

The Impact of Spatial Conformation and Visibility on Space Use and Appropriation in the Intermediate Urban Spaces of Collective Housing Cities

Case Study: The District of 244 Dwellings, Biskra, Algeria.

Fayçal Alouane^{1*}, Said Mazouz²

¹University Mohamed Khider-Biskra.

²University Oum El Bouaghui.

Received: October 17, 2022

Accepted: November 07, 2022

Published: November 11, 2022

Abstract

This work seeks to study the impact of visibility, permeability and accessibility on the use and appropriation of intermediate urban spaces of large collective housing complexes in the district of 244 dwellings in Biskra, compared to their physical and configurational characteristics, based on the syntactic approach and other combined investigation methods, in particular the questionnaire technique. This spatial conformation offers a variety of forms of their open public spaces in such a way as to bring out the most adequate, and therefore to draw up a set of recommendations on the spatial configuration. The objective is also the optimization of use and the strengthening of the inhabitant-space relationship which can help urban planners, architects, and all those involved in the design and development of open public spaces in large housing estates to better take charge of its spaces and thus avoid all the inconveniences observed and the dysfunction and degradation of the public space. The theme of our study has particularities because it requires both a maximum of knowledge in different areas such as; environmental psychology, urban planning, urban geography, spatial syntax theory, urban space. All these considerations require the establishment of a mixed methodological approach that combines qualitative (in-situ observation and a questionnaire) and quantitative (space syntax) methods, in particular the study of visibility, permeability and accessibility and their impact on social interaction and use in a coherent and harmonious way in order to enrich the results of the research, relying mainly on space syntax as a theoretical framework and method of analysis and investigation. The confrontation of the results of the analysis of the space syntax and the results of the investigation by the techniques of the questionnaire and the analysis in situ, showed a correlation between spatial properties such as visibility, accessibility, and user movement patterns with certain behaviors. It also showed a strong correlation between the spatial conformation of outdoor spaces and their use and appropriation, on the one hand, and between the spatial conformation and visibility, permeability and accessibility, on the other hand, and their impact on the environment. Note that the main elements of the configuration that affect use and appropriation are the shape of the space, the surface, the enclosure (enclosed space), the visibility, the compactness and the density from the interior private space (natural surveillance), towards the exterior. Spatial hierarchy, as well as the use and appropriation of space by the inhabitants, are intimately linked to syntactic values; the inhabitants appropriate and use the spaces mainly according to their visibility, their permeability, their accessibility, the closure of the space (territoriality/residentiality) and sometimes the density.

Key words: intermediate urban spaces, spatial conformation, space use, appropriation, visibility, accessibility.

INTRODUCTION

Since the 19th century, thinkers had put forward ideas on the ideal city, as a counterpoint to the industrial city. Between the two world wars, the most advanced current, the modern movement, advocated the functionalism of urban planning and habitat. It was necessary to separate the functions in space: residential areas, activities, leisure, and circulation spaces. Experiments were undertaken with new neighborhoods of collective housing estates (in France for example) composed of towers and bars, while in the USSR, the construction of “communal houses” on the model put forward by Charles Fourier in the 19th century was under debate. The theories of this movement were presented in the “Charter of Athens”, drawn up in 1933 on an “international congress of modern architecture” and published during the war by Le Corbusier.

From the appearance of the first human settlements to the present day, urban life consisted of two different modes: private space and public space commonly called outdoor space (Naceur F, Farhi. A, 1989). The border that separates them, often unstable, varies according to the context, thus allowing a certain characterization of belonging and appropriation of certain parts of the space and a feeling of attachment to this place. "The separation between private space and public space is, therefore, a historical reality that results from a division, itself changing, of human activity between these two spaces" (Prost, 1999, p214).

The present study is interested in the outdoor open public space, a relatively recent term (the 1970s). Still, its existence as an urban form and place of social practice is also sold as the urban space itself. We are interested in this research in the outdoor spaces of large collective housing complexes, which designates all the open spaces located at the foot of the buildings of the large complexes and designed according to the urban planning doctrines of the modern movement from the 1960s, and they are relatively undifferentiated from other public spaces. These spaces play a vital role in the structuring of urban space in residential areas. They are designed to meet very diverse needs, constitute the extension of housing or dwelling, and require a certain characterization of belonging to a group of a certain number of blocks or housing, hence this notion of territoriality and use of open public spaces in large housing estates). (Rim M. Souhaila B., Yassine B., 2019.)

Here, it should also be noted that a large housing estate is defined as being an urban form made up by a group of dwellings, equipped with the necessary residential and collective equipment, often it is designed as a break with the existing urban fabric and takes the form of bars and towers. Most of the definitions of the term 'Grand Ensemble' agree to affirm that it is a group of totally new collective housing, designed according to the principles of architecture and modern town planning which have changed the style and design with surprising speed, using new industrial techniques. (Hervé Vieillard-Baron, 2012).

In recent years, the quality of open public space in large collective housing developments has been a major concern and challenge for urban planners, and its multiple influences on the inhabitant-space relationship have become a subject of multidisciplinary research. This space constitutes a structuring element of the large ensembles via the links that are woven between the buildings that compose it, on the one hand, and, on the other hand, between the inhabitants who use it. It is a space where different social interactions take place, which requires a certain characterization of belonging and a sense of communitarianism (community space). Thus, the use of these public spaces has been one of the important topics addressed in many fields, where the emphasis is often placed on the study of human behavior in space based on the human-human relationship, or the man-space relationship. (Clare Cooper M., Carolyn F, Van Nostrand R., 1990.)

However, the current debate around cities of vertical collective housing, and more particularly the difficult management of their surroundings, has revealed the problematic nature of these spaces. Numerous research works have revealed these spaces as revealing places of imbalances. Street Control Theory, Research by Newman O., Jacobs. J and other more recent ones are always mentioned to elucidate our analysis.

Outdoor space has always been a poor relation in collective urban housing groups. It is on him that the most striking theories on security, urban vandalism, and the notion of defensive space have been developed. (MAZOUZ, S., 2005). These anonymous spaces, No Man's Land, do not promote conviviality, thus acting negatively on the behavior of users. Security and tranquility are today presented as the main dysfunctions of collective housing estates and for some tenants; the quality of housing extends to that of outdoor spaces and not only the closest ones. For other residents, on the contrary, the environment of the accommodation offers no interest and is perceived as totally outside family life, throwing various objects and rubbish through the windows are the most frequently reported nuisances (apart from spaces collective, they sometimes affect balconies and common areas).

The construction of large housing estates throughout the Algerian territory has generated suburbs whose structure and urban form are those of large housing estates where bar and strip buildings or tower buildings and oversized roads constitute a fragmented urban fabric and a discontinuous and fragmented structure (Amireche, 2000).

The intermediate urban space of large complexes corresponds to a very open space where social control is made difficult if not impossible; as Côte (1993) sums it up well, "neither its morphology (undeveloped outdoor spaces, few collective facilities) nor its social content (diverse populations in origin), facilitate the genesis of a neighborhood with his own life (anonymous). Thus, the use of these public spaces has been one of the important topics addressed in many fields, where

the emphasis is often placed on the study of human behavior in space based on the human-human relationship or the man-space relationship (territoriality). In its broad sense, the use of space can be defined as being an occupation of a place by carrying out several different activities. These activities can be dynamic involving bodily movements or static such as sitting, relaxing, reading, eating, and standing (chatting, looking, meeting others, etc.), as well as they can be individual or collective (Clare Cooper M., Carolyn F., Van Nostrand R., 1990.)

CASE STUDY

The City of Biskra

The first decade of independent Algeria was marked by spectacular urbanization, the result of the combination of a very high birth rate, an acceleration of the rural exodus, and an ambitious policy of industrialization of the littoral zone. However, we can say that the rural exodus remains one of the main factors of this phenomenon. It is considered the engine of urban growth. Indeed, the period of French colonization forced a massive number of peasants to move to urban centers. (Zerouala, I. 2009.) Very quickly, the housing structures of the coastal cities become insufficient, and the housing crisis rages. To deal with the most urgent and in the absence of urban planning, Algerian officials opted in the 1970s for the ZHUN (New Urban Habitat Zones), a procedure equivalent to that of the French ZUP according to the principles of modern town planning.

Biskra is a millennial city, located in a strategic area due to its position at the crossroads east-west and south-north, which makes it a point of convergence. The city's urbanization shifted to ZHUN East and West (1977) through large-scale housing operations, resulting in the emergence of thousands of housing units across the city.

The city of Biskra is of medium size located in the South-East of Algeria; on the edge of the Sahara in an extensive oasis territory, about 450 km south of the capital: it is known as the «queen of the Zibans» with a very hot climate in summer and mild in winters. The city and its surroundings are famous worldwide for the production of «Deglet Nour» dates and other cultivated crops. Moreover, the picturesque and tourist character of the city made the Europeans come to spend their winter holidays there. The city then takes on the status of a great oasis. Later, during the post-colonial period, the city of Biskra, like all other Algerian cities, experienced a major urban development that had already begun during the years of the war of liberation.

This urbanization, of a rigid and badly controlled character, invested essentially the unoccupied areas of the city leaving aside the colonial city center, and began to develop in a vertiginous way on the east and west sides (hence the creation of two ZHUN) (SritiL., A. belakehal, K. boussora, A. z. saouli ,2002).

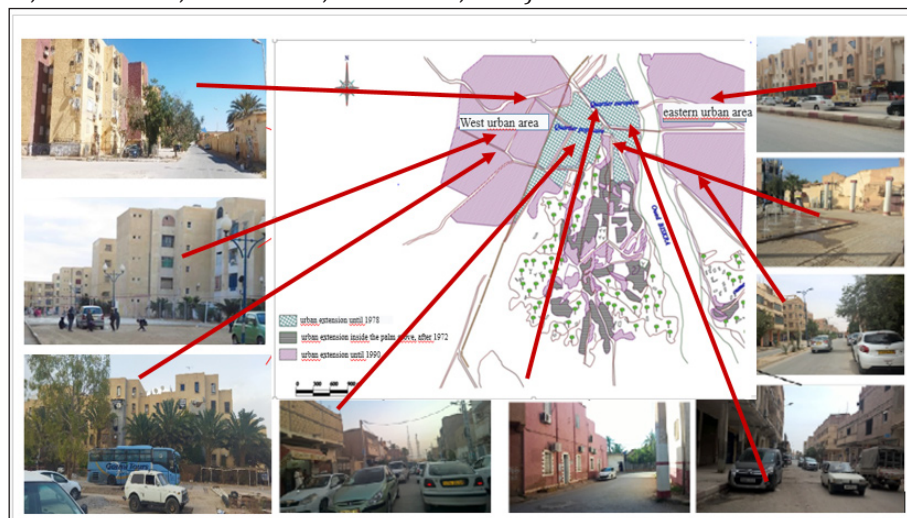


Figure 1. Types of urban morphologies in the city of Biskra

After independence, the Wilaya(province) of Biskra experienced strong demographic growth, with a natural growth rate of 2.90%. It contains a population of 589,697 inhabitants according to the RGPH 1998, to reach 758,401 inhabitants in 2006. The Biskra region is characterized by a very harsh arid climate (cold and dry in winter, hot and dry in summer), with an average annual temperature of 22.3°C.

District of 244 Dwellings

The district of 244 dwellings is one of the oldest districts in the city of Biskra, among the first operations of collective housing / duplex), is located west of the city center of Biskra, where the urban context is dense.

The district is delimited to the north by a lane and housing districts, to the south is bypassed by a motorized road with heavy traffic, to the west another lane and a neighborhood stadium and to the east a lane and local facilities such as the College “Madani Rahmoune” and the primary school “Abdelhamid Ibn Badis” .

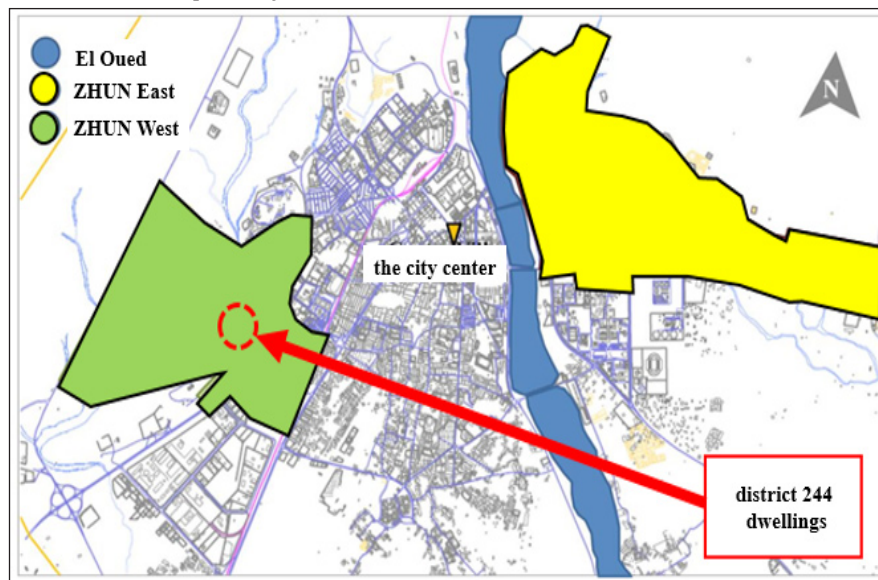


Figure 2. the location of the district of 244 dwellings and the distribution of ZHUN



Figure 3. An adequate layout of the intermediate spaces reinforces the natural monitoring and the conviviality.

The district represents variants of the block configuration, which also interpose in a linear way along the city (central block and linear side blocks)

- assembly of blocks in clusters of three (3)
- assembly of type blocks (A) and (B) in a linear way along the city the open public spaces are located at the level of the main roads. The semi-open public spaces are placed at the entrances of the blocks with wide accesses between the blocks and restricted accesses placed perpendicularly to the first configuration, the general appearance offers a particular spatial conformation thus allow a certain enclosure of the intermediate urban space.

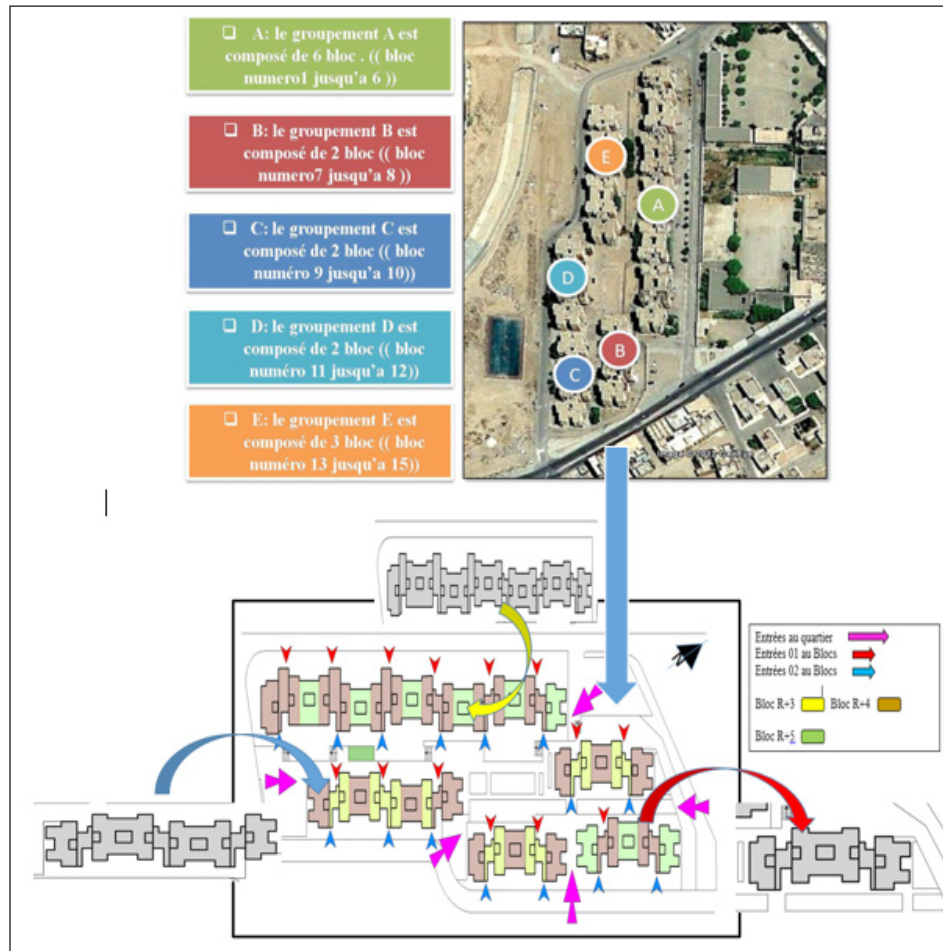


Figure 4. indicates the levels of the blocks according to their layouts in the housing district 244 dwellings and the distribution of the intermediate spaces in relation to the road axes with varieties of blocks: Types of block arrangement. (A) linear shaped blocks (03 twinned blocks), (B) linear shaped blocks (04 twinned blocks), assembly of linear shaped blocks (C) (07 twinned blocks)

The design of the ground plan offers better accessibility and permeability with the existence of double access at the level of the row of blocks located to the east of the district, where the main street to the east is located with a functional mix. The arrangement of the blocks about the double accesses offers residents free access to the intermediate spaces and acts as a filter against intruders.

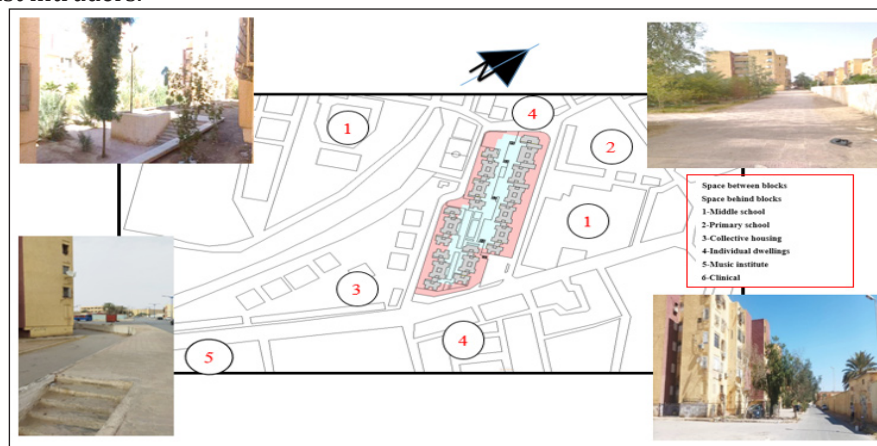


Figure 5. The location of the city is important in many ways, located halfway to the essential equipment and some amenities of the outdoor space due to the topography of the land and the location of the green space.

METHODOLOGY

We proceeded to the different methods of analysis for our case study by various research techniques according to a qualitative and quantitative approach from the combination of data. In order to obtain different and complementary data on our subject. Regarding the qualitative approach, we applied the technique of in-situ observation which will be combined with the theory of social psychology of the environment of Oscar Newman 'defensible space', as well as the technique of the survey by the questionnaire to understand the perception of the use and the appropriation of the residents at the level of the district of 244 dwellings and all the related social interactions.

Regarding the quantitative approach, we have chosen the method of syntactic analysis. These various research techniques will be mainly used to determine the inhabitant-space relationship (residentiality) and their impact on the use and appropriation of outdoor public spaces by the inhabitants of the neighborhood under study and to examine the relationship between use, appropriation, visibility and the accessibility produced by spatial conformation.

For the quantitative approach, we will apply the theory and the method of syntactic analysis on the corpus of the targeted city by using the software "Depthmap", which has for the essential object to simulate the visibility, the accessibility and to quantitatively analyze the impact of spatial conformation on the appropriation of intermediate urban spaces, their frequentation and their use.

The investigation results correlation of the two approaches; make possible the interpretations of the residents perception in collective housing and their methods of appropriation and practices in the open public spaces. This would generate the possibility of developing different recommendations relating to the spatial conformation and aimed at maximizing use and strengthening neighborhood relations within large complexes.

Space syntax is a set of theories and analytical tools that aim to study the human-space relationship, combining both the social and spatial aspect in the architectural or urban space. This theory is defined as "structural and experimental theory of urban and built spaces. This choice is based on the fact that the spatial syntax provides techniques and tools which make it possible to quantitatively measure the environment and make it possible to calculate the spatial properties linked in particular to the visibility, permeability and accessibility of space.

In this context, several studies have indicated that the spatial conformation and physical characteristics of intermediate urban spaces in the residential environment are particularly important to maximize their use (Mebirouk et Al., 2005; Naceur, 2013) (Hillier, 1996; Montello, 2007)

In this sense, Hillier asserts that the use of open spaces is related to the field of visibility or isovist properties of the space. This means that the visual field generated by the spatial configuration has an important impact on human behavior, as indicated (M. Turner, 2003, p.657).

By using the technique of 'survey by questionnaire' with the inhabitants to identify the modes of appropriation and the limits of the outdoor public space that each person perceives them and to identify the inhabitant-space relationship.

In-situ observation: the visit to the neighborhood of 244 dwellings was made several times during the month of May 2022, where the observation method was combined with that of photography, focusing on the physical characteristics of the setting built and unbuilt neighborhood. This allows residents to control and appropriate the public spaces around their buildings, based on Oscar Newman's "defensible space" theory and the theory's two principles: natural surveillance, and the hierarchy of spaces.

RESULTS AND INTERPRETATION

The natural surveillance, which is the control of the exterior public spaces of the district, it can be carried out from the interior of the dwellings. Which presents the clear limit between the interior and the exterior, and allows the individual to control and monitor their outdoor public space without necessarily being outside at ground level by its elements (windows and balconies).

Habitat interface elements can influence the behavior of residents in outdoor spaces and therefore their appropriation and use of space, co-presence and surveillance in residential communities. Julianne Hanson and Reem Zako used the terms "primary limits" and "secondary limits" to distinguish between limits that cover open public spaces in residential communities.

Primary boundaries are materially formed from the perimeter of the building footprint that describes the shape of the building and the position of its facades. Secondary boundaries are walls, fences ...etc. (Hanson and Zako, 2007.) In this regard, we note that the limits of open public spaces are spaces that have more than two wide accesses, formed by the arrangement of blocks in a linear form that provides a lower degree of closure.

- Semi-open public spaces are public spaces accessible by two wider accesses on two sides, and which result from the juxtaposition of blocks placed in a parallel way.

- Semi-enclosed public spaces are public spaces with a single access, which overlook a setback resulting from the pairing blockst air well.



Figure 6. The classification of public spaces between the blocks of the district of 244 dwellings according to their degree of closure and accessibility (number of accesses).

The visibility from the interior private space is checked by the elements of the habitat interface through windows and balconies that ensures sight of the exterior public spaces and allow residents to observe the interior of the neighborhood.. In Randall's study has a firm that the architectural design, should allow sightlines of less than 75 meters on common areas for natural surveillance to be meaningful. If the distances are further away, there will be little impact from natural surveillance (Atlas, 2013). According to our study, we note that all the facades of the blocks are pierced by windows and balconies overlooking the spaces exterior public except the gable facades are blind (figure 07).



Figure 7. Visibility Graph Analysis (VGA) and openings displayed at facade level (balconies and windows)

The VGA (Visibility graph analysis) will be established to assess the properties and characteristics of the outdoor public space from a visual point of view. Using 'Depth map' (Depth map is a multi-platform software to perform a set of spatial network analyses designed to understand social processes within the built environment.), a grid of points will be superimposed on the studied plane, in order to establish a 'graph', where each point is connected to the other points it can see (LetessonQ., 2014). Access to blocks: permeability between private and public and accessibility. According to the 'defensible space' theory, entrances to buildings that are oriented towards a public space, can provide surveillance over this space and allow residents to know if there is a danger in their neighborhood (Newman, 1996), the space which contains several accesses to the buildings is the most secure space and the most watched by the residents.

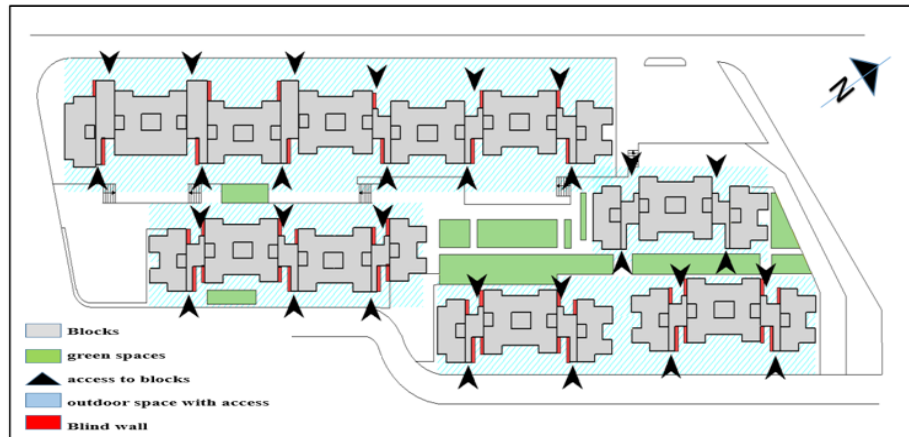


Figure 8. The arrangement of access to the blocks in the neighborhood 244 dwellings.

The majority of block entrances is through the public spaces between these blocks and the roadways, which allows us to predict that these spaces may be the most secure, controlled, and therefore the most appropriated according to the 'space defensible' theory. A clear hierarchy of space is found inside the neighborhood of 244 dwellings, this is due to the presence of the real limits that determine movement and use in its outdoor public spaces. The residual space is considered an open public space for everyone. Note that some blocks have double access, which enhances accessibility and security (this is specific to the city).Figure 08



Figure 9. The residual space is a semi-public space open and accessible to everyone, has no physical or symbolic limit.

The hierarchy of the outdoor public space according to the real and symbolic limits observed in situ is presented as follows:

- Private spaces: spaces bordering the dwellings, delimited by fences, in particular for the resident of the ground floor, and used as a vegetable garden or for domestic household activities and illegally appropriated by the inhabitants
- Semi-private spaces: the spaces bordering the accesses to a few blocks are marked and symbolically delimited by trees, shrubs or low vegetation (Figure 10).

-Public spaces: are the residual open spaces without physical or symbolic delimitation, with free access and free movement, can be used by the inhabitants of the district and foreigners (Figure 10).



Figure 10. The residual open spaces that juxtapose the blocks with physical or symbolic delimitation

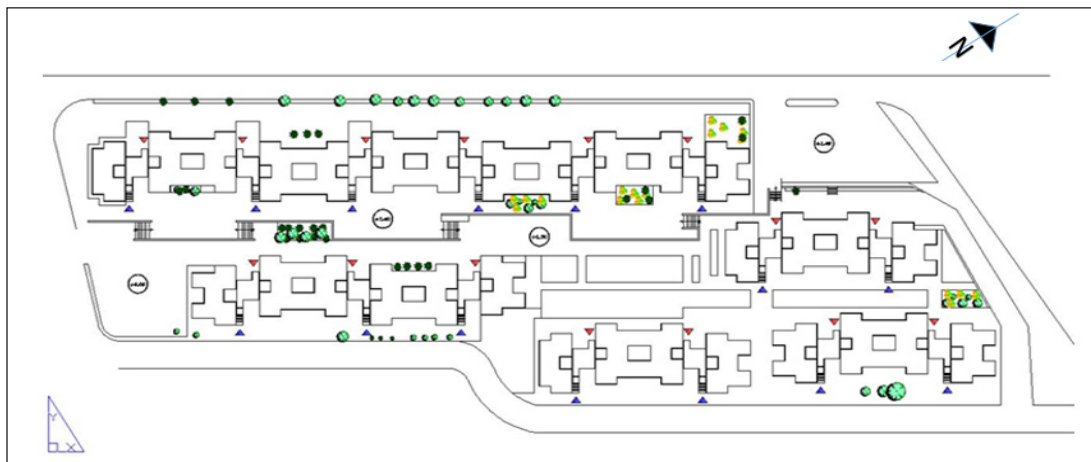


Figure 11. Access to the blocks

DISCUSSION

According to the physical characteristics of the neighborhood of 244 dwellings and in relation to the principles of the defensible space theory, it can be confirmed for natural surveillance that window and balcony elements can allow residents to control and monitor their outdoor public space without necessarily being outside, and this because these openings offer lines of sight of 75 meters in all directions that give a degree of effective visibility on the outdoor public spaces.

Then the blocks of the district are implanted in a linear way and the majority of the blocks having double access to the public space and to the intermediate spaces, which further reinforces the permeability and the accessibility inside the district.

The absence of a clear hierarchy of public spaces in the '244 dwellings' district can lead to a major dysfunction of the spaces, in terms of their use and their quality of life. They can also lead to poor appropriation of space and the reign of insecurity and anonymity in the neighborhood.

The survey by questionnaire aims to understand the perception of the outdoor public space by the inhabitants, their interactions with the space, their modes of appropriation and use. By applying the random sampling technique, where all residents of the neighborhood have the same chance of being included. Out of 100 questionnaires distributed, only 80 were collected and remain capable of evaluating the use and methods of appropriation of outdoor public spaces. For data processing, we used the "Excel 2007" statistical tool.

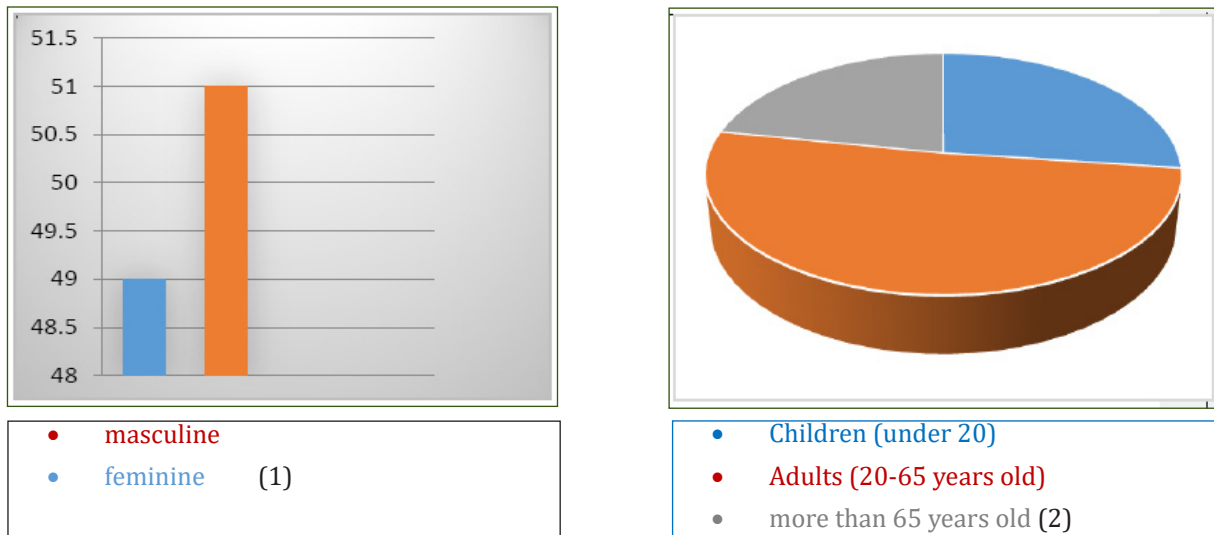


Figure 12. (1) percentages of male and female respondents. (2) The percentages of respondents according to their ages

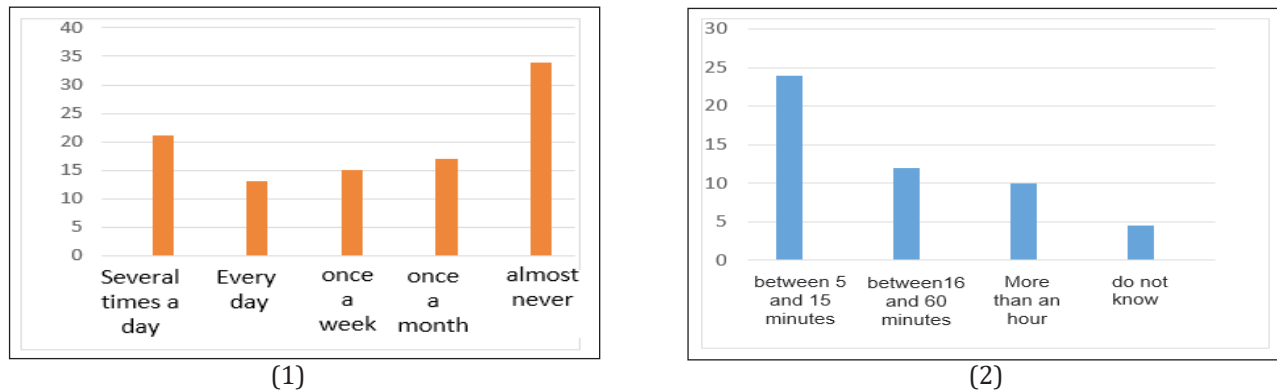


Figure 13. (1) use of outdoor public spaces near blocks by respondents (2) The time spent in outdoor public spaces in the 244 dwellings district according to the respondents.

In order to understand the perception of use and appropriation by residents of all age categories, we will process the responses of each theme, using the “Excel 2007” program in correlating the results with the variable ‘age’, as follows:

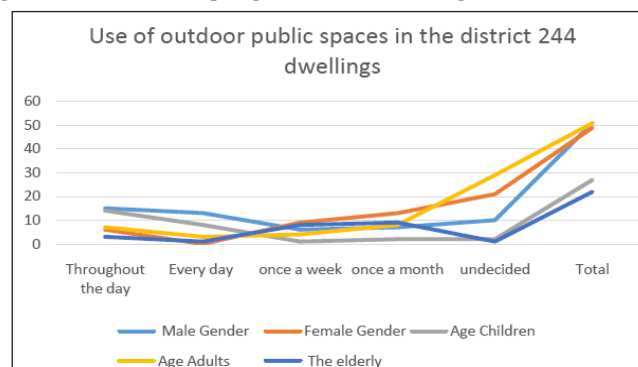


Table 1. The use of outdoor public spaces near the blocks by the respondents,

According to table (01), male respondents (29.42%) frequent the neighborhood’s outdoor public space several times a day, on the other hand, the majority (42.85%) of female respondents of female respondents almost never go there, indicating that outdoor public spaces in the 244housing units neighborhood are used and frequented primarily by male residents. We also find that the outdoor public spaces of the 244-housing district are more used and frequented several times a day, mainly by children (56.86%).

Concerning neighborhood relations (social interaction), Altman defines territorial behavior as one of the mechanisms used to close or open the self to social contact (Brown and Altman, 1983). In this regard, the questions addressed to this section aim to define the social ties and neighborhood relations that take place between the inhabitants of the 244-housing units district, based on the following indicators: the circle of acquaintance among the inhabitants, the places and encounter frequency.

According to the figure (20), 61% of respondents indicated that they only have relations with their neighbors in the same block; however, 29% of respondents think that all the inhabitants of the neighborhood are their neighbors, and the rest consider that their neighbors are only those who live in the neighboring blocks. On the other hand, the majority of residents avoid spending time with their neighbors in outdoor public spaces, especially adults (70.58%) and the elderly (68.18%) who almost never meet. On the contrary, the majority of children meet with their neighbors generally in intermediate public spaces several times a day mainly to play (table 03). This confirms for us, on the one hand, that the ‘children’ age category uses and outdoor public spaces more than the others, and on the other hand, the neighborhood’s outdoor public spaces do not ensure social interactions between their inhabitants, especially between adults and the elderly. This can negatively influence the safety, the use and appropriation of space by neighborhood residents.

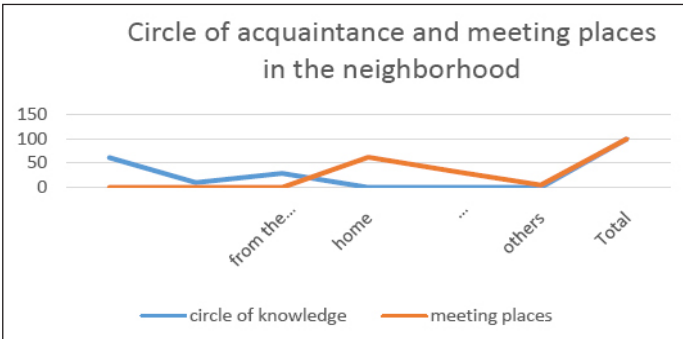


Table 2. (1): The circle of acquaintance between the inhabitants of the district, 2): meeting places with the neighbors of the district 244 dwellings.

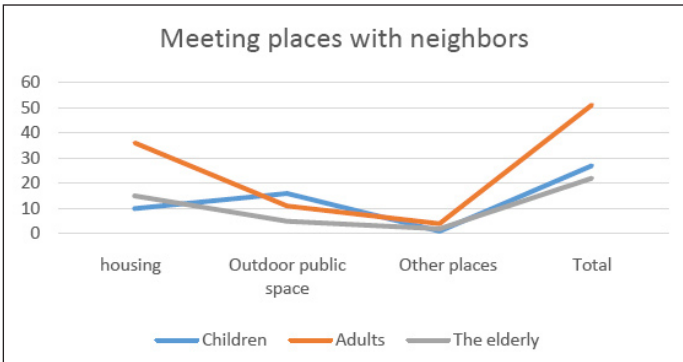


Table 3. Meeting places with neighbors in the 244dwellings neighborhood according to their age.

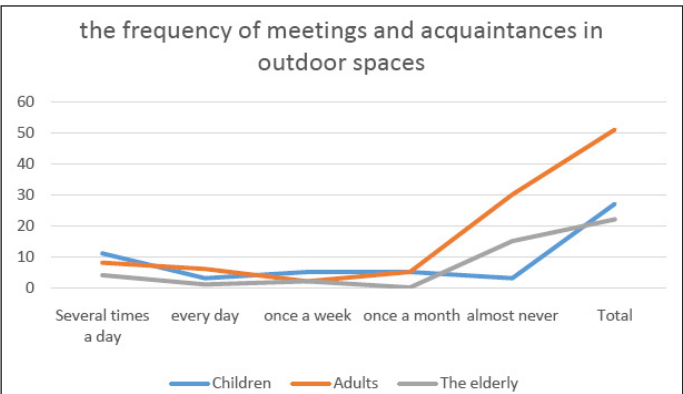


Table 4. The frequency of meetings and acquaintances / outdoor space

Respondents were asked to rate the level of security in outdoor public spaces in the neighborhood and the majority of respondents in all age categories (63%) rate security as poor, 4% overall rate it as being average, and 26% of the respondents confirmed that the level of security is high in the neighborhood (table 03).It was agreed that the spaces where they do not feel safe are the collective public ones, the car park and the spaces on the outskirts of the neighborhood, especially at night.

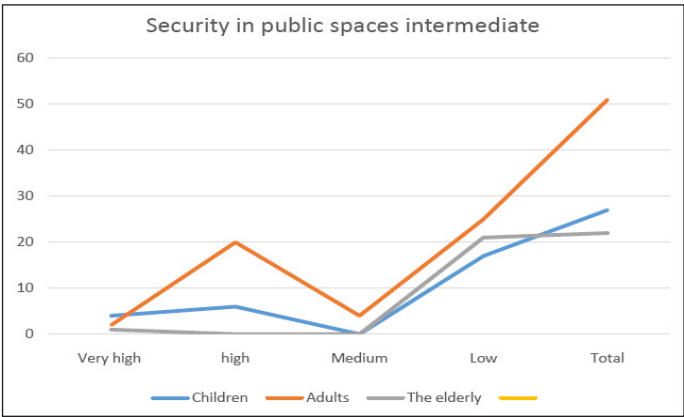


Table 5. The level of safety in intermediate public spaces according to respondents in each age category.

The use and attendance of outdoor public spaces in the neighborhood of 244 dwellings are low, where they are used and frequented mainly by male residents, in particular by children who find a few empty spaces to play freely. Neighborhood relations in the neighborhood of 244 dwellings are very weak due to the total absence of spatial planning, which is an important factor in determining and fostering the feeling of community and social ties (Bitner, 1992). So the feeling of insecurity in the neighborhood negatively affects the use, control, appropriation of the outdoor space although the intermediate urban spaces are geometric linear and the geometric configuration of the blocks is normally designed to accentuate social interaction and friendliness.

According to the map (Figure 14), children in the 244-housing neighborhood prefer to use public spaces between blocks, especially in front of building entrances, and in car parks near these entrances. So these spaces do not promote social interactions between their inhabitants. So the feeling of insecurity in the neighborhood negatively affects the use, control, appropriation of the outdoor space.

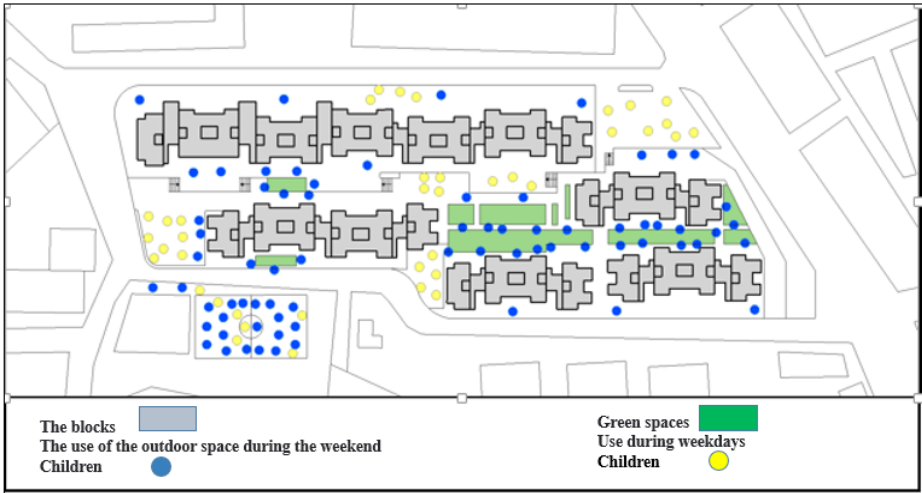


Figure 14. The use of the outdoor public space of the 244 housing district by children (under 18), where they are represented by small circles, using two colors; red for the day of the week (Tuesday), and black for the weekend (Friday).

The neighborhood of 224 dwellings will be modeled by the techniques of space syntax based on the properties of visibility and taking into consideration the high visual obstacles of more than 1.20 m. where most of these obstacles

are informal green spaces appropriated by residents near housing. The analysis is produced by the “UCL Depth map” software, from the export of a DXF format file containing the visible limits of space.

Analysis of the Axial Map

Considering integration as a global property means that we consider more accessible destinations as more integrated, while inaccessible destinations are less integrated. This can be examined using the axial map, where lines are colored red, orange, yellow, green, blue and indigo to indicate measures from the highest to the lowest level of accessibility (Assassi and Mebarki, 2021).

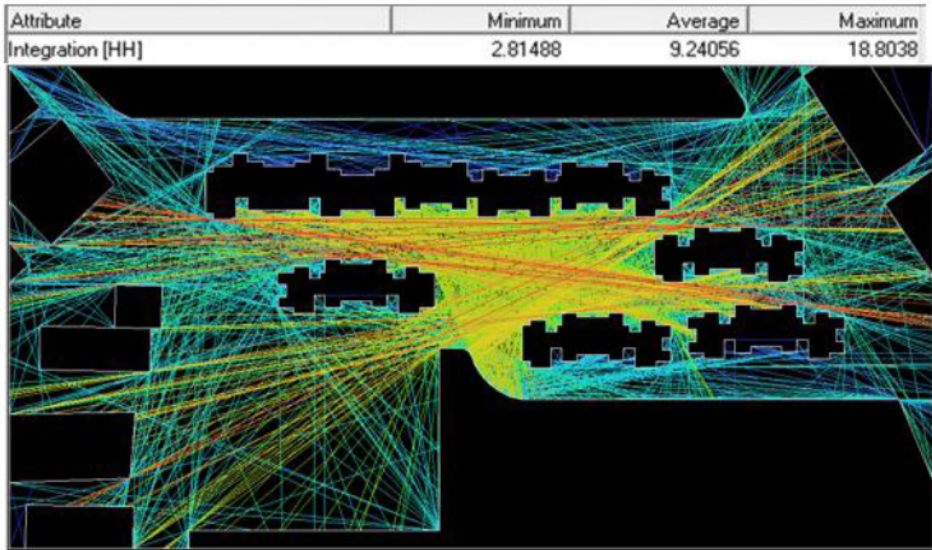


Figure 15. Analysis of the axial map (Integration)

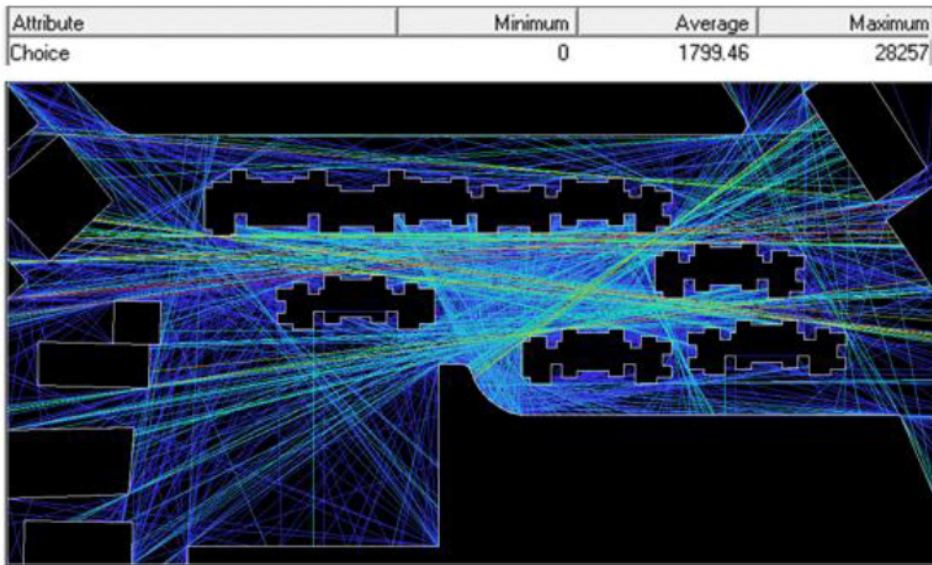


Figure 16. Axial Map Analysis (Choice)

Analysis of the Visibility Graph

Le Coefficient De Regroupement (CC)

It is a measure of the rate of intra-visibility of spaces approximately a specific visual point. The ING cluster coefficient is defined based on which is the rate of nodes that are effectively correlated near a local node versus the number that can be linked. It is a local measurement to see how far and how the spaces are grouped. Spaces with low values (cold colors) are spaces grouped around a social space with multi-directional fields of view and vice versa.

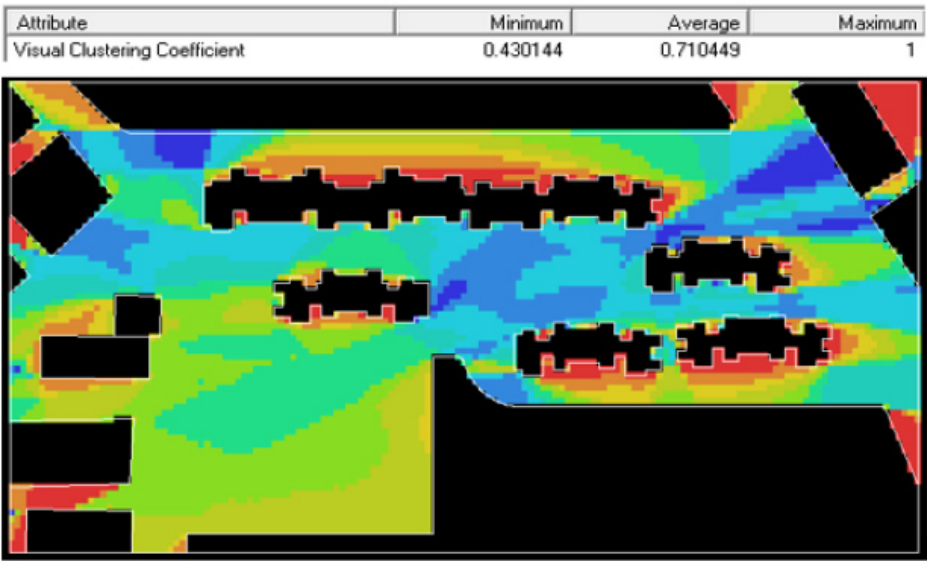


Figure 17. Analysis of the visibility graph (The clustering coefficient)

Visual Entropy

As a global property, it allows us to explore measurements of the depth distribution frequency. The calculation of the visual entropy leads to know if the vision of a particular point is permeable or not inside the spatial system (the shortest distance to the depth). Spaces with low values (cold colors) are spaces that are easy to pass to reach depth and vice versa.

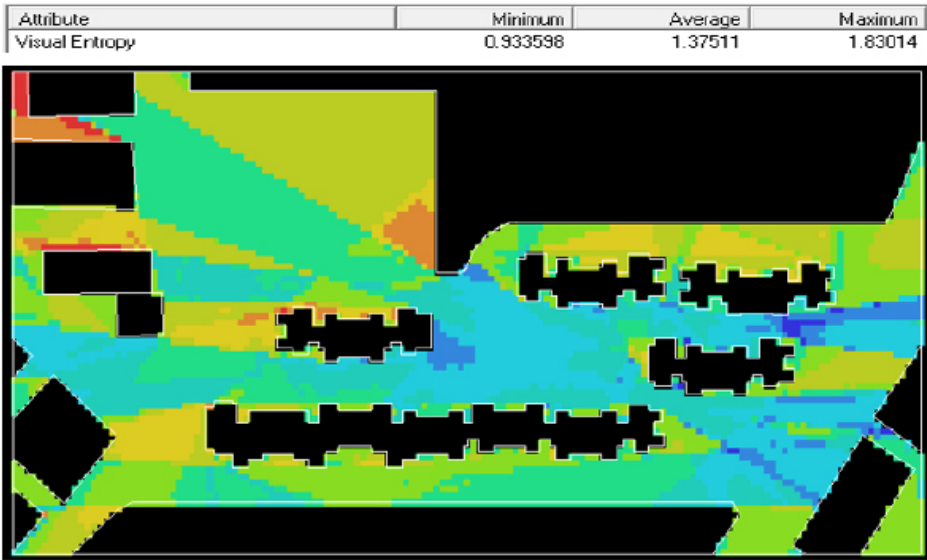


Figure18. Visibility Graph Analysis (Visual Entropy)

In summary, the use of the intermediate public space of the 244-housing district is intimately linked to visibility and the visual fields produced by their configuration, but in a way differs according to the age of the user; children avoid places of visibility and movement. On the other hand, adults and the elderly occupy places with good visibility and great movement. However, visibility and accessibility and the calculation of the visual entropy leads to know if the vision of a particular point is permeable or not inside the spatial system but there are other physical parameters which affect the use of space such as ; the surface, the shape of the space, the exterior layout.

CONCLUSION

The location of our district which is in a very diversified urban environment where the existence of several public facilities and bordering residential districts, bypassed by traffic lanes and therefore open to several types of users

and not only to the inhabitants neighborhood. All these factors have repercussions on the intermediate space and on the behavior of the inhabitants. This is what we have already observed in the exploitation of certain local events and activities related to social life.

In this research, which is based on two approaches: theoretical and an analytical study, the objective is to know and study the impact of visibility, permeability and accessibility on the use and appropriation of urban spaces intermediaries of large collective housing complexes. In this case, our case study of the 244 dwellings in Biskra, in relation to their physical and configurational characteristics, based on the syntactic approach and other combined investigation methods, in particular the technique of the questionnaire.

The objective also remains the optimization of use and the strengthening of the inhabitant-space relationship those concerned by the design and development of intermediate public spaces in large collective housing complexes, to take charge of the quality of these spaces and thus avoid all the inconveniences and the dysfunction and degradation of the public space observed.

However, it is also necessary to verify whether there is a correlation between the syntactic values: visibility, permeability, accessibility, and their impact on the use and appropriation at the level of the intermediate spaces of the suspended city and the way in which social interaction is affected. A confrontation of the results of two qualitative and quantitative approaches and by correlating the configurational properties of the model of visibility and accessibility with their use by the inhabitants of different age categories, as well as with their perception of belonging to a territory and its appropriation as well as residential practices, we have achieved results that are:

The use of the outdoor public space of large housing estates is intimately linked to the visibility produced by the appropriation and which differs according to the age of the user; children avoid the places of visibility and movement, on the other hand, adults and the elderly occupy the places with good visibility and great movement and good permeability.

The more accessible the space, the more it is used in particular by children, because these spaces provide good security, social control and natural surveillance and are located behind their places of residence, for this purpose, the more space is impermeable, it is often used by adults and the elderly who generally avoid stares and remain anonymous.

- The appropriation by the residents of the intermediate spaces is intimately linked to the visibility, the permeability and the accessibility which is produced by the spatial conformation but contrary to reality, the inhabitants tend to appropriate and delimit the spaces more invisible with weak integration values like their own spaces and which can keep more privacy for the inhabitants of the neighborhood and prevent the access of unwanted strangers.

- The appropriation by the residents of the intermediate spaces is intimately linked to the visibility, the permeability and the accessibility that are produced by the spatial conformation but contrary to reality. The inhabitants tend to appropriate and delimit the spaces more invisible with weak integration values like their own spaces and which can keep more privacy for the inhabitants of the neighborhood and prevent the access of unwanted strangers.

According to the use of open public spaces and according to their physical and configurational characteristics (visibility) and according to the results already obtained, the following is confirmed:

- The spatial configuration and the perception of territoriality by their inhabitants are: the shape of the space, the surface, the closure of the space, the visibility from the private interior space (natural surveillance), urban furniture, and spatial hierarchy.

-The inhabitants appropriate and use the space mainly according to their visibility, their permeability, and their accessibility. The perception of the appropriation and the use of space are two important parameters, which are closely linked and affect each other; the stronger the perception of ownership in housing estates, the better their open public spaces will be used and occupied by residents, and vice versa. In other words, use and appropriation are two important parameters that are shaped mainly by the physical environment in which the resident lives.

Finally, it is important to say that after the confrontation of the results of the survey with syntactic values (Analysis of the graph of visibility /Visual Entropy; min: 0.933; average: 1.375; max: 1.830), confirmed the role of the configuration space in the different patterns of use of space.

It seems, according to the confrontations between the various configurational values and the models of use of space, that the global values and in particular integration are more relevant than the local values. Visual integration seems to be an indicator of the fields of global social interactions in the space provided that the latter is accessible. It seems that the visual properties had better indicate the movement patterns in particular the passage or through-movement, more than those of the interaction and the different behaviors.

REFERENCES

1. Adels- Revue Territoire, Paris, cêtre, Besançon, 2006, 153p. Actes du Séminaire International Enseignement et Pratique d'Architecture, Quelles Perspectives.
2. Alpin M, la politique de la ville, l, Paris, 1996, 557p (nouv. éd., Hachette littérature, Paris, 2002 ,569p.
3. Amirèche M., 2000, La question des espaces urbains publics dans les grands ensembles à Constantine,
4. Amougou (Emmanuel), 2006. les grands ensembles, un patrimoine paradoxal, Le Harmattan, Paris, ,175p.
5. Assassi, A.; Mebarki, A. Spatial Configuration Analysis via Digital Tools of the Archeological Roman Town. Timgad – Algeria. Mediterranean Archaeology and Archaeometry 2021, 21, 71-84. <https://doi.org/10.5281/zenodo.4284429>
6. Bachmann (Christian) et le Guennec (Nicole), 1999. violences urbaines : ascension et chute des classes moyennes
7. Bardo, J., 1982. Urban sociology: A Systematic Introduction.- Illinois U.A.A, F.E. Peacock Publishers, - p.p.174-176.
8. Bauer (Alain), Violences et insécurités urbaines, coll. 1998. «Que sais-je ?, Puff, Paris, ,127p. (11 éd. avec Christophe Souleuz, 2007.
9. Begag (Azouz) et Delorme (Christian), 1994. Quartiers sensibles, Seuil, Paris, 209p, 65p.
10. Benatia, F., 1979. The Cunningham Road Scheme.- In Sakes Jane : (eds), Designing against vandalism : London Design Council,.
11. Burlen (Katherine) et Ali, 1987. La banlieue oasis, Henri Sellier et les cités jardins, 1900-1940, Presses universitaires de Vincennes, Saint Denis, 302p.
12. Chaline (Claude), 2010. Les politiques de la ville, coll. « Que sais-je ? », Puf, Paris ?, 127p.
13. Castex (Jean), Depaule (Jean Charles) et Pannerai (Phillippe), 1997, Formes urbaines : de l'ilot à la barre, Parenthèses Editions, 196 pages
14. Clare Cooper Marcus, Carolyn Francis, Van Nostrand Reinhold, 1990. Design Guidelines for Urban Open Space, Architecture - 295 pages
15. Corinne Delmas, 2007. « Cyprien Avenel, *Sociologie des « quartiers sensibles »* », *L'Homme*, 182 , 277-278.
16. COSTES, L., 2008. L'appropriation des espaces publics par les usagers Projet de fin d'études-Ecole Polytechnique de l'Université de Tours.
17. Chignier-Riboulon (Franck), 2009. Les quartiers, entre espoir enfermement, Ellipses, Paris, ,144p.
18. CÔTE, M., 1983. L'espace algérien, les prémices d'un aménagement O.P.U, Alger COUSIN, J., (1980).
19. Cubero (José), 2002. L'émergence des banlieues : au cœur de la fracture sociale, Privat, Toulouse, ,125p.
20. Jacobs, J. : The death and life of great american cities.- New York, Vintage Books, 1963.- (orig 1961) Dunod, Paris, 1977, 230p. (nouv. éd. Parenthèses, Marseille, 1997, 196p.).
21. Hervé Vieillard-Baron, 2012. De l'origine des grands ensembles, place publique, mai-juin 2012.
22. HILLIER, B., 1987. « La morphologie de l'espace urbain, l'évolution de l'approche syntaxique », in Architecture and Behaviour/Architecture et Comportement 3(3), pp. 205
23. L'espace vivant, Introduction à l'espace architectural premier, Edition, MONITEUR, Paris.

24. MAZOUZ, S., 2005. Limites de l'approche syntaxique, Avantage du VGA, Tunis, ENAU.
25. MEBIROUK, (H.), et al, 2005. Appropriation de l'espace public dans les ensembles de logements collectifs, forme d'adaptabilité ou contournement de normes,
26. Mohammed Issami, 2022.Planning design. Case Study: New urban pole "", Biskra, Algeria. Algerian Review of Human Security, Vol. 5, No. 1, pp. 841-857.
27. Naceur, F, Farhi, A, 1989. New urban habitat areas in Algeria : spatial Maladjustment and Social Unrest : the case of Batna ,https://doi.org/10.4000/insaniyat.6944
28. Newman, O Defensible Space. - New York, Macmillan, 1972.
29. Norberg, S.C. : Habiter – Vers une architecture figurative.- Traduction Hélène Rossinni, Paris, Electa moniteur, 1985.- p. 63.
30. Newman, O. ,1996. Creating defensible space. DC: US Departmentof Housing and Urban Development, Office of Policy Development and Research, Washington.
31. Normoyle, J, et Lavrakas, P. J. ,1984,. Fear of Crime in Elderly Women Perceptions of Control, Predictability, and Territoriality. Personality and social psychology Bulletin 10, p 191-202.
32. Pinelo, J. and Turner, A., 2010, Introduction to UCL Depthmap 10, Version 10.08.00r.
33. Quentin Letesson ,2014. From building to architectureThe rise of configurational thinking in Bronze Age Crete, Spatial analysis and social spaces: interdisciplinary
34. Randall C., 2010, La violence en situations. p. 239-255. https://doi.org/10.4000/traces.4930.
35. Reis, A., Portella A., Bennett, J., et Lay, M., 2003. Accessibility and Security: Syntactic and Perceptual analysis in Two Low-income Housing Estates. J. Hanson (Ed.), Proceedings, 4th International Space Syntax Symposium, p 44.1-44.12.
36. Rim Meziani Souhaila Bendjedidi, Yassine Bada, 2019. Urban plaza design process using space syntax analysis, International Review for Spatial Planning and Sustainable Development Section A: Planning Strategies and Design Concepts,v7issue 2,p 125-142
37. Sriti L., A. belakehal, K. boussora, A .z. saouli ,2002.le damier colonial de biskra ou l'histoirede la marginalisation d'un centre ville, Courrier du Savoir- N°02, Juin 2002, pp. 53-59
38. Vouillot H., 2006, La ville contre les grands ensembles : l'expérience de Quetigny : d'une ville pionnière aux villes durables.pp. 153
39. https://www.spacesyntax.online/software-and-manuals/depthmap/ (Consulted on 13/10/2020).

Citation: **Fayçal Alouane, Said Mazouz.** *The Impact of Spatial Conformation and Visibility on Space Use and Appropriation in the Intermediate Urban Spaces of Collective Housing Cities Case Study: The District of 244 Dwellings, Biskra, Algeria.* *Int J Innov Stud Sociol Humanities.* 2022;7(11): 107-123. DOI: <https://doi.org/10.20431/2456-4931.071110>.

Copyright: © 2022 The Author(s). This open access article is distributed under a Creative Commons Attribution (CC-BY) 4.0 license