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SOCIAL BEHAVIOR IN THE OUTDOOR SPACES OF SOCIAL HOUSING. CASE OF THE NEIGHBORHOOD OF 500 HOUSING UNITS IN THE CITY OF M'SILA (ALGERIA)

Abstract: Since Algeria's independence in 1962, Algerian towns have experienced strong population growth at a rate of over 3.2% and a considerable rural exodus causing a housing crisis. In order to quickly resolve this crisis, the state adopted the policy of industrialization of housing. During this period, social housing was the model best suited to the social, economic and political situation of the country. Consequently, during the mass production of social housing, a fundamental parameter was ignored: the quality of the living environment in the outdoor spaces of these social neighbourhoods. This has caused the emergence of multiple remarkable social behaviours. This article discusses the impact of outdoor spaces in one of the most important neighbourhoods of the city of M'sila with 500 collective social housing units on the socio-spatial behaviour of different categories of inhabitants. This research combined the techniques of direct observation, interviewing and the social use approach of Gehl. The results of the study will identify the impact of outdoor spaces on the behaviour of residents of social housing to be able to remedy in future urban development and architectural designs.

Key words: social housing, quality, behaviour, outdoor space, inhabitant

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Introduction

The massive destruction of housing after the two world wars provoked indignation among urban actors. Architects of modern trends have debated this question at successive International Congresses of Modern Architecture (CIAM) and have proposed to all governments the project of large housing complexes to solve the global housing crisis. Faced with this universal strategy, urban planners, architects, city managers and sociologists are convinced that the image of these large complexes depends both on the quality of housing and outdoor spaces. These outdoor spaces are considered as social meeting places par excellence (Bada, 2012), which provide the different categories of inhabitants with a friendly living environment based on the design of green spaces and play areas that enhance daily life (Mili et al., 2019). It can also contribute to the feeling of a strong relationship and social interaction. Like all countries in the world where governments consider housing as a fundamental source of their urban policies, Algeria, since its adoption of the socialist system, has not ceased for several decades to invest in the production and industrialization of social housing (Bachar, 2018; Boutabba et al., 2019). Considerable funding has been spent to meet the ever-increasing housing demand and provide the vital right of decent housing for every citizen (Mili, 2018). Currently and on a global scale, the outdoor spaces of collective housing, through their urban designs, are considered a fundamental parameter for the development of social behaviours. This parameter arouses the concern of city actors when the social behaviours become social ills.

Several studies on environmental psychology confirm that the architectural and urban design of outdoor spaces in residential neighbourhoods affects the behaviour of residents. Thus, Takei and Ohara (1978) showed that the spatial design of an urban area is the most important factor on the feeling of dissatisfaction leading to low use. Satisfaction is expressed through the activities and behaviours that take place in a space. In Algeria, this issue is considered by public authorities, city stakeholders and academics as a worrying situation in social housing neighbourhoods.

The emergency situation led the public authorities to produce monotonous housing, devoid of architectural and urban quality, ranging from individual (Zuccheli & Madrasat, 1984; Amiche et al., 2003; Boutabba et al., 2012) to collective habitat. In the latter, on the one hand, the urban and architectural composition is ill-suited to the needs of its inhabitants (Mezrag and al., 2018). On the other hand, the quality of the outdoor spaces is limited to an essentially functional approach to the detriment of collective life (Mazouz, 2013), the architectural genotype principle that considers the arrangement of spaces as an abstract relational model.

Unfortunately, the design of the exterior spaces of social housing in the city of M'sila seems to give primacy to the quantitative and functional aspect such as circulation, servicing and ease of construction instead of qualitative and aesthetic dimension.

Study area

M'sila is a city in the North-Central part of Algeria. The city has experienced two types of urban extension. The first concerns the various collective housing, residential subdivision, and public facility programs carried out by the public authori-

ties on public land (Salamani et al., 2019). The second concerns, essentially, individual housing in the eastern outskirts of the city made on privately owned land. Since 1975, the city of M'sila experienced the implementation of major collective social housing programs. It has more than seventy-one social housing neighbourhoods with a capacity ranging from 50 to 1000 dwellings per neighbourhood. To master our study, we chose an average neighbourhood of 500 dwellings with an occupancy rate per dwelling of 6.1 (RGHP, 2020). Of the eleven outdoor spaces in this neighbourhood, we will work on the three most representative spaces according to their planning. This neighbourhood has been inhabited since 1983. The land base is estimated at 9.32 ha. The studied city is located in the city centre. It is surrounded by several facilities, including the university and its annexes (Fig. 1). The neighbourhood is composed of 65 housing blocks which are subdivided into 11 sub-sectors. Each subsector surrounds an unbuilt space.

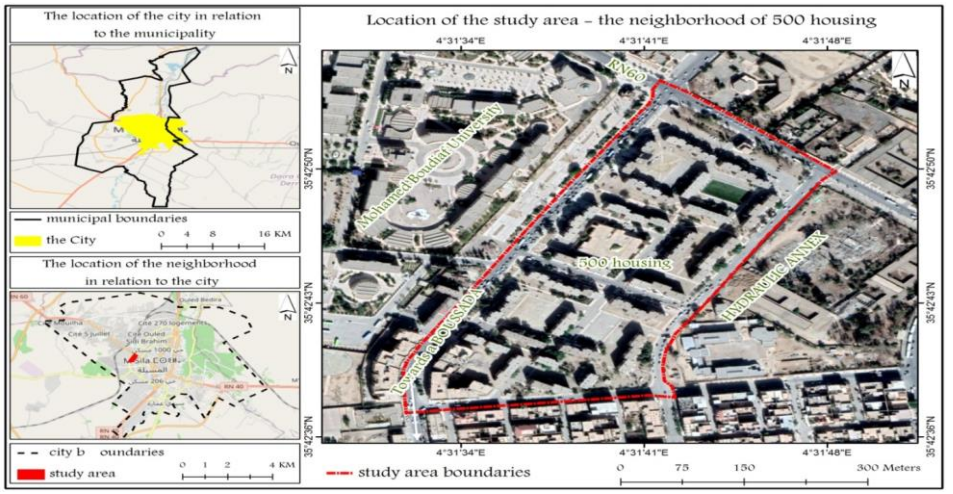


Fig. 1. Location of the study area (Source: Authors, 2022)

Material and Methods

In this study, the methodological approach used associates the layout of the exterior spaces of social housing with the behaviour of the various social categories of the inhabitants. Our choice of studying the urban quality of outdoor spaces refers to the work of Gehl (1987), combined with direct observation and interview. The analysis is based on three elements, namely: the social category of the inhabitants, the type of behaviour and the time of use of these spaces.

This research used the architectural survey technique. Thanks to the Geographic Information System (GIS) software as well as the (XLSTAT) program for analysing the obtained data, the physical limits of the three areas of the neighbourhood as well as the accesses to the various buildings have been precisely defined. Similarly, the length and width of each outdoor space were measured. Direct observation was used according to the quality criteria grid of Gehl (2013) in particular criteria B3, C1 and C2 (see Fig. 2). Similarly, the length and width of each outdoor space were measured. Direct observation was used according to the quality criteria grid of Gehl in particular the criteria and

indicators of the design characteristics of the intermediate spaces outside the dwellings which are the degree of spatial containment, the physical materiality, the degree of permeability from space. As for attendance, it is measured by three main criteria: the degree of efficiency of the outdoor space, the functioning score of the city, as well as the degree of homogeneity of the distribution of social behaviours.

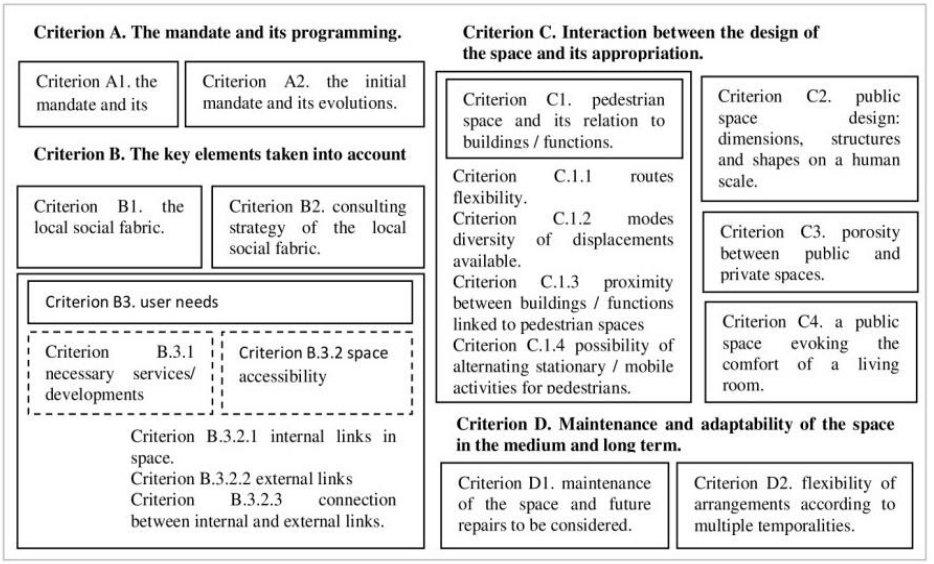


Fig. 2. Gehl criteria grid 2013

The aim was to collect behaviour patterns and data on occupation time. Data collection was carried out during peak use of the space, specifically during the beginning and end of the week. The survey took place over a period of 3 months including the period of school studies and that of the spring and summer school holidays.

The social success of an outdoor public space is determined by the degree of its attendance by users. Attendance is measured by variables that are not limited to determining the number of people present in the space, but detects the types of behaviours and their time. According to Gehl, attendance is measured by three main criteria: the degree of efficiency of the outdoor space, the overall functioning score of the city and the degree of homogeneity of the distribution of social behaviour.

Results

Containment Degree Calculation of The Outdoor Space of the 500 Housing Units

To begin the analysis, we numbered the three outdoor spaces chosen from the 500-unit neighbourhood into sub-sectors - SC1, SC4 and SC6 (Fig. 3). Then, we carried out cross sections to calculate the average length of the blocks of housing constituting each sector in order to calculate the containment degree (Table 1).

Tab. 1. Containment degree calculation of the outdoor space of each sub-sector

Section	Sub-sector (SC)	Space width (L)	Average block height (H)	Containment degree (S)
a-a	01	25	15.40	0.61
b-b	04	23.8	15.40	0.64
c-c	06	52.3	15.40	0.29

Source: Authors 2022

The analysis of the results showed the presence of a high containment degree in the exterior spaces of the SC1 and SC4 sub-sectors because the ratio between the height of the buildings and the width of the space, according is to the Equation 1, is approaching 1. A low containment degree was recorded in the SC6 sub-sector.

$$S=H/L \quad (1)$$

Calculation of The Physical Materiality Degree

This rate is determined according to the number of screens, whether materialized in hard or green, surrounding the outdoor space of the sub-sectors. Two physical materiality degrees are observed. The SC6 sub-sector has been identified as closed spaces.

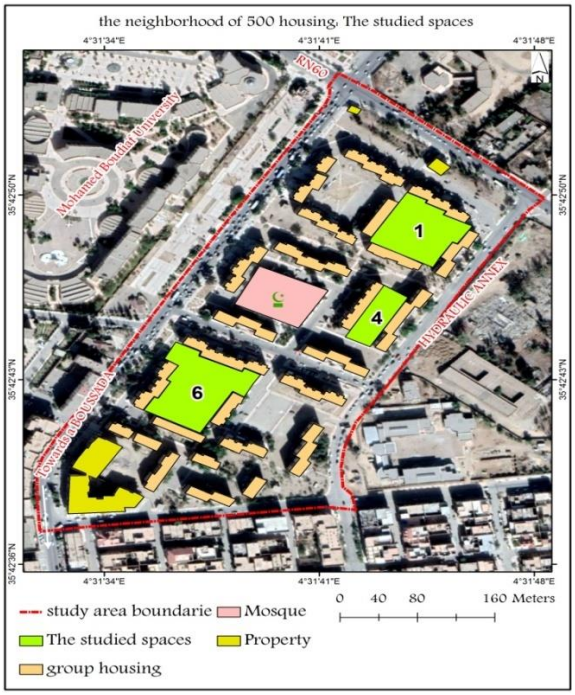


Fig. 3. The neighbourhood of 500 housing the division of spaces in the study area (Source: Authors, 2022)

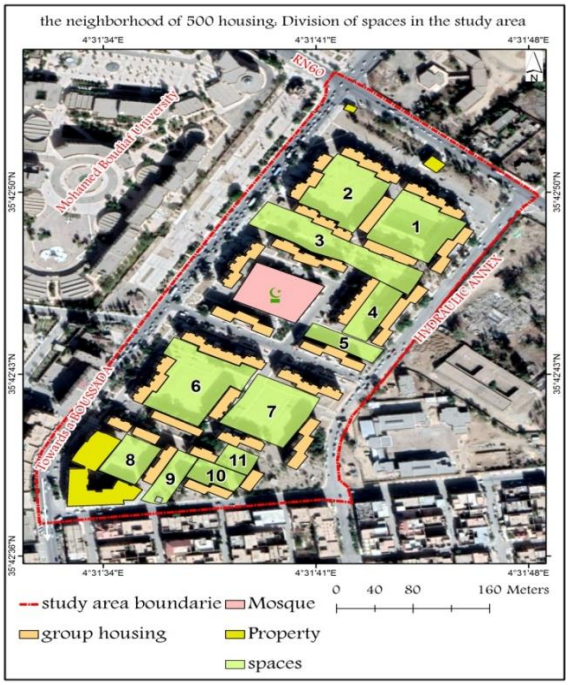


Fig. 4. The neighbourhood of 500 housing the studied spaces (Source: Authors, 2022)

The SC1 and SC4 sub-sectors are rather considered as open spaces that can allow propulsion and the feeling of impulsion.

Permeability of Outdoor Space

All of the accesses to the housing blocks forming the SC4 and SC6 sub-sectors are located on the opposite side of their outdoor spaces and consequently the user must take several other intermediate spaces to access the outdoor space, which leads to an indirect relationship between them. As for the SC1 sub-sector, it is characterized by a considerable number of buildings which have a direct relationship with their outdoor spaces. Two indicators were used to assess the type of permeability that exists between the outdoor space and the access to the buildings forming the sub-sector, namely: the total number of accesses to the buildings and the number of accesses to the buildings with a direct access to the outdoor space. Permeability (P) is evaluated by the ratio, as shown in Equation 2:

$$P=NbAI/NbTA \quad (2)$$

where NbAI = number of direct accesses; NbTA = total number of accesses to the buildings that form the outdoor space.

The analysis showed that the SC1 sub-sector has good permeability, while the SC4 and SC6 sub-sectors are of zero permeability. By combining type of relationship and type of permeability, the analysis reveals sub-sector SC1 with a direct and good relationship, while sub-sectors SC4 and SC6 with an indirect and zero relationship.

Efficiency Use Measurement of The Outdoor Spaces

To calculate the efficiency, use degree, we identified the different behavioural patterns that took place in the outdoor space of the sub-sectors studied, using the technique of direct observation according to Gehl.

The analysis showed that the highest degree of social efficiency was recorded in the SC6 sub-sector due to the existence of essential items shops as well as a large car park. The degree of social efficiency of sub-sector SC1 is considered high despite the limited number of activities. On the other hand, the degree of social efficiency of the SC4 sub-sector is the lowest, given its increased use as a transition passage for all users of the neighbourhood.

Fig. 5. Behavioural Patterns in the different sub-sectors (Source: Authors, 2022)

Social Behaviour Homogeneity Rate Measurement of The Global Outdoor Space

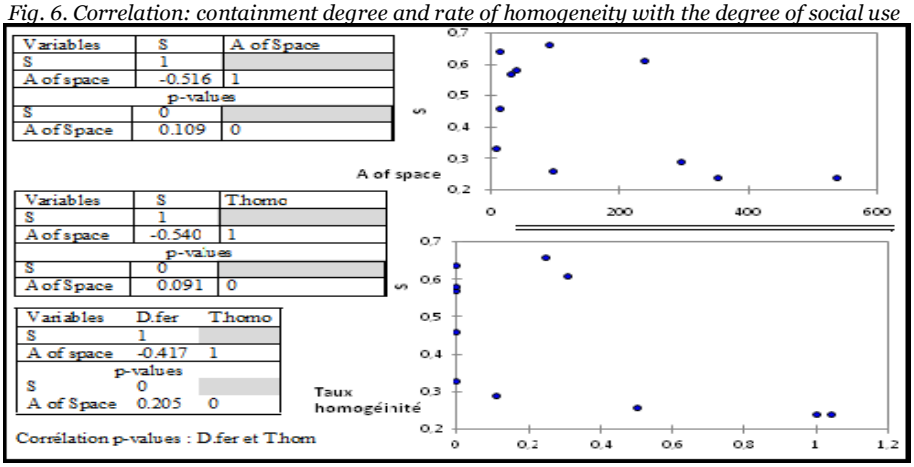
By applying the measurement equation, the analysis reveals that there is a decrease in the homogeneity degree in the behaviours distribution in the sub-sectors SC1 and SC6 due to the transitional movements recorded in SC1 sub-sector as well as the existence of car park in the SC6 sub-sector without the emergence of social interactions. As for the SC4 sector, there is a total absence in the homogeneity of the use of outdoor spaces, given the absence of particularly dynamic behaviour.

Tab. 2. Degree of homogeneity of behaviour of outdoor spaces

Sector (SC)	Number of behaviour patterns	Number of participants	Constants	Movables	Degree of homogeneity
1	01	102	32	102	0.31
4	04	05	00	05	0.00
6	06	49	05	44	0.11

Source: Authors 2022

Fig. 6. Correlation: containment degree and rate of homogeneity with the degree of social use



efficiency (Source: Authors, 2022)

Discussion

Effect of outdoor spaces design features on efficiency of use

In order to seek the effect of outdoor spaces design features on efficiency of their social use, we will correlate certain parameters on the basis of the Spearman coefficients while codifying the qualitative variables, namely the containment degrees, closure and permeability.

Correlation of the space containment degree "S" with the degree of social use efficiency

Figure 6 indicates that in general, "S" correlates negatively with the degree of social use efficiency. Since "p-value" is greater than the level of significance set at 0.1, the results are generally not significant.

In other words, the containment degree "S" has no influence on pedestrian movement, social interaction, domestic activity and children's games. Paradoxically, children's games are practiced in spaces with the lowest degrees of confinement. Similarly, despite the large width and the low degree of their containment, domestic activities are dominant there.

Correlation of the degree of closure with the degree of social efficiency

The correlative analysis indicates that the degree of closure correlates negatively with all the behavioural modes in space. This negativity is strong for the "presence in space" and moderate for the items "mechanical movement" and "Domestic activity". It is weak for the rest of the modes of behaviour. As for significance, it only concerns "presence in space" and children's games (p=0.001) as well as "mechanical movement" (p=0.085). These two items are inversely proportional to the degree of closure. In other words, the degree of closure has no influence on pedestrian movement, social interaction and domestic activity.

Correlation of the degree of closure with the level of homogeneity of the behavior distribution

The analysis indicates that the degree of closure correlates negatively with the homogeneity of the behaviour distribution with a degree of significance is equal to 0.205. This is in favour of the non-existence of a clear relationship between the degree of closure and the rate of homogeneity of the behaviour distribution.

Conclusion

Through the analysis of the neighbourhood of 500 collective social housing units, this study wanted to correlate two realities that seem antagonistic: the subjective representations of users on the one hand and the design of urban forms on the other. Like previous studies which have shown that urban designs can offer a certain quality of use, this study has been able to demonstrate that the degree of spatial containment has no influence on the efficiency of use, in particular for social interaction, domestic activity, pedestrian movement, and children's games. The efficiency of use seems rather linked to the existence of street furniture. Spatial containment is inversely proportional to the presence in space. The feeling of anonymity seems to favour this rather masculine presence of space. Similarly, the homogeneity of behaviour distribution is inversely proportional to the spatial containment degree.

The physical materiality or closure of the outdoor space exerts no influence on pedestrian movement, social interaction and domestic activity. On the other hand, children's games are more acutely materialized in open and semi-open spaces. The opening of the spaces also seems to exert a certain influence on the “presence in space” and the “mechanical movement”. The opening favours the existence of car park. As for the homogeneity of behaviour distribution, spatial closure has no clear relationship with the consistency of use of spaces.

Conflicts of Interest: The authors declare no conflict of interest.

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