64,100.08	53,844.03	53,830.89
Level 1 units	134,883	134,883	134,883	130,177	130,177	130,177
Level 2 units	315	315	315	315	315	315

Notes: The reference groups for the individual-level variables and interaction terms are under college, unemployed, Han, nonsingle, and nonmigrant. Regression coefficients (standard errors) and p-values are presented in the table.
Source: Authors' calculations based on the Seventh National Population Census Microdata (2020).

5.4 Average marginal effects and adjusted probabilities

To compare the interaction effects of socioeconomic development and individual-level variables on the probability of living alone, we discuss the AMEs and adjusted probabilities for prefecture-level SED index and individual-level factors (single status, migrant status, and education level) according to different development levels derived from model 3 (see Figures 4 and 5). The AME of the SED index on the probability of living alone was negative when the SED index was lower than 4 and turned positive and increased gradually when the SED index was greater than 4. This can be seen in Figure 5, where the adjusted probability of living alone is higher in the least- and most-developed prefectures and lower around an SED index of 4 (approximately 10% for men and 6% for women). For young men and women, the adjusted probabilities of living alone were approximately 12% and 9% in the least-developed prefectures (SED index < 2), and reached approximately 17% and 10% in the most-developed prefectures (SED index ≥ 8). Young men were more likely to live alone than young women by approximately 3–7 percentage points across different developmental levels, with a large gender gap in the most-developed prefectures.

Turning to single status, the AMEs of single status on living alone were positive for both male and female subsamples and were much larger in the most-developed prefectures (SED ≥ 8). Single adults living in prefectures with an SED index lower than 8 were more likely to live alone than nonsingle young adults by approximately 12–16 percentage points. In the most-developed prefectures (SED ≥ 8), single men and women were more likely to live alone than their nonsingle counterparts by more than 20 percentage points. In addition, there was no gender gap in the adjusted probability of living alone for young single adults regardless of development level.

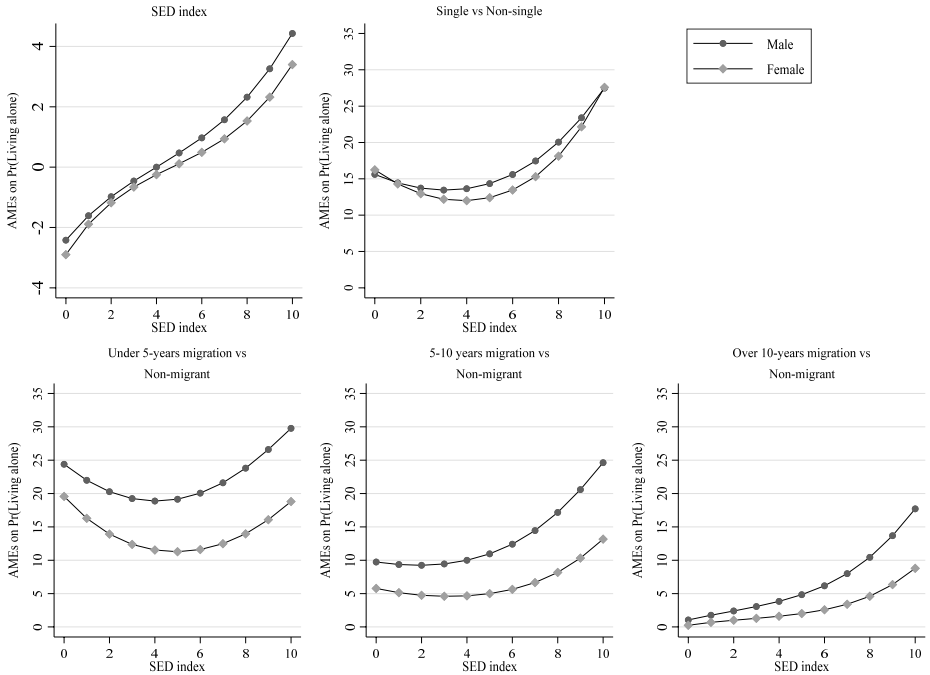
The impact of the individual-level variable of migrant status on the probability of living alone was conditional on the prefecture-level SED index. In prefectures where the SED index was lower than 4, the AMEs of short-term and mid-term migrants on living alone were positive. Specifically, short-term migrants were approximately 22 and 16 percentage points more likely to live alone than their nonmigrant counterparts for male and female subsamples, respectively. For mid-term migrants, the magnitudes were approximately 9 and 5 percentage points for men and women, respectively. For long-term migrants, their adjusted probabilities of living alone were close to that of nonmigrants with no differences for either men or women.

In prefectures where the SED index was larger than 4, the AMEs of migrant status on living alone were positive and increased gradually, including for long-term migrants. In the most-developed prefectures (SED ≥ 8), the adjusted probabilities of the three kinds of migrants were higher than nonmigrants by approximately 27 (short-term), 21 (mid-term), and 14 (long-term) percentage points for men, and approximately 16, 10, and 6 percentage points, respectively, for women. In brief, short-term migrant status had the

strongest effect on living alone regardless of development level, indicating that the concentration of short-term migrants explains the increased probability of living alone in all prefectures. Mid-term migrants had a smaller effect than short-term migrants but drew attention in the most-developed prefectures. The effect of long-term migrant status on living alone was only positive in the more-developed prefectures.

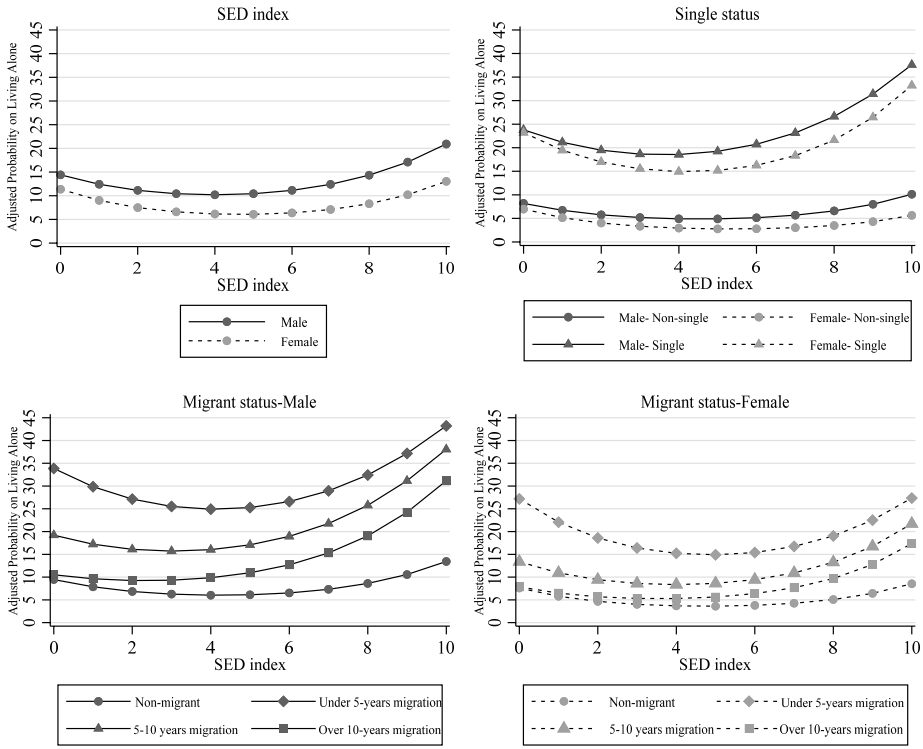
In addition, unlike nonmigrants, a gender gap exists in the propensity to live alone for young migrants in the most-developed prefectures (SED ≥ 8). As shown in the bottom panel of Figure 4, the AMEs of all three migration durations were larger for men than women in the most-developed prefectures. As shown in the bottom panel of Figure 5, in the most-developed prefectures, male short- and mid-term migrants were both more likely to live alone than their female counterparts by approximately 10 percentage points; this dropped to approximately 7 percentage points for long-term migrants.

Figure 4: Average marginal effects on the probability of living alone: SED index, single status, and migration status



Source: Authors' calculations based on the Seventh National Population Census Microdata (2020).

Figure 5: Adjusted probability of living alone: SED index, single status, and migration status

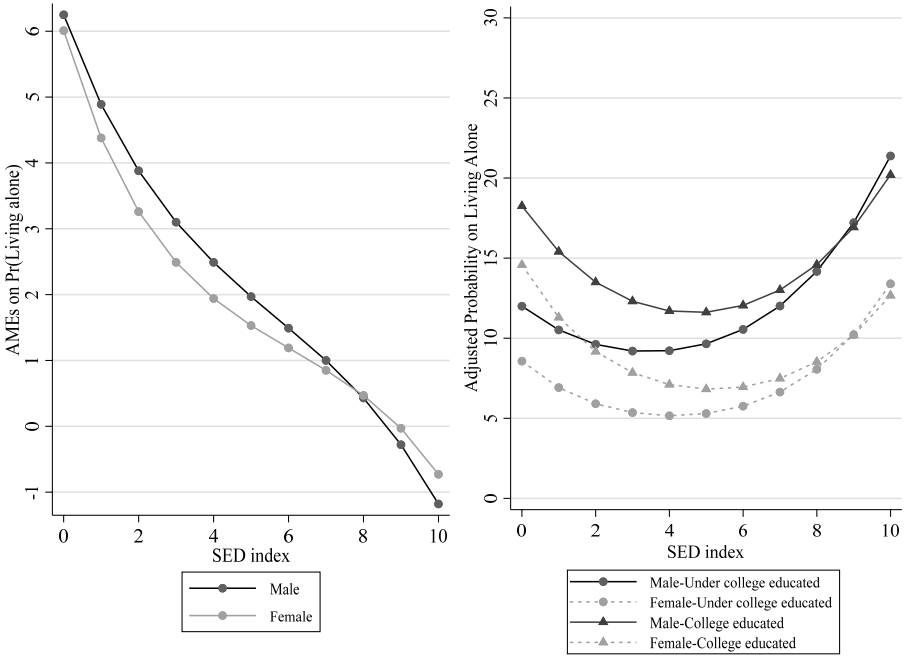


Source: Authors' calculations based on the Seventh National Population Census Microdata (2020).

We also examined patterns of education level and living alone in different development contexts. As shown in the left panel of Figure 6, compared to less-educated samples, the AMEs of having a college education on living alone were positive and decreased to zero as the development level increased for both male and female subsamples. Thus, there is a large difference in the propensity to live alone between college-educated and less-educated young adults in prefectures with lower SED index. The right panel of Figure 6 showed that college-educated young adults living in prefectures with an SED index lower than 4 were more likely to live alone than their less-educated counterparts by approximately 2–6 percentage points. When living in

prefectures with an SED index greater than 4, the adjusted probabilities of college-educated young adults were not different from those of less-educated young adults.

Figure 6: Average marginal effects and adjusted probability of living alone: Education level



Source: Authors' calculations based on the Seventh National Population Census Microdata (2020).

6. Discussion and conclusions

Cheung and Yeung (2021) disentangle the effects of socioeconomic development on living alone into compositional and contextual effects and provided a comprehensive understanding of the high concentration of one-person households in the most-developed areas. However, the empirical data used in their study (ending in 2005) have limited applicability to understanding the patterns of one-person households in China now. To address this issue, we conceptually and methodologically replicated Cheung and Yeung's

(2021) work but used the 2020 National Population Census Microdata, which is representative of China's current demographic structure. The findings are as follows.

Regardless of gender, the percentage of young adults living alone greatly increased from 2005 to 2020, especially in the most-developed provinces. Notably, the percentages of young adults living alone were not lowest in the least-developed prefectures, where the percentage was slightly higher than in the less-developed prefectures (for young men) and in the middle-developed prefectures (for young women). Consistent with the conclusions of Cheung and Yeung (2021), we found a positive curvilinear relationship between prefecture-level socioeconomic development and living alone on the right side of the curve and a pronounced negative relationship on the left side. After controlling for individual-level factors, both young men and women living in the least-developed prefectures were less likely to live alone than those living in the more- and most-developed prefectures, but more likely to live alone than those living in the less- and middle-developed prefectures. Similarly, our study confirmed that single status was positively associated with living alone; this positive association interacted positively with prefecture-level SED index. Single young adults were more likely to live alone than nonsingle young adults in particular development contexts; namely, this difference was larger in more-developed than less-developed prefectures. In 2020, the percentage of single young adults is higher in different development contexts, with a smaller difference across prefectures than in 2005.

Cheung and Yeung's (2021) results show that the relationship between the SED index and the probability of living alone in 2005 could be explained by the compositional effect of internal migration. Our results confirmed this finding, revealing that the effect is stronger among short-term migrants. The high salaries, ample job opportunities, and rich urban culture in the developed prefectures attract a large number of young migrants. It takes time for these young migrants to build social networks, and they are probably unable to bring their families with them, therefore short-term migrants are more likely to live alone. After a while, they may be able to afford to bring their families to live with them or possibly find a partner to start a new family. Others may be unable to cope with the economic pressures of living alone (more pronounced in developed prefectures) and choose to co-rent with others or move back to their provinces of origin to co-reside with their families. As migration duration increases, migrants face additional living costs in terms of health care, transport, recreation, and education. Given a certain income, these increased expenses may reduce young migrants' housing expenditures and force them to give up living alone. Whatever the reasons, increasing migration duration decreases the probability of young migrants living alone, though the figure remains higher than that of young locals.

As for the surprisingly high probability of young adults living alone in the least-developed prefectures, it may be explained by the effect of migration status. Our results

show that the effect of short-term migration status on living alone is high in the least-developed prefectures (higher than in the less- and middle-developed prefectures). Therefore, there is a high adjusted probability of living alone among young migrants in the least-developed prefectures, especially among short-term migrants. This may be explained by the spread of the migrant population to undeveloped western areas as a result of national policy. Since the initiation of economic reforms in China, regional economic heterogeneity has increased dramatically. To address the relative underdevelopment of the western regions, China has implemented the Strategy for Large-Scale Development of Western China in the last 20 years, which seeks to take advantage of the surplus economic development capacity of China's eastern coastal regions. The strategy has been a great success. Many experienced and knowledgeable young adults have been attracted to utilize their talents; university graduates have been encouraged to work in the western regions of their own will. As stated by Duan et al. (2022), with the implementation of the Strategy for Large-Scale Development of Western China and the New-Type Urbanization Plan, east–west development imbalances have been addressed to some extent. Correspondingly, the distribution of the migrant population has become more balanced after 2000. Furthermore, the low cost of rent and adequate housing market in undeveloped areas may increase the feasibility of living alone for young adults. Thus, policy-based responses to uneven development may be the key driver behind the increased probability of young adults living alone in less-developed prefectures, though this needs further study.

Turning to the cross-level effect of education on living alone, we find college-educated young adults are more likely to live alone in undeveloped prefectures than their less-educated counterparts, though this is not the case in developed prefectures. Educational level is an essential determinant of personal income and earnings (Card 1999) and can be representative of a person's economic situation (Park and Choi 2015). The cost of living in developing countries often varies enormously with socioeconomic development (Ravallion and Van De Walle 1991). For example, the per capita consumption expenditure in the most-developed regions, such as Beijing and Shanghai, is almost three times higher than in the least-developed regions of China, and housing costs are five times higher (China Statistical Yearbook 2021). Housing costs greatly impact young people's living arrangement decisions (Choi 2023), with the largest effects on those with some college education or a college degree or more (Matsudaira 2016). In the developed areas, the financial advantages of college education seem to disappear in the face of the higher cost of living, making the probability of living alone no different from young adults without a college education. However, this advantage still exists and is even greater in the least-developed regions with lower cost of living, explaining why young adults located in the least-developed prefectures with a college education have a high propensity to live alone.

Overall, we found that young men were more likely to live alone than young women; they showed similar correlational patterns of living alone, except in the interaction effect of contextual development and migration status. Specifically, in the most-developed prefectures, young male migrants were more likely to live alone than their female counterparts. Previous studies indicate that men break the traditional family mold earlier and more decisively than women (Esteve et al. 2020). Young women are less likely to live alone voluntarily due to gender differences in factors such as labor force participation, educational attainment, family role, and safety considerations (Park and Choi 2015). Especially in the developed areas, the insecurity and sense of not belonging due to migrant status are heightened among women, which may lead them to prefer living with others. In developed countries such as Europe and North America, the proportion of women living alone is quite high, and the pace of change is much more rapid than that among men (Esteve et al. 2020). Given the rapid socioeconomic development, the revolution of individualism, and the increasing awareness of women's independence in China, the gender differential of young adults living alone is expected to decline in the future.

The propensity to live alone reflects attitudes toward household formation and the choices made about particular living arrangements (Ogden and Hall 2004). We believe the prevalence of one-person households can be considered an indicator of the second demographic transition (SDT). As summarized by Coleman (2006), "the second demographic transition, following hard on the heels of the first, describes and explains the revolution in living arrangements and sexual behavior." Living arrangements are the focus of the SDT (Lesthaeghe 2014). Whether in developed or developing economies, the growth of one-person households has been rapid within the longer-term historical process of declining household size, accounting for most of the growth in the number of households (Hall and Ogden 2003; Ogden and Schnoebelen 2005; Podhisita and Xenos 2015). At any given moment, the proportion of one-person households reflects reversed nuptiality trends, changing demographic behavior, and the economy and culture associated with the SDT. These factors combine to increase both the level of transitions to smaller households and the likelihood that a higher proportion of the population will spend at least some part of their life course living alone (Ogden and Schnoebelen 2005). This clear trend of demography and household transition should be taken into account when characterizing the SDT.

Young adulthood is a vulnerable developmental stage of the life course, marked by tremendous social and emotional challenges. Previous research shows that young adults are susceptible to chronic disease, mental health crisis, addictive behaviors, and risky sexual behaviors (Ames, Leadbeater, and MacDonald 2018; Rosenthal 2023), which are more likely to occur when they live alone and are not restrained by family members (Seo and Park 2021). This study highlighted that young singles and short-term migrants are

more likely to live alone and concentrated in developed areas. The demographic patterns of young adults living alone may further exacerbate the negative effects of living alone, thereby undermining the value of the freedom it brings. Examples include the safety concerns of young women living alone and accidents that occur unnoticed. Additionally, increasing housing costs in cities make living alone more expensive, stunting young adults' development and putting them in both material and spiritual dilemmas. In the context of China's new urbanization and broader demographic trends similar to the SDT (Yu and Xie 2022), these findings compel policymakers to consider the impact of living alone on the well-being of young adults. It is crucial to prevent group social risks and pay attention to the living situations of young singles and short-term migrants, especially in developed areas.

There are several limitations to this study. First, the limited choice of variables in the dataset meant that some important variables (e.g., income) were omitted, which may have suppressed the estimated effects. Previous studies rely on educational attainment as a proxy for economic resources (Park and Choi 2015), and our results suggest that regional variations between young adults' education level and propensity to live alone could be explained by economic factors. Further studies controlling for additional individual-level factors and considering personal economic resources are needed. Second, the explanations of migration status are limited. Specifically, migration duration examined in this study refers to the duration since migrants left their families in their prefectures of origin according to their *hukou* status. We were unable to identify the duration they had lived in their current residences and the duration of any previous migrations. This is particularly relevant for young adults who have attended universities outside their home prefectures; for these individuals, any time spent in higher education was also included in their migration duration. More detailed migration data could be examined in the future to more precisely discuss the association between migration and the propensity to live alone. Third, this study estimated the complex association of socioeconomic development, individual characteristics, and living alone; although we used the term 'effect' throughout to describe these associations, the results do not make statistical claims of causality. Future causal inference research with longitudinal or panel data is needed to extend the explanation.

7. Acknowledgments

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no relevant or material financial interests that relate to the research described in this article.

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References

Ames, M.E., Leadbeater, B.J., and MacDonald, S.W.S. (2018). Health behavior changes in adolescence and young adulthood: Implications for cardiometabolic risk. *Health Psychology* 37(2): 103–113. doi:10.1037/hea0000560.

Brannen, J. and Nilsen, A. (2005). Individualisation, choice and structure: A discussion of current trends in sociological analysis. *The Sociological Review* 53(3): 412–428. doi:10.1111/j.1467-954X.2005.00559.x.

Brown, S.L. (2022). Union and family formation during young adulthood: Insights from the add health. *Journal of Adolescent Health* 71(6): S32–S39. doi:10.1016/j.jadohealth.2022.06.020.

Cai, Y. and Feng, W. (2021). The social and sociological consequences of China's one-child policy. *Annual Review of Sociology* 47(1): 587–606. doi:10.1146/annurev-soc-090220-032839.

Card, D. (1999). The causal effect of education on earnings. In: Ashenfelter, O.C. and Card, D. (eds.). *Handbook of labor economics*. Amsterdam: Elsevier Science B. V.: 1801–1863. doi:10.1016/S1573-4463(99)03011-4.

Chen, W. and Zhang, F.F. (2022). Marriage delay in China: Trends and patterns. *Population Research* 46(4): 14–26.

Cheung, A.K.L. and Yeung, W.J.J. (2015). Temporal-spatial patterns of one-person households in China, 1982–2005. *Demographic Research* 32(44): 1209–1238. doi:10.4054/DemRes.2015.32.44.

Cheung, A.K.L. and Yeung, W.J.J. (2021). Socioeconomic development and young adults' propensity of living in one-person households: Compositional and contextual effects. *Demographic Research* 44(11): 277–306. doi:10.4054/DemRes.2021.44.11.

Choi, S. (2023). After moving back to the nest: The heterogeneous effect of returning to parental home on the employment outcomes by income group. *Cities* 133: 104114. doi:10.1016/j.cities.2022.104114.

Coleman, D. (2006). Immigration and ethnic change in low-fertility countries: A third demographic transition. *Population and Development Review* 32(3): 401–446. doi:10.1111/j.1728-4457.2006.00131.x.

Duan, C.R., Qiu, Y.D., Huang, F., and Xie, D.H. (2022). From 6.57 million to 376 million: Remarks on migration transition in China. *Population Research* 46(6): 41–58.

Esteve, A., Reher, D.S., Treviño, R., Zueras, P., and Turu, A. (2020). Living alone over the life course: Cross-national variations on an emerging issue. *Population and Development Review 46*(1): 169–189. doi:10.1111/padr.12311.

Euromonitor International (2022). Global household trends [electronic resource]. London: Euromonitor International. https://www.euromonitor.com/global-household-trends/report.

Eurostat (2023). Distribution of households by household size – EU-SILC survey [electronic resource]. Luxembourg: Eurostat. https://ec.europa.eu/eurostat/web/products-datasets/-/ilc_lvph03.

Fan, C.C., Sun, M., and Zheng, S. (2011). Migration and split households: A comparison of sole, couple, and family migrants in Beijing, China. *Environment and Planning A: Economy and Space* 43(9): 2164–2185. doi:10.1068/a44128.

Guilmoto, C. and Loenzien, M. D. (2015). Emerging, transitory or residual? One-person households in Viet Nam. *Demographic Research* 32(42): 1147–1176. doi:10.4054/DemRes.2015.32.42.

Hall, R. and Ogden, P. (2003). The rise of living alone in Inner London: Trends among the population of working age. *Environment and Planning A: Economy and Space* 35(5): 871–888. doi:10.1068/a3549.

Ho, J.H. (2015). The problem group? Psychological wellbeing of unmarried people living alone in the Republic of Korea. *Demographic Research* 32(47): 1299–1328. doi:10.4054/DemRes.2015.32.47.

Jiang, Q., Feldman, M.W., and Li, S. (2014). Marriage squeeze, never-married proportion, and mean age at first marriage in China. *Population Research and Policy Review* 33(2): 189–204. doi:10.1007/s11113-013-9283-8.

Kim, S.won, Brown, K.-E., and Fong, V.L. (2017). Chinese individualisms: Childrearing aspirations for the next generation of middle-class Chinese citizens. *Ethos* 45(3): 342–366. doi:10.1111/etho.12168.

Klinenberg, E. (2012). *Going solo: The extraordinary rise and surprising appeal of living alone*. New York: Penguin Press.

Lesthaeghe, R. (2014). The second demographic transition: A concise overview of its development. *Proceedings of the National Academy of Sciences* 111(51): 18112–18115. doi:10.1073/pnas.1420441111.

Levin, I. (2004). Living apart together: A new family form. *Current Sociology* 52(2): 223–240. doi:10.1177/0011392104041809.

Li, T., Fan, W., and Song, J. (2020). The household structure transition in China: 1982–2015. *Demography* 57(4): 1369–1391. doi:10.1007/s13524-020-00891-7.

Liu, J., Wang, J., Beaujot, R., and Ravanera, Z. (2020). Determinants of adults' solo living in Canada: A longitudinal perspective. *Journal of Population Research* 37(1): 53–71. doi:10.1007/s12546-019-09235-8.

Matsudaira, J.D. (2016). Economic conditions and the living arrangements of young adults: 1960 to 2011. *Journal of Population Economics* 29(1): 167–195. doi:10.1007/s00148-015-0555-y.

McGarry, K. and Schoeni, R.F. (2000). Social security, economic growth, and the rise in elderly widows' independence in the twentieth century. *Demography* 37(2): 221–236. doi:10.2307/2648124.

National Bureau of Statistics of China (2021). *China Statistical Yearbook 2021*. Beijing: China Statistics Press

National Bureau of Statistics of China (2022). *China Population Census Yearbook 2020.* Beijing: China Statistics Press

Ogden, P.E. and Hall, R. (2004). The second demographic transition, new household forms and the urban population of France during the 1990s. *Transactions of the Institute of British Geographers* 29(1): 88–105. doi:10.1111/j.0020-2754.2004.00116.x.

Ogden, P.E. and Schnoebelen, F. (2005). The rise of the small household: Demographic change and household structure in Paris. *Population, Space and Place* 11(4): 251–268. doi:10.1002/psp.370.

Ogihara, Y. (2023). Chinese culture became more individualistic: Evidence from family structure, 1953–2017. *F1000Research* 12: 10. doi:10.12688/f1000research.128448.3.

Park, H. and Choi, J. (2015). Long-term trends in living alone among Korean adults: Age, gender, and educational differences. *Demographic Research* 32(43): 1177–1208. doi:10.4054/DemRes.2015.32.43.

Podhisita, C. and Xenos, P. (2015). Living alone in South and Southeast Asia: An analysis of census data. *Demographic Research* 32(41): 1113–1146. doi:10.4054/DemRes.2015.32.41.

Ravallion, M. and Van De Walle, D. (1991). Urban–rural cost-of-living differentials in a developing economy. *Journal of Urban Economics* 29(1): 113–127. doi:10.1016/0094-1190(91)90030-B.

Raymo, J.M. (2015). Living alone in Japan: Relationships with happiness and health. *Demographic Research* 32(46): 1267–1298. doi:10.4054/DemRes.2015.32.46.

Reher, D. and Requena, M. (2018). Living alone in later life: A global perspective. *Population and Development Review* 44(3): 427–454. doi:10.1111/padr.12149.

Ronald, R. (2017). The remarkable rise and particular context of younger one-person households in Seoul and Tokyo. *City and Community* 16(1): 25–46. doi:10.1111/cico.12221.

Rosenthal, S.R. (2023). Rhode Island young adult survey reveals mental health crisis. *Rhode Island Medical Journal* 106(3): 7–10.

Ruggles, S. (2009). Reconsidering the northwest European family system: Living arrangements of the aged in comparative historical perspective. *Population and Development Review* 35(2): 249–273. doi:10.1111/j.1728-4457.2009.00275.x.

Saracoğlu, D.Ş. and Roe, T.L. (2019). Regional cost-of-living differentials, rural–urban migration, and the contribution to economic growth. *Papers in Regional Science* 98(2): 973–994. doi:10.1111/pirs.12404.

Seo, B.K. and Park, G.R. (2021). Housing, living arrangements and mental health of young adults in independent living. *International Journal of Environmental Research and Public Health* 18(10): 5250. doi:10.3390/ijerph18105250.

Smock, P.J. and Schwartz, C.R. (2020). The demography of families: A review of patterns and change. *Journal of Marriage and Family* 82(1): 9–34. doi:10.1111/jomf.12612.

Song, J. and Ji, Y. (2020). Complexity of Chinese family life: Individualism, familism, and gender. *China Review* 20(2): 1–17.

Statistics Bureau of Japan (2021). 2020 Summary of the results and statistical tables [electronic resource]. Tokyo: Statistics Bureau of Japan. https://www.stat.go.jp/english/data/kokusei/2020/summary.html.

Statistics Korea (2022). 2021 Population and Housing Census (Register-based Census) [electronic resource]. Seoul: Statistics Korea. https://kostat.go.kr/board.es?mid=a20108070000&bid=11747&act=view&list_no=419981.

Stone, J., Berrington, A., and Falkingham, J. (2011). The changing determinants of UK young adults' living arrangements. *Demographic Research* 25(20): 629–666. doi:10.4054/DemRes.2011.25.20.

Stone, J., Berrington, A., and Falkingham, J. (2013). Gender, turning points, and boomerangs: Returning home in young adulthood in Great Britain. *Demography* 51(1): 257–276. doi:10.1007/s13524-013-0247-8.

Vitali, A. (2010). Regional differences in young Spaniards' living arrangement decisions: A multilevel approach. *Advances in Life Course Research* 15(2): 97–108. doi:10.1016/j.alcr.2010.04.003.

Wang, G.X. and Chen, Y.J. (2023). Influencing factors and spatial heterogeneity of China's interprovincial migration: An analysis of the 7th census data. *Population Research* 47(2): 48–62.

Xiao, F. and Liu, Y. (2023). Understanding living alone among the young- and middle-aged in China (1990–2010): A gender perspective. *The History of the Family* 28(3): 572–600. doi:10.1080/1081602X.2023.2219250.

Yang, J. and Du, S. (2021). Family change in China: A-70 year perspective. *China Population and Development Studies* 4(4): 344–361. doi:10.1007/s42379-020-00068-0.

Yang, S., Jiang, Q., and Sánchez-Barricarte, J.J. (2022). China's fertility change: An analysis with multiple measures. *Population Health Metrics* 20(1): 12. doi:10.1186/s12963-022-00290-7.

Yeung, W.J. and Cheung, A.K. (2015). Living alone: One-person households in Asia. *Demographic Research* 32(40): 1099–1112. doi:10.4054/DemRes.2015.32.40.

Yu, J. and Xie, Y. (2022). Is there a Chinese pattern of the second demographic transition? *China Population and Development Studies* 6(3): 237–266. doi:10.1007/s42379-022-00113-0.

Zhao, Z. and Chen, W. (2008). Changes in household formation and composition in China since the mid-twentieth century. *Journal of Population Research* 25(3): 267–286. doi:10.1007/BF03033891.

Zhou, Y. (2017). Macro effects on the household formation of China's young adults – demographics, institutional factors, and regional differences. *International Journal of Housing Policy* 17(4): 512–540. doi:10.1080/19491247.2016.1265267.