A Comparative Study on Residential Satisfaction in Relation to Spatial Characteristics of the Residential-Commercial Area in Urban Seoul
Focused on the Analysis of Seorae Village of Banpo 4-dong and the Garosu-gil area of Sinsa-dong

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Abstract
This study compares residential satisfaction in terms of local urban spatial characteristics between Seorae Village of Banpo 4-dong, and the Garosu-gil area of Sinsa-dong, both of which display distinct local identities and instances of mixed use. The results can be summarized as follows: First, residential satisfaction was higher in Seorae Village, Banpo 4-dong, than in the Garosu-gil area, Sinsa-dong, across all statistically significant criteria which were related to urban space characteristics such as the effective utilization of shared external space through block-unit development, independent territoriality of commercial and residential areas, qualitative completeness of green and street spaces. Second, the most influential factors affecting residential satisfaction were amenity, neighborhood, and safety in descending order, with amenity and safety showing a high degree of correlation. The amenity factor was significantly affected by the quality of transition areas situated between individual housing and urban space, and the neighborhood factor was closely related to community awareness. Third, while the commercialization of residential areas was largely regarded in a positive light, satisfaction regarding the street space in residential and commercial areas showed low correlation to overall residential satisfaction. Securing parking space and green space, and resolving the noise issue were identified as areas in need of improvement associated with the commercialization of residential areas, and they were major causes for residents in Sinsa-dong near the Garosu-gil area to relocate.

Keywords: residential satisfaction; residential-commercial area; Seorae Village; Garosu-gil area

1. Introduction
1.1 Objectives and Significance
More than half of the urbanized area in Seoul is comprised of 2nd class residential districts which include residential, commercial, and business areas. Residential areas in high-quality locations tend to establish a distinct local identity and benefit from the commercialization of central streets, which accompanies urban revitalization. However, the excessive expansion of commercial facilities leads to a qualitative decline in housing conditions and an inequitable infringement upon the original functions of residential areas (Yu, 2013; Kang, 2006). Ensuring the social sustainability of urban residential districts first requires a certain degree of habitability to be secured, and for commercialized streets to serve as a venue for social exchanges and activities. This requires the diagnosis and exploration of urban architectural requirements.

This study selected two areas among residential areas recognized to be commercially vibrant, so as to compare residential satisfaction according to local urban space characteristics, and to analyze the factors that affect residential satisfaction and the exact nature of their influence. The purpose of this was to discover the specific problems facing residential areas that are becoming increasingly commercial, and also the changing aspects of residential satisfaction in terms of street space, commercialization status, architectural typology, green space and the quality and usage of external space. This study aims to provide preliminary data in identifying a desirable direction in terms of environmental improvement and residential planning, with the ultimate aim to ensure the sustainability of residential areas in inner cities.

1.2 Study Scope and Method
This study was conducted through a comparative analysis of Seorae Village in Banpo 4-dong and the Garosu-gil area in Sinsa-dong, both of which have a sense of local identity established over decades. Another commonality between the two areas is that their commercial and business spaces have developed...
around a 15 m-wide side street located within the Gangnam Area in Seoul.

However, the two areas differ in their urban space characteristics, which rendered the areas suitable for comparing the effects of said urban spatial characteristics on residential satisfaction, and any correlation behind such effects. The survey of urban space structures in this study is based on the on-site survey conducted in July and August, 2015. The survey on residential satisfaction was conducted on 85 residents each from Seorae Village and the Garosu-gil area, once during weekdays and once during weekends. All questions were measured on a five-point Likert scale, and the software IBM SPSS Statistics 22 was used for the statistical analysis.

2. Overview and Formation of Target Areas

Seorae Village began to be developed in the 1980s through the construction of apartment complexes and public facilities around Sapyeong-daero and Banpo-daero. Subsequently, it became recognized as an area with a large foreign population, after a French international school relocated into the area in 1985. The 1987 relief map of Seorae Village shows that the general structure of the road system was similar to its present-day state, and the development process mainly consisted of low-rise buildings in individual lots, which largely remain the case for the 1995 relief map. The 2006 relief map shows the combination of multiple blocks for redevelopment purposes, and the construction of mid- and large-scale multiplex housing and row house complexes. Seorae Village is perceived as a luxurious multiplex housing area and its Café Street is recognized as a commercial area that combines exotic restaurants and cultural spaces.

In the early 1970s, the Sinsa-dong block adjacent to Garosu-gil formed a low-density area of detached houses around the inner farmland. In the 1976 relief map, Garosu-gil was of the same width as other neighboring roads with no particular precedence over other roads, but in the 1987 relief map, its width was expanded to become the central road, and the road had transformed into a main community street. During that period, art galleries originally based in Apgujeong-dong started to move into the area, further attracting related facilities, and later, the 1990s saw a steady rise of development centering on commercial and business functions. In the 2000s, the side streets on both sides of Garosu-gil were completed, which led the functions of the central road to expand into the sides of Garosu-gil, and today, businesses in the area are mainly in fields such as design, fashion, and interior design.

3. Analysis of the Spatial Characteristics

3.1 Road Systems and Lot Structures

In terms of street structure, the main road in Seorae Village stretches from Sapyeong-daero, and is connected with internal minor streets, whereas the Garosu-gil area has the central street connecting Dosan-daero and Apgujeong-ro, and internal minor streets. Both central streets of Seorae-ro and Garosu-gil comprise the central axis connecting the peripheral side streets and minor streets, and serve as commercial streets as well. Although both Seorae Village and the Garosu-gil area take the form of a grid-type urban structure, both house a number of uneven and irregular blocks. On the shorter side, blocks generally measure 40-50 m, while on the longer side, they measure at 90-110 m, but there are severe variations in size, and 3-column blocks are the norm.

3.2 Types and Use of Buildings

In daero, Seorae-ro, and on Seorae-ro 5-gil/6-gil, and atelier-type work/retail spaces are dispersed around the entire area in individual structures. Lots in many blocks are combined to be developed as residential areas consisting of five-story row houses, and the expansion of commercial facilities is restricted as Seorae-ro itself ends in front of Bangbae Middle School and faces a
Table 2. Comparative Analysis of the Spatial Characteristics

| Seorae Village of Banpo-dong | Road Systems and Lot Structures | Types and Use of Buildings | Green Space |
|-----------------------------|--------------------------------|---------------------------|------------|
| Garosu-gil area of Sinsa-dong | Road Systems and Lot Structures | Types and Use of Buildings | Green Space |

| Building Boundaries | Use of Outdoor Space | Seorae-ro (Top left) and minor streets |
|---------------------|----------------------|--------------------------------------|
| Garosu-gil (Top left) and minor streets | Building Boundaries | Use of Outdoor Space | Garosu-gil (Top left) and minor streets |
steep incline. The area around Garosu-gil in Sinsadong is equipped with residential-commercial complex facilities and commercial facilities even in internal minor streets, and purely residential buildings are located within blocks. The buildings are mostly small-scale multiplex and multi-household residences, which allow for easy conversion of building usage, and the street structure is organized with effective hierarchical structures and connectivity, which allows the rapid expansion of the commercial space.

3.3 Green Space
In Seorae Village, there are a total of three neighborhood parks. Trees are also planted along the sidewalk on Seorae-ro. A considerable area of green space has been created outside of multi-unit residential buildings, while in many cases, private gardens are visually open to the streets, contributing to a relatively pleasant outdoor environment. In contrast, in the Garosu-gil area, sidewalk trees are planted along main streets and central commercial streets, and there is only one small-scale neighborhood park. In both Seorae Village and the Garosu-gil area, the green space outside multiplex and multi-household residences only conforms to the minimum scale required by law, and does not comprise a significant proportion of the urban space, merely functioning as shrubbery.

3.4 Street Space and Building Boundaries
Although both Seorae-ro and Garosu-gil are lined with sidewalks, the side streets and minor streets connected to Seorae-ro and Garosu-gil do not clearly separate between sidewalks and roads. This is only a minor inconvenience for pedestrians in Seorae Village since the area has little traffic, but in the Garosu-gil area, the safety of pedestrians is threatened. In Seorae Village, the walls of each housing block enclose the street space. Aside from the walls, building entrances are a half-floor high, and in many cases, areas are separated through street-side plants. In the vicinity of Garosu-gil, Sinsadong, there are a number of complex buildings whose lower floors are for commercial use with higher floors reserved for residential use, which led to the infringement of privacy in the residential space in terms of visibility and noise.

3.5 Use of Outdoor Space
In Seorae Village, parking space around commercial buildings was built a half-floor higher or lower than the general entrance level in many cases, which is suited to the natural incline of the plot. Multi-unit houses developed by block were equipped with semi-underground parking lots with green space situated above ground, leading to a high degree of space utility. In contrast, around the Garosu-gil area, the accelerating commercialization of residential areas led to illegally parked cars encroaching on street space. Commercial use of outdoor space was particularly pronounced, and spaces between buildings were utilized for commercial purposes on special occasions, or as entry into stairs and alleyways leading to the back of the lots. Consequently, street continuity was reinforced through the illegal occupation of spaces between buildings for commercial use, which led to the active connection of commercial space to street space.

4. Analysis of Residential Satisfaction
4.1 Respondents’ Characteristics
As shown in Table 3., multiplex and multi-household residences occupied the largest portion in both Seorae Village and the Garosu-gil area with 48.2% and 50.6%, respectively. As for housing tenure, in Seorae Village, home ownership made up the largest percentage at 65.9%, while in the Garosu-gil area, lease on a deposit basis made up the largest percentage at 52.9%. Although the two groups displayed a statistically significant difference in housing types, housing tenure, and occupations, the results of the cross analysis on respondents’ characteristics and overall residential satisfaction showed that respondents’ characteristics did not affect overall residential satisfaction.

### Table 3. Respondents’ Characteristics

| Classification          | Detailed Classification | Frequency (%) | Statistics |
|-------------------------|-------------------------|---------------|------------|
| Age Group               |                         |               |            |
| 10's                    | 9(10.6)                 | 9(10.6)       |            |
| 20's                    | 24(28.2)                | 29(34.1)      |            |
| 30's                    | 20(23.5)                | 21(24.7)      |            |
| 40's                    | 15(17.6)                | 15(17.6)      |            |
| 50's                    | 9(10.6)                 | 4(4.7)        |            |
| Over 60's               | 8(9.4)                  | 7(8.2)        |            |
| Housing Types           |                         |               |            |
| Low-rise                | 41(48.2)                | 43(50.6)      |            |
| Multi-family            | 24(28.2)                | 29(34.1)      |            |
| Multi-purpose           | 6(7.1)                  | 18(21.2)      |            |
| Single-family           | 4(4.7)                  | 7(8.2)        |            |
| Housing Occupancy       |                         |               |            |
| Owner                   | 56(65.9)                | 29(34.1)      |            |
| Lease on Deposit        | 24(28.2)                | 45(52.9)      |            |
| Monthly Rent            | 5(5.9)                  | 11(12.9)      |            |
| Household Occupation    |                         |               |            |
| Small Business          | 21(24.7)                | 29(34.1)      |            |
| Office Job              | 21(24.7)                | 29(34.1)      |            |
| Professional            | 33(38.8)                | 16(18.8)      |            |
| Technical Job           | 6(3.5)                  | 2(2.4)        |            |
| Service Job             | 3(3.5)                  | 8(9.4)        |            |
| Simple Labor            | 0(0.0)                  | 1(1.2)        |            |
| Others                  | 1(1.2)                  | 0(0.0)        |            |

4.2 Residential Satisfaction
4.2.1 Street Space and Commercial Facilities
There was no statistical difference between the two groups in terms of distance to and usage frequency of commercial facilities, but there was a difference in terms of usage purpose for the said commercial facilities. This study found that the main purpose for Seorae Village residents was to visit restaurants or cafes (50%), whereas the main purpose for Garosu-gil residents was to gain access to public transportation.
Table 5. Positive Aspects of Commercial Expansion

| Existence of Positive Aspects | Seorae Village (%) | Garosu-gil (%) | Statistics |
|-------------------------------|--------------------|----------------|------------|
| Yes                           | 67(78.8)           | 68(80.0)       | χ²=8.291   |
| No                            | 18(21.2)           | 17(20.0)       | df=3       |
| Total                         | 85(100)            | 85(100)        | p=0.040    |

Table 6. Urban Street Space and Commercial Area Satisfaction

| Classification | Seorae Village | Garosu-gil | t   | df  | p   |
|----------------|----------------|------------|-----|-----|-----|
| Sidewalk Width | 3.000          | 2.706      | 2.059 | 168 | .041|
| Recreational Area | 2.776      | 2.765      | .075  | 168 | .940|
| Green Space    | 2.694          | 2.706      | -0.079 | 168 | .937|
| In-between spaces | 3.012      | 2.835      | 1.304  | 168 | .194|
| Commercial Area Satisfaction | |            |       |     |     |
| Parking        | 2.000          | 2.071      | -0.509 | 168 | .612|
| Outdoor Space  | 2.847          | 2.953      | -.733  | 168 | .464|
| Accessibility  | 3.424          | 3.424      | .000   | 168 | 1.000|
| Noise          | 2.376          | 2.271      | .734   | 168 | .464|
| Outdoor Lighting | 2.894      | 2.576      | 2.262  | 168 | .025|
| Privacy        | 2.871          | 2.588      | 2.159  | 168 | .032|
| Commercial Area Expansion | 2.812      | 2.753      | .413   | 168 | .680|
| Overall Level of Satisfaction | 3.353      | 3.165      | 1.368  | 168 | .173|

Table 6. presents the results of comparative analysis through the t-test on satisfaction with street spaces and commercial areas. The results showed that satisfaction with street spaces is higher in Seorae Village, and a statistically meaningful difference was found between the two areas with regard to the width of walkways among subordinate factors. Problems associated with commercial facilities included violation of privacy due to public access and light pollution, which also show statistically meaningful differences in satisfaction levels between the two areas. However, since the overall satisfaction with street spaces and commercial facilities was over the significance level of 0.05, it can be interpreted that there was no real difference between the two areas.

4.2.2 Residential Environment

As shown in Table 7., the results of comparative analysis on satisfaction demonstrate that the satisfaction of residents in Seorae Village is higher in terms of overall satisfaction and also across the four areas of safety, amenity, facility convenience and neighborhood, with the exception of location convenience. As for amenity, there were significant differences in satisfaction between the two areas with regard to relevant criteria such as noise, green space,
orientation, light, outdoor space, and surrounding environment. In terms of facility convenience and sense of neighborhood, satisfaction towards Seorae Village was higher in overall satisfaction levels and subordinate factors by statistically significant differences. In the neighborhood factor, there were significant differences in the subordinate factors of interactions with neighbors, living standards of neighbors and community awareness, which indicates a more active sense of community in Seorae Village.

4.2.3 Community Interactions
Table 8. shows the evaluation results of community vitalization. The main reason for community interactions in Seorae Village was shared hobbies, and in the Garosu-gil area, children. Respondents in Seorae Village also responded more positively towards community vitalization. However, a higher number of residents in the Garosu-gil area responded that they are willing to participate in community activities if such an opportunity becomes available, which indicates at least a potential desire for community improvement.

Table 8. Measurement of Community Vitality

| Classification | Seorae Village (%) | Garosu-gil (%) | Statistics |
|----------------|-------------------|----------------|------------|
| Neighbor- hood Community Interaction (Monthly) | | | χ²=3.651 df=4 p=.455 |
| 1 time | 11(12.9) | 7(8.2) | |
| 2 times | 12(14.1) | 11(12.9) | |
| 3 times | 10(11.8) | 6(7.1) | |
| 4 times | 20(23.5) | 18(21.2) | |
| None | 32(37.6) | 43(50.6) | |
| Reason for Community Interaction | Economic Level | 9(12.5) | 2(4.0) | |
| | Blood or School Relation | 18(25.0) | 12(24.0) | |
| | Children | 16(22.2) | 23(46.0) | |
| | Hobby | 29(40.3) | 13(26.0) | |
| Meeting Participation | Participation | 21(24.7) | 13(15.3) | |
| | No Participation | 64(75.3) | 72(84.7) | |
| Overall Community Vitality | Above Average | 11(12.9) | 3(3.5) | |
| | Average | 40(47.1) | 34(40.0) | |
| | Intent of Future Participation | 34(40.0) | 48(56.5) | |

4.2.4 Improvements
Table 9. presents nine criteria related to the improvement of housing and the surrounding environment, displayed in the order of importance. Notwithstanding minor differences in order, both Seorae Village and the Garosu-gil area were evaluated to require improvements for parking spaces, green spaces and security facilities, as priority areas that need to be addressed.

Table 9. Needs for Environmental Improvement

| Rank | Seorae Village | Garosu-gil |
|------|---------------|-----------|
|      | Classification | Average | Classification | Average |
| 1    | Parking Space | 3.918 | Parking Space | 4.024 |
| 2    | Green Space | 3.659 | Crime Prevention | 4.000 |
| 3    | Crime Prevention | 3.494 | Green Space | 3.847 |
| 4    | Outdoor Space | 3.318 | Noise, Lighting Problem | 3.671 |
| 5    | Noise, Lighting Problem | 3.224 | Child-care Facilities | 3.635 |

4.2.5 Willingness to Stay
Residents of Seorae Village demonstrated greater willingness to remain in the area, which was found at a statistically significant level. Meanwhile, residents in the Garosu-gil area cited noise, parking, and traffic problems, followed by the lack of resting and green spaces, as reasons for wishing to leave the community. There were relatively fewer responses citing the issue of facilities inside of the residence, which indicates that residents' willingness to stay in the community is determined by external factors, if the quality of internal spaces is secured to some degree.

4.3 Multiple Regression Analysis
As shown in Table 11., the results of multiple regression analysis on the overall residential satisfaction showed that the overall residential satisfaction was affected in the order of amenity, neighborhood, and safety. As indicated in Table 12., the analysis results on the influence of detailed residential environment factors showed that the amenity factor was affected by the surrounding environment, noise and light, the neighborhood factor by community awareness, interactions with neighbors and living standard of neighborhood, and the safety factor by security facilities, privacy, and soundproof facilities, in descending order of influence.

4.4 Comprehensive Review on Analysis
4.4.1 Influence of Street and Commercial Spaces on Residential Satisfaction
Seorae Village features an ideal combination of evenly distributed residential, commercial and business spaces, with a relatively high usage frequency of commercial facilities by residents in this area. On the other hand, the Garosu-gil area saw the number of facilities for resident convenience diminish due to the expansion of commercial spaces. Although 80% of respondents in both areas responded positively to commercialization, there was no statistically significant
Table 12. Multiple Regression Analysis

| Model                        | B   | S.E  | β    | t    | p    | VIF |
|------------------------------|-----|------|------|------|------|-----|
| Surrounding Environment      | .280| .063 | .278 | 4.443| .000 | 1.951|
| Noise                        | .207| .056 | .204 | 3.685| .000 | 1.524|
| Daylighting, Ventilation     | .260| .065 | .236 | 4.005| .000 | 1.724|
| Distance between Bldg.        | .192| .056 | .182 | 3.410| .001 | 1.413|
| Green Space                  | .170| .058 | .176 | 2.923| .004 | 1.813|

R= .819, R² = .671, Adjusted R² = .661, Dependent Variable: Amenity Satisfaction

| Model                        | B   | S.E  | β    | t    | p    | VIF |
|------------------------------|-----|------|------|------|------|-----|
| Sense of Community           | .505| .066 | .525 | 7.622| .000 | 1.684|
| Neighborhood Exchange        | .175| .066 | .171 | 2.664| .008 | 1.470|
| Neighborhood Level           | .144| .065 | .148 | 2.207| .029 | 1.589|

R= .730, R² = .533, Adjusted R² = .524, Dependent Variable: Neighborhood Satisfaction

| Model                        | B   | S.E  | β    | t    | p    | VIF |
|------------------------------|-----|------|------|------|------|-----|
| Crime Prevention             | .474| .058 | .480 | 8.184| .000 | 1.803|
| Privacy                      | .248| .064 | .253 | 3.860| .000 | 2.261|
| Sound Barrier                | .198| .063 | .206 | 3.129| .002 | 2.274|

R= .827, R² = .684, Adjusted R² = .678, Dependent Variable: Safety Satisfaction

The correlation between overall residential satisfaction and satisfaction with street and commercial spaces. However, there was a statistically significant difference between the two areas in terms of exposure to light and noise pollution at night, which is a subordinate factor. Since there is no fundamental objection to commercialization itself, however, mixed-use areas may serve as highly convenient and attractive spaces for housing, if the problems related to parking and green spaces can be resolved.

4.4.2 Key Factors Influencing Residential Satisfaction and Relations between Community Characteristics and Urban Spatial Structure

Results of the crossover analysis between respondent characteristics and overall satisfaction showed that sex, age, residence duration, occupation and housing type have no impact on the overall residential satisfaction. Meanwhile, housing tenure is not statistically significant in the overall residential satisfaction, but there was a statistically significant difference in amenity (p=0.028<0.05) and neighborhood (p=0.031<0.05), and high satisfaction in the subordinate factor of home ownership.

Overall residential satisfaction was higher in Seorae Village at statistically significant levels in terms of amenity, safety, facility convenience and neighborhood. Regarding amenity, there were differences in community satisfaction not just in internal factors such as view and orientation, but also in external factors including the surrounding environment, noise, green spaces, and external spaces, which demonstrates the importance of the quality of space in the intermediate range where individual housing and urban spaces meet.

With regard to neighborhood, community awareness was identified as the most important variable, and community interactions in general were found to be more active in Seorae Village. Given that residents of the Garosu-gil area were more willing to take part in community activities in the future if there are more opportunities for such activities, it can be surmised that the area may potentially enhance residential satisfaction through an improved sense of neighborhood. In terms of safety, satisfaction among residents in Seorae Village was higher at a statistically significant level across the criteria of security facilities, soundproofing, and privacy. It can be deduced that this is because commercial facilities in Seorae Village are not widely dispersed, while commercial street spaces and housing spaces are clearly separated.

4.4.3 Future Directions and Implications for Developing Mixed-Use Residential, Commercial and Business Areas

The comparative analysis of the physical characteristics and residential satisfaction in the two areas found that enhancing residential satisfaction requires efforts to strengthen the community by emphasizing community awareness, along with physical improvements in the short term, including securing parking spaces and buffer zones. In the long run, ensuring habitability in residential and commercial mixed-use areas is deemed to require the application of design guidelines for protecting residential areas from commercial streets and commercial facilities, improvement of the living environment in residential areas consisting of small-scale plot units through block-unit development, as well as legal and institutional supplementation of general residential areas in which residential and commercial mixed-use takes place.

First, specifically, physical elements should be designed for residential areas in the vicinity of commercial areas by establishing design guidelines with the aim to protect existing residential areas. Creating boundaries between commercial and residential areas may use physical elements such as layouts placing residential and commercial facilities back to back, construction of detour access roads in residential areas, and installation of fences, green spaces and parking lots between residential areas and street space.

Second, high-density neighborhoods in general residential areas consisting of small-scale individual plots will undergo housing regeneration through small-scale joint development projects. Joint developments will allow the diversification of housing types, concurrent to the improvement of the living environment in existing residential areas consisting of small-scale plots, and housing regeneration by each neighborhood unit.

Third, a legal system should be introduced to prevent the phenomena of excessive mixed-use in residential areas and further subdivisions in zoning classifications. It would appear that there is a need to allow greater flexibility in the zoning system in accordance with the local characteristics of the urban space by specifying...
separate regulations for zoning, development density and permitted usage, with each area to become modularized. Moreover, in order to prevent excessive mixed-use in residential areas, residential areas must be able to maintain their function through the subdivision of usage groups and the reestablishment of regulations on usage groups permitted depending on the usage area.

5. Conclusion

The results of analysis on the physical characteristics of the Garosu-gil area and Seorae Village show that the Garosu-gil area has a high-density, multi-family housing area with small-scale, individual plots, while Seorae Village exhibits a diverse range of housing types resulting from the combination of block-unit row houses and multi-family houses with individual plots. The differences in housing types between the two areas led to qualitative differences in the pedestrian environment and the external residential environment with regards to elements such as streets, green and external spaces and parking lots, while such differences were also found to influence the spread of commercial usage in residential areas. According to the results of analyzing residential satisfaction in the Garosu-gil area and Seorae Village, it is expected that the residential and commercial mixed-use areas will continue their growth as urban residential areas since residential areas in the vicinity of commercial streets are viewed favorably among residents due to their location and convenience.

Also, there were significant differences in satisfaction levels between the two areas in terms of safety, amenity, facility convenience, neighborhood and overall residential satisfaction, except for location convenience, with satisfaction higher among Seorae Village residents in all sectors. The characteristics of the urban space structure created by differences in methods of housing development appear to have an effect on residential satisfaction. Overall residential satisfaction was influenced the most by amenity, neighborhood and safety in descending order. Given the fact that the factors influencing residential satisfaction were mainly related to the external space between housing and neighborhood living areas, rather than internal residential spaces, environmental improvement of the external residential space should be considered as the first priority to enhance residential satisfaction.

In the long term, securing the sustainability of commercial and residential mixed-use areas will require the application of design guidelines for the protection of residential areas, improvement of the residential environment through block-unit development, and legal and institutional supplementation based on usage classification.

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