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# Meeting Chinese New-Generation Young Single-Person Households' Unique Housing Demand: General Backgrounds and A Case Study of the "Lingyu 3.0" Single-Occupancy Apartment Model

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## Abstract

**Purpose:** Consistent with the global trend, both the total number and the population ratio of single-person households has surged in the past few decades, especially among those aged 20-39. How to meet this group's housing and community-life demand has become a significant social concern. **Research methodology:** This paper begins by reviewing the living conditions and arrangement of single-person households worldwide, highlighting the global growing prevalence of living alone. It is observed that young single-person households in China face several housing challenges, including the shortage of suitable and quality small housing units, mismatches in needs and demand, and constraints from institutional operations. This paper also examines the lifestyle characteristics and unique housing needs of young single-person households, emphasizing that the freedom and independence associated with living alone come with challenges such as loneliness, social difficulties, and a lack of security. **Results:** It is observed that strong dependency, inadequate life skills, and pronounced individualism are significant realities for young people living alone today. To provide inspirations on solutions to address these challenges, this paper uses the Lingyu 3.0 single-occupancy apartment model as an example to illustrate how innovative design can meet the needs of young single-person households, proposing strategies for creating suitable living environments. These strategies include concept reshaping, methodological innovation, space design, and technological empowerment. **Conclusions:** It is therefore crucial to foster a conducive living environment for young single-person households not only enhances individual quality of life but also supports the mental health and social integration of this demographic, contributing to social stability and sustainable development. The paper concludes by stressing the importance for multi-stakeholders to form sustainable collaboration in producing humane, personalized, and diverse housing and community solutions for the new generation single-person households.

**Keywords :** single-person household; living alone; living needs; psychological needs; housing and community design

**JEL Classification Code :** E44, F31, F37, G15

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## 1. Introduction

The last few decades have witnessed significant demographic restructuring globally, and the rapid rise of single-person households is one of the most prominent global demographic phenomena and this trend extends across all world regions (Ortiz-Ospina, 2024). It is estimated that the number of single-person households rose by 31% between 2010-2019, with half of growth attribute to Asian countries (Rude, 2020).The expansion of the single-person household population has been particularly significant in China over the last three decades.

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Based on waves of historical data from China's population censuses, the ratio of single-person households in all households was 6.30% in 1990, reached 8.56% in 2000, surpassed 11% in 2010 and soared to an astonishing level of 25.39% in 2020 (see Table 1). Over the thirty years from 1990 to 2020, the proportion of single-person households has more than quadrupled, underscoring the growing importance of addressing the housing needs of this demographic as a key component of improving China's housing system.

**Table 1 :** Changes in the size of single-person households in China, 1990-2020

Year	Single-person households surveyed	All households surveyed	Proportion of single-person households
1990	184,090	2,923,140	6.30%
2000	29,555	345,167	8.56%
2005	53,407	741,224	7.21%
2010	74,514	630,417	11.82%
2015	45,276	405,829	11.16%
2020	125,490,007	494,157,423	25.39%

Source: Compiled by the authors based on available data from all national censuses from 1990-2020.

Factors such as delayed marriage, increased job mobility, and personal preferences have driven more young people to move out of their parents' homes and live independently, making "one-person households" and "empty-nest youth" increasingly prevalent (Li & Zhen, 2023). According to the *China Population and Employment Statistical Yearbook 2023*, there are currently 240 million single-person households in China. In legal terms, "single" typically refers to adults not in a marital relationship, including those who are divorced, widowed, or have never married.

This paper specifically focuses on the living conditions of unmarried young single-person households aged 20-39. According to national statistics from 2022-2023, the probability of being unmarried among those aged 25-29 in China reached 51.3%, while the rate for those aged 30-34 was 18.4%. Additionally, the age at marriage and childbearing in China has been increasingly delayed. According to the Seventh National Population Census, in 2020, the average age at first marriage for men and women reached a historic high of 29.38 and 27.95 years, respectively. A recent real estate industry research report forecast that, by 2030 the total population of individuals living alone in China could reach 150-200 million and the number of young people aged 20-39 living alone is projected to rise to 40-70 million (Shell, 2021).

As China enters a new era of development featured with rising number of middle-class, the contradiction between the people's growing demand for quality life and inadequate supply of quality goods and services becomes intensified. Housing, as a vital sector of public welfare, faces a similar challenge—the increasing demand from the single-person households for a better living environment versus the mismatch in market supply. Addressing the living environment needs of the expanding young single-person households has become both critical and urgent.

## 2. The Housing Challenges Facing Young Single-Person Households

### 2.1. The Housing Conditions of Young Single-person Households Worldwide

The research report "The New Age of Solitude Report, NASR" by Shell Research Institute reveals the global increasing prevalence of solitary living and its notable manifestations in major countries (Shell Institute, 2021). The rate of solitary living has reached historical highs—28% in the U.S., 34% in Japan, and over 40% in Sweden, Germany, and Finland. These statistics indicate that living alone has become a significant lifestyle in modern societies.

In major U.S. cities like New York and Los Angeles, more than half of the population opts for single living, resulting in a high proportion of single residents (Bennett, 2006). Young singles in the U.S. favor small apartments and shared living arrangements, with renting being the primary mode of housing (Olson et al., 2022). According to the Shell Research Institute, Harvard University's Joint Center for Housing Studies' 2017 American Rental Housing Report<sup>6</sup> indicates that between 2005 and 2016, the proportion of single renters surged by 6.4 percentage points, cementing singles as the primary demographic in

<sup>6</sup> See <https://www.jchs.harvard.edu/research-areas/reports/americas-rental-housing-2017> for details.

the rental market. The U.S. rental housing market is also highly developed, with an institutionalization rate nearing 55%, providing a range of tailored living solutions for young singles. For instance, industry leader NASR reports that 40% of its clientele are single renters, with a product line heavily slanted towards one-bedroom apartments ranging from 37 to 93 square meters, effectively capturing market demand.

Focusing on Japan, Wang et al. (2022) analyze the changes in Japanese family structures from 1960 to 2020, highlighting key trends. They found that the stabilization of nuclear families, the decline of extended families, and the rise of single-person households are prevailing trends. The proportion of single-person households doubled from 16.1% to 38.1% during this period. This increase is closely linked to the decline of extended families, driven by delayed or abandoned marriage and childbirth, such as late marriage, non-marriage, divorce, and fewer births. Regarding housing conditions, the rise in single living has increased the proportion of single-person households, with singles making up half of the rental market. Data shows that Japan's overall rental rate stays around 40%, and nearly 60% of renters are under 40, reflecting the youth's preference for flexible living. In cities like Tokyo, high population density and limited land make small apartments ideal for young singles. These compact apartments are thoughtfully designed to meet the needs of single youths. Data from Japan's National Institute of Population and Social Security Research further confirms the rise in single-person households and the construction boom of one-bedroom apartments, signaling that solitary living is deepening in Japan and altering living patterns. The rental market in Japan has matured and has become a vital part of the housing supply system.

In South Korea, Statistics Korea's "2021 Korea Social Indicators" report indicates that the population has been consistently declining since 2010<sup>7</sup>. The average household size has also decreased from 3.12 persons in 2000 to 2.34 persons in 2020. Single-person households have surged, from 15.5% in 2000 to 31.7% in 2020, becoming the most prevalent household type, with this trend expected to persist until 2047. This increase is tied to low economic growth, youth unemployment, and job instability. Like Japan, South Korea's rental market is appealing to singles, with rental rates remaining high. Young singles, in particular, dominate the rental market. According to a study by the Korea Real Estate Research Institute, over 50% of young singles choose to rent, favoring flexible and convenient living arrangements to cope with the fast-paced urban lifestyle and high job mobility. This trend is especially pronounced in major cities like Seoul, where land scarcity and high housing prices make small apartments (such as studios and one-bedroom units) the preferred choice. These apartments are not only designed to maximize space but also incorporate smart and personalized features to meet the lifestyle demands of young singles. The South Korean government is addressing this trend by introducing housing support policies, such as building youth housing in economic zones near subway stations and converting hotel rooms to increase the supply of small housing units.

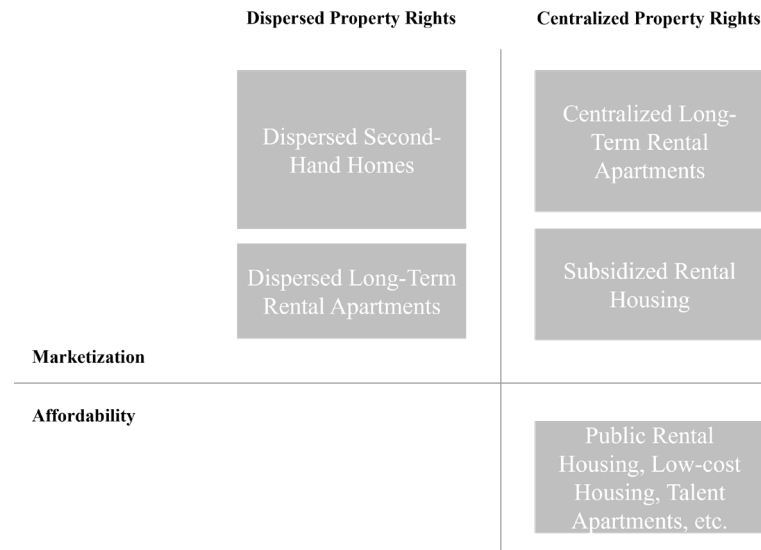
## 2.2. The Housing Conditions of Young Single-Person Households in China

Data suggests that the rapid increase in the solitary population in China is part of a global trend. In China, renting is the main solution to meet young single-person households' housing needs in the cities (Wang, 2023). Compared to the U.S., Japan, and South Korea, China's rental housing market develops only recently, with the emergence of long-term rental apartments for singles only around 2010. In recent years, the Chinese government has vigorously promoted the development of the rental housing market. Since 2016, the housing system in China has been considerably restructured, making significant strides towards achieving a balance between renting and purchasing. However, there is still substantial room for growth in China's rental housing market. The Seventh National Population Census shows that the proportion of Chinese residents renting homes is 21% in the year of 2020, which is lower than in most developed countries. Additionally, the primary suppliers of rental housing in China are still individual landlords. China Securities pointed out that as of 2021, the institutionalization rate of the Chinese rental housing industry was still under 10%, far below the average level of 50%-60% in developed countries.

The rental housing supply system shows a diversified pattern based on its supply mechanisms and property characteristics in China. Specifically, from the supply method dimension, it can be divided into two main categories: market-based rental and government-subsidized rental. From the property structure perspective, it is subdivided into two models: dispersed rental and centralized rental, as illustrated in Figure 1.

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<sup>7</sup> Data from the National Statistical Office of Korea (<https://kostat.go.kr/anse/>)



**Figure 1.** Diagram of the Rental Housing System in China

Government-subsidized rental housing, a crucial livelihood project under government leadership, seeks to alleviate the housing challenges of low-income and disadvantaged groups through government ownership and operation. In comparison, market-based rental housing sources are broadly derived from individual landlords and professional agencies, serving a wider range of consumers and fulfilling varied rental requirements.

In the dispersed property rental domain, large-sized apartments take up a significant portion. These properties often require multiple tenants to co-rent, sharing living space and public amenities. Although rental costs are relatively low, the arrangement also comes with challenges related to space sharing and daily coordination with housemates. In contrast, the centralized rental market, especially exemplified by long-term rental apartments in commercial-to-rental conversion projects, features properties typically managed as entire buildings, presenting strong advantages of intensive management. The design of such properties tends to favor small, well-furnished studio apartments, directly targeting the housing preferences of young tenants. Moreover, government-subsidized rental housing, as a new rental product strongly endorsed by the country in recent years, not only offers various housing options but also actively integrates commercial, educational, and medical resources, aiming to build a holistic community ecosystem that incorporates living, lifestyle, and services. This initiative strives to improve the living quality and happiness of specific groups, such as single young people.

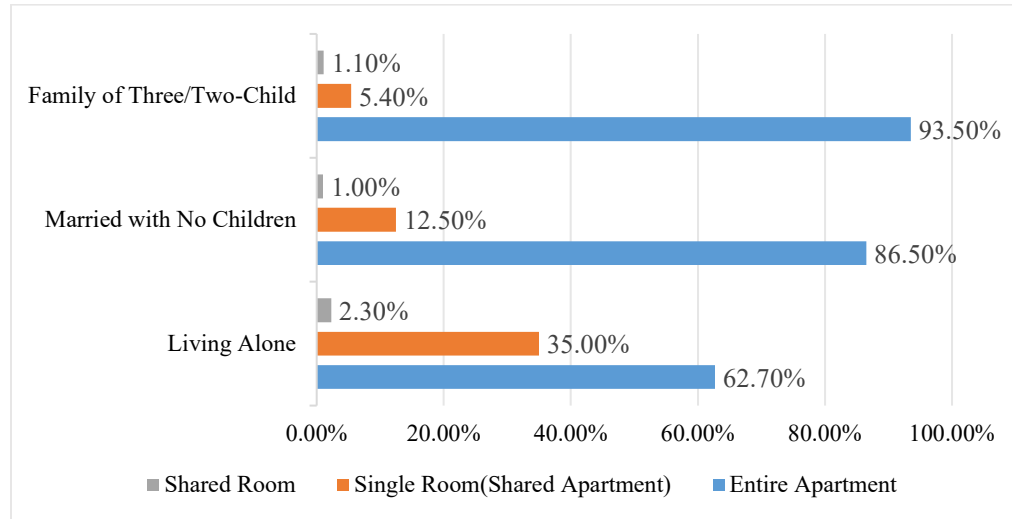
### 2.3. The Living Challenges of Young single-person households in China

Due to the late development of China's rental housing market, there are still evident problems and challenges in the market's growth.

#### 2.3.1. Scarcity of Small Units: Shackles of Whole-rent Freedom

Single young people, after leaving their original families and striving alone in cities, find that having a private space is crucial for enhancing their happiness in fast-paced urban life (Fritsch et al., 2023). According to data from the 58 Anjuke Research Institute<sup>8</sup>, up to 62.7% of single residents prefer renting a whole apartment. This data not only reveals their yearning for independent living space but also underscores the current imbalance in the supply-demand structure of the rental market. Nevertheless, the reality is that urban housing markets are generally oriented towards family living, with medium to large, multi-bedroom homes dominating. Small, low-rent apartments are scarce resources that can hardly meet the growing needs of young singles living alone, as illustrated in Figure 2.

<sup>8</sup> Data from 58 Anjuke Research Institute "2024 Post-holiday Rental Survey Report" (<https://ai.anjuke.com/introduce/hydc>)



Source: 58 Anjuke Research Institute, "2024 Post-holiday Rental Survey Report"

**Figure 2.** Preferred Housing Types Among Different Tenant Categories

Data from the NASR indicates that between 2000 and 2019, China only added approximately 20 million one-bedroom apartments, which is far from sufficient to meet the demand of the roughly 60 million increases in the single-person population during the same period. This supply-demand gap has forced many single youths to give up the ideal of renting an entire apartment and instead choose shared living arrangements. In first-tier cities such as Beijing, co-renting is especially prevalent, with as many as 66% of tenants living in shared accommodations. Among these tenants, 76.5% have to share their space with strangers. In this mode of living, constrained personal space and differing living habits can easily lead to conflicts, increasing the loneliness and anxiety of single youths and posing a potential threat to their mental health.

### 2.3.2. Homogenization of Housing Products: High Quality of Life out of Reach

Confronted with the realities of the rental market, single youths often find themselves having to settle for "old and small" residences located in city centers or long-term rental apartments converted from commercial office buildings. These rental units typically have issues such as aging buildings and outdated infrastructure, which significantly compromises the living experience. Beike Research Institute points out that nearly 80% of single tenants in Beijing are renting apartments over ten years old, underscoring the urgent necessity for improving living conditions.

At the same time, while long-term rental apartments in the market partially address the issue of living space, they suffer from severe homogenization, making it difficult to meet tenants' expectations for high-quality living environments. According to the "2023 Long-term Rental Apartment Youth Tenant Living Behavior Survey Report,"<sup>9</sup> the most dissatisfactory factors regarding living conditions in China's core cities are high prices, small spaces, and poor soundproofing. Additionally, for the refined youth of Chengdu, "poor renovation quality" and "poor community environment" are also troubling issues (see Table 2.).

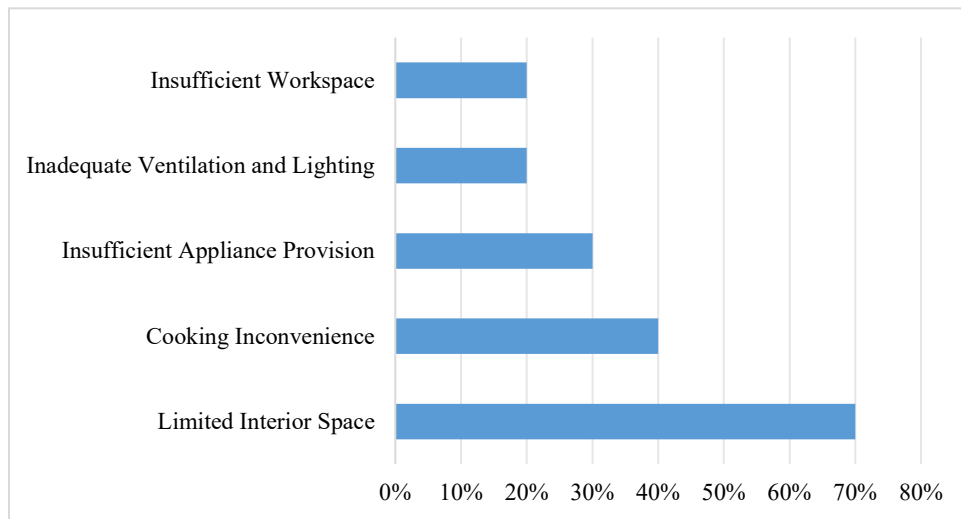
<sup>9</sup> Data from Coral Data (<http://www.coraldata.com.cn/tank>).

**Table 2:** Six Leading Causes of Tenant Dissatisfaction in Major Chinese Cities by Percentage (%)

Beijing		Shanghai		Hangzhou		Chengdu	
Excessive Price	31.35	Inadequate Sound Insulation	41.91	Inadequate Sound Insulation	35.54	Inadequate Sound Insulation	30.53
Inadequate Lighting	25.4	Limited Space	27.57	Excessive Price	21.69	Excessive Price	19.85
Negligent Property Management	23.41	Excessive Price	27.21	Prolonged Commute	13.25	Substandard Renovation Quality	13.74
Inadequate Sound Insulation	23.02	Inadequate Lighting	19.49	Insufficient Local Amenities	12.65	Limited Space	13.74
Insufficient Local Amenities	22.62	Renewal Rent Hike	13.24	Renewal Rent Hike	10.84	Degraded Community Environment	12.21
Renewal Rent Hike	19.44	Prolonged Commute	12.13	Limited Space	10.24	Insufficient Local Amenities	12.21
Guangzhou		Shenzhen		Fuzhou		Xiamen	
Inadequate Sound Insulation	45.31	Inadequate Sound Insulation	29.93	Inadequate Sound Insulation	48.01	Inadequate Sound Insulation	47.74
Limited Space	36.72	Pest Infestation (Cockroaches, etc.)	24.82	Insufficient Local Amenities	38.43	Excessive Price	28.98
Excessive Price	25.02	Excessive Price	21.9	Pest Infestation (Cockroaches, etc.)	18.4	Pest Infestation (Cockroaches, etc.)	26.71
Pest Infestation (Cockroaches, etc.)	25	Limited Space	17.15	Insufficient Services	16.29	Limited Space	20.45
Inadequate Lighting	24.22	Renewal Rent Hike	15.33	Prolonged Commute	15.24	Insufficient Local Amenities	15.34
Prolonged Commute	14.84	Prolonged Commute	14.6	Substandard Renovation Quality	15.2	Inadequate Lighting	14.21

Note: Data compiled by the author from the 2023 Survey Report on the Renting Behavior of Young Tenants in Long-term Apartments

CRIC research further highlights the deficiencies of centralized apartments in internal space layout, cooking convenience, and home appliance provisions, resulting in low living satisfaction. These shortcomings have become major factors restricting the enhancement of living quality for single young people, as illustrated in Figure 3.

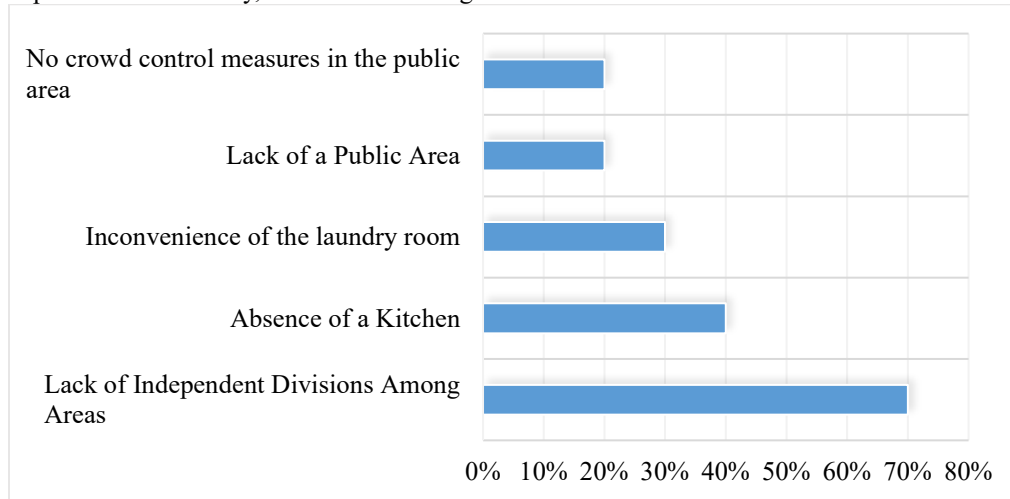


**Figure 3.** Proportions of Dissatisfaction Factors in Interior Design of Centralized Apartments

**2.3.3. Mismatch of Social Needs: Spread of Loneliness**

Living alone does not equate to social isolation; rather, single young individuals have even stronger social needs (Byrd & Ahn, 2020). However, in older residential areas, social facilities are relatively lacking, and the resident population is predominantly elderly. In such an environment, single youths often find it difficult to establish a resonant social circle, which affects their sense of belonging in these communities. Although long-term rental apartments include communal areas to

facilitate interaction and engagement among tenants, these public spaces are often limited by the overall layout and spatial restrictions, making it hard to satisfy various social needs. Whether seeking quiet personal moments or craving a bustling party atmosphere, these desires may be hindered by space limitations, thereby impacting the overall vibrancy and harmonious atmosphere of the apartment community, as illustrated in Figure 4.



**Figure 4.** Proportions of Dissatisfaction Factors in Public Area of Centralized Apartments

#### 2.3.4 The Constraints of Institutionalized Operations: Individualized Needs Ignored

While institutional operations in the rental market have somewhat improved service efficiency, standardized service models often neglect the individualized needs of young single-person households. From property amenities to service offerings, institutions frequently adopt uniform standards, making it difficult to flexibly adapt to the specific needs of tenants. Take pet companionship as an example: pets have become a crucial way for many single young people to relieve stress and seek emotional companionship. However, due to concerns about property maintenance and market turnover, most apartments prohibit pets. This regulation undoubtedly limits young people's lifestyle choices to some degree, intensifying their feelings of loneliness and dissatisfaction.

### 3. Characteristics and Needs of Contemporary Young People Living Alone

In today's society, the demand for young people to live alone has become a significant social phenomenon. Besides the necessity to better satisfy their physical housing needs, addressing the psychological needs of young people is essential for their holistic development and the overall stability of society. Nevertheless, living alone presents certain psychological challenges, including a sense of insecurity, loneliness, and unmet social needs.

#### 3.1. Challenges of Loneliness, Difficult Socialization, and Lack of Security

##### 3.1.1. The Double-edged Sword of Freedom and Independence

Living alone has gradually become an important living arrangement for single individuals, reflecting young people's pursuit of personal freedom and independent living. However, related studies indicate that while enjoying personal space and freedom of choice, contemporary young people living alone in China are also deeply mired in social dilemmas, pervasive loneliness, and a lack of security (Xiao & Liu, 2023). Many of them, with dreams in their hearts, resolutely settle in big cities after graduation, hoping to cultivate a brilliant chapter of career development in this fertile land. Yet, the stark reality gradually reveals itself: high housing costs, long commutes, fierce workplace competition, and the successive arrival of life challenges such as marriage and child-rearing all test the psychological resilience of young people living alone.

##### 3.1.2. Fragmentation of the Virtual from the Real

While technological advancements have brought many conveniences to our lives, they have quietly altered the way

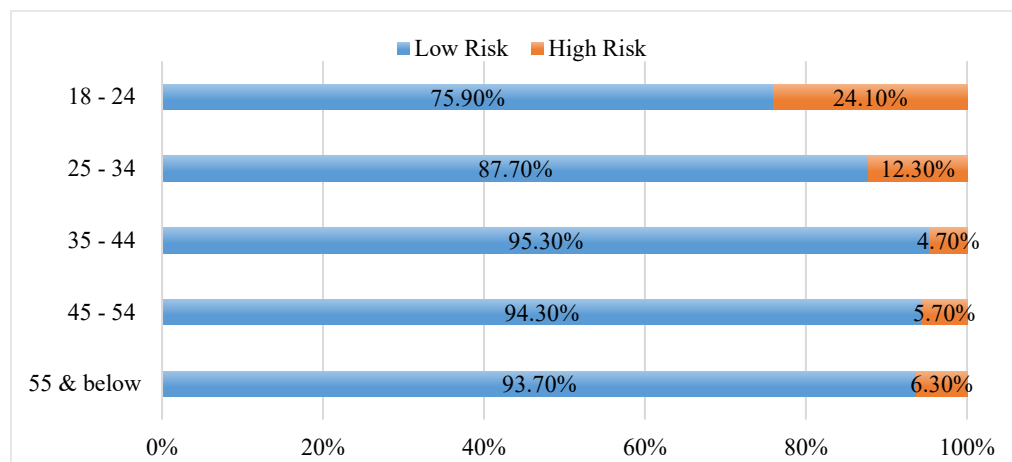
people socialize. The decline of traditional group entertainment activities has led single youths to seek comfort by immersing themselves in the virtual world. However, this "information cocoon" phenomenon not only limits their access to diverse sources of information but also weakens the real emotional experience and sense of interaction that face-to-face communication provides. The stark contrast between the glamorous world on social media and the mundanity of real life further intensifies the feelings of inferiority and loneliness among single youths. Moreover, the prevalence of cyberbullying and misinformation casts an even darker shadow over the mental health of this group.

### 3.1.3. Social Dilemmas and Psychological Challenges

From a psychological viewpoint, young individuals living alone appear to be experiencing a significant deficiency in the "love and belonging" needs as described in Maslow's hierarchy of needs. Klinenberg (2013) highlights the dual aspects of the phenomenon of living alone in the United States: it fosters personal autonomy, growth, and social integration, yet it also carries the risks of social isolation and profound loneliness. Domestic research similarly confirms that, on the whole, those who live alone experience more intense feelings of loneliness compared to those who do not. This "empty nest youth" demographic is facing multiple challenges, including psychological stress, loneliness, a lack of security, and an exacerbated sense of loss.

### 3.1.4. Trends in the Rejuvenation of Depression

This further exacerbates another significant social issue: the increasing prevalence of depression among younger populations. Data indicate that within the adult demographic, young people constitute a high-risk group for depression. Among those aged 18-24, 24.1% are identified as high-risk, while 12.3% of those aged 25-34 fall into the high-risk category (see Figure 5), significantly higher than other age groups. Furthermore, research by Shaw et al. (2021) points out that individuals living alone have a significantly higher likelihood of developing mental illnesses compared to those who do not live alone.



Source: Data are derived from the 'Annual Report on Psychological Health Development of Chinese Citizens, 2021-2022', compiled by the Institute of Psychology, Chinese Academy of Sciences.

**Figure 5.** Prevalence of Depression Risk among Different Age Groups

### 3.1.5. Reconfiguration of the Social Model and Needs

Despite numerous social challenges, the need for social interaction among young individuals living alone has not weakened; rather, it has shown more diverse characteristics. They seek deep engagement based on shared hobbies and interests rather than the simple maintenance of traditional familial ties. The internet offers them a platform for transcending time and space limits to socialize, but face-to-face interactions remain the most desired form of social contact for them. Public spaces such as gyms and screening rooms have become important venues for expanding their social networks and enriching their personal lives.



## **3.2. Highly Dependent, Poorly Capable of Living, Highly Individualized**

### **3.2.1. Lack of Self-care: the Gap from Dependence to Independence**

In today's society, the trend of young individuals living alone is becoming increasingly prevalent, and their lack of self-care skills has emerged as a significant issue that this demographic must confront. Comprised mainly of post-90s individuals who are highly educated, high-income earners, and high consumers, many of these young individuals grew up in environments where parents provided meticulous care, often taking on household chores, thus depriving them of opportunities to develop independent living skills. Additionally, some parents, preoccupied with work, have neglected to foster life skills in their children, and the exam-focused education system has further marginalized life skills education, leaving the younger generation particularly inept in basic life skills such as cooking, cleaning, and laundry.

The convenience of internet services, such as online shopping and food delivery, while making life easier, has also inadvertently weakened the self-reliance of young people. They have become increasingly dependent on external services to handle daily issues, eroding their self-management and caregiving capabilities. This dependency extends beyond daily life skills to include areas like financial management and time management, leading to unplanned spending, dependence on credit cards and loans, and irregular daily routines.

Self-care skills are fundamental to independent living, impacting young people's confidence and poise when facing life's challenges. By systematically learning and mastering basic life skills, young people can reduce their reliance on external services, thereby boosting their self-identity and sense of value. Therefore, enhancing the self-care abilities of young people is essential not only for personal development but also as a key step in addressing broader social issues.

### **3.2.2. The Double Contradiction between Individualization and the Pursuit of Freedom**

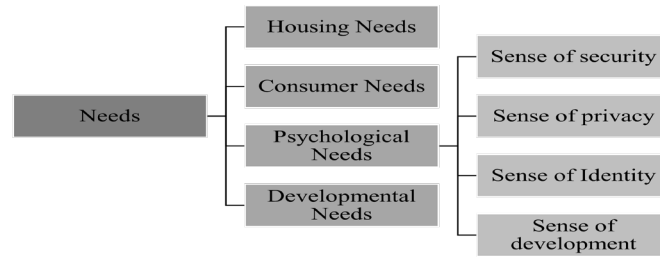
On the other hand, with the advancement of the times and the rapid development of information technology, contemporary young people display a strong tendency towards individualization and the pursuit of freedom. They are exposed to more diverse knowledge and ideas, favor independent thinking and decision-making, and place a high value on self-expression and individuality. This openness to new ideas and questioning of traditional rules not only fosters societal innovation and change but also embodies the spirit of exploration and courage to challenge conventions that characterize the youth.

However, in the workplace and social contexts, an excessive focus on individuality can lead to several issues. Some young people, in their pursuit of self-expression, may overlook team rules and collective interests, leading to instances of non-compliance with management and disregard for regulations. This not only potentially hinders team collaboration and project progress but also may negatively impact individual career development. Therefore, learning how to balance individuality with social and team integration presents another significant challenge for contemporary young people.

## **4. Strategies and Recommendations for Designing Living Environments for Singles: A Case Study of Lingyu 3.0 Products**

With the growing prominence of young single-person households living alone, single-living products have entered a new phase of transformation driven by both policy and market forces. Creating a high-quality, ecological, stable, and sustainable living environment for contemporary young single-person households offers valuable insights and practical benefits for the development of the housing rental market, the reform of the housing system in the "new era," and the establishment of long-term mechanisms.

Currently, the government is actively deploying and promoting the construction of a guaranteed rental housing system to build a more comprehensive housing security framework. In this process, the national team, with its profound heritage and solid strength, serves as the "ballast" and "stabilizer," providing a solid foundation for the steady progress of the entire housing rental market. Concurrently, a group of outstanding market-oriented rental operators, leveraging keen market insights and excellent operational capabilities, are actively exploring the evolving needs of customers. They are dedicated to creating rental housing products that not only meet the physical living and consumption needs of young single-person households but also address their psychological and developmental needs, as illustrated in Figure 6.



**Figure6.** Analysis of Housing Needs among Single Youths

Lingyu International, a leading co-operator and one-stop service provider in China, is dedicated to the rental housing sector, providing long-term living solutions for new urban residents and young adults. With the brand mission "to make renting affordable and living enjoyable," Lingyu International offers a new rental experience that integrates "living, lifestyle, and social connections," contributing to a harmonious society.

To date, Lingyu's rental housing projects have evolved across three generations, transitioning from traditional centralized apartment models to large-scale rental communities. Their primary clientele consists of young adults aged 25 to 35 in major cities. Lingyu aims to create a familiar community that feels like home through "lower living costs, diverse lifestyle amenities, convenient services, and harmonious neighborly relationships." In the early stages of industry development, Lingyu 1.0 aimed to provide basic living spaces to meet the fundamental needs of individuals living alone, such as security, privacy, ease of use, and affordability, while also creating basic communal areas. Due to project constraints, its buildings were mainly multi-story or standalone, lacking a community atmosphere.

As the industry continued to evolve, Lingyu 2.0 products placed greater emphasis on the functionality and comfort of interior spaces. By cleverly interlocking layouts, they increased storage capacity (graded sizes, distributed storage), expanded kitchen and bathroom areas, and adjusted furniture placement to enhance natural lighting in living spaces, thereby improving overall comfort. Additionally, various soft furnishings were introduced to enhance aesthetics, and enclosed building designs were utilized to expand communal areas and design landscapes. However, the product still fell short in internal humanization. The primarily commercial layout width of 2.6 meters resulted in a high number of units but insufficient overall living comfort and spatial cohesion. Furthermore, the external communal spaces lacked integration and clear boundaries, meeting only basic social needs of strangers.

Currently, Lingyu 3.0 products employ internet-driven thinking, integrating user behavior and usage scenarios to deconstruct and reconstruct spaces, thus balancing efficiency and experience. High-frequency activities are positioned indoors, while low- and mid-frequency shared spaces are designated in semi-private and public areas, fostering a more efficient and orderly community atmosphere and reshaping the "solo rental living" lifestyle.

This article draws on the advanced concepts of Lingyu 3.0's single product design to explore strategies and recommendations for designing living environments for singles.

#### **4.1 Conceptual Redesign: People-Centric Approach to Creating a Space Design Philosophy Focused on Users' Psychological Needs**

With the growing emphasis on psychological needs in modern society, space design should not be limited to mere functionality and aesthetics but must deeply address users' psychological anchors and emotional appeals. For young single-person households, an ideal living environment transcends the physical aspects of beds and residences; it is a haven for mental peace, life fulfillment, and a sense of belonging and growth.

As previously discussed, the most prominent challenge facing young single-person households living alone is the pervasiveness of "loneliness." This can be traced back to a lack of security, lost sense of control, and absence of psychological identification. To effectively address these challenges, living product designs must embrace the core concept of "people-oriented" design. The primary task is to recreate the warmth and shelter of "home," making it a refuge for the minds of young single-person households.

The core roots of loneliness lie in the prevalent absence of safety, control, and belonging. Young single-person households, drifting in unfamiliar territories, often find themselves isolated and bereft of the warmth and shelter of home. In this context, "home" as a tangible embodiment of belonging becomes crucial. It constructs a solid psychological defense for young single-

person households, providing a stable foundation for secure living. Therefore, in creating living environments for singles, the primary mission is to help residents rediscover the long-lost warmth and sense of belonging of "home." Specifically, creating a home involves multiple dimensions: firstly, safety is the paramount cornerstone, ensuring peace of mind and bodily security for residents; secondly, the home should be a private, self-managed space where young single-person households can freely control their personal sanctuary, enjoying their undisturbed private time; finally, the home is a spiritual haven, representing the emotional connection and deep affection of the resident for every detail within the living space. This deep emotional link allows residents to find a serene refuge amidst the bustling city life, providing mental peace and emotional comfort.

Additionally, the concept of home encompasses a distinct and profound sense of boundaries. This sense is not only reflected in the clear demarcation of physical spaces but also deeply rooted in subtle psychological limits. In the physical sense, it is embodied by solid walls and firmly closed doors that effectively isolate private spaces from the outside world, ensuring individual privacy and independence. However, the boundary of home is not confined to the physical aspect; the construction of psychological boundaries is more complex and diverse. Young single-person households demonstrate unique characteristics in this regard. They emphasize emotional independence, tending towards self-sufficiency and self-comfort rather than excessive reliance on external emotional support. Simultaneously, their appreciation of personal space and time forms an essential part of their psychological boundaries. They delight in immersive personal activities like reading, traveling, or exercising, using these avenues for relaxation, self-improvement, and personal growth. This dedication to personal space signifies their clear understanding of personal needs and comfort zones and highlights the stability and independence of their psychological boundaries. In social interactions, young single-person households equally seek freedom and autonomy. They prefer to select social activities based on personal interests and needs, placing greater emphasis on the quality rather than quantity of social relationships. They aim to establish meaningful and emotionally resonant social connections, enriching the psychological boundary of home and making it a crucial cornerstone for building self-identity and achieving a sense of psychological belonging.

After ensuring safety and boundaries, a comprehensive and warm living environment must also extend to the surrounding community. By fostering familiar neighborhood relationships, comfortable public spaces, and rich community activities, the sense of "home" is further extended. This enables young single-person households to feel a sense of belonging and connection within the broader community network, fully meeting their multi-level psychological and emotional needs.

#### **4.2. Methodological Reform: Using the "Frequency" Concept to Balance Commercial and Social Values**

Exploring solutions for the housing needs of young single-person households carries profound social value and must also confront the inherent commercial nature of "renting," which is inevitably constrained by cost and profit considerations, making it difficult to meet all residents' expectations without limit. Therefore, within a given cost framework, how to create a comprehensive and comfortable living space becomes an urgent and challenging issue to address.

In this context, the new methodology advocated by Lingyu 3.0 products can provide valuable insights and references: by introducing the core concept of "frequency," it meticulously dissects, classifies, and flexibly adjusts various scenarios within the living space. This process is not only a deep optimization of space layout but also an accurate capture of residents' behavior patterns and preference needs. Based on "frequency" analysis, Lingyu can scientifically select and carefully create those high-frequency usage scenarios, ensuring complete coverage of living functions and significant enhancement of living experience within limited cost investment, ultimately achieving a balance between commercial and social value, as illustrated in Figure 7.

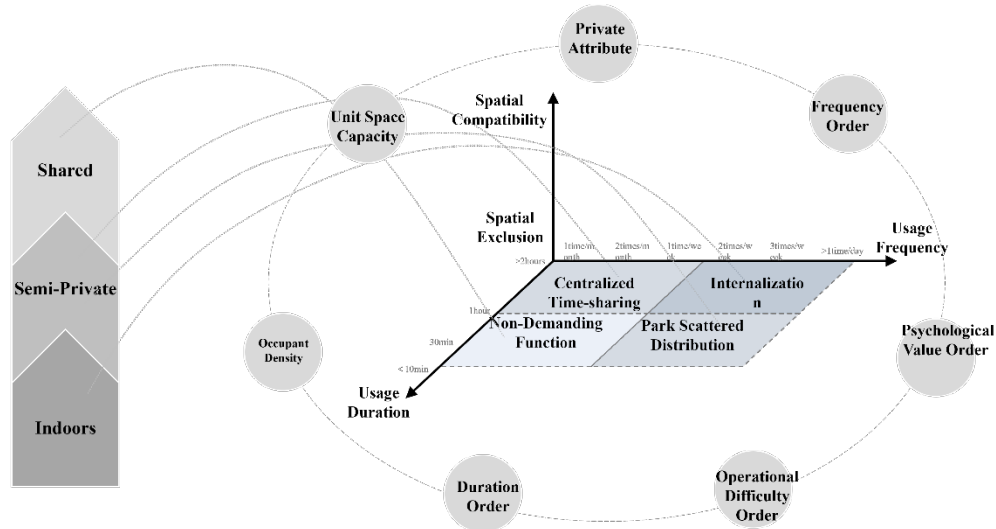


Figure 7. Guiding Space Design with 'Frequency' in Lingyu 3.0 Product

The value of spatial scenarios depends on the harmonious coexistence of comfort and usage frequency. Comfort is intuitively reflected in the effective utilization of space, whereas "frequency" reveals how intensely users demand specific scenarios. By carefully analyzing the relationship between space size and user frequency, Lingyu International has discovered a new method for optimizing space value. This strategy focuses not just on rational space allocation but deeply understands residents' behavior patterns, aiming to improve space resource efficiency and overall living experience.

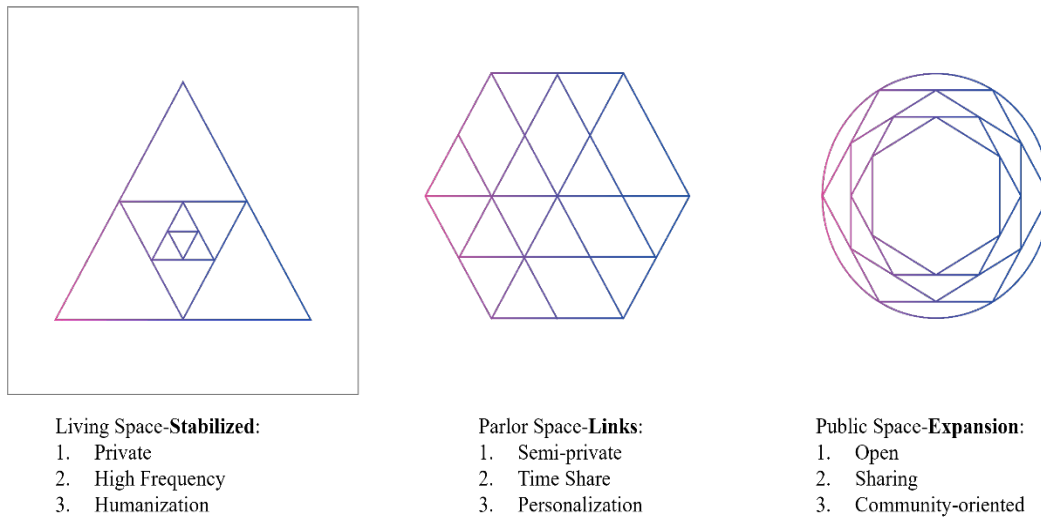
Specifically, the methodology of Lingyu 3.0 products focuses on identifying and defining various life scenarios in living spaces, such as sleeping, washing, cooking, hosting guests, studying, exercising, and entertainment. By considering factors like occupancy time, usage frequency, space utilization, and user satisfaction, these scenarios undergo detailed quantitative analysis and value evaluation. This process assesses the importance and frequency of each scenario in residents' daily lives. With this data, living spaces can be scientifically planned and adjusted. High-frequency scenarios are given ample resources and optimized design, while low-frequency scenarios are compressed or integrated without sacrificing overall comfort.

By utilizing a scientific scenario ranking and screening mechanism, efficient space optimization and product design can be achieved even under limited space and budget constraints. This strategy ensures the completeness of living functions while significantly enhancing comfort and living experience, achieving a transition from "basic housing" to "quality living." More importantly, it strikes a balance between commercial value and social value by meeting market profitability needs and addressing societal expectations for improving the living conditions of young single-person households, showcasing a sustainable and humane development approach.

### 4.3 Spatial Innovation: Achieving the Seamless Integration of Private, Semi-Private, and Public Spaces

Under the design concept that focuses on the psychological needs of young single-person households, optimizing living spaces and precisely matching scenarios are key to creating an ideal living environment.

Lingyu 3.0 products address this with their unique innovative strategies. Lingyu 3.0 products redefine the boundaries of "home," expanding the concept from the private domain to the community ecosystem. They view the community ecosystem as an indivisible whole, achieving a transition from "private residence" to "community home." Based on the "community as home" concept, they further divide community space into three levels: absolute private space, semi-private space, and public space. This division is based on deep insights and precise classification of 170 living scenarios, creating a hierarchical and functionally complementary living ecosystem, as illustrated in Figure 8.



**Figure 8.** The concept of “Private, Semi-private and Open” spaces of Lingyu 3.0 products

Absolute private spaces are the core living areas for young single-person households, integrating high-frequency living scenarios such as resting and personal work. These spaces ensure that residents' needs for independence and privacy are maximally met, providing a strong sense of security and stability.

The innovative design of semi-private spaces is a key highlight of the living environment. This design places low-frequency but essential scenarios, such as hosting guests and engaging in hobbies, outside the private domain and configures them flexibly through time-sharing arrangements. This approach offers residents various settings for social interactions and personal interest expansion while maintaining a balance between privacy and openness.

Public spaces are designed to deeply explore and nurture community culture. Lingyu 3.0 products feature meticulously planned public spaces, such as shared leisure areas and cultural exchange centers, to promote mutual understanding and friendly interactions among neighbors. This fosters a warm, harmonious, and open environment, allowing residents to truly experience a sense of belonging and happiness by considering "community as home."

#### 4.3.1. Construct Humanized Private Space so that Single Youth can Enjoy “Small Area and Big Experience”

Given the constraints of cost and space, striving for absolute comfort and personalization in living environments becomes impractical. Thus, when creating private living spaces, placing "human-centered" design at the core is crucial for balancing residential needs and resource limitations. The primary task is to accurately capture and meet common resident needs within a limited space, addressing the essential 50% of common demands while pursuing excellence in core areas and being flexible in non-core areas. This approach ensures the harmonious coexistence of commercial value and humanistic care.

The essence of human-centered design is to achieve an "optimal cost-performance ratio" for the living experience. This means creating living spaces that are both economical and high-quality even under strict cost control. This process requires a deep understanding of residents' emotional needs, employing design methods that evoke emotional resonance, along with continuous optimization of user experience and the scientific principles of ergonomics. With ingenuity, small spaces can become exemplary living areas that offer "great enjoyment in a small area." Through meticulous layout and clever spatial expansion, residents can feel unprecedented spaciousness and comfort in compact living environments, experiencing a quality of life that transcends physical limitations, as exemplified by Lingyu 3.0 products.

#### Comfort width setting based on perception of use:

Building on traditional design norms, Lingyu 3.0 introduces an innovative 3.4-meter-wide unit design. This breakthrough is based on a deep understanding and precise consideration of tenants' actual needs. The design diligently includes requirements for bed width, wardrobe width, and necessary passage space, ensuring residents can move freely within a fully functional space. Compared to the commonly used designs with widths of less than 3 meters, the 3.4-meter width significantly improves indoor lighting and ventilation, creating a brighter and more open living environment.

### **Ergonomically guided layout of kitchen and bathroom spaces:**

Adhering to ergonomic principles, Lingyu 3.0 meticulously simulates residents' daily activities to refine the design of kitchens and bathrooms. The kitchen layout is scientifically planned to streamline the workflow of washing, cutting, and cooking, resulting in smooth and efficient operations. Meanwhile, the bathroom design incorporates various functional needs such as showering, washing, and toilet facilities, ensuring each area is optimally expanded and fully utilized. This integration provides residents with a comfortable and convenient living experience.

### **Dual enhancement of silencing technology and privacy protection:**

Recognizing single individuals' high demand for tranquility and privacy, Lingyu 3.0 employs multiple strategies in wall construction and material selection. High-performance soundproofing materials are utilized, and weak sound-insulated areas are thoroughly sealed to significantly enhance wall soundproofing. Additionally, superior soundproof doors and windows are installed. Combining these with strategic space layouts and visual barriers, the living environment ensures complete privacy and a peaceful, private atmosphere for residents.

### **Innovative applications of customized storage systems:**

To tackle the challenge of modern youths having numerous belongings and storage difficulties, Lingyu 3.0 has created an efficient and flexible storage solution informed by extensive market research and user needs analysis. This solution features versatile spatial layouts and increased storage capacity, focusing on functional divisions and intelligent adjustments within cabinets. Personalization based on residents' usage habits ensures each item has a specific spot, promoting organized and efficient space utilization.

Furthermore, Lingyu 3.0 employs a multi-scenario layout strategy to create a diverse living atmosphere that addresses the psychological needs of single young individuals. This approach provides a rich selection of choices and a strong sense of belonging. For example, Lingyu 3.0 offers three main types of unit designs, complemented by six meticulously planned situational setups tailored for single youths. This strategy integrates work, rest, and entertainment areas flexibly and efficiently. It also offers a variety of interior decoration styles to meet the diverse and personalized living needs and aesthetic preferences of young singles, creating a practical and emotionally resonant living space.

For example, to cater to post-90s women who love nature and seek an artistic lifestyle, Lingyu has introduced the "Green Wonderland" themed design. Featuring green as the dominant color, this design integrates residents' passion for flower planting, love of coffee aromas, and desire for a leisurely life to create a comfortable and artistic living space. Thoughtfully designed scenes for hobbies, movie-watching, and leisure not only address daily needs but also inspire a yearning for an ideal life. Here, the beauty of nature and humanistic sentiments coexist harmoniously.

For young pet enthusiasts born in the 90s, Lingyu has introduced the "Pet Paradise" themed design. Featuring blue as the base color, this design creates a serene and lively living environment. It prioritizes interactions between pets and owners by incorporating dedicated areas for pet activities, such as playing with cats and dogs. Additionally, it includes multifunctional spaces for gaming, reading, and relaxing, ensuring residents can enjoy every moment with their pets. In this humanistic and private environment, single young residents can experience enhanced security and stability.

### **4.3.2. Build Personalized Semi-private Spaces, Deepen Social Networks of Acquaintances, and Educe the Sense of Isolation**

To tackle the widespread issue of loneliness in the single population, the Lingyu 3.0 project ingeniously broadens the traditional boundaries of "home" into a more expansive community ecosystem. By employing foresighted space planning and innovative functionalities, it aims to rebuild the warm connections between neighbors, creating a social ecosystem that is both cozy and lively, thereby effectively alleviating feelings of loneliness.

Specifically, Lingyu 3.0 cleverly relocates semi-frequently used spaces such as tea rooms, media rooms, study rooms, art studios, small lounges, and Western kitchens from private residences to public areas. This not only greatly optimizes indoor space utilization but also endows these spaces with a new life of semi-privacy. Through an innovative time-sharing leasing model, residents can flexibly book and exclusively use these spaces, hosting a variety of social activities from family dinners to small parties, private salons to movie and game nights. This invisibly expands living spaces for social interactions, promoting emotional elevation and integration from the individual "home" to the community "collective."

The design of these spaces preserves their individual independence and distinctive themes while offering users significant autonomy. Students seeking a tranquil study environment or young artists can find dedicated areas that suit their needs, free from external disturbances. Moreover, residents are encouraged to personalize and decorate these spaces to reflect their interests and needs. This approach not only stimulates creativity and a sense of belonging but also fosters the diversity and

inclusiveness of community culture.

Ultimately, as young people gather, interact, and create within the spaces they have personally crafted, a strong sense of community identity and belonging naturally emerges. This fosters a community brimming with warmth, understanding, and support. In this environment, loneliness is replaced by warm interpersonal interactions and rich community activities, ensuring each resident feels the homeliness and societal care.

#### **4.3.3. Creating Community-oriented Public Space and Building a Living Ecology of Coexistence and Co-prosperity**

Once humanized and personalized needs are fully and meticulously met, a warm and harmonious community environment can further enhance residents' sense of belonging and happiness.

##### **Diversified communal areas to enrich leisure life:**

Understanding the modern resident's needs, the project carefully designs diverse public areas such as a fitness center, a grand living room, study rooms, and a pet park. These spaces are accessible to all community members, offering a wide range of leisure options for young single-person households and becoming crucial platforms for fostering neighborly connections. Residents can share fitness activities, enjoy quiet reading time, or engage in discussions that ignite intellectual sparks, thereby weaving a richly diverse community life together.

##### **Different scenes are positioned in different zones without disturbing each other:**

Embracing the core tenets of humanism, the project eschews the traditional layout of tightly interlinked centralized public spaces found in conventional rental properties, opting instead for a more nuanced zoning strategy for various activity spaces. For instance, diverse functional areas like fitness centers, grand living rooms, and study rooms are distributed across different buildings. This arrangement ensures the independence and specialization of each function, avoiding interference between different activities and optimizing the configuration and experience of each service. Furthermore, it strikes a delicate balance between the lively ambiance of group activities and the tranquility needed by individuals.

##### **Optimization of homecoming routes and integration of ecological landscapes:**

Incorporating green ecological elements into community planning—such as rooftop gardens, vertical green walls, and recreational pathways—these landscapes not only enhance the community's aesthetics but also offer residents ideal spots to connect with nature and unwind. Moreover, through the thoughtful design of homecoming routes, ecological landscapes are seamlessly integrated with living areas, making every return home a journey through nature. This ensures that young single-person households can feel the warmth and serenity of home, even amid a busy urban setting.

##### **Enabled by technology and escorted by intelligent security systems:**

Safety is paramount in residential living, requiring the implementation of advanced intelligent security systems. These systems feature comprehensive video surveillance, efficient intrusion alarms, and emergency call functions, forming a robust security network. Capable of monitoring community safety in real-time and responding swiftly to emergencies, these intelligent systems provide residents with holistic, 24/7 security. This allows every resident to reside with peace of mind and enjoy a worry-free life.

##### **Community activities and community self-governance to stimulate intrinsic motivation:**

Beyond constructing the external environment, it is vital to adhere to the community development concept of "internal and external integration." By actively guiding and organizing various social activities, such as reading clubs, fitness groups, and craft workshops, the project can ignite residents' inner vitality and creativity, promoting mutual understanding and cooperation among neighbors. Additionally, the establishment of a tenant committee for community self-governance enables residents to realize their value and strength through active participation, collectively building an autonomous, co-governed, and shared living ecosystem. This "resident-centered" governance model not only strengthens community cohesion and unity but also ensures that every resident finds a sense of belonging and happiness, jointly crafting a new vision of symbiotic and prosperous living.

#### **4.3.4. Technology-enabled: Artificial Intelligence Efficiently Integrates and Reconfigures Production Factors to Achieve Product Design Feasibility**

To effectively implement the aforementioned design concepts, relying solely on traditional design methods is inadequate. In conventional design approaches, allocating and managing resources such as costs, technology, and manpower often present

significant challenges, including limited budgets, information asymmetry, and inefficient decision-making. The application of artificial intelligence (AI) technology can address these bottlenecks by leveraging big data analysis and intelligent algorithms to accurately predict market demands and optimize resource allocation. This not only lowers design costs but also improves resource utilization efficiency, establishing a strong foundation for the sustainable development of design.

Specifically, the practice of Lingyu 3.0 showcases this transformation vividly. The project integrates AI technology to analyze and optimize apartment layouts across seven key data dimensions, including cost-effectiveness, spatial arrangement, comfort, and low-frequency space utilization. This approach not only ensures precise control over design details but also allows for dynamic adjustment of parameters, enabling the scientific prediction and quantification of the impact of different design variables on apartment prices and market acceptance. This provides solid data support for informed design decisions.

With the aid of AI, designers can more effectively capture market opportunities and create products and services that meet current needs while possessing future potential, thereby increasing the market competitiveness and longevity of designs. More importantly, the deep integration of AI in the design process makes feasibility assessments and iterative optimizations more efficient and precise. Utilizing methods like simulation testing and performance prediction, AI can identify and address potential issues in design plans early on, ensuring their effective implementation in real-world applications. This seamless transition from concept to practice not only shortens the product launch cycle but also greatly enhances user experience and satisfaction.

AI-guided design implementation represents not only a revolution in traditional design models but also a crucial force driving the design industry towards greater intelligence and efficiency. By optimizing productive factors, enhancing foresight, and strengthening implementation, it breathes new life and possibilities into product design innovation.

## 5. Conclusions

In the midst of profound demographic transformations in contemporary social structures, the growing rise of single-person households who usually choose to live alone is becoming increasingly prominent. While this demographic restructuring is often accompanying the pursue of personal freedom and independence, the young single-person households also face multiple physiological and psychological pressures. Solving the living-alone issues of young single-person households not only pertains to individual quality of life but also holds significant social importance. A stable and harmonious living environment aids in the mental health and social integration of young people, fostering social stability and sustainable development. Moreover, meeting the psychological needs of single young people can enhance their sense of belonging to the community and their recognition of society, thereby stimulating their enthusiasm and creativity in social participation. Consequently, creating more humane, personalized, and diverse living environments for young single-person households, providing them with a sense of security, identity, and belonging, is a profound practice of society's collective humanistic care. This requires the concerted efforts of various social stakeholders, particularly the government, developers, and rental housing operators, to jointly promote the transformation and upgrading of the rental market towards a more humane, refined, and innovative direction. The government should introduce more scientific and rational housing policies to guide the equitable distribution of resources and offer affordable, quality housing for young single-person households. Developers need to emphasize design innovation to create living spaces that align with young people's preferences and incorporate social interaction functions. Operators should enhance service processes and strengthen community management to cultivate a warm and harmonious community atmosphere, enabling every single young person to find their own spiritual home.

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