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The case of Shenzhen, China**

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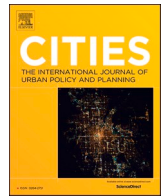
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Residential satisfaction of private tenants in China's superstar cities: The case of Shenzhen, China

Bo Li, Chi Jin^{*}, Sylvia J.T. Jansen, Harry van der Heijden, Peter Boelhouwer

Management in the Built Environment, Faculty of Architecture and the Built Environment, Delft University of Technology, Julianalaan 134, 2628BL Delft, the Netherlands

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ABSTRACT

In recent years, Chinese housing policies have been shifting from encouraging homeownership toward developing the private rented sector, especially in the superstar cities. Nevertheless, what are the target groups and characteristics of private rental housing in Chinese superstar cities, and whether the private rental housing is capable of meeting private tenants' housing needs remain unclear. This paper attempts to bridge this gap from the tenant perspective by examining the determinants of private tenants' residential satisfaction. We argue that residential satisfaction should be examined within different submarkets. By adopting the Structure of Housing Provision thesis, we identified three main sub-sectors in China's superstar cities, i.e. urban village housing, commercial rented housing, and Long-term Rented Apartment (LTRA). Based on a questionnaire survey in Shenzhen, we examined the characteristics of the three subsectors and tenants living in each sub-sector. Furthermore, we evaluated whether the residential satisfaction levels varied significantly in different sub-sectors and the determinants of residential satisfaction in each sub-sector. The results of an ANOVA showed that tenants living in commercial rented housing and LTRAs were more satisfied than those living in urban village housing. The regression results showed that the determinants of residential satisfaction vary considerably among different sub-sectors. The results of this paper can be useful not only for the landlords to improve tenants' residential satisfaction but also for policy-makers engaged in private rental market development and urban renewal.

1. Introduction

China has become a country of homeowners since the Housing Reform in the 1990s. According to the 2010 National Population Census, the homeownership rate reached 85% at the national level while only 11% of Chinese live in the private rented sector¹ (National Bureau of Statistics, 2010). However, if we zoom in on the superstar cities (or so-called first-tier cities²), the proportion of the private rental housing is much higher (see Fig. 1). Reasons for the boom of private rental sector are multi-faceted and vary markedly across different nations and cities. Researchers often attribute it to the unaffordable housing prices, rapid urbanization, increasing workforce mobility, and shortage of social housing (Hulse et al., 2019; McKee, 2012; Power et al., 2018).

Although the continually growing private rental sector alleviates the housing shortage to some extent, new issues come to light, the most prominent of which are the inflated rents (Li et al., 2019), poor housing conditions in the informal sector such as the underground rental housing market and urban villages³ (Kim, 2016; Liu et al., 2010) and insecure tenancy (Huang et al., 2015; Liu et al., 2018; Wu, 2016). The unregulated, profit-oriented private rental housing market has directly shaped the unhappy personal experiences of tenants in urban China (Nie, 2016). According to his interviews with tenants in China, many interviewees expressed their negative feelings about private renting, including "low quality and inconvenience", "long-term financial loss", "instability and insecurity", and "a feeling of homelessness".

After being neglected for many years, it was until 2015 that the

^{*} Corresponding author.

E-mail address: C.jin-1@tudelft.nl (C. Jin).

¹ The private rented sector is often defined as "a counterpoint to the social rental, referring to dwellings which are privately owned and let for a profit at rents set at market levels rather than those owned by governments or 'third sector' organizations on a not-for-profit basis and let at sub-market rentals" (Hulse et al., 2010).

² Superstar cities were described as metropolitan areas where demand exceeds supply and supply growth is limited (Gyourko et al., 2013). In both academia and practice, it is well acknowledged that there are four superstar cities in China, i. e. Beijing, Shanghai, Guangzhou and Shenzhen (Chen et al., 2019).

³ Details about urban village will be presented in Section 2.

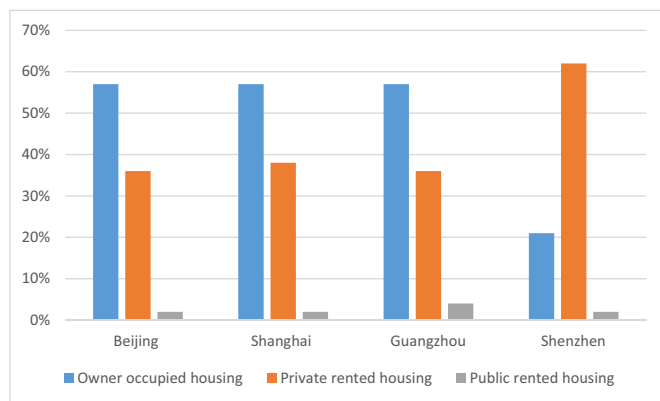


Fig. 1. Tenure distribution in four Chinese superstar cities in 2010. Sources: The data come from the sixth national population census (ratios may not add up to 100% because the category “others” is excluded).

Ministry of Housing and Urban-Rural Development (MOHURD) first proposed the idea of “accelerating the development of the rental housing market” (MOHURD, 2015). Several proposals have been put forward in this guidance document, including the establishment of government service platforms for housing rental information, the cultivation of professional housing rental institutions, the promotion of real estate investment trusts (REITs), etc. Two years later on the 19th National Congress of the Communist Party of China, President Xi re-emphasized the importance of private rental sector with the famous slogan “rent and purchase”, which means both the rental sector and the owner-occupied sector should be encouraged instead of the latter alone. Since then, numerous initiatives have been taken to promote the development of private rental sector in urban China. For example, in 2019 the central government announced to invest about 40 billion yuan (equivalent to 5.82 billion USD) over three years to support the development of the rental housing market in 16 pilot cities (Yang, 2019). As one of the pilot cities, the Shenzhen municipality claimed to renovate more than one million units in the urban villages before 2020 by involving professional developers (Zhou, 2019). However, considering the fact that the public in China is not enthusiastic about participating in the urban renovation (Zhuang et al., 2019), it is important to have a deep understanding of the characteristics and preferences of prospective residents in order to effectively develop the housing market or to renovate existing dwellings.

Whether the private rental sector in Chinese superstar cities is capable of fulfilling the housing needs of private tenants remains a question. The test of a well-functioning housing system is the wellbeing of its occupants (Smith et al., 2017). To quantitatively examine the living experiences and well-being of private tenants, the concept of residential satisfaction is employed in this paper. A high level of residential satisfaction is important for the residents and neighborhood because satisfaction creates stability in the neighborhood and acts as a significant predictor of residents’ subjective well-being (Mouratidis, 2020; Phillips et al., 2005; Speare, 1974). Besides, an understanding of the factors that facilitate a satisfied or dissatisfied response can play a critical part in making successful housing policies (Lu, 1999). From the perspective of consumerism, the tenant satisfaction survey has been seen as a means of improving the quality of service delivery and heralded as an effective means of listening to consumers, through which the rental organizations becoming more demand-responsive (Satsangi & Kearns, 1992).

There have been a vast number of studies looking into the residents’ satisfaction with their residential conditions in different nations (Amole, 2009; Du et al., 2020; Jansen, 2014a; Li & Song, 2009; Li & Wu, 2013; Milic & Zhou, 2018). Most of the researchers only distinguished the residents between homeowners and tenants in general (Huang et al., 2015; Ren & Folmer, 2017) or focused on tenants in public rental housing (Huang & Du, 2015; Salleh et al., 2011; Ukoha & Beamish,

1997), or a specific group of private tenants such as migrant workers (Chen et al., 2020; Tao et al., 2014), elderly tenants (James, 2008) or tenants living in urban villages (Li & Wu, 2013; Wu, 2016) or multi-family units (James, 2007). With the rapid development of the private rental sector in Chinese superstar cities, market segmentation is becoming increasingly evident. Various “sub-sectors” can be distinguished within the private rental sector, with different functions on the housing market and aiming at different groups of tenants. For example, Whitehead and Kleinman (1985) classified the private rental sector in the UK into three sub-sectors, namely the Furnished Rented Sector, the Employment Related Accommodation, and the Unfurnished Rented Sector. Although previous Chinese researchers often use community type or neighborhood type to classify the whole housing system (Ren & Folmer, 2017; Wang et al., 2019), little attempt has been made to categorize the private rental sector in urban China. As a result, there is a surprising paucity of comparative studies focusing on tenants living in different sub-sectors of the private rental sector. This paper is a first attempt to examine the residential satisfaction of private tenants living in different sub-sectors in China’s superstar cities.

The purpose of this study is to examine whether there are differences in residents’ residential satisfaction levels among different sub-sectors of the private rental sector in Chinese superstar cities. Furthermore, we explore the determinants of private tenants’ residential satisfaction in each sub-sector. In specific, we address the following questions:

- (1) What sub-sectors can be distinguished within current private rental sector in Chinese superstar cities?
- (2) What are the characteristics of private tenants in each sub-sector? What are the differences in their housing, neighborhood, landlord service, and residential satisfaction level in each sub-sector?
- (3) What are the determinants of private tenants’ residential satisfaction in different sub-sectors?

The first research question will be answered using a literature review in Section 2. Data for answering the second question was collected through field survey. The characteristics were examined using descriptive analysis while the differences were explored by statistical tests. For the third research question, regression analysis was performed in each sub-sector using the data collected.

In the subsequent section, we will identify the sub-sectors of the private rental sector with the Structure of Housing Provision thesis. Next, some selected literature will be reviewed on residential satisfaction to construct the theoretical framework. Then we introduce our study area, the data collection process, and the statistical methods, followed by the descriptive and regression results. The paper ends with a discussion of the main findings, policy implications, and limitations of this study.

2. Sub-sectors of the private rental sector

As stated above, the private rental sector is not homogeneous but often demonstrates a considerable variety. Researchers have classified private rental housing differently in various countries (Gray, 2002; Rugg et al., 2002; Whitehead & Kleinman, 1985). However, it is problematic to directly use their taxonomies in the Chinese context since there are so far no formal and clear rent control regulations aimed at the private rental sector in China. A theoretical tool that can enable us to dig below the surface and analyze the whole process from housing production to distribution, consumption, and housing services is needed (Van Der Heijden, 2013, p. 10). Therefore, in this study, we use the thesis Structure of Housing Provision developed by Ball (1981, 2017) to analyze and classify the private rental sector. According to Ball (1981), research on housing should concentrate on describing and analyzing the development of relationships between the social agencies involved in the production, allocation, and consumption of housing and housing services in specific housing categories or structures (Ball, 1998; Ball & Harloe,

1992).

The 1998 Land Administration Law stipulates that urban land is owned by the state while rural and suburban land is owned by collectives. With rapid city sprawl, the suburban land lots were encroached and surrounded by high-rise buildings, becoming the so-called urban villages. The urban villagers are not legally entitled to capitalize on their assets through land or housing sale, so they redevelop their housing at high densities to maximize their profits and lease the units out (Liu et al., 2010). As a result, the urban village is characterized by high-density, narrow building distance, often accompanied by inadequate ventilation and lighting (Liu et al., 2010). Housing conditions in the urban village can be described as overcrowded, in lack of basic facilities such as indoor toilets and kitchens (Wu, 2016). Due to the unique land ownership, housing and neighborhood characteristics, and informality of urban village housing, we take it as the first sub-sector.

In contrast, dwellings built on the urban land can be considered as “formal” housing because their production goes through a standard legal process and can be traded freely on the market. The two most common kinds of formal dwellings are commercial housing and condominiums, which are both built for purchase. The owner of commercial housing or condominiums can rent out their housing for profit to tenants privately. Although commercial housing and condominiums differ in some aspects such as the length of land use rights and living expenses,⁴ they bear a close resemblance from production to allocation, consumption, and housing services. Therefore, we merge them into one sub-sector as commercial rented housing.

In recent years, a considerable number of professional institutions stepped into the private rental market, known as Long-Term Rented Apartment (LTRA, changzu gongyu in Chinese) companies. LTRAs are defined as dwellings rented out and managed by professional institutional landlords with a tenancy period often longer than one year. LTRA companies are nascent in China but have been well established in the developed nations, known as Apartment Management Companies. The expansion of LTRA can be explained by the increasing demand for quality rental housing as well as supportive policies for the LTRA companies such as tax benefits and financial deregulation. Tenancies for LTRAs are generally longer than the private landlord’s short-term rental which dominates the private rental sector (Chen et al., 2021). LTRAs also distinguish themselves from the commercial rented housing and condominiums run by individual landlords or letting agencies from property rights, building design, decoration, and facilities to services and rents (Clare, 2017; Zhang, 2018). For example, LTRA companies can buy land use right from the local government and build apartments on their own, or choose to purchase or rent existing commercial housing or condominiums from homeowners, which is quite costly. Therefore, many LTRA companies lease or buy under-utilized assets like hotels and offices and redevelop them into rental units.⁵ Moreover, the live-in managers of LTRA can respond to tenants’ requests quickly and efficiently. For the amenities and services that they provide, rents for LTRA are generally 15 to 30% higher than comparable spaces nearby (Zhang, 2018). Therefore, LTRA differs substantially from urban village housing and commercial rented housing and should be categorized as a new structure of housing provision.

⁴ For commercial housing, land use rights go up to 70 years, whereas for condominiums the range is up to 40 years (Yang & Chen, 2014). Besides, utility costs in condominiums are slightly higher than in commercial housing.

⁵ For more detailed information about the business model of LTRA companies, please refer to Chen et al. (2021).

Based on the above analysis, three structures of private rented housing provision were identified (see Fig. 2).⁶ The appendix shows the exteriors of the three rental dwellings.

The three sub-sectors vary considerably from each other on housing conditions, neighborhood environment, and landlord services, etc. Most likely, tenants living in different sub-sectors have distinguished characteristics and residential satisfaction levels, which is going to be explored in our empirical research.

3. Residential satisfaction

The nature and meaning of the concept of residential satisfaction have been frequently discussed in the past literature and a number of definitions have been put forward (Francescato et al., 1989). According to Amole (2009), three main perspectives of residential satisfaction can be identified. The first is called the purposive approach which conceptualizes residential satisfaction as a measure of the degree to which the environment facilitates or inhibits the users’ goals (Canter & Rees, 1982). The second is called the actual-aspiration gap approach which conceives residential satisfaction as a measure of the gap between residents’ actual and aspired needs (Galster, 1987). The third approach was developed by Francescato et al. (1989) who conceptualized residential satisfaction as an attitude and a multifaceted construct which has cognitive, affective, and conative dimensions. The conative component (behavioral intentions) has merely been studied in terms of the intention to move (Fornara et al., 2010). The present paper adopts the second approach and assumes residents perceive salient attributes of their physical environment and evaluate them based on comparison (Galster, 1987). If the current residential situation is broadly similar to their aspirations, then satisfaction should occur (Galster, 1985). Galster and Hesser (1981) maintained that the overall degree of residential satisfaction is ultimately influenced by two sets of objective factors. One set is “contextual”: the physical characteristics of the resident’s dwelling and physical and ecological characteristics of the surrounding neighborhood. Another is “compositional”: characteristics of the resident’s household, especially social class and stage in the life cycle. These two sets can either influence residential satisfaction directly or operate through their effect on the resident’s subjective attitudes and assessments of specific aspects of the residential environment, which thereby influence residential satisfaction. For example, one of the independent variables can be the noise level in the environment measured by decibel. It can either directly influence the residential satisfaction level of the inhabitants or through the residents’ reaction toward the noise (whether they are bothered by the noise). Many previous studies have shown that subjective aspects are more important for residential satisfaction than objective ones (Amérigo & Aragones, 1997; Jansen, 2014a). Therefore, in the current study, we include both the objective characteristics and subjective assessments of the tenants.

Over the past few decades, an enormous amount of work has been carried out to explore the determinants of residential satisfaction (Du et al., 2020; Elsinga & Hoekstra, 2005; Li & Song, 2009; Lu, 1999; Paris & Kangari, 2005; Riazi & Emami, 2018). Li and Wu (2013) concluded that these studies usually focused on three aspects: the effects of residents’ socio-demographic characteristics, their housing characteristics, and variables describing the socio-spatial characteristics of the neighborhood. To better capture the characteristics of renting, we also include some rent-related features or variables such as landlord service and rent, which are considered to be important for tenant satisfaction (James,

⁶ It is important to note that there are numerous structures of housing provision and they vary in different cities. In some cities such as Beijing, the privatized work-unit housing is also an important component (Ho, 2017). In the current research only the three sub-sectors will be discussed because they are the three most basic sub-sectors and accommodate the vast majority of private tenants in our case study.

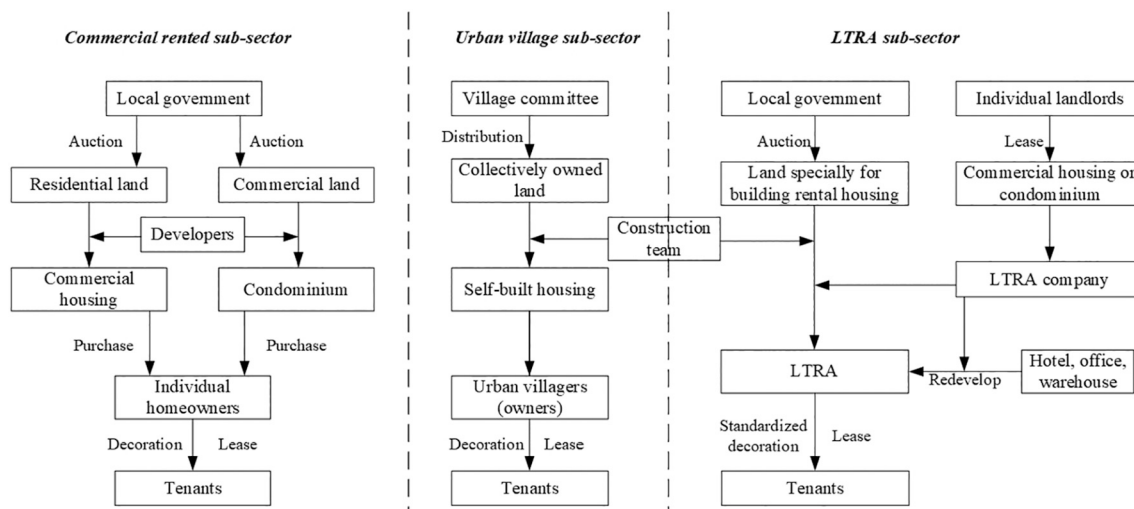


Fig. 2. Three sub-sectors based on Structure of Housing Provision perspective.

2007). In the remainder of this section, potential predictors of residential satisfaction for private tenants will be examined on the four aspects.

3.1. Personal and household characteristics

One's demographic status is considered to be an important determinant of residential satisfaction. Many empirical studies have suggested that residents with higher incomes are more satisfied with their residential environment (Chen et al., 2013; Ren & Folmer, 2017). Some researchers found being male is positively related to a higher level of residential satisfaction (Galster & Hesser, 1981) while others found a negative relationship (Lu, 1999). Higher age was found to be positively related to residential satisfaction (Wang et al., 2019). The influence of educational attainment remains controversial. Some researchers confirmed a positive relationship between educational level and residential satisfaction (Ibem & Amole, 2013; Vera-Toscano & Ateca-Amestoy, 2008) while some found a negative correlation (Chen et al., 2013; Dekker et al., 2011). In the context of China, some researchers found residents with a local hukou⁷ were more satisfied with their housing and neighborhood than those without a local hukou (Ren & Folmer, 2017). The household composition was also found to be associated with residential satisfaction (Clark et al., 2006). Being married was found to be negatively related to residential satisfaction (Galster & Hesser, 1981). Furthermore, some researchers found that couples with children expressed lower levels of residential satisfaction than those without children (Brodsky et al., 1999; Dekker et al., 2011; Ren & Folmer, 2017). One's occupation type can also have a significant impact on their residential satisfaction. For example, Wang et al. (2019) found unemployed people expressed higher residential satisfaction than employed in China's inner-city neighborhood. Chen et al. (2013) found that among the low-income residents, people working in the public sector had higher levels of residential satisfaction. Besides, researchers have found the length of residence had a significant impact on residential satisfaction but with conflicting results (Adams, 1992; Amole, 2009; Chen et al., 2013). Commuting time is a less frequently explored predictor for residential satisfaction in the previous research. However, unlike homeowners, living close to the workplace is a priority for tenants when they choose residence location, not only to save time but also to

⁷ The Hukou (household registration) system in China has segregated the rural and urban populations. Each person has a hukou (registration status), classified as "rural" or "urban" in a specific administrative district (Chan, 2010). In most cities, people without a local hukou are not allowed to buy housing in this city.

reduce transportation-related costs (Letdin & Shim, 2019; Novaco et al., 1991). From another point of view, long commuting time also represents job-housing spatial mismatch, which is extremely severe in Chinese superstar cities (Fan et al., 2014). Therefore, we include commuting time as a predictor of residential satisfaction for private tenants.

3.2. Housing characteristics

Housing quality is an important determinant of housing satisfaction (Elsinga & Hoekstra, 2005). As mentioned above, housing characteristics can be divided into two categories, i.e. objective and subjective characteristics. Elsinga and Hoekstra (2005) argued that objective characteristics of the dwelling were dwelling type, the number of rooms, the presence of facilities, and the condition of the dwelling, which were found to have significant impacts on residents' housing satisfaction. Many studies have shown that residents living in larger housing have higher residential satisfaction (Chen et al., 2013; Huang et al., 2015). Meanwhile, residents' subjective assessments of the housing (e.g. whether there is a perceived shortage of space) were found to be even more important in determining residential satisfaction than objective characteristics because objective characteristics may be perceived differently by different residents (Marans, 1976). Notably, researchers often regard property value or management fee as characteristics of the housing and found higher housing costs were associated with higher residential satisfaction level (Jansen, 2014a; Lu, 1999; Wang et al., 2019), probably because higher housing costs generally means higher housing quality. Few studies have been conducted to explore the impact of rent with the exception of James (2007). In his study into tenants in multifamily units, it was shown that higher monthly rent was associated with housing satisfaction improvement. Tenants may make a value-for-money assessment in deciding whether they are happy or not with what they are receiving (Satsangi & Kearns, 1992). High rents might trigger dissatisfaction if the residents' expectations of housing quality are not met. Therefore, we include both objective rents and subjective rent assessment in this study.

3.3. Neighborhood characteristics

The housing unit is a part of an environment, and the inhabitants, through the interaction processes, inevitably come into contact with the various components of their environment (Onibokun, 1974). Therefore, one's level of acceptance or satisfaction may be more dependent on where the unit is situated than on its actual or perceived quality (Gruber & Shelton, 1987). Besides facilities in the house, public facilities such as

the presence of shops, markets, schools, clinic, good quality of public transport, green areas, playground, and others are important to support the daily life of the dwellers and enhance residents' quality of life (Nurizan & Hashim, 2001; Rioux & Werner, 2011; Wilson et al., 1995). Therefore, it is reasonable to assume public facilities can increase residents' residential satisfaction levels, which has been confirmed by some previous studies (Huang & Du, 2015). However, whether the location of the neighborhood (i.e., distance to the city center) could have an impact on residents' residential satisfaction is still uncertain. Some researchers found people living in suburban areas were more likely to be satisfied than those living in urban areas (Chen et al., 2013; Kearns & Parkes, 2003) while Dekker et al. (2011) found the distance of the neighborhood to the city center was not a significant predictor for neighborhood satisfaction.

3.4. Landlord service

What distinguishes private tenants and homeowners is that private tenants maintain a contractual relationship with their landlords and expect to obtain services from them. Marcuse (1975) argued that tenants might experience residential alienation which was referred to as "the condition of estrangement between a person and his/her dwelling", because of antagonism toward a landlord. James (2007) also claimed that potential conflicts with management might be a central reason why tenant satisfaction was almost universally lower than homeowner satisfaction. In their empirical research into tenants living in multifamily affordable housing in the US, Paris and Kangari (2005) concluded that satisfaction with property management, management staff's quick response, cooperation, and friendliness are important predictors for tenants' residential satisfaction. Following Morrow (2020), we selected five landlord services and responsibilities, including signing a written contract, timely repairs, maintaining a hazard-free and pest-free environment, and giving notice before entering the rental units.

4. Research design

4.1. Study area

Shenzhen is one of the most developed cities in China, ranking third in terms of GDP in 2019, only behind Beijing and Shanghai. However, its area of about 2050 km², is only one-eighth the size of Beijing, one-third that of Shanghai, and one-fourth that of nearby Guangzhou. Therefore, the housing shortage in Shenzhen is an acute problem. Known as a migrant city, Shenzhen has a resident population of about 13 million,⁸ of which 8 million are migrant workers (Shenzhen Bureau of Statistics, 2019). As a result, the proportion of private tenants is much higher than the other three superstar cities (see Fig. 1). The large share of private rental housing makes Shenzhen an interesting research area. Furthermore, although there are almost no official data about the proportion of each subsector, the private rental sector in Shenzhen appears to be more diversified than in other superstar cities. To get a general picture of the private rental sector in Shenzhen, data from industry reports, news, and government officials' speeches were collected (Lianjia Property, 2017; Wang, 2018). According to our rough estimates, in 2018 there were 5.4 million private rented dwellings on the market and the market shares of urban village housing, commercial housing, and LTRA are 83%, 12%, and 5% respectively (industrial dormitories are excluded because they are provided by the employers and cannot be acquired through the market). Therefore, Shenzhen provides a piece of fertile soil for our research.

⁸ Resident population refers to people live in Shenzhen for more than six months in one year. According to the deputy major of Shenzhen, the actual management and service population in Shenzhen has exceeded 22 million in 2020 (Sina, 2020).

However, due to the constraints of time and budget, we are unable to conduct field survey in every district of Shenzhen. Therefore, we selected four districts, i.e., Baoan, Longgang, Nanshan, and Futian for on-site surveys (see Fig. 3). The four districts were chosen mainly for two reasons. First, the four districts include two inner-city districts and two outer-city districts, thus we can examine whether the location of the neighborhood influences residential satisfaction. Another reason is that they are the most densely populated areas in Shenzhen, accounting for 67% of the city's whole population (Shenzhen Bureau of Statistics, 2019). In this way we are more likely to reach tenants from different sub-sectors, especially the LTRA sub-sector that has a market share of only 5%.

4.2. Data collection

The field survey was conducted in August 2020. Before the large-scale distribution of the questionnaire, an online pretest was conducted among 30 private tenants living in Shenzhen. Based on their feedback, we modified several questions to make them more comprehensible. To ensure an adequate sample in each sub-sector, respondents were recruited in a variety of ways. In specific, we distributed leaflets to the residents in different communities and passersby in each district after confirming that they were private tenants. On the leaflet, there was a brief description of our research, inviting texts, and a two-dimensional code. Respondents could participate in the survey by scanning the QR code, while paper questionnaires were also available on request. However, most of the respondents lived in urban village housing and commercial housing. To include more LTRA tenants, we visited about 300 households living in LTRAs after we got permission from the LTRA managers. Some managers of LTRA also helped us to distribute the leaflets to the tenants. To facilitate participation, respondents could receive a small gift as a reward after completing the questionnaire.

A total of 667 online and offline questionnaires were collected, from which 48 were invalid due to missing values or too short filling-in time (<5 min⁹). In the end, we have 619 valid questionnaires with a valid rate of 93%, including 285 (46%), 206 (33%), and 128 (21%) respondents living in the urban village housing, commercial housing, and LTRAs respectively. Since there is almost no official data about characteristics of the private tenants in Shenzhen, the age structure of the whole resident population in Shenzhen was used for approximate stratified sampling because 80% of the whole population are renters (Dai, 2017). According to the Sixth Census, 48.8% of the resident population was between 15 and 29 years old, 47.9% between 30 and 59 years old, and 3.3% above 60 years old¹⁰ (Shenzhen Bureau of Statistics, 2010). In our sample, the three figures were 48%, 50.5%, and 1.5%, respectively. Our sample was slightly overrepresented by tenants aged between 30 and 59 years old but underrepresented by the old tenants aged over 60 years old. However, it is because 21% of our respondents were LTRA tenants who are generally the youth. But in reality, only 5% of private tenants live in LTRAs. As aforementioned, it was conducted to ensure adequate respondents from each sub-sector for further analysis. Regarding the gender ratio, our sample (male = 54.1%) is representative compared with the whole population (male = 54.3%) (Shenzhen Bureau of Statistics, 2019).

4.3. Measuring overall residential satisfaction levels of the private tenants

Before exploring what are the determinants of residential satisfaction in empirical research, we first need to measure it. The way residential satisfaction is measured is critical in empirical studies because it directly influences the results (Lu, 1999). Some researchers measure overall residential satisfaction with one single question, for example, by asking

⁹ The e-questionnaire can record the start and end time automatically.

¹⁰ Residents younger than 15 years old were excluded from calculating.

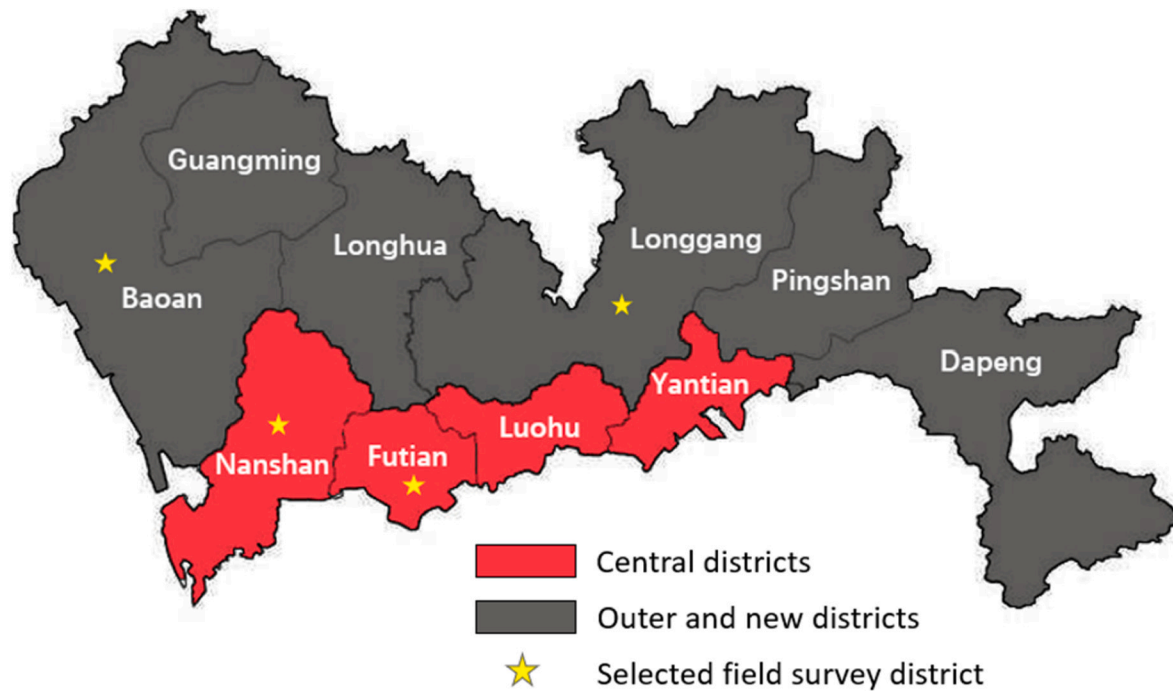


Fig. 3. Administrative districts of Shenzhen and survey sites.

the respondents “How satisfied are you about living here?” (Casakin & Reizer, 2017; Paris & Kangari, 2005). Although overall measurement is convenient to conduct, to capture multiple dimensions of residential satisfaction and increase the reliability of the criterion, more and more academics measure residential satisfaction through an index (Franciscato et al., 1989; Weidemann & Anderson, 1985; Wu et al., 2020). The number of items included in the residential satisfaction index varies considerably depending on how specific these items are. According to Satsangi and Kearns (1992) and Varady and Carrozza (2000), tenant satisfaction encompasses satisfaction with the dwelling, neighborhood, and landlord service. Meanwhile, many researchers have suggested that neighborhood satisfaction had a complex and multidimensional basis and should be measured through several dimensions (Hur et al., 2010). Following Huang and Du (2015), except for overall neighborhood satisfaction, we also asked the respondents about their satisfaction levels on four aspects of the neighborhood, i.e. greenery, cleanliness, quietness, and security. Therefore, a total of seven questions were asked to evaluate renters’ residential satisfaction (see Table 1). Responses are scored through a five-point Likert scale ranging from 1 “very dissatisfied” to 5 “very satisfied”.

The mean value of the above seven items was used for tenants’ residential satisfaction. The reliability statistic Cronbach’s alpha was employed to test whether the seven items could be averaged. Usually, the value of alpha above 0.70 is considered to reflect a reliable scale (Nunnally, 1994). The results showed a high correlation (Cronbach’s alpha = 0.874) among these seven items ($n = 619$), suggesting these items are internally related and can be combined into one overall score for residential satisfaction.

Table 1
Questions to measure residential satisfaction.

1. How satisfied are you with your neighborhood?
2. How satisfied are you with your current dwelling?
3. How satisfied are you with your landlord service?
4. How satisfied are you with the four aspects of your neighborhood?
a) Greenery; b) Cleanliness; c) Quietness; d) Security

4.4. Statistical methods

The present study examines the residential satisfaction level in each sub-sector and explores the impact of personal characteristics, housing characteristics, neighborhood characteristics, and landlord services on residential satisfaction. First, a one-way ANOVA was conducted to examine whether tenants’ overall residential satisfaction levels vary significantly in different sub-sectors. Besides, a multivariate regression analysis was performed to find out the determinants of residential satisfaction in different sub-sectors. There are a total of 38 independent variables in this research, which are selected based on the literature review in Section 3. As a general rule of regression, researchers should include as few predictors as possible (Field, 2009, p. 214). To simplify the models, the backward elimination-by-hand procedure was employed following Jansen (2014a). This means that all variables were entered simultaneously in the regression analysis. Ordinary Least Squares (OLS) regression analysis was performed with the “enter” method in SPSS. Next, the predictor with the highest, non-significant, p -value was omitted from the analysis, and the analysis was done again. This process was repeated until only statistically significant predictors remained. This procedure ensured a careful and insightful way to remove non-significant predictors as opposed to automated forward, stepwise and backward procedures in SPSS. All the categorical variables were recoded into dummy variables. Missing values were coded into the category “others” in order to include as many respondents in the regression as possible.

5. Results

5.1. Descriptive results

5.1.1. Personal and household characteristics

Respondents’ demographic characteristics are shown in Table 2 (numerical variables) and Table 3 (categorical variables), respectively. Table 2 shows that tenants living in LTRAs were generally younger than those living in the other two sub-sectors. Besides, the average number of people living in the dwelling is smaller in the LTRA sub-sector. From Table 3 it is clear that the ratio of male and female tenants was relatively

Table 2
Respondents' numerical demographic characteristics.

		Urban village N = 285	Commercial housing N = 206	LTRA N = 128	Total N = 619
Age	Mean	32.5	30.9	28.1	31.1
	Median	31	29	27	30
	S.D.	8.6	7.6	6.5	8.04
Number of people in the dwelling	Mean	2.68	2.42	1.99	2.45
	Median	2	2	1	2
	S.D.	1.5	1.3	1.3	1.45

Table 3
Respondents' categorical demographic characteristics.

	Urban village N = 285 (%)	Commercial housing N = 206 (%)	LTRA N = 128 (%)	Total N = 619 (%)
Gender				
Male	53	51	61	54
Female	47	49	39	46
Marital status				
Single	27	31	47	32
In a relationship	12	20	25	17
Married	60	47	27	49
Divorced/widowed	1	2	1	2
Presence of children				
Have child(ren) and live with child(ren)	41	27	13	31
Do not live with child	18	15	9	15
Do not have child	41	59	78	54
Household composition				
Live alone	31	30	51	34
Co-rent	5	18	6	9
Live with family	58	38	33	46
Live with partner	7	15	11	10
Household monthly income (RMB)				
Low (<5000)	22	12	13	17
Lower-middle (5000–10,000)	38	28	34	34
Middle-higher (10,000–20,000)	30	33	39	33
High (>20,000)	10	27	15	17
Educational level				
Middle school & below	25	10	9	17
High school	25	15	20	21
Junior college	26	19	25	24
Bachelor's degree & above	24	56	46	39
Hukou status				
Local hukou	15	37	22	24
Non-local hukou	85	63	78	76
Occupation				
Working in the private sector	55	63	65	60
Working in the public sector	11	13	16	12
Self-employed	24	11	9	17
Unemployed	4	13	10	12
Length of residence				
< 3 months	9	15	27	15
3 months–3 years	54	67	63	60
Above 3 years	37	18	9	25
Commuting time				
< 15 min	37	32	29	34
15–30 min	30	27	31	29
> 30 min	33	39	36	3
Not applicable	0	2	4	2

even in the first two sub-sectors, whereas male tenants were over-represented in the LTRA sub-sector. Furthermore, tenants in the urban village sector were more likely to be married, have a child(ren), and live with families, which suggests households living in urban village housing were generally on the later stage of the life circle. Notably, tenants living

in urban village housing were apparently overrepresented in the low and lower-middle-income categories and below-bachelor educational attainment categories. Most tenants in each sub-sector did not have a local hukou, while the proportion of migrants was the highest in the urban village sub-sector. Compared with tenants in the other sub-sectors, urban village tenants were more likely to be self-employed and live for more than three years in their dwelling. Interestingly, urban village tenants generally spent less time commuting compared with those living in the other two sub-sectors. This may be because the ubiquitous urban villages in Shenzhen make it possible for the tenants to live close to their workplace. Another possibility is that the proportion of self-employed is significantly higher in the urban village sub-sector, thus reducing the average commuting time.

5.1.2. Housing characteristics

To capture both the objective and subjective housing characteristics (Elsinga & Hoekstra, 2005), 12 categorical variables were included (see Table 4). We used subjective measurement when this item was not appropriate to or cannot be measured objectively. For example, in most dwellings, there is “some” natural daylight even if it might be limited. Therefore, we asked whether there was sufficient natural daylight from the view of tenants. According to Table 4, the one-bedroom housing layout was the most popular design in each sub-sector, while commercial housing tended to have more bedrooms and LTRA tended to have more studios. The proportions of the four housing layouts were relatively more evenly distributed in urban village housing than the other two sub-sectors. Dwellings smaller than 40 m² were overrepresented in the urban village housing and LTRA, while units larger than 60 m² were

Table 4
Categorical characteristics of the dwelling.

	Urban village N = 285 (%)	Commercial housing N = 206 (%)	LTRA N = 128 (%)	Total N = 619 (%)
Objective	Housing layout			
	Studio	20	12	26
	One-bedroom	38	42	43
	Two bedrooms	29	28	17
	Three bedrooms and more	13	19	14
	Living space (m ²)			
	< 40	59	46	64
	40–60	18	21	19
	≥ 60	23	33	27
	Presence of a balcony	65	78	52
	Presence of hot water	58	88	87
	Presence of an air conditioner	65	93	93
Subjective	Presence of elevator	35	73	62
	Presence of cooking facilities	63	77	63
	Sufficient natural daylight	37	57	38
	Fast and stable network	23	51	45
	Adequate ventilation	57	75	66
	Adequate privacy from the neighbors	27	56	45
	Adequate space for personal activity	33	53	46
	Rent appropriateness			
	Too high	57	63	56
	Too low	3	2	1
	Reasonable	32	29	31
	No idea	8	6	13

overrepresented in commercial housing. Urban village housing had the lowest proportion of the presence of indoor facilities except balcony while commercial housing had the highest proportion for each facility. The subjective assessments of tenants showed the same pattern. The proportion of tenants who perceived adequacy on each subjective assessment was highest in the commercial rented sub-sector and lowest in the urban village sub-sector. Over half of the respondents complained about the high rents in each sub-sector. The percentage of tenants in each sub-sector who considered their rents to be reasonable was about the same.

Table 5 reports the numerical dwelling characteristics i.e., monthly rent, dwelling space, rent per square meter, and space per capita. Only 162 respondents provided their exact dwelling space. The respondents who did not mention an exact dwelling space had been asked to indicate a category (range) for their dwelling space (< 40, 40–60, ≥60). The responses of the 162 respondents were used to calculate the rent per square meter and space per capita. For the regression analyses, these responses were categorized and added to the responses of the other respondents. It is clear from Table 5 that tenants in urban village housing had the lowest rent per square meter and space per capita, while LTRA tenants had the most expensive rent per square meter. Nonetheless, the mean dwelling space of urban village housing was larger than LTRA.

5.1.3. Neighborhood characteristics

Table 6 reports the location of respondents' housing and the public facilities nearby. Most of the respondents lived in the outer districts of Shenzhen even if they were reached in the inner districts, maybe because of the severe rental housing shortage and high rents in inner districts. Nevertheless, the proportion of inner-city housing was apparently higher in the commercial rented sub-sector. In terms of public facilities, all of them are present more frequently in the commercial rented sub-sector and less frequently in the urban villages. The most pervasive facilities were the market and bus station while the scarce facilities were subway entrance, primary school, and hospital.

5.1.4. Landlord services

Table 7 shows the proportions of tenants who indicated that they had received five different landlord services. The most commonly mentioned landlord service was "signing a written contract". The vast majority of tenants had a written contract in each sub-sector, which was significant progress compared with the findings of Wu (2016). According to his study, only 16%, 28%, and 56% of the urban village tenants in Shanghai, Beijing, and Guangzhou signed a written contract in 2010. On the contrary, "maintaining a pest-free environment" was the most infrequent landlord service, which was indicated by only one-fourth of the respondents. The proportions of tenants who received landlord services are highest in the LTRA sub-sector (except "written contract"), which indicates landlord services in LTRA are generally better. In contrast,

Table 5 Numerical characteristics of the dwelling.

		Urban village N = 285	Commercial housing N = 206	LTRA N = 128	Total N = 619
Total rent (RMB) N = 619	Mean	1820	2717	2143	2186
	Median	1600	2200	1900	1800
	S.D.	1020	1857	1188	1461
Space (m ²) N = 162	Mean	47	60	36	52
	Median	39	58	30	40
	S.D.	30	30	25	30
Rent per square meter (RMB/m ²) N = 162	Mean	53	67	88	64
	Median	44	54	70	52
	S.D.	43	38	67	47
Space per capita (m ²) N = 162	Mean	19	31	30	26
	Median	15	28	21	20
	S.D.	16	18	24	19

Table 6 Neighborhood characteristics of the respondents.^a

	Urban village N = 285 (%)	Commercial housing N = 206 (%)	LTRA N = 128 (%)	Total N = 619 (%)
Location				
Inner Shenzhen	12	25	19	18
Outer Shenzhen	88	75	81	82
Market	91	92	93	92
Primary school	46	50	39	46
Hospital	39	44	36	40
Park	52	53	55	53
Shopping mall	57	59	61	59
Subway entrance	32	38	41	36
Bus station	70	83	79	76

^a The listed public facility variables are binary variables as respondents were asked to indicate whether each public facility exists within 1 km range.

Table 7 Landlord services in each sub-sector.^a

	Urban village N = 285 (%)	Commercial housing N = 206 (%)	LTRA N = 128 (%)	Total N = 619 (%)
Your landlord signs a written contract with you	80	89	88	85
Your landlord makes any requested repairs promptly	46	53	62	52
Your landlord ensures that living conditions are hazard-free	37	51	53	45
Your landlord maintains a "pest-free" environment	16	24	40	24
Your landlord gives notice before entering a rental unit	45	56	57	51

^a The percentages are those who indicated to have received the specific service from their current landlord.

respondents living in the urban village sector were indicated to receive the five services least frequently.

According to the descriptive results, the three sub-sectors vary considerably from each other. In specific, the urban village sub-sector has the lowest quality in terms of housing, neighborhood facilities, and landlord services and targets the tenants who are generally older, less affluent and educated, and in the later stage of their life circle. The commercial rented sub-sector has apparently better housing quality and slightly better neighborhood facilities and attracts tenants with higher income and educational attainment. The LTRA sub-sector has a moderate quality of housing and neighborhood but the best landlord services, targeting young professionals who are unmarried and have a middle income, which confirms our analysis in Section 2. However, the difference in landlord services was small when compared with the commercial rented sub-sector.

5.2. Residential satisfaction in three sub-sectors

The purpose of this section is to examine whether tenants living in different sub-sectors have different satisfaction levels on the overall residential environment and seven specific aspects. The distribution of the mean residential satisfaction level in each sub-sector is plotted in Fig. 4. The proportions of private tenants who were satisfied or very satisfied with their residential environment are 60%, 75%, and 73% in urban village housing, commercial housing, and LTRAs respectively.

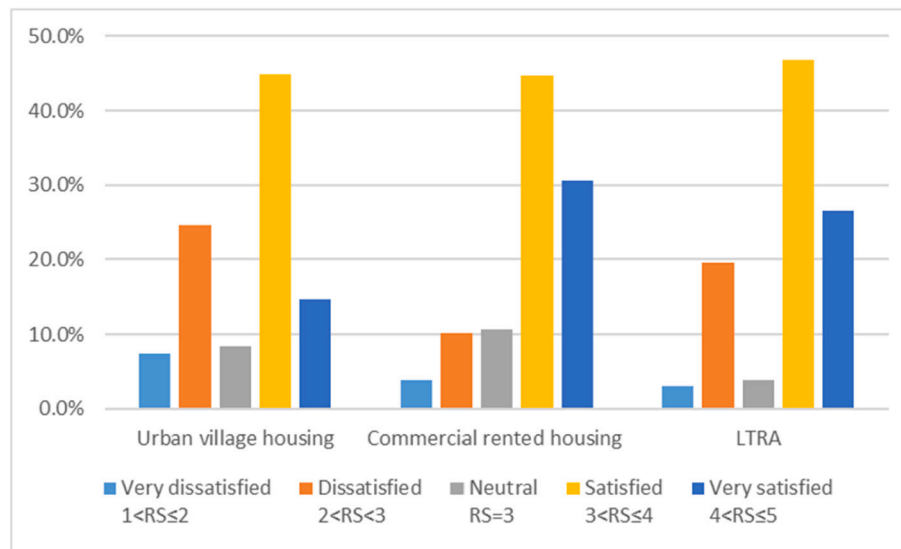


Fig. 4. Distribution of mean residential satisfaction score in each sub-sector
 Note: RS refers to residential satisfaction measured by the mean value of the aforementioned seven items.

Meanwhile, the proportion of tenants who were “very satisfied” in the urban village housing is obviously lower than in the other two sub-sectors. Table 8 presents the mean satisfaction score of private tenants among three sub-sectors on seven aspects of the residential environment as well as the average score of these seven items. Tenants living in urban village housing expressed the lowest satisfaction level on all seven aspects. Tenants living in commercial housing have higher levels of satisfaction on five aspects (except housing and landlord) than tenants living in LTRA. To explore whether the difference in overall residential satisfaction is statistically significant, a one-way ANOVA was employed. The results showed that tenants in LTRA and commercial housing have significantly higher levels of residential satisfaction compared to tenants living in urban villages ($F = 16.68, df = 2, p < 0.001$), while this difference is not significant between LTRA and commercial housing ($p = 0.311$). Indeed, satisfaction with the seven distinct aspects showed the same pattern, except for the greenery. Tenants living in urban villages and LTRA did not express significant differences in terms of green spaces in the community, while tenants in commercial housing are significantly more satisfied.

5.3. Regression results

In this section, the determinants of residential satisfaction in each sub-sector will be explored using multivariate regression. The dependent variable was residential satisfaction, which was the mean value of the aforementioned seven items. The independent variables are personal characteristics, housing characteristics, neighborhood characteristics, and landlord services. The results are summarised in Table 9. Note that variables such as gender, household composition, local hukou, etc. were excluded because they were insignificant in each model, meaning that they had no relationship with residential satisfaction. The three models explained a considerably different amount of variation in residential

satisfaction. The model in LTRA had the highest predictive power ($R^2 = 0.555$), urban housing was in between (40.8%) while the model in commercial housing explained the fewest variance ($R^2 = 0.264$).

Table 9 shows that the presence of a park and less commuting time are related to higher residential satisfaction in each sub-sector. Having a park nearby increases residential satisfaction by 0.19 to 0.35, depending on the subsector. For the commuting time, the impact is most remarkable for LTRA tenants. Besides these two common predictors, the determinants in different sub-sectors varied remarkably. For tenants living in urban villages, the statistically significant predictors were household income, educational attainment, occupation, living space, housing layout, presence of cooking facilities, inner-city, presence of shopping mall nearby, “having a written contract” and “ensuring that living conditions are hazard-free”. Judging from the standardized coefficients, the presence of cooking facilities was the most important predictor (0.251), followed by “high income” (0.185), “self-employed” (0.185), and “hazard-free” (0.18). Looking at the commercial housing tenants, it is shown that their personal and household characteristics did not significantly influence their residential satisfaction level. For them, the significant determinants were housing layout, “adequate space”, “written contract”, and “pest-free”. “Maintaining a pest-free environment” had the largest impact on tenants’ residential satisfaction in the commercial rented sector, followed by tenants’ perception of adequate space. In the LTRA sub-sector, the statistically significant predictors were age, household income, educational attainment, dwelling space, presence of balcony, “adequate privacy”, presence of hospital, and “pest-free”. Surprisingly, tenants living in units of 40–60 square meters expressed lower levels of residential satisfaction than those living in housing < 40 square meters. This may be because a larger dwelling space does not mean a larger space per capita. Besides, a larger space may be associated with higher rents. The most important predictor was educational attainment (0.363), followed by “pest-free” (0.358), and the

Table 8
 Mean satisfaction score in three sub-sectors.

	Housing	Neighborhood	Landlord	Greenery	Cleanliness	Quietness	Security	residential satisfaction
Urban village N = 285	2.97	3.06	3.25	3.21	3.48	3.05	3.72	3.25
Commercial housing N = 206	3.32	3.47	3.46	3.71	3.80	3.55	4.16	3.64
LTRA N = 128	3.34	3.30	3.56	3.43	3.72	3.46	4.02	3.55

Table 9
Determinants of residential satisfaction in each sub-sector.

	Urban village		Commercial housing		LTRA	
	Coeff.	St. Coeff.	Coeff.	St. Coeff.	Coeff.	St. Coeff.
Constant	2.732***		2.699***		3.115***	
Personal characteristics						
Age					0.029**	0.25
Household income (Ref = low income)						
Lower-middle income	-0.158	-0.097			-0.179	-0.111
Middle-higher income	-0.088	-0.051			-0.411*	-0.263
High income	-0.483**	-0.185			-0.608**	-0.283
Educational attainment (Ref = middle school & below)						
High school	-0.394***	-0.218			-0.666**	-0.346
Junior college	-0.386**	-0.216			-0.278	-0.157
Bachelor's degree & above	-0.294*	-0.159			-0.557**	-0.363
Occupation (Ref = private sector)						
Public sector	0.290*	0.113				
Self-employed	0.346***	0.185				
Unemployed	0.246	0.1				
Commuting time (Ref ≤ 15 min)						
15–30 min	-0.263**	-0.152	-0.167	-0.073	-0.522**	-0.315
> 30 min	-0.194	-0.117	-0.242*	-0.13	-0.268*	-0.171
Housing characteristics						
Living space (Ref ≤ 40 m ²)						
40–60 m ²	0.073	0.035			-0.468**	-0.239
Above 60 m ²	0.388**	0.21			0.223	0.11
Housing layout (Ref = studio)						
One-bedroom	0.221*	0.136	0.299*	0.197		
Two bedrooms	0.030	0.017	0.146	0.088		
Three and more bedrooms	-0.126	-0.054	0.392*	0.205		
Balcony					0.534***	0.35
Cooking facilities	0.409***	0.251				
Adequate space			0.335***	0.224		
Adequate privacy					0.285**	0.185
Neighborhood characteristics						
Inner city	-0.317*	-0.129				
Park	0.187*	0.118	0.245**	0.164	0.353**	0.23
Shopping mall	0.205**	0.129			-	
Hospital					-0.315**	-0.198
Landlord service						
Written contract	0.252**	0.127	0.462**	0.195		
Hazard-free	0.293***	0.18				
Pest-free			0.395***	0.227	0.559***	0.358
R square	0.408		0.264		0.555	

* $p < 0.05$.
 ** $p < 0.01$.
 *** $p < 0.001$.

presence of a balcony (0.35).

6. Discussion

The present study has shown that the private rental sector is not unified but demonstrates considerable variations, which is consistent with Whitehead and Kleinman (1985) and Rugg et al. (2002). Our sample of private tenants in Shenzhen was generally satisfied with their residential environment, showing contradiction with some previous studies that found tenants had generally low residential satisfaction (Hu, 2013; Huang et al., 2015). For example, Hu (2013) found that only about 30% of tenants were satisfied with their housing based on an analysis of a national database. This may be because all respondents in our study lived in Shenzhen, where the housing options are quite limited while the sample in Hu's (2013) research was a national population. Researchers have found that the vast majority of tenants, even those who live in poor-quality homes, are satisfied with their dwellings because the lack of alternative housing options leads to reduced aspirations (Jansen, 2013, 2014b; Varady & Carrozza, 2000). This finding

supports Song et al.'s (2008) assertion that urban villages play an important role in the urban housing system as they have not only provided inexpensive shelter for migrants but also have freed governments from building costly social housing for the low-income groups. However, the residential satisfaction level of urban village tenants was significantly lower than commercial rented and LTRA tenants, while the difference is not significant between the latter two sub-sectors.

The determinants of residential satisfaction vary considerably among different sub-sectors. Two common determinants of residential satisfaction in each sub-sector are the presence of a park nearby and commuting time. These findings correspond with Liu et al. (2017) who found parks can facilitate physical activities and interaction with nature, thus bringing mental health benefits, and Mouratidis (2020) who found commuting satisfaction is positively related to neighborhood satisfaction.

Age is positively related to residential satisfaction in the LTRA sub-sector, which is consistent with Parkes et al. (2002) and Amole (2009) who found age was a positive predictor for residential satisfaction among young people. This may be because the proportion of friends and

relatives nearby increases and as age increases (Speare, 1974, p. 183). Considering age was not a significant determinant in the urban village sub-sector and commercial housing sub-sector, our finding echoes with Waziri et al. (2014) who found age was a determinant for residential satisfaction only “for a given interval of time and within specific age groups (Morrison, 1967, p. 555)”. Interestingly, higher income is negatively related to residential satisfaction in the urban village and LTRA sub-sector while it is insignificant in commercial housing. This result seems contradictory to many previous studies that found income was positively related to residential satisfaction (Chen et al., 2013; Ren & Folmer, 2017) because households with low income have limited choice on where to live while having a higher income generally means that there are more possibilities to move to a better dwelling and neighborhood (Américo & Aragones, 1997; Dekker et al., 2011). However, it is understandable as our regressions were conducted within each sub-sector. This result indeed suggests that tenants with high income have higher expectations for their residential environment but living in urban village housing or LTRAs cannot meet their expectations. On the contrary, income was insignificant in the commercial rented sub-sector, which implies tenants of all different income levels living in commercial rented housing were generally satisfied. In other words, LTRAs are able to meet the aspirations of tenants with different incomes. The same rationale could also be applied to educational attainment. Tenant’s occupation matters only in the urban village sub-sector. Urban village tenants working in the private sector were less satisfied than those working in the public sector or self-employed, which is consistent with Chen et al. (2013) and Wang et al. (2019). This may be because people working in the public sector and self-employed spend less time at work but more time at home or in the neighborhood compared to private employees (Mishra & Smyth, 2013; Wang & Hancock, 2019). When more time is spent in the residential area, they gradually adapt to their living conditions and also devise coping strategies that can improve their satisfaction level (Amole, 2009).

As for housing characteristics, it is shown that tenants in different sub-sectors value different aspects. For example, space has a different influence among different sub-sectors, which is somewhat inconsistent with previous studies that often found larger space could contribute to higher residential satisfaction levels (Dekker et al., 2011). Another example is that the presence of cooking facilities is strongly related to residential satisfaction in the urban village sub-sector but it is insignificant in the other two sub-sectors. This is maybe because urban village tenants have a greater reliance on self-cooking while commercial housing tenants and LTRA tenants are more likely to use online meal-ordering. Similarly, commercial housing tenants care more about adequate space while LTRA tenants value a balcony and adequate privacy from the neighbors. These results demonstrate that the determinants of residential satisfaction should be examined within different sub-sectors, otherwise the results may be misleading.

With regard to neighborhood characteristics, urban village dwellers living in inner-city districts were less satisfied than those living in outer districts, perhaps because of the degraded facilities (Wang et al., 2019) or relatively higher living expenses. Besides, the presence of a shopping mall nearby can significantly increase urban village tenants’ residential satisfaction levels while it is not a determinant in the other two sub-sectors, suggesting tenants in different sub-sectors have different sources of entanglement. Interestingly, the presence of a hospital nearby had a significantly negative impact on tenants’ residential satisfaction in the LTRA sub-sector, which is contrary to the findings of Huang and Du (2015). This may be attributed to the loud sirens from the ambulances or crowding on the streets.

Having a written contract can significantly improve residential satisfaction in the urban village sub-sector and commercial rented sub-

sector,¹¹ which is a new finding to the best of our knowledge. “Ensuring hazard-free living conditions” was only significant in the urban village sub-sector, suggesting that urban village tenants were concerned about the potential safety hazards in the residential environment. This finding is consistent with James (2008) who found maintenance could increase residential satisfaction of elderly tenants living in apartment housing. Last but not least, “maintaining a pest-free environment” was a strong predictor in the commercial housing and LTRAs, which may be attributed to the warm moist environment in Shenzhen. As Shenzhen is located in southern coastal China, the cockroach problem is ubiquitous and quite troublesome. However, it is an insignificant predictor in the urban village sub-sector, which means urban village tenants are less sensitive to pests like cockroaches compared to other tenants living in commercial housing and LTRAs. This finding corresponds to Varady and Carrozza’s (2000) assertion that the tenants living in poor-quality housing have low expectations because they know there are few available housing options for them.

7. Conclusion

The current paper aims to distinguish different sub-sectors in China’s superstar cities, examine the differences among the sub-sectors, and explore the determinants of tenants’ residential satisfaction in each sub-sector using Shenzhen as an example. To the best of our knowledge, it is the first study to examine the residential satisfaction and its determinants among private tenants living in different sub-sectors in China’s superstar cities.

The results show that private tenants are generally satisfied with their residential environment, although tenants living in commercial housing and LTRAs are more satisfied than those living in urban village housing. Furthermore, the current study demonstrates that tenants’ residential satisfaction is influenced by a combination of personal characteristics, housing characteristics, neighborhood characteristics, and landlord services. The determinants of residential satisfaction vary considerably among different sub-sectors, suggesting different groups of tenants have different aspirations about their living conditions. The results of this paper can be useful not only for the individual and institutional landlords to improve tenants’ residential satisfaction on specific aspects but also for policy-makers engaged in private rental market development and urban renewal. For example, urban village landlords should better provide cooking facilities and maintain a hazard-free living environment to improve the residential satisfaction level of their tenants. In addition, urban village landlords could consider building larger rental dwellings with living space above 60 m². While commercial housing landlords and LTRA landlords should get rid of pests regularly. Furthermore, LTRA companies might consider avoiding building rental dwellings with living spaces between 40 and 60 m², because the demand for “medium space” rentals may not be high for their target customers in Shenzhen. For urban planners and policy-makers, it is important to keep in mind that the ongoing urban village housing renovation program in Shenzhen should be operationalized with great caution as urban villages indeed accommodate the vast majority of private tenants, especially the low-income households. Arbitrary demolishing and gentrification might deprive their last resort living in superstar cities. It is recommended that a small number of pilot urban village rentals and LTRAs could be gentrified to meet higher housing needs. More importantly, legislation should be enacted to oblige the landlords to sign a written contract with their tenants. Regulations should specify what responsibilities landlords should take and what services to be provided. For urban planners, the construction of parks in residential areas and building more shopping malls near urban villages could be taken into consideration. Considering a top-down approach is

¹¹ Only 15 LTRA tenants did not have a written contract, so this variable is excluded from regression in the LTRA sub-sector.

usually implemented in urban renovation process (Zhuang et al., 2019), more informative surveys should be conducted among the residents to better understand their aspirations.

A limitation of this study concerns the sample representativeness. Given the wide variation among superstar cities in China, generalizations of the findings need to be made with prudence. Furthermore, as there are few official data about the characteristics of private tenants in Shenzhen, this study only serves as an exploratory work on the residential satisfaction of private tenants in China's superstar cities. Future research could explore other alternative structures of rental housing provision and examine the variations of tenants' residential satisfaction levels between different superstar cities.

CRediT authorship contribution statement

Bo Li: Writing- Original draft preparation, Conceptualization, **Chi**

Jin: Data collection, Investigation, Software. **Sylvia J.T. Jansen:** Writing- Reviewing and Editing **Harry van der Heijden:** Methodology **Peter Boelhouwer:** Supervision.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A



Fig. 5. Urban village housing in Baoan district.
Source: Taken by Chi Jin



Fig. 6. LTRA in Baoan district.
Source: Taken by Chi Jin



Fig. 7. Commercial housing in Nanshan district.
Source: Taken by Chi Jin

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