

AMURCON 2020
International Scientific Conference**IDENTIFICATION OF THE CITY AND STAGES OF READING
THE URBAN ENVIRONMENT**Daria G. Sohatskaya (a)*
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design@yandex.ru**Abstract**

The purpose of this article is to study and identify the stages of reading a person's urban environment, including buildings, structures and landscapes (objects and things), as well as recognition levels for marking this environment. Reading stages and recognition levels are presented in the form of identification of three-dimensional space along the x, y and z axes, where x is the horizontal plane of space (path, road), y is the vertical axis (volume) and z is the space that is generated in the merger of the x and y. To compare and analyze fragments of city streets, studies of individual factors were carried out that describe the influence of the environment on a person: the facade and its architectural properties. Influence of outdoor advertising, its use in the canvas of the front wall were taken into account; city silhouette and panorama: the geometry of the roofs of buildings; window, doorways and balcony blocks, their shape are considered; color in architecture was analyzed and the effect of climatic conditions on the color scheme of facades and the architectural space as a whole was investigated. Based on the factors of the influence of the architectural environment, conclusions were drawn; the reading levels of urban space were advanced. The process of reading urban space is based on a comparison and analysis of fragments of city streets: Lenin Avenue in Komsomolsk-on-Amur (Russia) and Modrzejowska in Sosnowiec (Poland). The analysis was carried out using Google spherical 3D panoramas.

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Keywords: Urban space, city identification, reading stages, recognition levels, design-code

1. Introduction

The purpose of this article is to study and identify the stages of reading a person's urban environment, including buildings, structures and landscape (objects and things), as well as recognition levels (Barke, 2019) of this environment. Reading stages and recognition levels are presented in the form of identification of three-dimensional space along the x, y and z axes, where x is the horizontal space plane (path, road), y is the vertical axis (volume) and z is the space that is generated in the merger of the x and y (Sohatskaya, 2020; Zayats, 2016).

1.1. Identification parameters

To identify the stages of reading, an analysis (comparison) of fragments of city streets is carried out on the examples of Lenin Avenue in Komsomolsk-on-Amur (Russia) and Modrzejowska in Sosnowiec (Poland). These fragments were chosen because they are comparable in many respects (Table 1):

Table 1. Comparison of parameters of selected cities

№	Parameter	Sosnowiec (Poland)	Komsomolsk-on-Amur (Russia)
1	Year of foundation	1902	1932
2	Population	218 thousand people	246 thousand people
3	Climate	Moderately cold	Moderately cold
4	Type of the city, economy, industry	Mining, metallurgy, heavy industry, metalworking, service and trade	Industrial, oil and gas processing, engineering, ferrous metallurgy, woodworking, food industry

2. Problem Statement

To compare and analyze fragments of city streets, studies of individual factors were carried out that describe the influence of the environment on a person: the facade and its architectural properties, details and infrastructure of the building, the influence of outdoor advertising, its use in the facade wall painting, as well as color and shape; silhouette and panorama of the city (Brown, 2020). The article discusses the geometry of the roofs of buildings; an attempt was made to scan windows, doorways and balcony blocks; color in architecture is considered and the effect of the influence of climatic conditions is analyzed.

3. Research Questions

Research in the field of reading and identification of urban space was carried out by various scientists. The main conclusions are as follows:

- The urban space is saturated and united by architectural volumes;
- The correct interpretation of urban space is required;
- The study of architecture reveals the historical and cultural value of urban space;
- The definition of the street as a typological unit carries its codes: urban planning, natural, architectural and artistic, and spatial;

- there is a trend in architecture, which has its own methods and principles, and it is its necessary component (insolation, aeration, calculation of wind loads, organization of engineering networks, the movement of people and vehicles in space, the angle of view of people in space) (Burdakova & Byankin, 2018);

- Space is perceived as a whole organism, which requires a phased reading at different functional levels;

- Linear symbolism of facades, signboards, window and doorways, balcony blocks and their architectural style are an integral part of architectural structures;

- Methods of reading by human vision are important for studying the visual environment and, accordingly, for designing a healthy visual environment (using visual ecology).

4. Purpose of the Study

Parameters used for reading urban space are applicable for various architectural environments. The city is identified in stages and corresponds to the three-dimensional space of coordinates x, y and z.

Facade. From the history of architecture, it is known that in each architectural ensemble, as well as in a separate building or construction, there is an image of influence, the rules for the location of windows, balconies, doorways and their distribution along the facade walls.

In modern times, especially in provincial cities, there is a tendency to glazing balcony blocks. The fencing of the balconies is finished with a metal siding construction of various colors. In addition, the facade features are: the cladding material, graphically dense or enlarged, smooth or rough texture of its structure, vertical or horizontal image of the cladding. Based on the function and decoration, the lower level of the building may include signs, advertising of private enterprises and shops. The shape, volume, and color of outdoor advertising may be different at different heights.

Advertising can be located anywhere, but we consider it only within the 1st floor. There is an assumption that the “richer” the decoration of the facade, the less “active” outdoor advertising is required. The stylistics of the urban space of the average Russian city varies from classical to modern. If we consider the provincial cities built in the 30s and 40s of the 20th century, then such a style as “Stalin's Empire” or neoclassicism is surely noted. The facades of the buildings are decorated with architectural details: dripstones, luxurious cornices, stucco moulding, modillions, pediments, bas-reliefs. Over time and the development of modern technologies, building facades are filled with elements of engineering equipment: downpipes, air ventilation devices, gas pipes; and electric wires.

Considering the engineering features of the building, one should not forget about sanitary-protective landscaping. According to Construction Directives and Rules, landscaping delimits the roadbed with the pedestrian part (Galkina & Grinkrug, 2018), which is adjacent to the buildings. It follows that the facade is read by a person not only from the pedestrian strip, but also from the road.

As a result, we would like to single out the following factors that affect the perception of the facade: 1 - geographical location, climatic features; 2 - the specifics of the building cladding material, architectural details, windows, and balconies; 3 - the presence of engineering equipment on the facade; 4 - the nature of landscaping; 5 - the ideology manifested in the architecture of the era of building construction; 6 - associations that cause the structure.

Silhouette and panorama of the city. Alberti represented the building as a “body”, which has outlines, matter or form, space and image (Alberti, 1937). Their combination makes an architectural structure (Ikonnikov, 1986). The form defines the space and image it is built in. An architectural ensemble is considered harmonious if its composition is organically and completely interconnected (Kashkabash, 2012), where buildings: a) are on the same level; b) relate only to medium or high-rise buildings; c) proportional (possibly symmetrical) use of both medium and high-rise buildings, creating a clear silhouette; architecture is subject to the laws and rules of construction; d) buildings do not end with a linear roof, but with irregular outlines in the form of spires or other roof forms.

From what has been said, it becomes apparent that the architectural silhouette consists of the height of buildings and structures, their stylistic line and the completion of the shape of the roof, and location in the environment.

Reading windows and doorways. Reading windows and doors occurs using scale (size, relative to the building or floor height). The user of the window or doorway and their viewer (reading from the building facades, a passing person) identify them differently: from bottom to top and outside for the viewer, for the user - from the inside of the building (at any height, depending on the number of floors of the building).

The window realizes two functions: insolation and aeration. Window size depends on the climate zone. For example, in warm climates, windows can reach the floor. Consequently, the windows of the "northern architecture" are smaller in size; their use can be considered frequent. Because of this replication, window openings were decorated with architectural details: cornices, architectural fragments with ornaments.

In addition to the function and shape of the window opening, frame binding should also be considered. The design of the casements can consist of horizontal and vertical rungs and expresses the static or dynamic facade. There is a number of works that mention the influence of the frequency of facade windows on a person. Repeated use of window blocks on the facade makes a person feel ripples in the eyes, discomfort, and despondency. In automatic saccadic movement, the visual organ focuses on one window and transfers the image to the brain, then collects the same information again, thereby there is nothing for the human eye to “catch on”, causing anxiety and apathy. The same effect is observed with a fully glazed façade. The following should be noted: 1 - window reading occurs: from the point of view of the "viewer"; from the point of view of the "user"; 2 - the window is endowed with a function; 3 - the size and scale of the window depends on the geographical location and climatic features of the location; 4 - decorative elements and the shape of the window tell about the style of the building, the ideology of the construction era; 5 - human visual perception of the visual environment is one of the significant components of human life, its incorrect formation negatively affects the person.

Color in an architectural environment. Semantics of color in architecture. The semantics in the color of the facades of buildings, as well as research in this area were searched by scientists: Aristotle, L. B. Alberti, Leonardo da Vinci, I. Goethe, Ya. E. Purkine, F. Schelling, G. Helmholtz, G. Hegel, A.F. Losev, S. Ya. Lurie, O.E. Zheleznyak, E.A. Lapshina, T.M. Potokina.

The architectural ensemble in urban space has a “city sound” or “street emotion”. This "sound-emotion" represents the color of buildings and structures. It is interesting that each era carried its own “sound-emotion”. In modern Russia, in particular, in provincial cities, colors are used randomly. The color

that belongs to the image of the city in most cases is not emphasized, and is only exacerbated by whitened shades of pastel colors that can be distorted in the cold season, become even brighter due to reflection of light from snow or with a predominance of gray in rainy weather (Kuzmina & Drozd, 1992).

Based on this, it can be assumed that color plays an exceptional role in architecture and requires proper use. The emotional shades of urban space, buildings and structures should have corresponding dynamics, identifying with the function that they carry for reading it by a person. The essence of the above is that: 1 - the color of the facades should be subordinate to the function of the building; 2 - the color scheme depends on the geographical location and climatic features of the city in question; 3 - there is an “emotional palette”, that helps to identify a “city sound” or “sound-emotion” favorable for a given urban space and to be used only to this area (Jinwei et al., 2020).

5. Research Methods

Now, having determined the nature of the basic concepts, it is possible to determine how the realities associated with them are embodied in a specific architectural environment. For analysis, fragments of Modrzejowska Street in Sosnowiec (Poland) and Lenin Avenue in Komsomolsk-on-Amur (Russia) were selected. The analysis was carried out using Google spherical 3D panoramas (Borden, 2007; Vyrva, 2017).

6. Findings

Modrzejowska, Sosnowiec (Poland). Modrzejowska Street is located in the city of Sosnowiec in Poland. Modzheevskaya street is one of the oldest streets in the center of Sosnowiec, which is also a walking area. It was laid at the beginning of the 19th century.

Readout vertically (Y axis). Modrzejowska street houses buildings of 2, 3 and 4 floors. According to the facades of buildings, we can say that the construction period ranges from the 2nd half of the 19th and the 1st half of the 20th centuries. The facade of the house number 17 (2 floors) is long. Horizontal lines are clearly visible along the entire length of the facade, which cut the facade into 2 floors. In addition, horizontal lines frame a series of windows on the 2nd floor, as well as a parapet of the roof. The 1st floor has continuous glazing from design zero to the beginning of the 2nd floor. The facade is dominated by gray colors. It is made up of cladding material (concrete, plaster). The material for the manufacture of window frames is white metal-plastic, door frames are aluminum constructions. The entrances to the building are marked with a sign, calculating in proportion, we can say that the height of the sign is 2.20 m. However, as can be seen from the photo of the place, the location of the images of the signs is not only horizontal, but also vertical. Signs are flat images and voluminous font compositions. Another way to solve the signage is to cover the glazing on the 1st floor - completely, ½ part or ornamental.

The building opposite (house number 16) has 5 floors. According to the architectural details of the facade, as well as the shape of the balcony openings, it can be assumed that the building reminds the Neo-Moorish style. The color scheme of the facade has warm, beige shades. The windows are devoid of the source material, made in modern technologies of a plastic double-glazed window. A bay window with narrow vertically elongated windows prevails in the building's facade.

Horizontal reading (X axis). Modrzejowska street is a pedestrian, therefore, it has a paved surface. The shape of the paving elements is presented in 3 forms: round, rectangular, and in the form of an I-beam.

Interestingly, the entrance areas in front of the building are lined with paving elements of a rectangular shape in light red. A pedestrian zone passes from the entrance area, which is marked in light gray and has a circular shape of paving elements. Further, a narrow strip of paving with I-beam elements visually separates the pedestrian zone near the building and the quiet rest zone. It is made in paving gray, light red. The quiet rest area is limited by the arrangement of city furniture and creates behind-the-scenes spaces in a busy street.

Thus, this option of paving and functional zoning of the street space solve several problems:

1 - distinguish between pedestrian traffic; 2 - identify areas of hiking, relaxing and entrance groups of buildings; 3 - visually determine the movement (path) of a person.

Reading space (Z axis). Based on the analysis of urban fabric, it can be assumed that space for a person can be attractive due to the variety of buildings, the use of various types of paving footpaths and the color scheme of buildings.

Lenin Avenue. Lenin Avenue originates from the intersection of the avenue with Kirov Street. This work involves the analysis of a fragment from Metallurgov Square to 25 Lenin Avenue.

Facades on Lenin Avenue. Lenin Avenue from Metallurgov Square begins with a house (5 floors, with a flat roof), built in 1976 according to the 85th type series, and painted in horizontally alternating stripes (light yellow stripes between the windows of the floors) of light yellow and pink colors. There are shops on the ground floor of the building. The windows in the form of continuous glazing are “clogged” with outdoor advertising of a flat type. Signs are at different heights.

Further, the building of the Technical school carries the idea of the post-war years of the construction of high-rise buildings in Moscow with towers and spires (Kuzmina & Drozd, 1992; Ladeyshikov, 2004), which affected the formation of the style of buildings in Komsomolsk-on-Amur. The structure is decorated with pilasters, which at the side facades hold an additional cornice separating the 3rd floor from the 4th one.

The building with a spire on Lenin Avenue, 21 is full of bas-reliefs, cornices with floral ornaments, and balconies with balusters. The windows are decorated with cornices. The tower itself is crowned with a pointed spire with Soviet symbols. Cladding color is terracotta. Against the background of this color, architectural details painted white are favorably read. The ground floors of the building (shops) include large windows that have rounded shapes on top. The subsequent floors in the building are residential. Outdoor advertising is made in different coloristic solutions and at irregular heights. The building is located on the "red line" and has no sanitary-protective landscaping. It is freely readable in traffic and in the pedestrian zone. The buildings opposite are also tied to the red line. The buildings on the even side are plastered and painted in pastel colors, decorated with a small amount of architectural details. Some balconies have retained their original style and are decorated with balusters. The portals of the balcony block are enclosed between 2 columns of the Doric order, standing at the base in height equal to the fence of the balcony. The columns hold the pediment over the balcony without any details. There are balconies decorated with a balustrade. The brick building on Lenin Avenue, 17, is plastered, decorated with balusters and stucco moulding. The middle part of the facade on the ground floor is cut through by arched windows

that decorate the windows of the shops located here. The 3 axes of the building between the bay windows are marked by stairwells and front doorways of the entrances to the house, decorated with dripstones. Along with other buildings, the building participates in the design of the main street of the city, distinguished by its architectural appearance, characteristic of the neoclassical style of the post-war period. An interesting fact is that on the odd side, starting from the Metallurgov Square (building numbers are 13 – 25) there is no sanitary-protective landscaping.

Paving (X axis). Throughout the entire length of Lenin Avenue, the pedestrian road is covered with paving starting from Lenin Avenue, 13 to Lenin Avenue, 25.

There are two types of paving: 1) rectangular, resembles a zigzag pattern; 2) a composition of elongated rectangles. The entrance areas of the building are paved with 2 types and are marked in gray. A pedestrian zone passes from the entrance zone, which is highlighted by a gradient from bright to light pink and with a view of paving 1. A narrow paving strip of type 2 visually separates the pedestrian zone with the transport track. As in the previous analysis of Modzheevskaya Street, paving solves several problems: it delimits the movement of pedestrians and distributes the movement of people.

Reading space (Z axis). Lenin Avenue leaves an impression of monumentality and spaciousness. The wide and main street of the city is filled with five-story buildings in the neoclassical style. The exterior decoration is rich in architectural details. The silhouette of the avenue changes only in that fragment where there is a "tower with a spire." Space is of interest to people in it. As a result of the analysis, we can conclude that the parameters used for reading urban space are applicable for various architectural environments. The city is identified in stages and corresponds to the three-dimensional space of coordinates x, y and z. Each of the coordinates includes the following levels of space recognition:

I stage (X axis) - calculation of the place: Level 1 - the functional purpose of the road plane (pedestrian, transport, entrance groups of buildings, places of quiet rest); Level 2 - delimits traffic, pedestrians; Level 3 - visual predetermination of the movement of people; Level 4 - special creation of a "legend" of movement (initial design); Level 5 - the presence of urban lighting; Level 6 - improvement of pedestrian paths, the presence of borders, flower beds.

Stage II (Y axis) - volume calculation: Level 1 - geographical location and climatic features; Level 2 - cladding of the building and architectural details, the presence of decor, window, doorways and balcony blocks; Level 3 - engineering equipment of the facade; Level 5 - outdoor advertising and its impact; Level 6 - the presence of landscaping; Level 7 - coloristic decision of facades; Level 8 - ideology of the construction era; Level 9 - the associations that the structure causes; Level 10 - the presence of light design and urban lighting (medium - lights, light boxes advertising and high-rise - on the building).

Stage III (Z axis) - synergy of place and volume: Level 1 - the silhouette of space; Level 2 - a panorama of space; Level 3 - coloristic decision of facades, paving and outdoor advertising in a compartment; Level 4 - associations, ideology, symbolism of space; Level 5 - the color of urban vehicles (buses, taxis, trams, trolleybuses, and minibuses).

7. Conclusion

We should pay attention to the practical side of this study. Based on the research, you can read both one fragment of urban space, and the whole city. In this case, you can get results that will help in the

development of the architectural environment, its free reading and use for the improvement of public spaces, which keep the prevailing ideology, style of buildings and the urban environment as a whole (Lars & Barthel, 2019).

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