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Homeownership, family composition and subjective wellbeing

Wenjie Wu^a, Mark Stephens^a, Minzhe Du^b, Bing Wang^b

^a Heriot-Watt University, Edinburgh, EH14 4AS, UK.

^b College of Economics, Jinan University, No. 601 Huangpu Road West, Guangzhou, 510632, China.

Abstract: While a central insight of a large class of literature is that homeownership contributes to subjective wellbeing, little attention has been paid to the influence of family composition on this relationship. Using a large scale cross-sectional survey in metropolitan Beijing, our results clarify the important roles of family composition such as the presence of children, marital status in moderating the effects of homeownership on subjective wellbeing. We find that the relationship between homeownership and subjective wellbeing is varied across commodity housing, affordable housing and other housing types. Findings of this study indicate that socio-spatial contextualized nature of subjective wellbeing is dependent upon not just family composition but also other individuals' socioeconomic characteristics and neighborhood built environment.

Keywords: Wellbeing; homeownership; family composition; neighborhood built environment; China

1 Introduction

Improvements in living standards in post and transitional socialist countries have fueled a desire to access homeownership in cities (Szelenyi, 1987; Wu, 1996; Stephens, 2010; Logan et al., 2010). The Chinese urban residents are in no exception. People often combine homeownership with family composition under the presumption that access to homeownership is an important milestone in one's life. Holding the homeownership signifies one's social status and confers self-esteem. This is particularly the case in China since most Chinese cities have experienced dramatic urban housing and welfare regime transformations over the past two decades (Hu, 2013). In this context, access to homeownership has been viewed by traditional family norms and practices as a prominent social incentive that imposes psychological and subjective wellbeing implications.

The growing body of empirical literature on subjective wellbeing and housing conditions has largely focused on the evidence from Western countries (e.g. Diener, 1999; Dolan et al., 2008; Clapham, 2010). Most existing research evaluating subjective wellbeing implications of homeownership assesses the effects of homeownership on housing satisfaction or life satisfaction through self-reported subjective statements in surveys. Typically, existing studies suggest that residents are satisfied when they have obtained homeownership (Shlay, 2006; Diaz-Serrano, 2009; Guven and Sørensen, 2012). Other recent work suggests negative or no significant association between homeownership and wellbeing after controlling for socio-demographics differences between owners and non-owners (Bucchianeri, 2011).

Previous studies have mostly examined the average or independent effect of homeownership on individuals' subjective wellbeing (Cheng et al., 2015). However, individuals' subjective wellbeing may respond to homeownership differently depending on family composition, such as the presence of children and marital status (Artazcoz et al., 2004; Shapiro and Keyes, 2008; Stevenson and Wolfers, 2009; Hu, 2013).

This study explores the influence of homeownership, family composition and their interactions on subjective wellbeing by investigating detailed individuals' life satisfaction responses in the metropolitan Beijing, China. Our contribution is threefold. First, it adds to the existing work by explicitly considering the interaction effect of homeownership and family composition on subjective wellbeing in China. In our context, family composition would incorporate key dimensions of family composition such as having children, marriage. Second, we examine the role of neighborhood built environment in moderating the interaction effect. Existing studies have shown that the relationship between homeownership and subjective wellbeing could be a correlated consequence of distributive neighborhood built environment characteristics such as density, location and local public goods accessibility (Basolo and Strong, 2002; Wang and Wang, 2016). Third, we elucidate the impact of the length of residence on the

observed effects. We compare the results among residents who lived in the neighborhoods for different time periods, and explore how residential durations play a role in influencing subjective wellbeing. Due to the nature of cross-sectional survey information, we acknowledge the existence of the endogeneity of homeownership.

China provides a typical setting for studying subjective wellbeing consequences of homeownership and family composition. The transition from the centrally planned economy to market-oriented economy since the 1980s has resulted in the rise of housing inequality across socioeconomic and institutional groups (Huang and Jiang, 2009). This transition has come alongside massive housing price growth and the rapid urbanization arising from rural to urban migration that place great pressures on homeownership. Meanwhile, multigenerational traditions of owning one's own home have long been thought to shape the links between homeownership and subjective wellbeing in China (Chen et al., 2011). Homeownership is often regarded as a pre-requisite for marriage and the presence of children in a modern Chinese family (Wei and Zhang, 2011). By concentrating on family composition we aim to go beyond the straightforwardly positive or negative effects of homeownership on subjective wellbeing. Our findings provide new insights on conceptualizing the socio-spatial contextualized dependent nature of subjective wellbeing.

2 Literature review and hypothesis formulation

2.1 Homeownership, family composition and subjective wellbeing

Homeownership is a key component of one's life circumstances. The characteristics of home ownership are not the same for places over time and there have been debates about the use and abuse of "tenure" in developed countries (Barlow and Duncan, 1988). The past decades have seen a renewed interest in individuals' subjective wellbeing and how it is influenced by homeownership and other housing conditions (Clapham, 2010). The mainstream literature uses self-reported satisfaction levels in relation to the perception of current life conditions as a reflection of respondents' subjective wellbeing (Campbell et al., 1976). Following the convention, the terms "subjective wellbeing" and "life satisfaction" are used interchangeably in this study. We acknowledge that the use of life satisfaction as the sole metric for subjective wellbeing may overlook the existence of a compelling alternative measure of SWB (such as moment-by-moment happiness, see Huta and Ryan, 2010; Howell and Guevarra, 2013; Fagundes, 2016).

Most existing research has suggested that access to homeownership may affect individuals' subjective wellbeing. There are several underlying mechanisms at work. First, Rohe and Stegman (1994) posit that holding homeownership could enhance subjective wellbeing by promoting one's self-esteem and social status. In comparison to renters, homeowners would not worry about the rental term and changes in rental prices as guided by landlords that may place residential uncertainties on one's life

circumstances. In this respect, a lack of homeownership may be viewed as a residential uncertainty or insecurity signifier of people's life conditions and the inability of renters to meet the mainstream family ideals and practices (Elsinga and Hoekstra, 2005). Meanwhile, the association between homeownership and subjective wellbeing could be related to social capital incentives and perceived financial wealth gains through the appreciation of housing prices and hence wealth (Dietz et al., 2003).

Some studies find negative or little positive subjective wellbeing implications associated with homeownership (Rossi and Weber, 1996; Parker et al., 2011). For example, it is possible that some home-owners may suffer from perceived housing value depreciation in the local housing market or serious financial burdens in maintaining homes and thus are less satisfied. Meantime, it is also likely that homeownership would decrease subjective wellbeing, which are that the subjective experience of owning a home disappoints the socially constructed aspirations that lead people to buy real property.

The urban housing system in formerly socialist countries has created distinctively high homeownership societies. Stephens et al. (2015) posit that the big rise in home ownership across the European transition countries is not such a big change because public rental tenants under socialism had very strong security of ownership and paid little rent – and has been described as “quasi home ownership”. The Chinese urban homeowner occupation under socialism was not the same as under capitalism.

Before economic reforms in the 1980s, housing was allocated to urban workers as a social welfare good provided by the state or state-owned enterprises. The dominance of public housing rental ownership was prevalent across Chinese cities (Huang and Clark, 2002). This socialist welfare housing allocation system largely met with the ideals and practices of Chinese family formation in which urban workers were entitled to hold public housing rental ownership status even after their retirements (Logan et al., 1999). In this context, Chinese public housing tenants enjoyed very strong security of tenure, as in communist countries in Europe. It was believed that access to public homeownership was normalized for individuals who would get married in urban China. This was paralleled with the long tradition of the Chinese society in terms of multigenerational co-residence given the dwelling space constraints. These conventional wisdoms were rooted in people's perceptions to perform as psychological channels by shaping subjective wellbeing outcomes (Hu, 2013; Cheng et al., 2015) when there are necessity family composition.

In 1978, China's economic reforms initiated the transition from the centrally-planned economy system to the market-oriented economy. The Central government has implemented a series of housing reform policies for stimulating housing consumption (Li and Huang, 2006). The previous public housing units allocated by the state were privatized to urban workers who became home-owners. In the post-reform era the newly-emerging commodity housing units could be not only be purchased by residents, but they could sell them at a profit. As a result, the homeownership rate in urban China has gradually increased from a relatively low level in the pre-reform period to more than 80% nowadays (Wang, 2011).

In the post-reform era, several mechanisms could lead to the rise of people's

homeownership expectations. First, expansion of the urban population has been rapid. This rapid urbanization has come alongside the substantial rise in urban densities and housing prices (Chen et al., 2011) that place great pressures on access to homeownership for younger generations. Second, the gradual relaxation of Hukou registration policy that once allowed migrants to purchase commodity housing in large cities including Beijing has recently been banned to control for the rising demand for housing and local public goods (Chan and Zhang, 1999; Zheng et al., 2016). This may impose adverse subjective wellbeing effects for families who cannot become home-owners due to the lack of Hukou status in the host city.

Overall a combination of conventional wisdoms and market-oriented economy mechanisms has strengthened the relationship of homeownership and subjective wellbeing for Chinese residents.

Hypothesis 1: Homeownership is associated with higher subjective wellbeing.

However, it is difficult to exclude confounding issues of the observed increase in SWB. For example, it is possible that those who are wealthy enough to buy a house would feel happier due to the wealth effect, not because of the homeownership. As such, we acknowledge that our results have shown a correlational relationship (not a causal relationship) between homeownership and subjective wellbeing. In the meantime, a rising tide of family composition through the presence of kids and school-age children, and marital status has been accompanied by the importance of Hukou status and the emergence of the nuclear family residence living style in modern urban families (Wang, 2004; Cheung and Kwan, 2009). These family composition dimensions are likely to be substantial when interacting with homeownership on subjective wellbeing. This leads to our second hypothesis:

Hypothesis 2: homeownership and family composition generate significant interaction effects on subjective wellbeing.

2.2 Residential experiences, and neighborhood built environment

In this study, we develop a conceptual model for understanding how the influences of family composition and homeownership on subjective wellbeing would vary across individuals' socioeconomics, neighborhood built environment and perceived neighborhood characteristics. In this model, individuals hold relatively unlimited homeownership expectations which are embedded into the ways in which family composition are formulated and subjectively evaluated within the context of residential preferences. Human subjective wellbeing perceptions about satisfaction or dissatisfaction could occur when there is a relative mismatch between one's subjective perceptions and realities. For example, Sunega and Lux (2016) find the variation in the discrepancy between subjective perceptions and objective indicators of housing affordability and overcrowding in some European countries.

In the pre-reform era, there had been relatively limited social inequality including income and housing inequalities among Chinese urban residents and neighborhoods (Wang, 2004). Individuals were unlikely to have privatized homeownership expectations given that housing was allocated as a socialist welfare

good by the state or the state employers. The reforms since the 1980s marked the significant shift from the socialist egalitarian society into the market-oriented economy, leading to substantial social inequalities (Huang and Li, 2014). In the post-reform era, the rise of social inequalities has played a dominant role in the diversification of homeownership expectations and realizations.

Local residents with relatively high incomes are more likely to fulfill their homeownership preferences and realizations as housing prices or home loans are more affordable to them. In the context of costly housing markets, wealthy residents would gain the priority to select themselves into locations that could not just fulfill their homeownership expectations, but also satisfy their demands for an appealing neighborhood built environment with access to local public goods. Meanwhile, residents with lower incomes may realize their financial constraints, adjust their family composition expectations and select themselves into locations that could avoid the adverse subjective wellbeing implications generated by the inability to secure the homeownership. This subjective channel can be measured by using people's perceptions about comparable income satisfaction levels relative to their peer groups. As in developed countries, recent studies that suggest that low-income residents can still be happy even when their living environments are poor (Amérigo and Aragonés, 1990; Grinstein-Weiss et al., 2011). There is a view that housing is a "positional" good and one's utility is derived from a comparison with other people, i.e. status. The realization of homeownership expectations is rationally constructed through interactions with comparable social groups (Hagerty and Veenhoven, 2003). People from different socio-economic spectrum could respond psychologically to homeownership in different and relative ways. This leads to our third hypothesis:

Hypothesis 3: the association between family composition, homeownership and subjective wellbeing are likely to vary among residents with relatively different household income levels and comparable income satisfaction levels.

Figure 1 illustrates the conceptual framework for the above hypothesis formulation. In the recognition of individual-level socioeconomic disparities, Lovejoy et al. (2010) posit that individuals' current residential location is a predictor of residential preferences. Residents would adjust their subjective wellbeing perceptions based on contextually perceived neighborhood characteristics and residential experiences. We therefore expect that the interaction effects of family composition and homeownership on subjective wellbeing are likely to be contextually dependent on perceived neighborhood characteristics. In addition, as homeownership experiences are relationally shaped by neighborhood built environment, differences in people's subjective wellbeing may also be linked with their residential experiences in the neighborhoods. To reflect the potential residential experience effects, we follow the literature and compare subjective wellbeing of residents who had lived in the same neighborhood for a long time compared to those who had recently moved into them (Jansen, 2013; Cao and Wang, 2016). We acknowledge that the length of time living in a neighborhood is not the same thing as length of time being a home owner, i.e. they may have been an owner before they moved. Due to data limitations, we cannot explicitly test for the length of time being a home owner but we are able to access to

the length of time living in a neighborhood in our empirical analysis.

3 Methodology

3.1 Data and key measures

The survey dataset used in this study was collected in 2013 through the Chinese Livable Studies organized by the Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences. The survey used a stratified proportional-to-population size sampling design to cover main metropolitan Beijing areas (Figure 2) and was featured by its sampling representativeness in terms of fundamental socio-demographic characteristics of Beijing city population based on the 2010 population census data (Zhang et al., 2015). Building on the sampling design, questionnaires were posted to urban residents in proportional to local population at the neighborhood (*jiedao*) and district levels. After the data cleaning process, 5408 sampled respondents were included in the analysis.

The key measures include five categories of variables: subjective wellbeing, homeownership, family composition, individuals' socioeconomic characteristics, neighborhood built environment and perceived neighborhood characteristics. The self-reported life satisfaction levels from the survey are used as a reflection of respondents' subjective wellbeing (Campbell et al., 1976; Knight et al., 2009). By answering the statement about "how well are you satisfied with your life as a whole" in the survey questionnaire, subjective wellbeing is gauged by using a five-point scale ranging from "very dissatisfied" (1) to "very satisfied" (5). Because only a small proportion of respondents are very dissatisfied or very satisfied with their life, we combine "very dissatisfied" and "dissatisfied" into a single category, and combine "very satisfied" and "satisfied" into a single category for the analysis. The results are robust to changes in the ways of categorizing the life satisfaction levels.

To measure the homeownership, the survey asked respondents to report whether they hold the homeownership. We are aware of the potential negative effects of one's home loans or partial homeownership on subjective wellbeing due to perceived financial mortgage burdens. For example, Cheng et al. (2015) found that both of full homeownership and partial homeownership could bring positive impacts on subjective wellbeing in Chinese cities, although magnitudes of coefficients vary slightly across different homeownership conditions. We argue that by occupiers living in various entitled homeownership categories such as affordable housing, work-unit housing will shed light on the heterogeneity across occupiers living in different types of housing. As robustness checks, our results show the significant variation in the interaction effect of homeownership and family composition on subjective wellbeing.

Regarding about family composition, we focus on several dimensions. First, family size is often regarded as an essential indicator for family preferences (Artazcoz et al., 2004). In the survey respondents were asked to report their family size based on

the number of people living in the household. Following the literature, we control for the respondent's marital status as a robustness check.

In the survey the respondents were asked to report if they have children aged under 6 and whether they have school-age children. These two variables are converted into binary variables for indicating the respondent's family structure. In comparison to single-person homeowners or families without children, we expect that families with pre-school and school-age children would have experienced different subjective wellbeing even if they have obtained homeownership. We do not know who reports in the survey when there is a married family, so there is a potential gender bias in reporting.

Finally, the survey contains a list of individuals' socioeconomics such as Hukou, age, income, gender, and educational attainment levels that are used as conventional control variables in the analysis. For example, Hukou registration status designates a resident or family's status in accessing to various public goods and housing (Cai et al., 2009; Meng, 2012). It is therefore regarded as a unique factor in configuring people's subjective wellbeing in urban China (Tani, 2017). Migrant families, without registering into the local host city's Hukou status, cannot get access to public goods and services such as access to medical and unemployment insurance, schools for their children and affordable housing benefits of the host city where they currently live in (Frijters et al., 2010). As such migrant families tend to gain local hukou status as a part of their implicit family demands (OECD, 2011). As an additional extension, we have controlled for the interaction term of homeownership and Hukou in the main empirical analysis.

Due to the privacy consideration, the survey did not provide detailed information about personal wealth including bank deposits, stock shares and housing values. We acknowledge this limitation. However, respondents were asked to state their perceived perceptions about comparable income positions regarding "how well you are satisfied for your income levels in comparison to people you are familiar with". This perceived perception about comparable income positions were measured on a five-point scale from "very dissatisfied" (1) to "very satisfied" (5). The inclusion of this perception about comparable income positions into the analysis would shed light on the extent to which one's subjective wellbeing is the relative outcome of personal attitudes of comparable income positions.

In terms of residential experiences, respondents were asked to state: "whether you have experienced residential relocation over the past five years". We view respondents as long-term residents in the current residential neighborhood (stayers, thereafter) if they have not experienced residential mobility over the past five years, and as short-term resident who have recently moved into the neighborhood (movers, thereafter).

We further consider a range of perceived neighborhood characteristics relating to respondents' perceptions about living convenience, commuting convenience, safety and health on a five-point scale ranging from "very dissatisfied" (1) to "very satisfied" (5). Finally, we control for neighborhood built environment characteristics such as population density based on the recent population census data and the

accessibility from respondents' residences to the central business district (CBD), urban green parks, expressways and other local amenities.

3.2 Analytical approach

We begin by examining the correlates of subjective wellbeing. We examine how homeownership and family composition are associated with subjective wellbeing. To do this we fit an ordered logit model with subjective wellbeing is measured by using life satisfaction on an ordinal scale (Lovejoy et al., 2010).

To test for the hypotheses, we fit ordered logit models with several interaction terms of homeownership and key dimensions of family composition to look at the interaction effects of homeownership and family composition on subjective wellbeing. Our analysis proceeds in several stages. First, we examine the main interaction effects of homeownership and family composition, net of perceived neighborhood characteristics. Second, we explore to what extent perceived neighborhood characteristics moderate the main results. Third, we look at how socio-economic position moderates the influences of homeownership and family composition on subjective wellbeing. By doing so, we explore the heterogeneous effects by stratifying the sample based on whether the socio-economic position is above or below the median level of the whole sample.

As a robustness check, we conducted a number of sensitivity analyses. First, we test the sensitivity of the key results to changes in the set of controls across model specifications. Second, we change the ways of categorizing the levels of the life satisfaction. Third, we test for the robustness of the results to alternative generalized logit models using *gologit* in Stata software. Finally, we compare the results for the mover and stayer sub-samples.

Table 1 compares the life satisfaction for homeowners and non-homeowners who do not access to the homeownership. Comparing to non-homeowners, homeowners have reported higher mean levels of life satisfaction. The distribution of subjective wellbeing responses is upwardly skewed, with more respondents reporting that their life satisfaction reasonably well than poorly. Table 2 presents descriptive results of key survey measures used in this study. The overall sample distribution of homeownership is slightly skewed towards homeownership, with 51 percent of respondents owning homes. The mean family size of respondents is 2.74 and 60 percent of respondents are married. About 65 percent of respondents have the Beijing Hukou status while the remaining percentage of respondents would be migrant residents at the time of the survey. In terms of presence of kids aged below six and school-age children, there are clear variations as suggested by relatively large standard deviation levels across respondents. The perceived neighborhood characteristics of living convenience, social environment, commuting convenience, safety and health are reported in Table 2 and will be used to explore how perceived neighborhood characteristics moderate influences of homeownership and family composition on subjective wellbeing.

4 Results

4.1 Correlates of subjective wellbeing

Table 3 reports the correlates of subjective wellbeing. In the initial model specification (column (1)), we consider the main effects of homeownership and family composition, after controlling for individuals' socioeconomic status. Column (2) augments the model specification by including neighborhood built environment characteristics. Column (3) adds the control variables of perceived neighborhood characteristics. Column (4) adds the control variables of living space.

The results from column (1) of Table 3 support the first hypothesis and suggest that access to homeownership is significantly associated with higher subjective wellbeing. The marginal effect of homeownership on subjective wellbeing is 0.046 (The results of the marginal effects are detailed in the Appendix tables.). This is largely consistent with findings of previous studies in China (Chen et al., 2015). The marginal point estimates associated with homeownership and family composition indicators in subsequent columns (2)-(4) remain relatively stable (ranging from 0.034 to 0.045) when controlling for neighborhood built environment and perceived neighborhood characteristics.

By revisiting Table 3, there is evidence of other factors that are associated with subjective wellbeing. The models show that residents with Beijing Hukou status has a significant and positive association with subjective wellbeing. Higher income respondents enjoy higher levels of subjective wellbeing, but this effect is not significant when controlling for neighborhood built environment characteristics. Perhaps unsurprisingly, higher comparable income satisfaction also contributes to one's subjective wellbeing. While there are differences across male respondents and female respondents, other individual socioeconomic variables providing no significant contribution include the age of the respondent, educational attainment levels of the respondent. It is also worthwhile to note that living space is an important factor in influencing subjective wellbeing. Not all neighborhood built environment characteristics such as population density and local public goods accessibility have played significant roles in influencing subjective wellbeing of residents. Among the perceived neighborhood characteristics, residential satisfaction perceptions about safety and social environment make significant contributions to residents' subjective wellbeing.

Taken together, the headline finding is that homeownership and family composition are associated with subjective wellbeing in Beijing. Meanwhile, residents' lived experiences of subjective wellbeing are likely to be moderated by household socio-economic positions, neighborhood built environment and perceived characteristics.

4.2 Interaction effects of homeownership and family composition

Table 4 presents the results for interaction effects of homeownership and family composition on subjective wellbeing, with interaction effects estimated for family composition-homeownership interactions. We find that the second hypothesis largely holds as most of interaction terms are statistically significant. Model A only includes household socioeconomics as explanatory variables. Models B and C further include neighborhood built environment and perceived neighborhood characteristics, and the results do not differ significantly across models.

Three resulting patterns have been emerged. First, we find that the interaction of family size and homeownership is positively associated with subjective wellbeing. The marginal effect is 0.057. One thing to note is that, while reading the table, it should be noted that the interpretation of the marginal effects of interaction terms is not equivalent to the conditional effects. To facilitate the interpretation, we have reported the results of original independent variables. Second, we find that the interaction effects of homeownership and the presence of kids aged below 6 become statistically significant at the conventional level. The marginal effect is -0.113. Third, the results are also significant when interacting between homeownership and the presence of school-age children. Indeed, we conjecture that raising up kids would be very costly in Beijing and therefore the subjective experience of raising up a child disappoints the aspirations of homeownership for post-1980 and post-1990 born younger social groups. Further studies are encouraged to investigate this conjecture. These findings support the claim of substantial psychological wellbeing implications of raising children for homeowners in Chinese mega-cities.

In robustness results that are not tabulated, we found that the sign and significance levels of the interaction terms between homeownership and family composition are robust to the use of alternative generalized ordered logit models in Stata (Williams, 2006). We also find that families which are home-owners and have Beijing Hukou tend to be have higher levels of subjective wellbeing. Thus far we have concentrated on the average effect of interactions of family composition and homeownership. However, this focus obscures heterogeneity across housing types and household social dimensions. The Chinese urban housing system transitions may be strengthening the subjective wellbeing awareness about residential exposures to housing type variations.

To partially test for this presumption, columns (1)-(4) of Table 5 report the results by categorizing the housing type into four broad groups: (1) *Commodity housing*. Commodity housing is the dominated housing type in post-reform urban China. Its notion indicates that housing has been transformed from a formerly socialist welfare product to become as a commodity for allowing people to purchase on the market based on their residential preferences. (2) *Work unit housing*. Work unit housing including those privatized work unit housing in the reform era (*fang gai fang*) is featured by its pre-determined residential location, and good access to local public goods and services provided by the state or state-owned enterprises. In the post-reform period these housing units have been privatized to work unit employees

with relatively low prices (Logan et al., 1999; Logan et al., 2010). (3) *Affordable housing*. The presence of the economically affordable and comfort housing is aimed to solve the housing affordability problem in Chinese cities. This housing type is characterized by its pre-determined residential location and occupiers can hold the homeownership status by purchasing these properties with government-regulated prices. (4) *Others*. This category includes other types of housings in the complex urban property market, such as replacement housing (*chai qian fang*), self-built housing, low-income rental housing. Occupiers living in the self-built housing units usually include residents from urban villages, whereas occupiers who are eligible to live in low-income rental housing and replacement housing are essential vulnerable social groups.

Ideally we can break down each of these housing types into one independent category but this won't bring us more meaningful results. To simplify the analysis, we combine them together into one general category since they are quite different from the nature of work unit housing, commodity housing and affordable housing. The results largely support the claim that access to different housing types is likely to generate heterogeneous effects on life satisfaction. For example, we find no significant interaction effects of homeownership and family size on life satisfaction for commodity housing and affordable housing occupiers, whereas such effects are significant for other housing type occupiers. In the results that are not tabulated, we find that the interaction of Hukou and homeownership plays the most significant role in influencing life satisfaction for commodity housing occupiers.

Table 6 explores the heterogeneity in our baseline interaction effects by stratifying sampled respondents across household socioeconomic characteristics. We stratify the sampled respondents based on whether the median value of their socioeconomic characteristics are above or below the population median level. The characteristics we explore are household income levels and comparable income satisfaction levels.

The results support the third hypothesis. Residents experiencing lower comparable income satisfaction levels gain more significant effects from homeownership and family composition on subjective wellbeing than those experiencing higher comparable income satisfaction levels. The marginal effect is 0.098. The estimates for the interaction of marital status and homeownership are modest in magnitude and statistically insignificant. These results clarify the importance of considering the socioeconomic inequalities in influencing the impacts of homeownership and family composition on subjective wellbeing. Given this dispersion, it is not surprising that family composition-specific interaction effects are not equal across social groups.

4.3 Comparing movers and stayers

As an extension exercise, we turn our focus to the consideration of residential experience effects. Long-term and short-term residents (stayers and movers) are investigated to determine whether there are differential influences of interactions of

homeownership and family composition on subjective wellbeing. In Table 7, Model A is based on the subsample of movers who have experienced residential relocations over the past five years. Model B uses the subsample of stayers who have stayed in their current neighborhoods for more than five years. The odd numbered columns report the results of model specifications that control for individuals' socioeconomic position and neighborhood built environment characteristics, but do not control for perceived neighborhood characteristics. The even numbered columns are from model specifications that further include perceived neighborhood characteristics. The results show that interaction terms of homeownership with family size, the presence of kids are significant for stayers (The marginal effects are 0.071 and -0.128 respectively), but insignificant for movers. One potential explanation is that, if having school-age children increases demand for space, it may not homeownership that matters but living space per capita, especially considering that some households have lived in their houses for some time. The results from Model B in Table 7 implies this. The results also show that interaction terms of homeownership with school-age children are significant in both of the mover model (Model A) and the stayer model (Model B), though marginal effects are different across models. These results suggest that residential experiences moderate the interactive relationship between homeownership, family composition and subjective wellbeing.

5 Discussion and conclusions

This study uses a large-scale survey dataset in Beijing to examine whether family composition has an interaction effect with homeownership on subjective wellbeing. While a central insight of a large class of Western psychological literature is that the interaction of homeownership and family compositions would contribute to subjective wellbeing, there is a surprising scarcity of empirical evidence on this question in the context of a transitional socialist country.

Our results enrich the debate in the literature by providing the insights that family composition such as the presence of kids and marriage are significantly interacted with homeownership in influencing subjective wellbeing in China's post-reform era. Our results further clarify the importance of conceptualizing the heterogeneity in the subjective assessment of homeownership for one's life circumstances as being conditional upon family composition. Married homeowners with kids are found to have the significant association with subjective wellbeing.

The reforms that occurred in transitional socialist countries are characterized by the substantial rise of social and housing inequalities (Huang and Li, 2014). Our results suggest that homeownership is positively associated with subjective wellbeing in the ways that are consistent with the recent literature (Hu, 2013; Cheng et al., 2015). By contrast, the socialist welfare-based housing allocation system and the dominant public housing rental ownership for urban residents were thought to limit individuals from adverse subjective wellbeing effects of non-private ownership conditions in pre-reform China. Yet at the same time family traditions and conventional wisdoms of

owning one's homes have long been rooted in the Chinese society. The transition to the commercialized urban housing market in the post-reform era has fueled individuals' willingness to gain privatized homeownership. These mechanisms are related to the association between homeownership and subjective wellbeing in the post-reform era.

An implication of our findings is that residents perceive homeownership expectations and experiences in heterogeneous and relative ways. First, there is evidence on the distributional influences of family composition and homeownership on subjective wellbeing along the social gradients. For example, interaction effects of family composition and homeownership on subjective wellbeing tend to vary with residents' position in the socio-economic spectrum and comparable income satisfaction levels relative to others. Second, differentiated relationships between family composition, homeownership and subjective wellbeing could be manifested by perceived neighborhood characteristics about living convenience, commuting convenience, safety, health, and social environment. Finally, a comparison of the models for movers and stayers suggests that the interaction effect of homeownership and family composition on subjective wellbeing appears to be more critical for movers than for stayers.

The ongoing housing marketization and the newly emerging forms of urban housing system have brought unprecedented housing inequalities for Chinese households. This rapid but differential spatial expansion in housing inequalities provides incentives for residential mobility and is likely to shape the subjective wellbeing implications across cities for decades to come. Access to homeownership may be easier to be achieved in cheaper cities as compared to megacities. Unfortunately, this survey did not ask megacity homeowners about their potential life satisfaction if they are living in other smaller cities, or if homeowners in megacities have the willingness to move to cheaper cities. Megacity homeowners may or may not be more satisfied with their quality of life if moving to cheaper cities to live. There is also a possibility that megacity homeowners may want to stay in big cities to enjoy high wages and high quality of local public goods and services, even though megacities impose substantial psychological costs. A worthwhile topic for future research is to look at megacity residents' perceptions about neighborhood built environment characteristics that are important to them and, to identify what makes their current residential location better to the alternative. It is also important to examine how these perceptions vary for occupiers living in the private sector of the housing market and occupiers living in the public sector of the housing market. For example, it is likely that occupiers living in the public sector of the housing market are happy where they live in spite of the lower satisfaction levels with specific domains of built environment characteristics. These research have profound policy implications for planners in contemporary indemnificatory housing infrastructure investments (Chen et al., 2013) and neighborhood regeneration practices aiming to promote wellbeing.

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Figure list

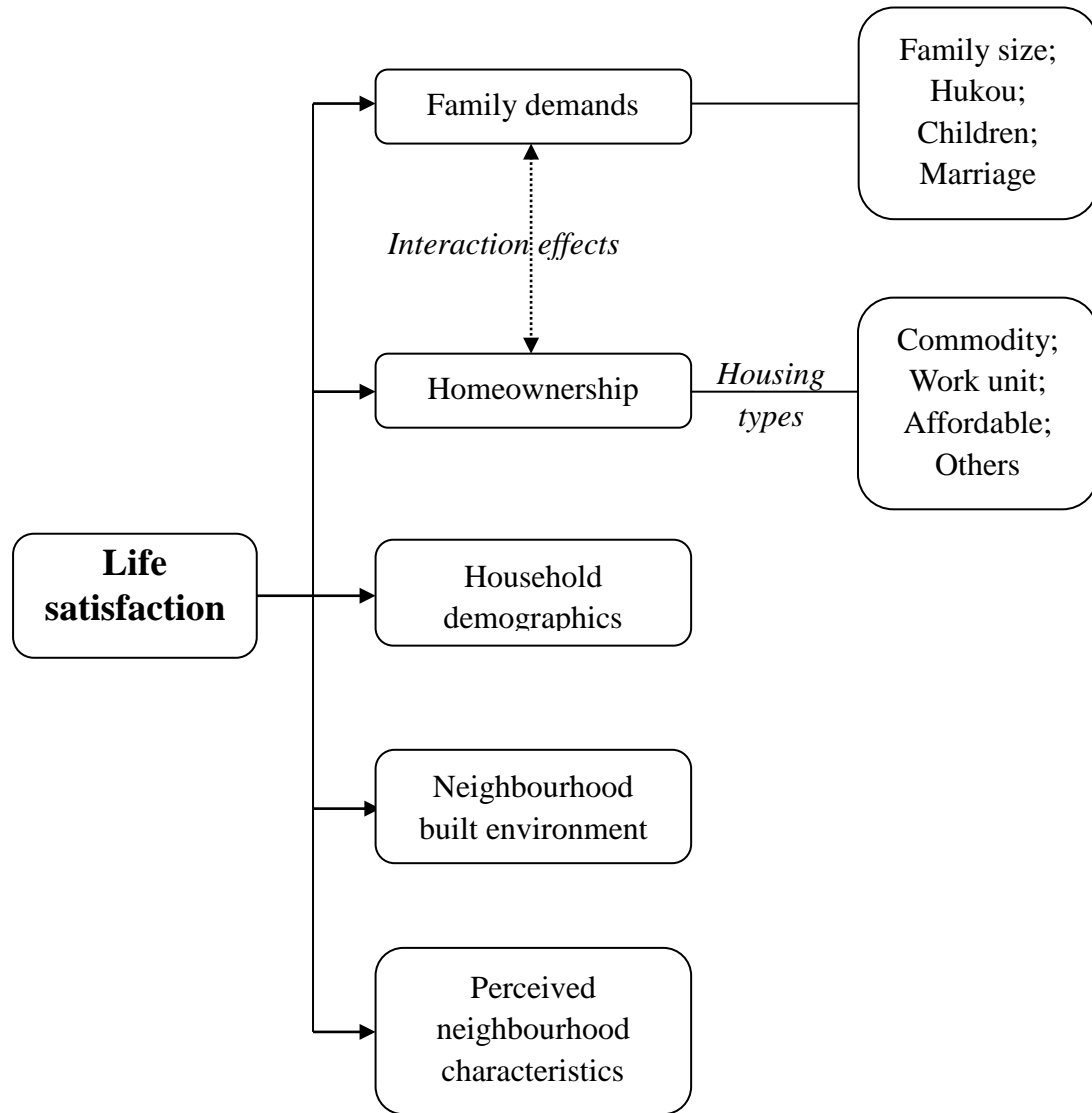


Figure 1. Conceptual framework

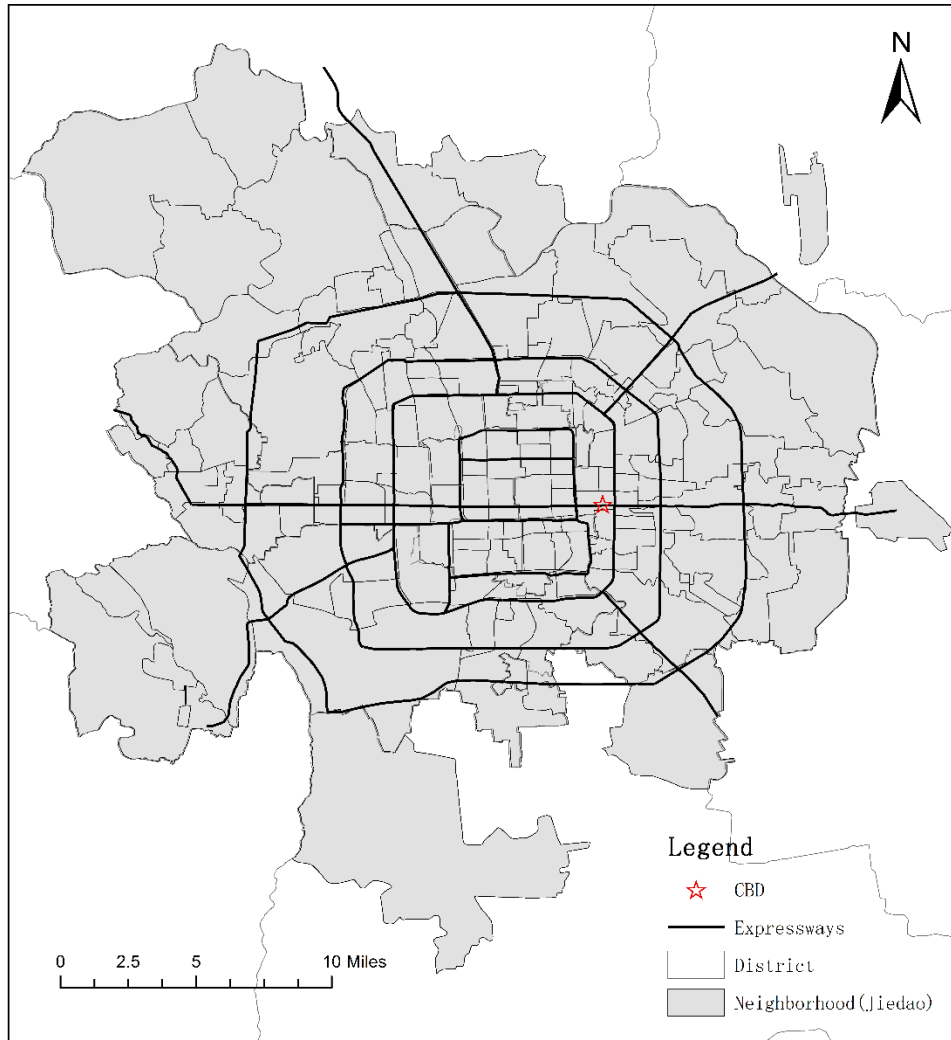


Figure 2.A sketch map of metropolitan Beijing areas.
Note: Grey-color neighborhoods are covered by the survey.

Table list

Table 1. Life satisfaction by homeownership in Beijing

	Mean	Std.dev	Dissatisfied (%)	Neutral(%)	Satisfied (%)
Homeownership (N=2747)	2.68	0.53	2.95	26.21	70.84
No homeownership (N=2661)	2.45	0.65	8.49	37.81	53.70

Note: The first row reports the distribution of the life satisfaction indicator for the sample of the homeownership respondents, while the second row reports the distribution of the life satisfaction indicator for the sample of the non-homeownership respondents.

Table 2. Descriptive Statistics of key measures in the survey

Variable	Definition	Mean or percentage	Std.dev
Panel 1: Subjective wellbeing			
Life satisfaction	How well you are satisfied with your life conditions: 1=very dissatisfied and dissatisfied; 2=neutral; 3=satisfied and very satisfied	2.57	0.60
Panel 2: Homeownership and family composition			
Home ownership	Binary variable: 1=homeownership; 0=non-homeownership	0.51	0.50
Family size	Number of family members	2.74	1.16
Kids aged below 6 (Child)	The presence of number of kids (under age 6)	0.48	0.58
School-age children (Student)	The presence of number of school-age children	0.72	0.56
Marital status (Marriage)	Binary variable: 1=Married; 0=otherwise	0.60	0.49
Panel 3: Household demographics			
Hukou	Binary variable: 1=the respondent has the Beijing Hukou registration status; 0=otherwise	0.65	0.48
Income2	5000-9999	0.35	0.48
Income3	10,000-15,000	0.21	0.40
Income4	>15,000	0.16	0.37
Comparable Income satisfaction	In comparison to people that you are familiar with, how well you are satisfied with your income conditions: 1=very dissatisfied and dissatisfied; 2=neutral; 3=satisfied and very satisfied	2.23	0.70
Gender	Binary variable: 1=male; 0=female	0.51	0.50
Age	Binary variable: 1=age larger than 40; 0= age lower than 40	0.26	0.44
Education	Binary variable: 1=education attainment at the college level and above; 0= education attainment below the college level	0.63	0.48

Living Space	Living space (m ²)	74.60	43.20
Panel 4: Perceived neighborhood characteristics			
Living convenience	Perceived satisfaction about local living convenience: 1=very dissatisfied and dissatisfied; 2=neutral; 3=satisfied and very satisfied	2.40	0.60
Safety	Perceived satisfaction about local safety: 1=very dissatisfied and dissatisfied; 2=neutral; 3=satisfied and very satisfied	2.27	0.64
Social environment	Perceived satisfaction about local human and social environments: 1=very dissatisfied and dissatisfied; 2=neutral; 3=satisfied and very satisfied	2.32	0.60
Commuting convenience	Perceived satisfaction about local commuting convenience: 1=very dissatisfied and dissatisfied; 2=neutral; 3=satisfied and very satisfied	2.41	0.62
Health	Perceived satisfaction about local health: 1=very dissatisfied and dissatisfied; 2=neutral; 3=satisfied and very satisfied	1.96	0.68

Table 3. Ordered logit models of life satisfaction

	(1)	(2)	(3)	(4)
<i>Homeownership and family composition</i>				
Homeownership	0.227** (0.097)	0.172 (0.127)	0.243* (0.131)	0.224* (0.128)
Family size	0.133** (0.061)	0.132** (0.061)	0.125* (0.064)	0.123* (0.072)
Child	-0.197 (0.135)	-0.195 (0.158)	-0.190 (0.123)	-0.166 (0.126)
Student	-0.001 (0.096)	-0.024 (0.112)	-0.078 (0.115)	-0.078 (0.109)
Marriage	-0.091 (0.085)	-0.141** (0.068)	-0.064 (0.068)	-0.101 (0.069)
<i>Household demographics</i>				
Hukou	0.298*** (0.069)	0.520*** (0.141)	0.513*** (0.188)	0.498** (0.213)
Income2	0.374* (0.214)	0.200 (0.285)	0.039 (0.275)	-0.013 (0.277)
Income3	0.612*** (0.215)	0.389 (0.331)	0.251 (0.329)	0.180 (0.352)
Income4	0.439* (0.254)	0.177 (0.342)	0.036 (0.287)	-0.013 (0.294)
Comparable Income satisfaction	1.095*** (0.103)	1.100*** (0.114)	1.043*** (0.119)	1.047*** (0.123)
Gender	-0.142 (0.136)	-0.114 (0.157)	-0.175 (0.195)	-0.149 (0.206)
Age	0.029 (0.149)	0.124 (0.154)	0.120 (0.124)	0.141 (0.164)
Education	0.244** (0.101)	0.346*** (0.118)	0.428*** (0.120)	0.445*** (0.131)
Living Space				0.001** (0.000)
<i>Neighborhood built environment</i>				
Population density		-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Distance to park		0.069*** (0.025)	0.069** (0.028)	0.080** (0.032)
Distance to CBD		0.005 (0.011)	-0.012 (0.011)	-0.015 (0.011)
Distance to hospital		0.151 (0.163)	0.255 (0.168)	0.199 (0.182)
Distance to expressway		-0.002	0.019	0.028

		(0.016)	(0.024)	(0.023)
<i>Perceived neighborhood characteristics</i>				
Living convenience			0.127 (0.103)	0.182** (0.092)
Safety			0.465*** (0.070)	0.415*** (0.068)
Social environment			0.555*** (0.110)	0.529*** (0.131)
Commuting convenience			0.106 (0.117)	0.101 (0.103)
Health			0.169** (0.084)	0.183** (0.093)
<hr/>				
cut1				
_cons	0.356 (0.232)	0.784*** (0.288)	3.576*** (0.524)	3.432*** (0.470)
cut2				
_cons	3.125*** (0.250)	3.565*** (0.358)	6.524*** (0.608)	6.380*** (0.545)
<hr/>				
<i>N</i>	1091	983	971	947
pseudo <i>R</i> ²	0.122	0.131	0.173	0.169
<hr/>				

Notes: Standard errors in parentheses, cluster at the district level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4. Interaction effects of homeownership and family composition

	Model A	Model B	Model C
Family size* homeownership	0.211*** (0.076)	0.205** (0.092)	0.288*** (0.076)
Child * homeownership	-0.496*** (0.168)	-0.586*** (0.164)	-0.569*** (0.166)
Student* homeownership	-0.262* (0.137)	-0.342*** (0.114)	-0.417*** (0.101)
Marriage * homeownership	0.046 (0.180)	0.095 (0.212)	-0.057 (0.188)
Homeownership	0.273 (0.305)	0.114** (0.052)	0.487** (0.212)
Family size	0.103* (0.058)	0.071 (0.087)	0.051 (0.087)
Child	0.096 (0.175)	0.050 (0.151)	0.012 (0.173)
Student	0.204 (0.136)	0.258** (0.131)	0.246 (0.154)
Marriage	-0.298** (0.146)	-0.193* (0.099)	-0.178 (0.126)
Household demographics		Y	Y
Neighborhood controls			Y
<i>N</i>	1101	1091	983
pseudo <i>R</i> ²	0.022	0.121	0.130

Notes: Standard errors in parentheses, cluster at the district level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

**Table 5. Interaction effects of homeownership and family composition:
Heterogeneity by housing types**

	(1) Commodity housing	(2) Affordable housing	(3) Work unit housing	(4) Others
Family size* homeownership	0.109 (0.125)	0.034 (0.803)	1.017** (0.435)	0.989** (0.485)
Child * homeownership	-1.192 (1.038)	0.456 (1.752)	-1.070** (0.483)	-0.402 (1.493)
Student* homeownership	-0.788 (0.572)	-0.414 (2.648)	-2.702** (1.324)	0.216 (0.781)
Marriage * homeownership	1.478** (0.727)	-2.193** (0.933)	0.775* (0.452)	-1.623* (0.836)
Homeownership	0.405 (0.487)	1.640 (1.872)	2.349** (0.964)	3.068*** (0.708)
Family size	-0.179* (0.101)	0.198 (0.232)	-0.070 (0.234)	0.275** (0.122)
Child	0.954 (0.946)	-1.438 (0.888)	-0.793** (0.326)	-0.124 (0.187)
Student	0.510 (0.452)	0.086 (1.543)	0.584* (0.303)	-0.196 (0.285)
Marriage	-1.257*** (0.364)	0.543 (0.660)	-1.001*** (0.360)	0.486 (0.402)
Household demographics	Y	Y	Y	Y
Neighborhood controls	Y	Y	Y	Y
<i>N</i>	417	114	147	263
pseudo <i>R</i> ²	0.173	0.285	0.267	0.148

Notes: Standard errors in parentheses, cluster at the district level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

**Table 6. Interaction effects of family composition and homeownership:
Heterogeneity by median income and comparable income satisfaction levels**

	Panel A: > median income level sample	Panel B: < median income level sample
Family size* homeownership	0.057 (0.173)	0.449*** (0.155)
Child * homeownership	-0.409 (0.381)	-1.992*** (0.545)
Student* homeownership	-0.096 (0.313)	-1.837*** (0.430)
Marriage * homeownership	0.037 (0.319)	0.505 (0.397)
Homeownership	0.311 (0.522)	0.225 (2.010)
Family size	0.163*** (0.048)	-0.044 (0.203)
Child	0.089 (0.354)	0.158 (0.276)
Student	-0.143 (0.248)	0.889** (0.393)
Marriage	-0.193 (0.214)	-0.770*** (0.264)
Household demographics	Y	Y
Neighborhood controls	Y	Y
<i>N</i>	671	295
pseudo <i>R</i> ²	0.061	0.057
	Panel C: > median comparable income satisfaction sample	Panel D: < median comparable income satisfaction sample
Family size* homeownership	-0.017 (0.200)	0.871*** (0.323)
Child * homeownership	-0.157 (0.401)	-1.352 (0.969)
Student* homeownership	-0.571*** (0.215)	-1.251** (0.611)
Marriage * homeownership	0.095 (0.334)	-0.188 (0.389)
Homeownership	0.019 (0.489)	1.821* (1.011)
Family size	0.053 (0.136)	0.173 (0.147)
Child	-0.083	-0.088

	(0.253)	(0.798)
Student	0.125	0.564*
	(0.141)	(0.297)
Marriage	-0.067	-0.580***
	(0.182)	(0.215)
<hr/>		
Household demographics	Y	Y
Neighborhood controls	Y	Y
<hr/>		
<i>N</i>	701	265
pseudo <i>R</i> ²	0.043	0.109
<hr/>		

Notes: Standard errors in parentheses, cluster at the district level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7. Comparing the movers and stayers

	Model A		Model B	
	(1)	(2)	(3)	(4)
Family size* homeownership	-0.046 (0.257)	0.054 (0.212)	0.297*** (0.102)	0.356*** (0.105)
Child * homeownership	-0.435 (0.402)	-0.232 (0.488)	-0.681*** (0.264)	-0.642** (0.255)
Student* homeownership	-0.812*** (0.245)	-0.823*** (0.312)	-0.274 (0.210)	-0.366** (0.185)
Marriage * homeownership	0.154 (0.844)	-0.432 (0.802)	0.087 (0.158)	-0.009 (0.131)
Homeownership	1.189 (0.934)	0.777 (0.803)	0.744*** (0.152)	1.043*** (0.283)
Family size	0.123 (0.167)	0.080 (0.155)	0.018 (0.089)	0.010 (0.083)
Child	-0.039 (0.301)	-0.117 (0.270)	0.012 (0.267)	-0.027 (0.289)
Student	0.463** (0.200)	0.430** (0.195)	0.171 (0.174)	0.170 (0.219)
Marriage	-0.340 (0.266)	-0.285 (0.326)	-0.044 (0.224)	-0.044 (0.263)
Household demographics	Y	Y	Y	Y
Neighborhood controls		Y		Y
<i>N</i>	340	304	737	667
pseudo <i>R</i> ²	0.157	0.169	0.113	0.124

Notes: Standard errors in parentheses, cluster at the district level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.