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Human-Scale Greenery in the Window View

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Abstract: In recent decades, the quality of life in cities has declined due to rapid growth. The global ecological crisis and climate change are leading to pollution and overheating of the environment, resulting in deteriorating health conditions and social segregation. The fact is that greenery in urban environments significantly improves people's well-being, health, and satisfaction. The research presented in this paper was focused on the issue of greenery in residential neighborhoods, which has many positive effects in addition to the health benefits. The purpose of the article is to check whether greenery also has an artistic effect in addition to environmental benefits. In the research, the importance of greenery was highlighted by examining two residential neighborhoods in the urban environment of the city of Ljubljana, Slovenia. Elements of greenery were analyzed from the perspective of "human scale", which refers to the size, texture, and arrangement of physical elements that correspond to human size and proportions. There were seven indicators highlighted that were used to verify the human scale: area connectivity, readability, and completeness of the ambience; transparency of tree canopies, and perception of artistic composition principles. The results show that the presence of greenery in residential neighborhoods is an important element of the human scale.

Keywords: human scale; greenery; window view; WV; survey; urbanism

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1. Introduction

Under the influence of dynamic urbanization, cities are expanding faster than densifying. Seen from the air, our cities lack shape and size; they appear amorphous and inhuman; they have no elements of measure related to the human scale [1]. The answer to the uncontrolled growth of cities offers the concept of sustainable development, which has a great impact on the modern way of life. In recent decades, in addition to the general concept of sustainable cities, many others have emerged, such as green cities [2,3], healthy cities [4,5], smart cities [6,7], cities of knowledge [8–10], resilient cities [11–13], inclusive cities [14,15], ecological cities [16–18], low-carbon cities [19–21], and many others, as well as combinations of all of the above. But a common feature of almost all cities—regardless of global location, economic viability and stage of development—is that the people who still use city space in large numbers have been increasingly poorly treated [22]. For decades, the human dimension has been an overlooked and haphazardly addressed urban planning topic, while many other issues, such as accommodating the rocketing rise in car traffic, have come more strongly into focus [22]. The human step, the angle of vision or that of the turning of our heads, our reactions to extreme temperatures, to noises, or to the kind of air we breathe are permanent factors-part of human nature [1]. Human scale refers to the unconscious assessment/understanding of the size of elements, distinguishing textures and shapes of physical elements in the immediate environment that are consistent with the size of a person [23]. The human scale is contributed to by artistic elements on buildings, pavement textures, trees and urban equipment on the street, etc. [23]. Many authors [24–28] defined the human scale primarily in terms of scale and size in urban space, which is

directly related to the human body, its movement, and perception of space. According to Arnold [23], tall buildings or wide streets are not in line with the human scale, as they are distracting for pedestrians, while a canopy of trees, which can be of larger dimensions, allows for the experience of a small space within a large volume. He suggests that where streets are more than forty meters wide, additional trees should be planted, or façades should be greened to bring the surroundings closer to the human scale. Given the correlation between green space and health and well-being, the drastic reduction of green space in urban environments is of great concern [29].

Exposure to outdoor greenery near homes is directly related to mental health and well-being [30,31]. Studies highlight the importance of greenery, especially in urban environments, which already offer a lower quality of life from the starting point. Some authors even claim that people living in urban areas are generally less healthy than people living in rural areas [32]. An increase of 10% in green areas in the living environment causes a reduction in the number of symptoms, which is comparable to a reduction in age by 5 years [32]. The amount of greenery in the surroundings is inversely proportional to the symptoms of depression in the elderly, especially in densely urbanized cities where the amount of greenery is limited or absent [30,33,34]. Wilson [35] argues that susceptibility to greenery and nature is based on evolutionary development because of humans' hunter-gatherer past. Consequently, nature is an environment in which one feels good, which is favorable for involuntary attention and does not require directed attention, and all this improves the ability to concentrate [36] and enables recovery from mental fatigue [37].

With the overarching issue of adapting urban settlements to climate change (rising surface temperatures, extreme precipitation, ocean warming and acidification, and rising average global sea levels) and climate-related extremes worldwide (floods, droughts, heat waves, forest fires, cyclones, occasional extreme winter cold, etc.), we ask about the parameters of green areas, which are not exclusively directly related to this topic. According to Aoki [38], most people have a favorable impression of the streetscape if more than 30% of the view consists of greenery. In an urban environment, greenery is formed by horizontal green areas (grassy areas and flower beds), while vertical ones are formed by trees, shrubs and green walls (green façade with climbing plants, greenery on balconies, terraces and windowsills).

Therefore, in this contribution, we focus on the issue of green areas in residential neighborhoods (Figure 1), which bring, in addition to the ones mentioned above, many other positive effects.

Level	IMAGE	Origin	Objects	Teksture	Dynamics
3 - SKY ELEMENTS		Natural	Sky, clouds, sun	Variable	Low
2 - BUILDING ELEMENTS		**Human (+ Natural)**	**Buildings, roads, streets, etc.**	**Hard and smooth**	**High**
1 - GREEN SPACE ELEMENTS		Natural (+ Human)	Greenery, water, soil, ground, etc.	Soft and rough	Medium

Figure 1. Elements of window view (WV).

A. Greenery in the surroundings improves the air

Rapid urbanization has resulted in greater exposure of people to polluted air, which threatens physical and psychological well-being. Greenery around homes significantly reduces the negative impacts of urbanization—on the one hand, it mitigates pollution, as trees and other vegetation reduce the levels of gaseous air pollutants (e.g., ozone, nitrogen oxides (NOx), sulfur oxides) and PM particles [39,40]. The extent of pollutant removal depends on local factors such as density, tree species and tree canopy age, air pollutant concentrations, and the length of the leaf season [41].

The level of air pollution in cities is therefore directly related to the amount of greenery, which the authors detected by calculating total leaf biomass [42], leaf area index [43], leaf area density [44], or green plot ratio [45]. Air pollution discourages people from physical activity and reduces people's willingness to socialize outdoors [46].

B. Greenery in the surroundings invites people outside and encourages people's physical activity

Greenery in the vicinity of residential buildings encourages people to take walks and carry out other forms of spontaneous physical activity, which brings benefits, especially to the elderly population and younger children [47]. The World Health Organization [48] recommends physical activity as an essential strategy for promoting health in cities [49]. Numerous studies show that exercise in nature, in the form of walking or running, is a major factor in the physical and mental health of the general public. Physical activity in nature leads to positive short-term and long-term health outcomes. Among other things, it improves self-confidence, mood, and self-image [50,51].

C. Socializing in the greenery/park around the home strengthens the social cohesion of the neighborhood

Studies [52] involving different methodological approaches (more than 1300 observations of personal space, 400 interviews, housing authority records, and 2 years of police crime reports) systematically linked trees and grass in neighborhoods with a wide range of social ecosystem indicators. In parks and green spaces near homes, strong bonds are formed between neighbors; a green environment increases the sense of security and adaptation, enables healthier patterns of children's play, and increases people's friendliness toward each other. In well-maintained settlements with greenery, there are fewer property crimes and acts of violence. On the other hand, natural features and open spaces in residential neighborhoods play an important role in the sense of attachment to the community and interaction with other residents [53]. In addition, green spaces around the home encourage people to go outside, and social groups are often formed there with common interests. Thus, they are encouraged in various joint activities, thereby improving psychological health and providing social support to elderly users [47]. Even if they are not physically active, people in a green environment can become healthier simply by being more exposed to natural features [32].

D. The view of greenery in the surroundings allows relaxation and supports recovery from stress

A large part of the population of the developed world today lives in urbanized areas, where greenery and natural elements significantly increase preference for the urban landscape [54]. Direct contact with vegetation in the external environment is often limited, and it has been proven that even a view through a window has a similar effect to that of actually being in nature [55,56]. Trees and grass in view from the window of apartments have been shown to increase residents' effectiveness in dealing with major life problems and reduce aggression within the family by reducing mental fatigue [52].

However, not every view guarantees positive responses. Unnatural elements in the view bring less benefits than natural ones [57–60]. In general, the view is more pleasant if the urban elements are more distant, and at a shorter distance, the view is improved by a tree or tall bush standing between the observer and buildings [61]. Conversely, an untidy, untended, and neglected environment evokes fear of crime and anxiety [52,62,63]. Views of an open space with natural features/elements are therefore preferred [53]. Building elements can also be useful if they conform to human preferences and adaptations in terms of appearance, order, and scale [64].

Numerous studies have shown that people perceive greenery as a positive element of a quality urban environment, but fewer studies have examined the correlation between greenery and the human-scale indicator. The purpose of the article is to examine whether greenery, in addition to its environmental benefits, has an artistic effect on the perception

of the external environment. We followed the research question of whether the presence of vertical greenery is an important factor on a human scale.

To examine the issue of green areas in residential neighborhoods, we tested the following hypothesis:

H1: *The presence of greenery in the city is an important indicator of the human scale of the urban environment.*

However, from a methodological point of view, we tested two hypotheses in relation to the indicators proposed in the literature:

H2: *There is a difference in the homogeneity of the assessment of the human-scale indicators proposed in the literature.*

H3: *The indicators proposed in the literature to assess the human scale of the urban environment provide consistent results, regardless of the two different survey methods used in our study.*

Note that all three hypotheses are alternative hypotheses in statistical hypothesis testing.

2. Materials and Methods

The study of the human scale of the urban environment was carried out in two (2) steps: preliminary research based on urban analysis of residential neighborhoods in the city of Ljubljana (1) and a study on perception of the human scale on two selected neighborhoods in the city of Ljubljana.

2.1. Preliminary Research

In the initial phase (Phase 1), various instruments were used to carry out preliminary studies to select neighborhoods. The city of Ljubljana, the largest urban area in Slovenia, was selected as a case study. On 1 January 2024, Ljubljana had 297,575 inhabitants and a population density of 1082 people per square kilometer in the Municipality of Ljubljana (MOL) [65]. The city is known for its compact, pedestrian-friendly design, built on a human scale [66]. For this reason, Ljubljana was awarded the title of European Green Capital in 2016 [67]. The city's green identity is clearly visible, with 540 square meters of public green space per inhabitant and green areas covering almost 75% of the city's surface [68]. As part of the preliminary study, the residential neighborhoods in Ljubljana were analyzed based on the following themes: perception of human scale based on design principles. In the morphological composition of the city, this aspect is important for understanding the harmonious floor plan, especially the ground floor, and its interaction and fluidity with the open space, when considering how the space "between buildings" in the neighborhood will be perceived as perspective spatial dimension. Neighborhoods were chosen based on a set of spatial criteria, including various factors relevant to their location and characteristics: morphological features, urban and built design composition (proportion, rhythm, contrast, harmony, etc.), period of development, building typology, public open space and its accessibility, street network and its fluidity, climatic comfort, etc. As for Sert [1], the neighborhood provides a specific logic of measure, of proximity of activities and relations, that is tied to the human body. The human step, the angle of vision, or that of the turning of our heads, our reactions to extreme temperatures, to noises, or to the kind of air we breathe are permanent factors—part of human nature [1]. The interconnectedness of transport systems, and of squares and streets and highways, rivers, railways and bike paths, is essential to achieving the intermediary scale—the human-scale ratio—which can make the difference between a good piece of city and a bad one [69]. What about green systems? For Browning et al. [70] greenery has an important spatial dimension, which he justifies with the intention that "it is important for physical health to have green areas within a five-minute walk (approximately 320 m)". There is a hidden meaning in this

and it is related to human scale, if it is considered that the physical definition of it refers to "matching" the height of a person and corresponds to the speed of movement with which we move in an open space.

In the first (1) phase, we used the following data and tools for the urban analyses:

- A literature review focusing on city neighborhood development, historical data, morphological features, building design, and the development of open spaces within a specific neighborhood.
- Geomorphological and real estate data from the Surveying and Mapping Authority of the Republic of Slovenia [71]. These included geomorphological features such as topography, relief, and terrain types, as well as mapping the characteristics of the neighborhood, including building typology, heights, and dimensions. These spatial data were analyzed using ArcGIS software (ArcMap version 10.3.1) for visual assessments and analyses.
- Conducted on-site fieldwork, urban analysis, and photographic surveys from April 2021 to April 2022.

2.2. Selection Criteria of Two Representative Neighborhoods in the City

In the second (2) phase of the study, two major residential neighborhoods in Ljubljana were selected: Litostrojski bloki (N1) and Štepanjsko naselje (N2). These neighborhoods possess distinct elements of identity. Figure 2 illustrates the morphology of each neighborhood and its location within the city. Two criteria were key in the selection—the floor plan design of the residential buildings and the typology of the green areas in their surroundings. The selected apartment buildings vary in several parameters: they range from three to seven stories, were constructed during different periods, and feature diverse urban designs, morphological structures, and compositions, as well as varying distances between them. Both neighborhoods include greenery between the buildings, but the types of greenery differ (Figure 3). The façades exhibit a range of architectural and construction elements and are maintained in different ways, allowing for a degree of variability. Notably, the façades were photographed on the same day and under identical weather conditions. The photographs of the façades in the survey questionnaire were taken under the same weather conditions, at the ground-floor-level, as the ground floor is important in the perception of the neighborhood in relation to the fluidity between the open space between the buildings. The photos intentionally do not contain people, as their activities could influence the participants' responses.

Two major residential neighborhoods in the city of Ljubljana were selected:

N1—Litostrojski bloki (1947–1963). The arrangement of the buildings and the morphological composition of the residential area show adaptability and the possibility of expansion, which was later limited by the growth of the city. The residential area was established in accordance with the concept of modernist urbanization, with freely distributed volumes of multi-apartment blocks in the greenery. During the planning period of the residential complex, the way the built structures were placed created a new urban order in the direction of Celovška street. The residential part envisioned multi-apartment structures spatially slightly removed from the city entrance of Celovška street but still connected to it. It was built at the same time as the factory, as there was a shortage of housing for workers in the city. The residential area is made up of freestanding four-story blocks that are arranged in a grid pattern of streets. The workers were ethnically diverse, as they came from different republics of the former Yugoslavia [72]. Prefabricated concrete façade elements of various shapes were used as façade cladding, which was a novelty in design at the time [73]. In the case of avenues of trees and the planting of parks, there is a big gap between the planned and actually realized, which is unfortunately a consequence of the difficult economic conditions, when there are hardly enough funds to build the most essential buildings [74].

N2—Štepanjsko naselje (1972–1978). The first example of a settlement with solidarity and social housing [75]. Štepanjsko naselje creates a contrast between tall blocks and

spacious green parks, in which the buildings are located. The urban design focuses on a central spine as a broad pedestrian "promenade" with branching pathways. The high density of built housing blocks is a reflection of and a contrast with the lower housing structure in the surroundings. A specific built morphology, in the shape of L, defines the inner part of the housing area along the promenade and offers openness to the outside part, which, in the construction period, was a green peripheral area. Traffic is routed around the edges, with public programs concentrated at both ends. Residential buildings consist of five-story block typologies.

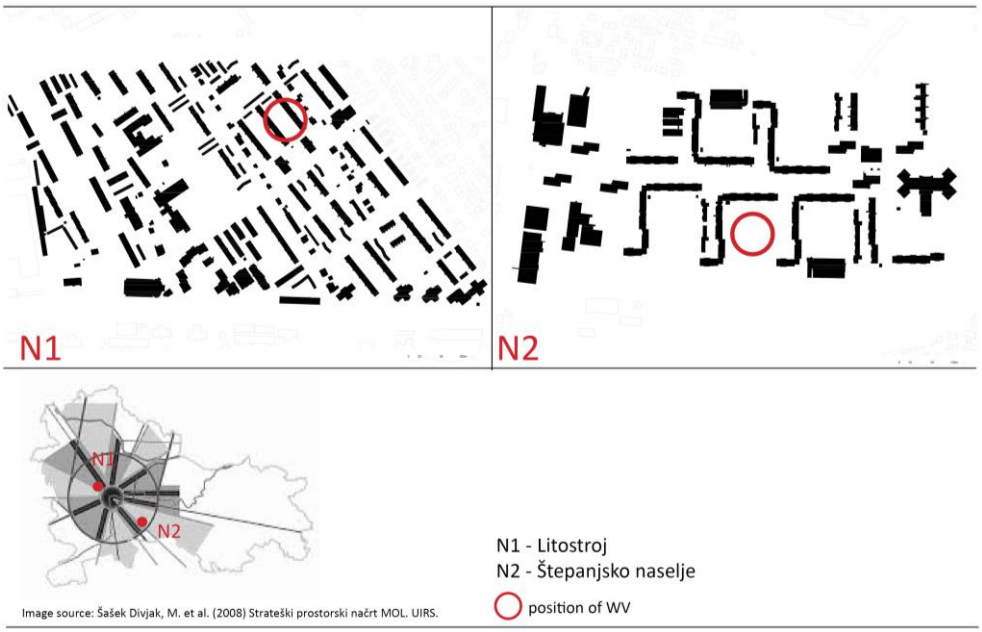


Figure 2. The position of the two residential neighborhoods in the strategy [73] of the city of Ljubljana.

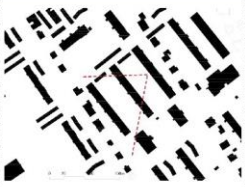
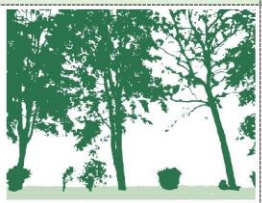
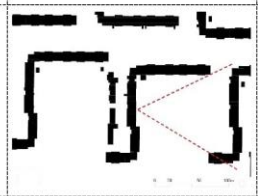
Abr. (1)	Name (2)	Urban plan (3)	BD IW View (4)	IW View (5)	Greenery (6)	IW % G (greenery) (7)
N1	Litostrojski bloki		31.80 m			32.40 % vertical G. 4.00 % horizontal G.
N2	Štepanjsko naselje		117.60 m			27.20 % vertical G. 36.00 % horizontal G.

Figure 3. WV in N1 and N2. The morphological scheme (**3**) indicates the viewing angle from the window. Greenery between the buildings varies (**6**), and their typology is different (**7**).

2.3. Survey and Research Framework

In the second (2) phase of our research, a survey questionnaire was developed, including eleven questions. The first six questions examined respondents' understanding of the necessity of windows in a space and their opinion on how important they find quality window views (WVs). In the second part of the survey questionnaire, respondents evaluated the WV of selected opposing façades in relation to the concept of human scale. We introduced the concept of human scale based on research presented by Ewing and

Clemente [76]: "Human scale refers to a size, texture, and articulation of physical elements that match the size and proportions of humans and, equally important, correspond to the speed at which humans walk. Building details, pavement texture, street trees, and street furniture are all physical elements contributing to human scale." Seven pre-prepared indicators (I) were selected from the literature [22,23,69,76–84], which the participants of the survey chose in their responses:

- Area connectivity—I1;
- Readability and completeness of the ambience—I2;
- Clarity and expressiveness of building design—I3;
- Complementarity of buildings, urban furniture, and other areas—I4;
- Presence of greenery—I5;
- Transparency of tree canopies—I6;
- Perception of artistic composition principles—I7.

We invited two distinct groups of students from the Faculty of Architecture at the University of Ljubljana to participate in our survey. Group A consisted of third-year architecture students, while Group B comprised third-year urbanism students. This setup ensured that the responses from groups A and B were independent, which allows us to confirm the hypothesis (H3) that the survey method used does not affect the variance of the human-scale perception indicators (I1–I7). In the first method (survey approach 1—SA1), respondents could only select one answer, while in the second method (survey approach 2—SA2), the number of answers was not limited.

A total of 88 students participated in the survey, with 49 from group A (architecture) and 38 from group B (urbanism). The survey was conducted in May 2022 using two online platforms: Moodle for group A (accessible via the UL FA online classroom) and 1KA [85] for group B.

The responses were organized by frequency, and the percentage of each answer was determined separately for SA1 and SA2. These percentages were then ranked accordingly. The three hypotheses introduced earlier were tested based on these rankings. Hypothesis H1, which asserts that the presence of greenery in the city is a significant indicator of the human scale of the urban environment, was tested using the chi-square test (χ^2 test) for categorical data:

$$\begin{gathered} H_0: \ \chi^2 = 0 \text{ (no dependency)} \\ H_1: \ \chi^2 \neq 0 \text{ (dependency)} \\ \chi_e^2 = \sum_{i=1}^{k} \frac{\left(f_i - f_i{}'\right)^2}{f_i{}'} \end{gathered} \tag{1}$$

where χ_e^2 is the experimental χ^2-value, f_i is the frequency from the contingency table, $f_i{}'$ is the expected frequency, and k is the number of cells in the contingency table.

Hypothesis H2, which suggests a difference in the homogeneity of evaluations of human scale indicators as proposed in the literature, was tested using the homogeneity test (F-test):

$$\begin{gathered} H_0: \ F = 0 \text{ (no difference in variances)} \\ H_2: \ F \neq 0 \text{ (difference in variances)} \\ F_e = \frac{s_{\text{I1,I5,I7}}^{*2}}{s_{\text{I2–I4,I6}}^{*2}} \end{gathered} \tag{2}$$

where F_e is the experimental F-value, $s_{\text{I1,I5,I7}}^{*2}$ is the variance of the ranks of indicators I1, I5 and I7, and $s_{\text{I2–I4,I6}}^{*2}$ is the variance of the ranks of indicators I2, I3, I4, and I6.

Hypothesis H3, which posits that the human-scale perception indicators yield similar results regardless of the survey approach (single response (SA1) or multiple responses

(SA2)) was tested by examining the significance of the Pearson correlation coefficient between the ranks of survey responses according to the survey approach (r):

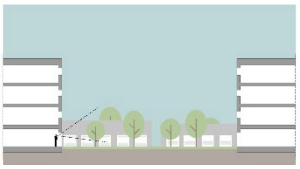
$$\begin{gathered} H_0: \rho = 0 \text{ (no correlation)} \\ H_3: \rho \neq 0 \text{ (correlation)} \\ t_e = \frac{r \cdot \sqrt{n-2}}{\sqrt{1-r^2}} \end{gathered} \quad (3)$$

where t_e is the experimental t-value, and n is the number of observations in the sample (in our case $n = 14$; seven indicators and two neighborhoods).

3. Results

Table 1 presents the number of responses related to the perceived human scale of each WV, categorized by survey approach. The relative distribution of these responses is depicted in the graphs in Figure 4a,b. For neighborhood N1, the most frequently selected indicators were the presence of greenery (I6); complementarity of buildings, urban furniture, and other areas (I4); and readability and completeness of ambience (I2). For neighborhood N2, the top indicators were readability and completeness of ambience (I2) and the presence of greenery (I6).

Table 1. Number of responses to the perception of human scale, categorized by neighborhood and survey approach.

		Litostrojski Bloki (N1)		**Štepanjsko Naselje (N2)**	
					
Code	**Human Scale Indicators**	**SA1**	**SA2**	**SA1**	**SA2**
I1	Area connectivity	1	2	5	8
I2	Readability and completeness of ambience	11	5	26	11
I3	Clarity and expressiveness of building design	5	7	3	8
I4	Complementarity of buildings, urban furniture and other areas	12	6	0	4
I5	Presence of greenery	12	13	12	14
I6	Transparency of tree canopies	5	6	2	3
I7	Perception of artistic composition principles	3	3	0	3
	Together	49	42	48	51

From Table 1, it is also evident that in the survey approach SA1 (single response), not all questions were answered by every respondent (49 responses for N1 but only 48 for N2). Conversely, in the survey approach SA2 (multiple response, 38 respondents), the fewest different human-scale indicators were chosen for the neighborhood N1 (42 responses), while the highest number of responses were recorded for the WVs of the neighborhood N2 (51 responses).

Hypothesis H3, which states that the indicators proposed in the literature to assess the human scale of the urban environment provide consistent results regardless of the two different survey methods used in our study, was tested with the Pearson rank correlation coefficient, which is $r = 0.831$ ($t_e = 5.184$, $t = 5.152$, $p = 1.2^{-4}$). This result indicates a

strong and statistically significant correlation in the ranking of the responses between the two survey methods (SA1 and SA2), thereby validating H3.

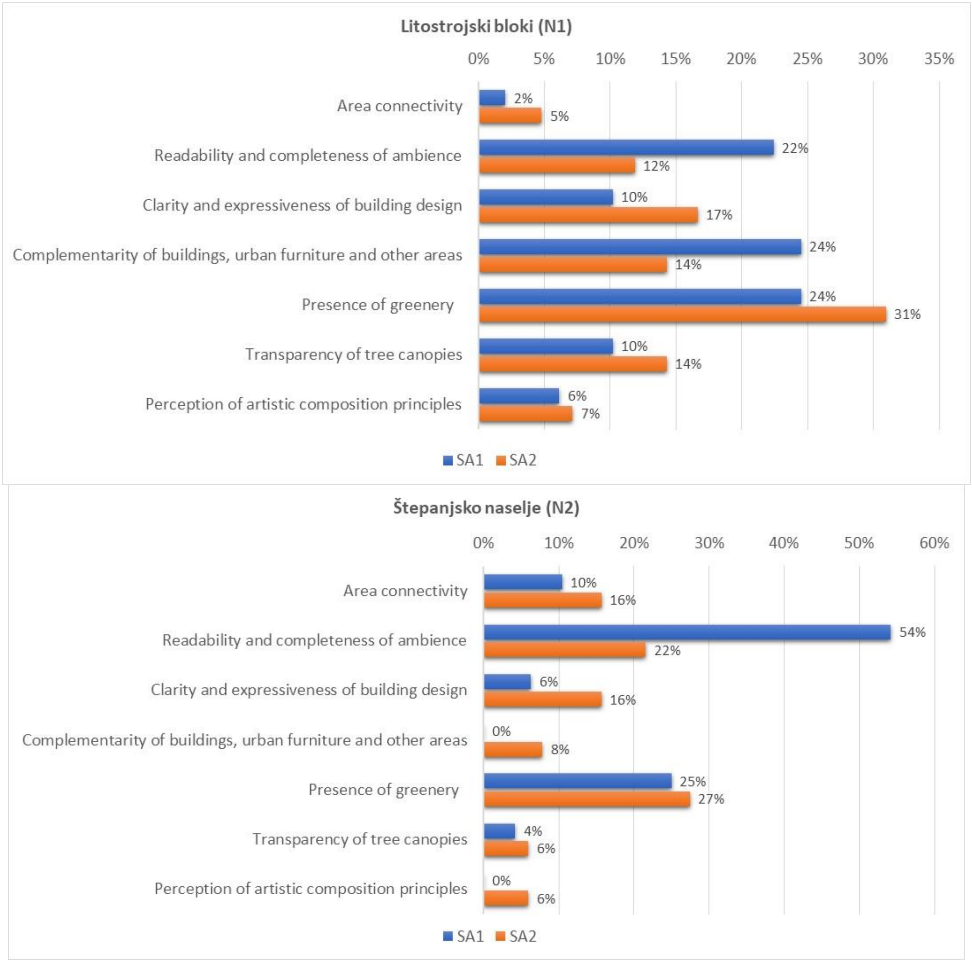


Figure 4. Relative number of responses on the perception of human scale, categorized by neighborhood (N1) and survey approach (**a**) and by neighborhood (N2) and survey approach (**b**).

We also computed rank correlation coefficients and performed significance tests for both neighborhoods. The findings reveal a minimal difference in response rankings between the survey methods, with very small p-values (see Figure 5). The p-value for neighborhood N2 is quite low, while it is slightly higher for N1. For N1, the higher p-value is primarily due to differences in ranks for the indicators "readability and completeness of ambience" (I2), "clarity and expressiveness of building design" (I3), and "complementarity of buildings, urban furniture, and other areas" (I4), where the rank differences between response groups for the survey approach are two units. For neighborhood N2, the highest rank difference is only one unit.

A more detailed examination of the absolute differences in ranks (see Figure 5) prompted us to test hypothesis H2, which posits that there is a difference in the homogeneity of evaluations of the analyzed human-scale indicators. We conducted this test using the homogeneity test, comparing the differences in homogeneity of respondents' answers for two groups of indicators (2). The first group (I1, I5, I7) had absolute rank differences of 1 or smaller, while the second group (I2, I3, I4, I6) had absolute rank differences of 2 or 3. The test revealed a difference in the homogeneity of evaluations of the analyzed human-scale indicators ($F_e = 2.405$, $F^{(upper)} = 2.404$, $p = 0.058$), thus confirming H2.

		N1		N2	
Code	**Human scale indicator**	**SA1**	**SA2**	**SA1**	**SA2**
I1	Area connectivity	7	7	3	3
I2	Readability and completeness of ambience	3	5	1	2
I3	Clarity and expressiveness of building design	4	2	4	3
I4	Complementarity of buildings, urban furniture and other areas	1	3	6	5
I5	Presence of greenery	1	1	2	1
I6	Transparency of tree canopies	4	3	5	6
I7	Perception of artistic composition principles	6	6	6	6
	Pearson's correlation coefficient :	0.787		0.895	
	T-statistic :	2.857		4.490	
	t-value :	2.846		4.262	
	p-value :	0.018		0.004	

Figure 5. Ranks of responses on the perception of human scale, categorized by neighborhood and survey approach, along with the results of testing the significance of the rank correlation coefficient. Notes: N = residential neighborhoods (N1 = Litostrojski bloki, N2 = Štepanjsko naselje), SA = survey approach (SA1 = only one answer allowed, SA2 = several answers allowed).

A review of the human-scale perception responses in Table 1 together with the rankings in Figure 5 shows that greenery (I5) is a critical factor in improving the human scale of the urban environment, supporting our hypothesis H1. Indicator I5 consistently ranks first or second. We tested hypothesis H1 using the χ^2 test (1) based on the data in Table 2. The test revealed a statistically significant correlation between the "presence of greenery" (I5) and high ranks of the human-scale indicators ($\chi_e^2 = 11.667$, $\chi^2 = 10.828$, $p = 0.001$), thus confirming H1.

Table 2. Contingency table showing the relationship between indicators and their ranked importance for the human scale of urban space.

	Rank 1–2	**Rank 3–7**
Presence of greenery (I5)	4	0
All other indicators (I1–I4 or I6–I7)	4	20

4. Discussion

The study tested three hypotheses: one directly related to the study's content and two concerning the methodology to evaluate the human scale of the urban environment. The hypothesis that the presence of greenery in the city is a significant indicator of the human scale (H1) was tested and confirmed using the correlation test for nominal variables. The hypothesis that the indicators used in the study for perceiving the human scale of the urban environment provide similar results regardless of survey approach (single or multiple answers; H3) has been tested and confirmed by the significance test of the Pearson correlation coefficient of the ranks. Lastly, the hypothesis that there is a difference in the homogeneity of evaluations of human-scale indicators suggested in the literature [22,23,69,76–84] and used in our study (H2) has been tested and confirmed by means of the homogeneity test.

The study used two survey approaches with two independent groups of respondents. Survey Approach 1 (SA1) used a single selection technique, while Survey Approach 2 (SA2) used a multiple selection technique. In general, the multiple selection approach is more intuitive and versatile and allows for easy data analysis with mutually exclusive choices. However, the single selection approach is more effective in identifying a user's primary preference from a set of options. Our study demonstrates that the indicators of perceived human scale in WVs are suitable for both single-selection and multiple-selection approaches. The two survey approaches (SA1 and SA2) yielded very similar rankings of possible responses. However, these approaches also highlighted different

perceptions of two groups of indicators, prompting us to test Hypothesis 1 (H1). Specifically, respondents' answers were more homogeneous for three indicators (area connectivity—I1, presence of greenery—I5, and perception of artistic composition principles—I7) compared to others (readability and completeness of ambience—I2; clarity and expressiveness of building design—I3; complementarity of buildings, urban furniture, and other areas—I4; and transparency of tree canopies—I6).

In the discussion, we rely on Table 2, the indicators of perceived human scale in WVs, by looking for a connection between the indicators, especially with the "presence of greenery". We sought to determine how we perceive the human scale through these six indicators (−1, which represents the "presence of greenery"—I5), and whether each indicator hides a connection with the "presence of greenery" in relation to the evaluation of the importance of the indicator, compared to the results of the survey (with reference to Figures 1–3 and Table 1).

4.1. Area Connectivity—I1

From the point of view of WVs, the connectivity of the area also refers to green areas (reference Figure 3 for horizontal and vertical greenery). The defined area is connected to green areas (in the case of N1 and N2), which is directly related to the "presence of greenery" indicator. It provides a direct connection between the outdoor ground level of open public space and the interior of buildings. This connectivity can be felt through three (3) criteria: the ground floor horizontal floor surface, the height of the interior of the building, which is transferred to the open space as the "point of view" of the space, and the criteria of individual trees, which in both neighborhoods represent a key element of arrangement of external surfaces (vertical greenery). At the same time, horizontal greenery is the element that creates a sense of unity between the buildings in the neighborhood as a whole. As Makower [69] says, "we are sensitive to horizontal distances, because this is how we move". In the case of a larger area of the interspace (example of neighborhood N2), this element is the one that further emphasizes the perspective and distance between the buildings. However, according to the survey, it is clear that the physical dimension of the distance between buildings, which is "too big" in the case of N2, is the decisive element that influenced the respondents' understanding of the quality of the neighborhood from the point of view of the human scale.

4.2. Readability and Completeness of the Ambience—I2

The integrity of the ambience is an indicator that is difficult to understand, as it is colored by the subjectivity of perception. From the point of view of WV, it is a fact that natural elements provide more benefits [57–60]. At the same time, distant urban elements can be better received in WVs than closer ones, especially if there is greenery between the observer and the built structure [61], which confirms that the feeling of the integrity of the ambience is more perceived in N2 (see Table 1 and Figure 4b). From the point of view of readability and completeness of the area, we can confirm that the trees, in the case of N1 and N2, are the element that adds dimension to the outdoor space. The tree as a vertical greenery element complements the dimension of distance. Therefore, we perceive the distance of the ambience (open space) in N2 as too large through the dimension of the tree. However, it is difficult to define this "feeling" as suitable for the human scale or as a suitable perception of distance. It is also about choice and freedom—how we choose to move and how this affects our experience of scale in cities [69]. Considering the large number of respondents choosing this indicator (and the large percentage of green areas in N1 and N2), we can claim that greenery is the indicator that confirms readability and completeness of ambience. At the same time, from the space dimension, N1 is closer to Gehl's [22] claim that "sense of the importance of intimacy and intensity in cities" is important at the same time as "overview and detail" on a human scale.

4.3. Clarity and Expressiveness of Building Design (I3) and Complementarity of Buildings, Urban Furniture, and Other Areas (I4)

These are two indicators that very clearly indicate the built elements of the building, the surroundings, and the urban equipment. The indicator of connectivity with the "presence of greenery" would only be possible if the built elements contained elements of green walls, green balconies, or other forms of greenery as a design feature, which was not detected either in the case of N1 or N2.

4.4. Transparency of Tree Canopies—I6

Transparency allows readability of the open space [86]. At the same time, the typology of trees is also important. In the case of N1 and N2, the transparency from the point of view of WVs from the ground floor clearing is evident. Most of the vertical trees on this level allow a wide view. In the case of both neighborhoods, transparency is directly related to the "presence of greenery". However, the indicator is not recognized as a special element of the human scale. If the question had been clearly formulated (that the latter refers to trees and to all elements of the tree, in this case the stem), the respondents would have been directed to the answer more unambiguously. The integration of street greenery and accessibility helps to measure greenery from a human-centered perspective [87]. But in our case, the area of the neighborhood (between buildings in N1 and N2) represents a green area with freely placed trees, which loses the value of perspective, as well as human scale. Transparency as an indicator enables the perception of the built environment and thus the neighborhood as a whole.

4.5. Perception of Artistic Composition Principles—I7

This is an indicator that can very quickly be mistakenly associated only with elements of the built. On the other hand, we note that the respondents were students who are close to artistic composition, regardless of whether it refers to an individual object, urban design, landscape structure, or even a single detail, a façade. In the case of WV, the indicator also refers to the very composition of the perception of the "picture" of the space. Therefore, the elements of the composition refer to the balance between horizontal and vertical elements, between the emptiness of the "sky" and the level of the built and the natural (segmentation according to Figure 1). Undoubtedly, all these elements are influenced by the "presence of greenery", which in the case of N1, represents more than one-third of the picture surface and, in N2, more than two-thirds of the surface. Considering the latter, we can claim that the indicator has a direct influence and a strong connection with the "presence of greenery" indicator.

5. Conclusions

In recent decades, cities have grown rapidly, but the quality of life in them has declined. Human needs have been overlooked in dense urban settlements, and the priority is primarily on the design of the infrastructure. Today, partly due to the global ecological crisis and climate change, cities are experiencing pollution and overheating, leading to deteriorating health and social segregation.

Studies show that a green urban environment significantly improves people's well-being, health, and satisfaction. In this article, we have therefore focused on greenery in residential neighborhoods, which has many other positive effects in addition to health: greenery improves the air; greenery invites people out of enclosed spaces into a green environment and encourages them to be physically active; spending time in the park or green space next to the apartment block strengthens the social cohesion of the neighborhood; looking at the surrounding greenery relaxes people and helps them to recover from stress.

Based on the study of two neighborhoods in Ljubljana, Slovenia, we focused in this paper on the importance of greenery in the urban environment. The studied neighborhoods have greenery between buildings but differ in the typology of greenery and the distance between buildings. We highlighted the human scale, which refers to the size,

texture, and arrangement of physical elements that correspond to the human scale and proportions. Building details, pavement texture, street trees, and street furniture are all physical elements that contribute to the human scale. Two groups of students participated in the survey—students of architecture and students of urbanism. In the survey, they chose from seven pre-prepared indicators that we linked to the human scale.

The correlation between greenery and the human scale is demonstrated by four indicators. Area connectivity (I1) is demonstrated through vertical greenery (trees), through the height of buildings, which represents a "visible point", and, above all, through horizontal greenery, which connects the building masses of opposing buildings. Horizontal greenery emphasizes perspective and distance between buildings. Trees define the readability and completeness of the ambience (I2), while the transparency of tree canopies (I6) enables the perception of the built environment and thus the entire neighborhood, emphasizing the importance of tree typology. In the research, we found that respondents understand the perception of artistic composition principles (I7) as a balance between natural and built elements.

We included architecture and urban planning students in the research, which initially meant a different perception of space than the lay user might experience. We do not see this as a limitation but, rather, an opportunity to obtain clearer answers to rather complex questions about the ambient nature of outdoor space. In the future, we plan to repeat the same study in both neighborhoods and survey actual users of the space. This will also verify the methodology used.

Architectural design is a process that incorporates the professional knowledge of the planner. The result of design is an environment that affects human health and well-being for decades after construction, but this fact is most often neglected. Given the results of studies that demonstrate the influence of the visual image of the external environment on human perception, some of which are presented in the article, we believe that planners should understand the correlation between greenery and the human scale and integrate it into the environment in a way that releases positive responses. The research has proven the necessity of connecting architecture, urban planning, engineering, and landscape architecture, which provide the external environment the necessary content.

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