

## Characterization of the frequency of use of public spaces, case of the public places of the city of Biskra / Algeria.

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### ABSTRACT/RESUME

*Abstract: The use of the Public Place or public space in general depends on what the urban form offers to its users and the uses it accommodates. The characterization of the use's intensity (frequency) of the public place deserves a measuring tool. This use is both qualitative and quantitative, as it depends on the number of people using the public place during a given period of the day and year. This work attempts to understand on what basis we can evaluate the intensity of use of public places. The objective is to draw up a scale of attendance intensity and an observation grid using two public places in the city of Biskra, Algeria, as case studies. A critical analysis of the bibliographical review has allowed us to apprehend the different scales of measurement in various fields and to classify them in order to adapt a scale concerning the intensity (frequency) of public places attendance and to implement it on a corpus defined in Biskra as a validation model. As a result, we propose a tool (scale) that is easy to use, to measure the intensity (frequency) of the public place usage.*

### I. Introduction

The best approach to improving the quality of life of the city's inhabitants is to think about enhancing the use of public spaces and public places in particular. This article attempts to evaluate the intensity (frequency) of use of public spaces by applying the scale of frequency of use and the observation grid in two public places of the city of Biskra / Algeria: Ben Badis Place and Zwaka Place, among all the places already studied and analyzed as a method of validation of the scale of intensity (frequency) of use with the results obtained. The public space is mainly a living space. This public space cannot be studied without the people who live it, use it, practice it and inhabit it Public places in the city of Biskra / Algeria: El-Houria place, Ben Badis place, Revolution place , Dhalaa place, Istiqlal place, Zwaka place and others show a lack of use, these are public spaces that have been deserted by their users most of the time. The problem of this research is to know how and on what basis has been characterized (quantitatively / qualitatively) the intensity (frequency) of use of public places in the city of Biskra in Algeria.

### II. Methodology

In order to characterize the intensity (frequency) of public places use in the city of Biskra in Algeria between qualitative and quantitative data we choose to apply as a tool the reliable intensity of scale use, valid and simple in its use. Through research on public places and another bibliography on scales to determine and apply the ideal intensity of scale use in public places in the city of Biskra / Algeria as a method of validating the latter.

### III. Public space / The public place, use and practice

According to Saidouni, (2000) "Streets and places are the spaces where architecture is displayed and where the daily life of city dwellers takes place" [1]. Public space must be the place of all mixes, mixes of uses and mixes of population, it must allow to weld together a fragmented urban fabric, to gather heterogeneous spaces, to restore a certain continuity in the urban fabric [2]. The term public space appeared in the 1970s, which is both an open space, where the collective life of

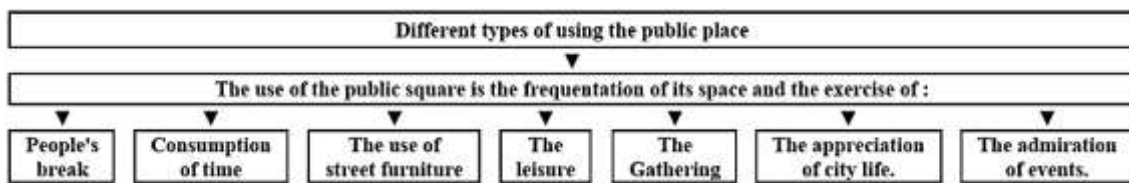
city dwellers takes place, and a symbolic place that carries the personality of the city [3]. (Figure 1)



**Figure 1.** (a): The place of the martyrs / Algiers, (b): the trips Seddik Benyahia, Biskra / Algeria; Source: site web: <https://www.cairn.info/revue-hermes-la-revue-2014-3-page-77.htm>

**III.1. Modes of use and practice**

The use of public spaces does not lack in value to the other elements involved in the planning and



**Figure 2.** Relative to the different modes of use of the public place [7].

The users of the public place are the population that uses it regularly while including the users at a given time. It is therefore composed of men, women and children from all social classes, without segregation or elimination of any segment. In addition, the practice of individual walking is good for health, strengthens social life and reduces car use. Public spaces designed solely for travel are less pleasant and do not promote conviviality and sociability [8].

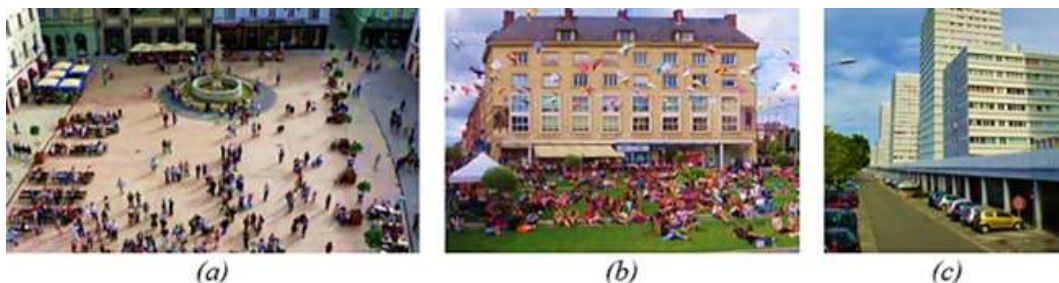
**III.2. Public place between animation and frequency (intensity) of use**

Animation is the opposite of calm, coldness and rest. It is the character of that which is animated, lively, and full of life. For Gauthiez (2003), it is the intensity and frequency of frequentation of a free public space by individuals, vehicles and pets [9]. This term is commonly used to represent the intensity (frequency) of social life and its outdoor

composition of the city, Delarc, (2016) announces “that the notion of uses can constitute an analyzer of the forms of cooperation between the different professionals mobilized in urban projects” [4]. Usage in General is the practice, the way of behaving in accordance with the social norm considered [5]. The use of a space or a place is a socially determined human activity; it is the usual attendance of that place. Pannerai (2002) “defines the practice in the context of the spatial practice announces for that “Social practice includes concrete activities: work, non-work, frequentation, journeys, social relationship, rites, representations that engage and influence daily life” [6]. (Figure 2)

activities in a city, a district and a street [10]. In addition, the animation of a district or a public space has as a factor the nature and number of their functions as well as the mode of use, circulation and attendance of the latter. Frequency or intensity of use is the degree of activity, strength or power in exercising the latter. It is also the amplitude of a phenomenon expressed as a numerical value according to a determined scale.

However, this term is used in several fields to express multiple phenomena. In our research, the frequency or intensity of use of the public place means the degree, the force, the importance, the value, the power, the amplitude of an activity within the public place; again, it signifies either weak or strong force to perform an activity by the users [7]. (Figure 3)



**Figure 3.** (a) and (b) represents more animation of the public place and the public place; (c) since the design of the track was only for movement it is less lively and less animated [8].

### III.3. Validation of the measure scale use intensity (frequency)

According to Stevens (1946) "Scales are a set of tools that are constructed to measure or quantify responses to certain questions, especially those related to feelings, attitudes, opinions or beliefs" [11]. The measurement scale allows you to assign numbers to things, events and objects following certain rules; the latter is possible unless the principle of isomorphism is respected.

In general, the scale of measurement is the evaluation of any quantity in comparison with another of the same nature or species taken as a unit [5]. According to Gilles (1994) "To measure is to

establish a correlation between the set that constitutes the phenomenon to be measured and a set of numbers that one selects according to the nature of the phenomenon" [12].

#### III.3.1. Nature of data collected and types of scale

According to Ayache (no date) the data collected during any survey is characterized by three properties, quantitative and qualitative data, continuous and discrete data and scales [13]. (Figure 4)

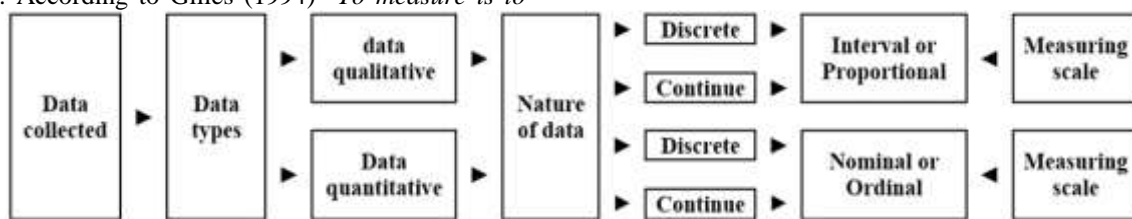


Figure 4. Relative to the properties of the data measured during a survey. Established by the author [13].

For scale types, we have the nominal scale: which is used to qualify things and elements of a non-hierarchical "name" type category; means that these elements do not fall into a logical gradation but through a modality where there is no relation of order.

The nominal scale only allows us to differentiate the things studied by means of codes [14]. The ordinal scale, which is not far from the nominal scale, allows all the more to classify elements, things or events in a logical order or gradation. This scale refers to non-measurable features. For example, home comfort can be found on the comfort sensation scale: very cold, cold, less cold, neutral, less warm, warm and very warm [15].

It should be noted that the scaled data on this scale are quantitative ones. And the range between two categories always has the same value and the same meaning [11] We find that the proportional scale "the proportional or ratio scale has all the properties and all the levels of information of other scales plus the profound advantage of lending itself to absolutely all the arithmetic and static operations that can exist" [15] This scale is characterized by equal proportions of the measured values. This means that the values of one can be obtained by multiplying the values of the other by the same number.

We cite a few examples of scales, of which we have the THURSTONE scale: to measure variables separated by equal distances and difference interval of 1° C; 1 m; 1 people for example [16]. The GUTTMAN scale: to classify phenomena into a series of factors having an absolute 0 point and

equal distances between them; from class to class (n) times greater or less than according to a ratio [17]. And the LIKERT scale, it is a nominal and ordinal scale; measures a variable (01 category or class), classified them in an established order from large to small or the opposite [17].

#### III.4. Role of the scale use intensity (frequency)

According to Schatz (1991), the scale is "the passage from a fuzzy shape to a more exact shape" [18]. And to get a closer look at the behavior of users and see the degree of intensity (frequency) of place use, the research technique used during a survey relating to the use of a public place with its various types is "participant observation" [19]. The data collected on the one hand is qualitative in nature, since it takes the form of symbolic information such as the gestures and behaviors of users. So the analysis will describe and evaluate a case, a phenomenon, a situation, a behavior, a look, an attitude, a manner, actions and acts of the users of the place [20]. And on the other hand of a quantitative nature, in the form of statistical data, relating to the size of the population relative to the number of people present who frequent and use the space of the place in different ways.

### IV. Materials (tools) and methods

#### IV.1. Intensity (frequency) measurement scale for public space use (the place)

Public space and the public place in particular is a space that can contain people, of different genders. The capacity of this space to resave size of

population is relative to these dimensions and to the vocation of: circulation, monumental or an esplanade. For the user to be comfortable in the public place there must be a hold specific to him, this hold allows him to carry out its activities without hindering or being hampered, either in a standing or in a seating position.

The data relating to the use of the public place collected during the "in situ" survey are on the one hand qualitative data and on the other hand quantitative statistics. Considering that, the exercise and the practice of all activities within the public place (meeting, leisure, gathering, games,

entertainment, etc.) are relative and proportional to the number of the population present in the latter. If the presence of people is half the space capacity of the place, then the intensity (frequency) of place use by the population is medium. On the other hand, if the place is full by its users, the intensity (frequency) of use is very high. So we opted for this scale of intensity (frequency) of use formed of five graduations (five degrees) starting with the empty public place, means no use, until its saturation. (Figure 5)

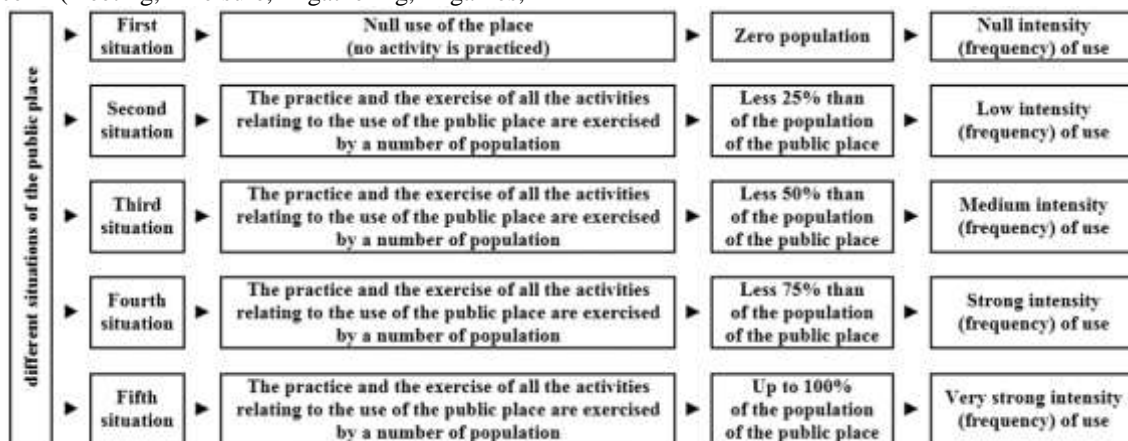


Figure 5. Relative to the different situations of use of the public place. Establish by the author [7].

**IV.1.1 Application an example: The cafeteria.**

Before applying the scale of intensity (frequency) of public places use in the city of Biskra, it is applied to the cafeteria, since it is a public place, structured and limited, it receives users who occupy it for a while. Users occupy the cafeteria by using

its furniture (tables and chairs). The occupation of all the cafeteria tables by users means that the cafeteria is full, so it is a very high occupation; however, if the cafeteria is empty, without users that means zero occupation (no use). (Figure 6)

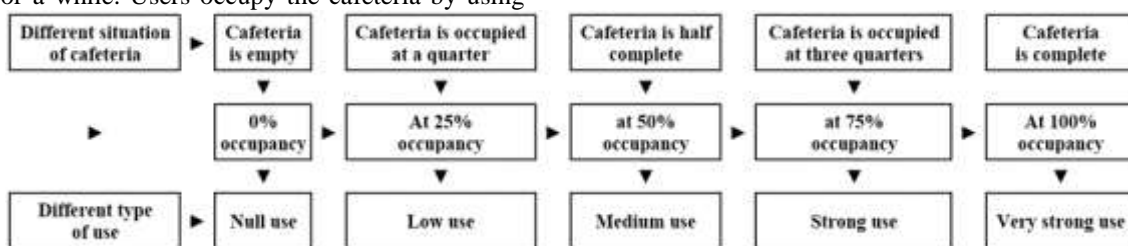


Figure 6. Relative to the different situations of use of cafeteria. Establish by the author.

**IV.1.2. Application of the intensity scale use in the public place**

The public place is used by both sexes in society: men, women, and different age's groups. The place is used for meeting, observation, discussion, traffic, breaks ... etc. the use of the public place happens in a determined period and may change from one period to another. So to better identify and understand all the phenomena and mode of use, we have divided the day, according to the different seasons, into separate periods, the morning, the afternoon and the evening.

publicly take them in a specific time. The number of the population will be used as a reference for the application of the scale of intensity of use. To do this, we divide the area of the concerned public open space by the investigation into the hold of a user.

Above all, we should determine the capacity of the public place by to accommodate its users. That implies calculating the number of people who can

**IV.2. Intensity (frequency) scale use and observation grid (explanations / Figure.7)**

On site and by applying the scale use intensity and the observation grid the task of the investigator becomes simple, where he begins:

- Determine the number of hours in each period: morning period / afternoon period and the evening period, since these changes according to

the season. (See cell represented by the symbol ① in the figure: 7).

✓For the autumn season, the morning period from: 7.30H to 12.00H. the period in the afternoon from: 12.00H to 17.00H and the evening period from: 17.00H to 20.00H.

✓For the winter season, the morning period from: 8.00H to 12.00H. the period in the afternoon from: 12.00H to 17.00H and the evening period from: 17.00H to 20.00H.

✓For the spring season, the morning period from: 7.00H to 12.00H. the period in the afternoon from: 12.00H to 18.00H and the evening period from: 18.00H to 21.00H.

✓For the summer season, the morning period from 6.00H to 12.00H. the period in the afternoon from: 12.00H to 18.30H and the evening period from: 18.00H to 21.00H.

- As already indicate at the top of this article the research technique used it is Participant observation, the investigator must estimate the number of users of the place by sex : men / women and at each hour relative to the period of the observed day: morning period / afternoon period and the evening period and recorded the number in the cells that are suitable, whose cells represented by the symbol ② (see figure: 7) on the scale of intensity of use and observation grid reserved for the men population, and for the women population the cells mentioned by the symbol ③. Or, the global population is the sum of the two populations: men, and women relating to each hour of the three periods of the day, the investigator has to put them in the cells carrying the symbol ④ (see figure: 7).

- Calculate the average of the global population of the place and put it in the cell that carries the symbol ⑤ (always on the scale of intensity of use and observation grid, figure: 7). Indeed, the result of the average of the global population is the sum of the population global of all hours divided by the number of hours of this period.

- The investigator writes the dominant type of use at each period of the day: period morning / afternoon period and the evening period in the cell mentioned by ⑥ in the scale of intensity of use and observation grid.

- In bottom of the scale of intensity of use and observation grid, there are two zones: one indicated by the symbol ⑦ for the quantitative (statistical) scale of intensity of use and the second mentioned by symbol ⑧ reserved for the qualitative scale of intensity of use. (See figure: 7)

▪ The investigator must calculate the rate of intensity of use for each day period: morning period / afternoon period and the evening period, based on the average of the population already calculated and recorded in the cell: ⑤. (See the example: 01) Then and after to see his correspondence with the quantitative scale of intensity of use, he begins by filling the cell: ⑨, ⑩, ⑪, ⑫ or ⑬. (See figure: 7)

Example 01: Calculating the rate of the intensity of use for each period of the day:

Assuming that the average of the global population (men and women) in the morning period was 520 users and the total number of the population (its total capacity) of the public place concerned by the study is evaluated at 1500 users, we obtain by the application of the formula: 1, the rate of intensity of use of the desired period (morning).

$$\begin{array}{l} 1500 \text{ users} \rightarrow 100\% \\ 520 \text{ (average of global population)} \rightarrow X\% \end{array} \rightarrow X = \frac{520 \times 100}{1500} = 34.66\% \quad (1)$$

**Formula 1.** Relative to the calculation of the rate of intensity (frequency) use of a desired period.

- The investigator records the result obtained in the corresponding cell. To this example the rate = 34.66% ; 25% < Population < 50% is the cell indicated by the symbol ⑩.

- Now, we have arrived at the objective of our study which is the evaluation of the intensity of use of the public place relative to the desired period. For example: 01, the intensity of use of the place during the morning period whose rate equal 34.66%, it is of medium intensity of use. (See figure: 12)

- At the bottom of the scale of intensity of use and observation grid, indicated by the symbol ⑭ is reserved to set the date of the day of the survey. (Figure: 7)

Date:	② Morning period (before noon / depending on the season)					① Afternoon period (depending on the season)					① Evening period (depending on the season)						
Hours	6.00	7.00	8.00	9.00	10.00	11.00	12.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00
Population / Men	②								②							②	
Population / Women			③								③					③	
Global population		④								④					④		
Average population			⑤							⑤					⑤		
Mode of use			⑥						⑥						⑥		
⑦ Quantitative scale	⑧ Qualitative scale of intensity of use					⑧ Qualitative scale of intensity of use					⑧ Qualitative scale of intensity of use						
0 (0%)	⑨						⑨						⑨				⑨
P < 25%		⑩						⑩						⑩			⑩
25 < P ≤ 50%		⑪						⑪						⑪			⑪
50 < P ≤ 75%			⑫						⑫						⑫		
75 < P ≤ 100%			⑬						⑬						⑬		
Comment:	⑭																

Figure 7. Relative to intensity (frequency) scale use and observation grid. Established by the author [7].

V. Results and discussion

V.1. Case study, the places of the city of Biskra / Algeria

The city of Biskra is located in a depression basin areas and average altitude of 88 meters and between the coordinates (lat.34.48 N; Long E 5.44), which gives a passing control position between north and the south, where on behalf of 'door of the desert' that suits it. Currently, the city of Biskra enjoys the status of the capital of a wilaya which covers an area of 21,671 km2 located in the south-east of Algeria [21]. (Figure 8)



Figure 8. (a): Geographical location of the city of Biskra / Algeria. (b): administrative division map, wilaya of Biskra [21].

The city of Biskra contains several public places, we mention among them: El-Houria place, El-Alia alleys (Chetma road), Zwaka place, the city el-Alia north place, Ben Badis place, Revolution place, Dhalaa place, Sedik ben Yahia Alleys, Istiqlal place. We analyzed and worked on five (05) places that met the criteria required by our research, we expose in this article two (02) public places, the Ben Badis place / Biskra and the Zwaka place / Algeria.

V.2. Application of the intensity (frequency) scale use in Ben Badis place Biskra / Algeria.



Figure 9. (a) site plan of Ben Badis / Biskra place; P.D.A.U / Biskra. (b): satellite view; Ground plan of Place Ben Badis. Source website: www.Google Earth.com

The Ben Badis place / Biskra (in the Ben Badis city), is located in the Z.H.U.N West, where it is part of the Seddik Ben Yahia alleys. Trapezoidal in shape; its total surface is : 7423.00 m<sup>2</sup>; consisting of a green space of: 2604 m<sup>2</sup> and a tiled part. The Ben Badis place / Biskra is limited to the North, East, West and South by mechanical traffic lanes; before the development of the place ; this place, the boundaries which have hardly changed, was asphalt paved land, considered as the roadway of the street; intended for the parking of vehicles of residents of the city at night and the display of goods for the weekly market on Thursday.

The area covered by the study is the tiled surface; since the latter which will contain the users. So the tiled surface = 3943.29 m<sup>2</sup>, with a capacity of 700 users. (After subtracting the service spaces) in fact, it is the state of saturation of the place.

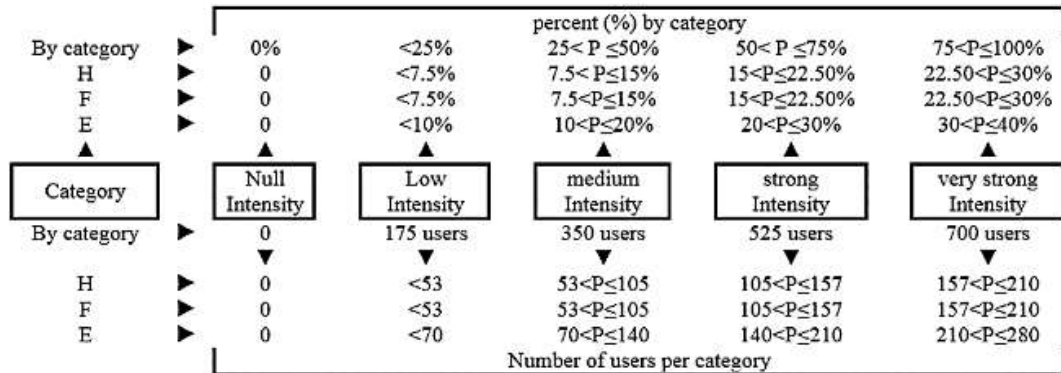


Figure 10. Relative to the intensity (frequency) scale use of the Ben Badis place / Biskra / Algeria [7].

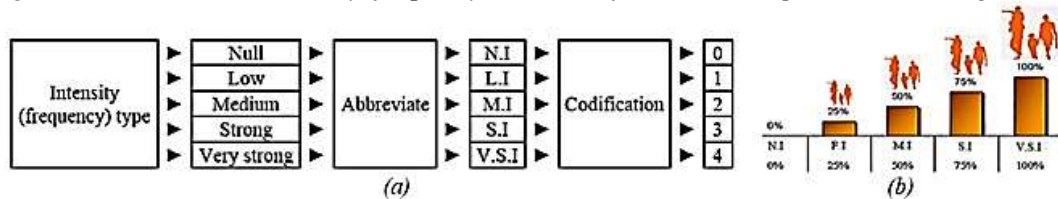


Figure 11. (a): relative to the coding of different types of intensity (frequency) of use, (b) explanatory diagram. Established by the author

**V.2.1. Method of work on site** (fill in the observation grid, figure 7)

The task of filling in the observation grids begins after the exploratory observation of Ben Badis place, Biskra / Algeria.

**V.2.2. Note the data of the Ben Badis public place, Biskra / Algeria**

The investigator, or as it is called in this phase of the investigation, the "observer" of whom he is in the field to collect data and then interpret it. Considering that the work of the observer is a task of appreciating and evaluating the use and the practice of the place, one proceeded to put an

observation scale which allows the observer to develop a work based on quantitative evaluation, the census rather than getting lost in qualitative work without a clear and well-defined reference. So, it is up to the observer to start his work and at the end of each period he just has to fill in the boxes of the observation grid by the number of users in the observation grid.

**V.2.3. Data interpretations**

The data relating to the observations (degrees of intensities) are represented by graphs (histograms). (Figure 12)

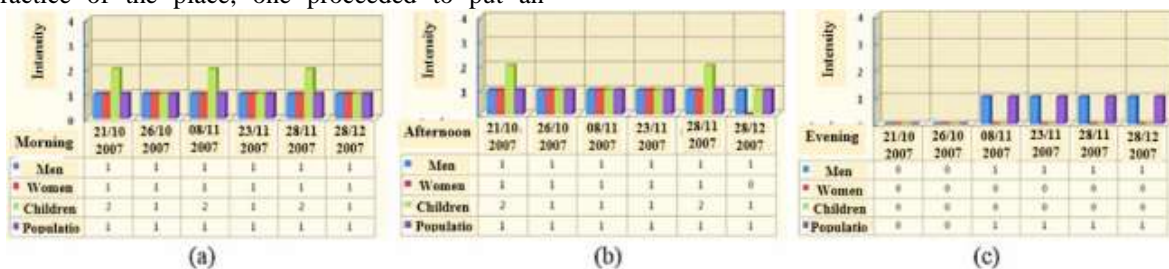


Figure 12. Graphs (histograms) relating to the degrees of intensity (frequency) of use of the Ben Badis place / Biskra / Algeria, the autumn season, three graphs, (a): representation of the intensity (of frequency) of use of the place, the morning period, (b): representation of the intensity (frequency) of use of the place in the afternoon period. (c): representation of the intensity (frequency) of use of the place, the evening period [7].

**V.3. Application of the intensity (frequency) scale use in Zwaka place Biskra / Algeria.**

Zwaka place / Biskra, located at Hakim Saadane Avenue, is limited: To the north by a lane, to the

east by Hakim Saadane Avenue, to the south by a lane leading to the district and to the west by a way, high school and dwellings (respectively).



Figure 13. (a) Site plan of Zwaka place / Biskra ; P.D.A.U / Biskra. (b): satellite image, Ground plan

of Zwaka place/ Biskra. Source website: www.Google Earth.com

Zwaka place / Biskra has a total area of 3048.89 m<sup>2</sup>, almost half of its area is green space, where it scores 1325.15 m<sup>2</sup>, the remaining area is tiled with an area of 1723.74 m<sup>2</sup>.

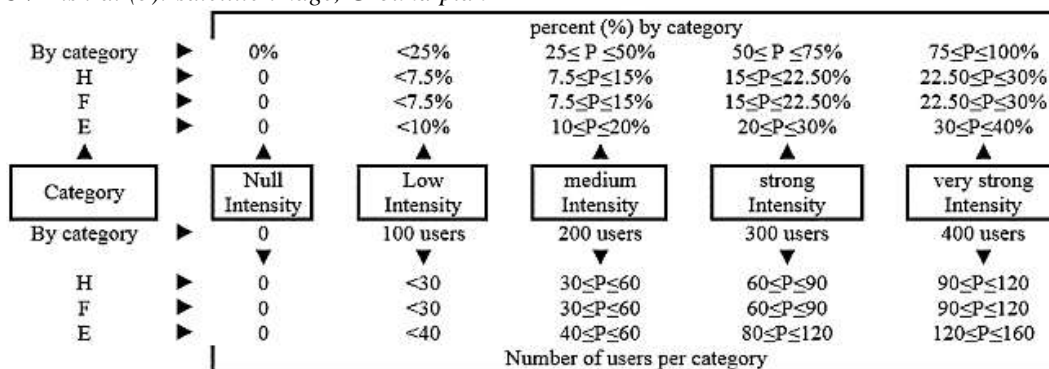


Figure 14. Relative to the intensity (frequency) scale of use of the Zwaka place / Biskra [7].

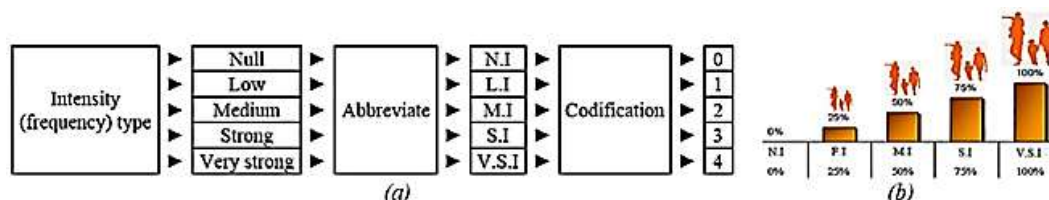


Figure 15. (a): relating to the coding of different types of intensity (frequency) of use, (b) explanatory diagram. Established by the author

### V.3.1. Method of work on site (fill in the observation grid, figure 7)

The task of filling in the observation grid begins after the exploratory observation of Zwaka place, Biskra / Algeria.

### V.3.2. Note the data of the Zwaka public place, Biskra / Algeria

The investigator, or as we call it in this phase of the investigation "the observer" where it is in the field collecting data and then interpreting it. Considering that the work of the observer is a task of appreciating and evaluating the use and the practice of the place, one proceeded to put an observation

scale which allows the observer to develop a work based on quantitative evaluation, the census rather than getting lost in qualitative work without a clear and well-defined reference. Therefore, it is up to the observer to start his work and at the end of each period, he just has to fill in the boxes of the observation grid by the number of users in the observation grid.

### V.3.3. Data interpretations

The data relating to the observations (degrees of intensities) are represented by graphs (histograms). (Figure 16)

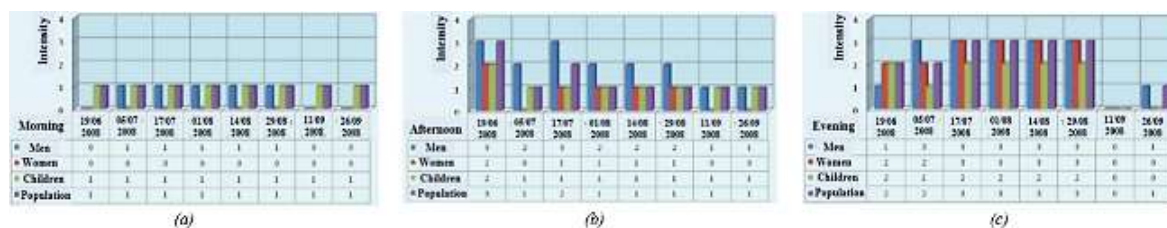


Figure 16. graphs (histograms) relating to the degrees of intensity (frequency) of use of the Zwakaplace, Biskra / Algeria, the autumn season, three graphs, (a): representation of the intensity of use of the place, the morning period, (b): representation of the intensity (frequency) of use of the place in the afternoon period. (c): representation of the intensity (frequency) of use of the place, the evening period [7].



## VI. Conclusion

In fine, our objective was to establish a practical scale as a simple and easy tool to evaluate the intensity of the use of public space. It appears that the use of space involves two types of data, on the one hand, the so-called qualitative data: meeting, gathering, break ... etc. and on the other hand, those qualified as quantitative (statistics) relating to the size of the population attending the place.

We have investigated the different scales of measurement and their characteristics, in addition to their compatibility with our subject and its specificities. This allowed us to use a scale that was more efficient, more accurate and simpler when it was adopted in our survey.

Indeed, the use of the adopted scale as a tool allows us to accurately evaluate the intensity of use of public places in the city of Biskra. This measuring instrument is of the interval scale type, based on five equal graduations (degrees) to measure the intensity of the use of public space and for the frequency of the duration of the selected day.

This study has covered several public places in the city of Biskra / Algeria, including the El-Houria place, Zwaka place, Ben Badis place, Revolution place, Dhalaa place and Istiqlal place. For demonstrating purposes, we have just exposed in this article two (02) public places which are the Zwaka place and the Ben Badis place.

The use of the instrument adopted (the intensity of use scale) during our survey allowed us to obtain real evaluations of the intensity of use and to preserve a lot of time in the field. In addition, it allowed us to more easily read the results obtained and their interpretations on graphs.

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