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physical Constituents of university urban environment; the impact on social behavior characteristics (University of Babylon A model)

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Abstract. Environment quality plays a major role in communication, and, enhances life.it has received increased attention across a number of disciplines in recent years. in contrast, there is no comprehensiveness of experimental behavioral studies. so the major ***problem*** there is a lack of knowledge in comprehensiveness of experimental behavioral studies, that determine the physical Constituents; Influencing the social behavior characteristics, and assessment the environment quality based on behavioral measures by observed behavior. the ***aim*** of this paper is to develop previous literature theoretical framework and draw out behavioral measures to assess the environment quality (functionally, physically and ecologically). The inductive experimental ***approach*** was adopted, six urban spaces were elected at the University of Babylon, and observation Student behavior during (2018-2019). Finally, the ***results*** showed that determine the measures based on observed behavior Characteristics contributes effectively to the assessment environment quality, on another side high quality of the urban environment leads to increase the variety of behavioral patterns and cognitive relationships.

1. Introduction

The importance of research is to study the physical environment as a behavioral system that has a role in social behavior characteristics. In contrast, there is a lack in the comprehensiveness of Previous experimental behavioral studies that determine the environment physical Constituents; Influencing the social behavior characteristics, in addition, assess the environment according to behavioral measures based on observed behavior in urban environment. Research has **hypothesized** that there is a correlation between the physical constituents of the urban environment and the social behavior characteristics (patterns and nature). Also the behavioral dominant in environment is the result of reciprocal influences with these constituents. these correlations can be revealed by behavioral measures based on observed behavioral characteristics in environment to assess environment quality (functionally, physically and ecologically).so the main **research goals** were identified such as:-

1. Build base knowledge about the role of physical constituents of the urban environment influencing the social behavior characteristics (patterns and nature of behavior).
2. Determine the physical indicators of the urban environment that stimulate the diversity of social behavior by identifying behavioral patterns and their nature.

3. Build objective scientific measures through the creation of behavioral criteria for the urban environment assessment and investment Later these measures in urban design.

To achieve these goals; adopted **Inductive experimental approach** Within two axes: -

1. **1st Theoretical axis**: - included Building the theoretical framework from previous literature, draw out Research problem, define procedural definitions for research phenomena, draw out a measurement indicator and his style, as well as, determine the general research methodology.
2. **2nd axis The practical axis:-** social behavior characteristics were monitored (the dependent phenomenon)in Urban spaces at the University of Babylon which have different physical, ecological and functional quality, during the academic year (2018-2019).also It has been identified the main vocabulary about social behavior characteristics (patterns and nature of behavior). classification the behavior patterns into (A-I), and determined behavior nature according to random or chance meetings into (7 degrees of relationship strength and weakness),as well as, the main vocabulary of the physical constituents identify, Within two key terms (ecological and physical quality), Included (37 indicators), Then divide [100 degrees by 37 index] and the value of the weight of one index (2.71%), finally, Five grades per index were given according to Likert scale[Clearly present (2.71), Less obviously (2.162), Exists to some extent (1.626), Low score (1.084)Not Found (0)].
3. **findings, conclusions, and recommendations** Examine research hypotheses and draw out the Results, Conclusions, and recommendations. It was found that there are correlations between the physical constituents of the urban environment (physical and ecological quality) and the behavioral characteristics (functional quality). The most influential indicators of behavioral patterns (Total isolation to High intimacy) are space containment and protect wildlife. also the most influential indicators on the behavior nature (random relationships and psoriasis) are the accessibility, choice and physical barriers with the presence of a group of other indicators less influential.

2. Urban environment

according to scientific and linguistic sources (dictionaries), as well as definitions of geographers, psychology, sociology, and architecture, the urban environment means a natural, physical, social and cultural environment in which man lives in it and he gets from environment the constituents of life. urban environment is the product of human interaction with the surrounding environment, including several interrelationships between them, such as social, cultural, economic and physical habits and traditions, as well as, the surrounding spaces (buildings and landscapes) that affect in his behavior at that moment which can be measured and estimate its effects. finally, it is the total quality of the social, cultural, physical and natural environment. [1, 214-215], [22,5], [29,4] , [50, 83-84], [8,35], [6,13] , [33, 77-81] , [44] , [14, 236]

2.1. urban environment Constituents

according to philosophical, scientific and linguistic sources (dictionaries)definitions, the urban environment constituents are everything that consists or composes it, and the urban environment is based on the basic elements. These elements contribute to the established urban environment, its existence, its effectiveness, and make its one entity. urban environment constituents represent all subjective and objective meanings of environment.so they are a group of substances (physical and natural), as well as subjective (social and cultural), interlaced among them, also influential each other and on human behavior characteristics (In terms of nature and patterns). This effect has appeared indirect physiological relationships and indirect psychological relationships through the S-R model. then represented these relationships in the mental environment as a (Conceptually, socially and physically). [45, 397-399], [2, 298] , [43, 118-128] ,[17,58] ,[48, 105-106] ,[40, 1874-1876] , [3],[49, 46-53], [27,39].

2.2. The quality of the university environment

There are three main levels in the open space that achieve the quality of the university environment, as follows: -

A. **Ecological quality**: -This supports the natural environment characteristics by protecting it, because of the green spaces contribute to the conservation and protection of wildlife, as well as, reduces environmental anxiety that grows within the university and in surrounding communities.
B. **Functional quality:-** This supports the interactions between human behavior in the physical environment. By providing multiple campus activities such as (Sunbathing, relax, formal and informal events, study, see and encourage meetings between students, faculty, and visitors, also meditation, chat with friends, hiking, playing, sense of comfortable, the degree of interaction between buildings and open spaces and green space, display artwork, and books, …ect) .so the regularly activities will stimulate curiosity, meeting and conversation, and the resulting atmosphere is truly educational, also external spaces are necessary to relieve tension between students and university staff, Making homogeneity between classes, and office work more likely.
C. **Physical quality (aesthetic and visual):-** Aesthetic preference depends on the visual sense it is the most important appearance of the aesthetic-visual quality of external spaces. The visual quality of the campus has high impact on the user experiences quality of campus and attracting and keep them, also developing educational and research programs, and show Concepts of environmental design, ethics, and art, in anther hand reinforce the campus as one of the origins of community design, through the realization of the campus identity. Without clear and distinct open spaces, there will be no distinct campus. The most important factor to make the place stand out is how the user sees the physical environment and they decide the quality and open space quality. People prefer an environment that provides them with the opportunity to get additional information, and help them understand it, as well as, help them manage their communications and social interaction with each other, determine the important features in their everyday environment, and enjoy the aesthetics. Finally users' perception is related to open spaces on campus with human activities [51,5-7].

3. social behavior

In language, the (Behavior, Behavior) means Biography, doctrine, and trend [47, 671],[41,1-2]. **Psychology** Human behavior means "Whatever comes from a man of activity both internally (in motivated form or emotional and cognitive skills and processes). or externally includes overt behavior towards others while interacting with the environment to achieve psychological balance between basic and sensory needs, as well as satisfy psychological and Social needs , such as sense of security and belonging and self-assertion[30, 43-102],[53, 7-13],[8, 27-28],[12, 147-155].**Biologically** human behavior is motor and glandular responses coming from the muscles of the organism or about the glands in his body to adapt to the requirements of living. This behavior is either innate (without learning), or acquired (Learned as a result of contact with the environment) [13,15],[42,2-3], [18,47].social behavior occurs because of common biological needs at the gene level within the human nervous systems. That responds to social and environmental information. This information is transmitted in individuals by initial or more sensory pathways. Then processed transmitted neural signals, and integrated into specific circuits of the brain, by move the saved signal, and systems of intramuscular nervous device. the control of the internal factors of the individual in the final behavioral activity [46, 896-900]. in social studies behavior classification as follows: -

1. Individual behavior: - innate and acquired behavior.
2. group behaviour :- innate behavior (without learning)
3. Social Behavior: -acquired behavior (Learned as a result of contact with the environment) [8, 27-28],[18, 49-50], [13, 121-122],[30, 43-102].

social behavior Is issued by the individual in levels as follows: -

1. Psychology of couple relations: - between (Mother - Father - Wife - Classmate - Friend)
2. Psychology of small groups: - among a number of individuals who interact with each other.
3. Psychology of collective behavior: - among the population or social mobilization for a large number of individuals they enter into distinct social relations, and interactive links to achieve specific goals [30, 43-102]

4. physical constituents of the urban environment

It is a collection of cognitive, morphological, and structuralism studies, that explain the physical constituents of the urban environment. These constituents are a collection of complex spatial systems affecting each other,and they represent the Physical surrounding in which people work and affect them. [33,98],[32,2],[43,3-12],[44, 17-18]. The most important of these studies are the following: -

1- **Kevin Lynch \1960 study:-** In his book (The Image of the City) he interest in his research early in the concept of legibility, and visual perception of cities. He identified the physical elements of the urban environment with five elements(path, node, landmark, district, and edge).as well as the urban environment is composed of three basic levels of identity, structure, and meaning.[34, 125],[35,6-8].

2- **David Site 1978 study:-** In his book(Environmental perception and cognition: toward a model for mental Maps) He identified the physical elements of the urban environment with four elements(Boundaries, Paths, Points, Barriers), [48,157-168]

3- **Jim McClusky, 1979 study** In his book (Road Form and Townscape) He identified the physical elements of the urban environment with tow elements (Places or Static space, and route or dynamic space). These elements are related in the urban environment within two main patterns (Serial and radial patterns), as well as, there are four network types (not network, branching network, serial network, grid network), [36,92].

4- **Ian Bentley and others, 1985 study** In his book (Responsive Environment) he try to analyze the environment physically through the paths, also he suggested two syntheses properties of the path: first they are the number of path connections with its neighbors, He considered it an important property in influencing the effectiveness of space and how direct it is and he measured the number of direct connections. The second multiple paths that are connected to it [11,10-15].

5- **Hillier&Harson,1984 study** In his book (The social logic of space) it is a set of space syntax rules and a set of research on the relationship between social variables, and characteristics of special organization. The goal was to discover the syntheses properties compatibility of spacial structures through two basic synthetic properties (Symmetry - Asymmetry) and (Distributedness - Non-Distributedness) [25, 78- 94].

6- **Shulz, 1971 study** In his book(Existence Space and Architecture) identified the physical environment in three elements they are (Paths, places, domains), as well as, he determined Characteristics of space in two characteristics, first classify the space shape to(paths, places, domains), the second space is made up of natural and industrial phenomena and realize the relationship between them through space Orientation [34, 273- 276],[39, 15-24],[20,46-47].

7- **Donald Appleyard, 1976 study** In his book (Planning pluralistic city) he identifies eight physical elements that fall under two basic classifications according to the different types of cognitive of these elements, first of them Sequential elements, it includes (Fragmented, Chain,

Branch, and Netted) elements, the second are Spatial elements it includes (Scattered, Mosaic, Linked, patterned) elements [9, 150-182].

8- **Tresidder (2005)** In his study (Using GIS to Measure Connectivity: An Exploration of Issues), he identifies the physical elements of the urban environment in five elements such as (link, real node, dangle node, and Circuit) [51,5].

9- **Gordon Cullen\1971 study** in his books (Townscape) and (The Concise Townscape), Gordon Cullen and (Camillo Sitte) before him focused on visual picturesque effects. He analyzed these effects through the perspective scene instead of the plans. He was interested in how people perceive the urban environment through their sense of eye and through the receiver's movement. also, he focused on the emotional rather than Kevin Lang's legibility.finaly he defines three ways to generate sensory excitement of urban space such as :

- (**Optics** they are the sequential scene achieved through contiguity and contradiction among spaces)
- (**Place:** The sense of place that results from scale, containment, surrounding, distinct, edges, borders, landmark, use topography and plants to create drama, And provide a series of fences or chain ranges to create a sense of drama.)
- (**Content:** color, scale, style, character, privacy, and uniqueness characteristics). [34, 118-119],[16, 13-195],[28,70],[32,2].

10- **Nikos Salingaros\2016 study** In an introduction of his study, He believes that human beings interact with the building according to their biological instinct. They judge the building according to its effect on their bodies because the human sense is universal. 90% of people share the same reactions to the environment, even if they are individuals with diverse cultural backgrounds. also, he believes architecture must have a theoretical basis on the natural ecosystem, and that people are the origin of the architecture theory not architects.so his two concepts-[47]:-

- Form language Consists of the basic elements of architectural components such as (Flooring, walls, ceilings, shapes, windows, materials, and decorations). Thes elements Formed within a specific formal language context. as well as, he discusses the concept of complexity of formal language according to the Kolmgrove-Cheaten concept and Alexander's three laws of complexity analysis.
- Pattern language It is determined by human adaptation to the environment and their responses و Through (the use of local materials, employing traditional patterns, methods of reducing energy cost, evolution and historical continuity of designs, and use traditional decoration, ... etc) [47].

11- **Rasoulpour and Charehjoo 2017** In his study (The Effect of the Built Environment on the Human Psyche Promote) he discusses the relationship of organisms with their surroundings is innate, adaptation and human responses are instinctive. by the time and experiences, a huge information network is created in mind to recognize and distinguish things, this excellence gives people the ability to control the environment.so he linking the architecture to reality, environment, and the world of memories. Through extrapolation of psychological, planning, and psychology studies, he identify the physical Constituents of urban environment affecting the human soul in(Architectural Controllability) which Include) planning flexible, privacy, relationship of direct space with buildings, legibility, climate control, and lighting, territoriality, impression, surrounded, and space depth) [44,17-19].

5. Ecological and Physical quality indicators of the urban environment

we draw out indicators of physical urban environment constituents based on the results of previous studies, as shown in Table (1). The selected based on the following: -

- Exclude indicators that have been studied previously
- Exclusion of indicators beyond research boundaries (associated with holistic Characteristics of a special organization)
- Integrate similar indicators
- draw out indicators that achieve the research goal through scientific theories and previous studies.

6. Functional quality indicators of the urban environment

It includes the patterns and nature of social behavior indicators, based on the results of (territoriality, Proxemic, Ecological, Cognitive, and social) theories: in order to derive behavioral measures to assess the urban environment (ecologically, physically and functionally), as well as, determine the relationship between behavior and urban environment in urban space and spatial organization through direct observation of overt behavior and physical environment. as follows: -

6.1. Indicators of Social behavior patterns

Based on indicators of behavior theories such as (territoriality, Proxemic, Personal Space,the Field,and behavior setting) theories; Ecological structures theory have been invested to determine social behavior patterns (from A- to I)type, also determine the nature of psychological relationships according to Social study such as (Mark S. Granovetter\1977) and (Thomas J. Allen \1984). also, (1-7) gradients were identified according to Likert scale .as shown in Figure (3) and Table (3), and as follows:-

A. **territoriality theory:-** it is Emphasizes the organization of space for humans grew up Biologically motivated to defend the clearly “territoriality” [25,6-7]. Irwin Altman defined territoriality as one mechanism to achieve privacy,also defined the behavioral Territory It is a self-regulating mechanism which is involving the allocation or mark a place or object to deliver that it belongs to a person or group. These definitions refer to some basic properties of territoriality which (ownership or place rights, the allocation of the area or distinguishable, the right to defend against intrusion, and perform multiple needs from basic physiological to cognitive and aesthetic needs)[33,148],[25,6-7]. The theory of behavioral territory was confirmed by Jane Jacobs through study open urban spaces (streets, sidewalks, and squares) behavioral territory is defined by three conditions (the presence of borders, continuity of observation, and preoccupied with users) [31, 32-35].

Privacy, behavioral territory, and personal space concepts are closely related. Irwin Altman proposes a conceptual organizational model he considered personal space and territorialities are mechanisms key to achieving privacy. Persons seeking to get the right level of privacy for the activity they're involved in (between isolation and Crowding). Privacy can be defined as the ability of individuals or groups to control their visual, auditory and olfactory interactions with the others. Amos Rapoport knows privacy as "the ability to control
interactions, get options, and achieve the desired interactions. "as well as it is not just physical withdrawal of someone in search of isolation. Westin identified four levels of privacy such as [***Isolitude: -*** *The state of freedom from observing others], [**Intimacy: -** The status of being with someone but free from the outside world], [**Anonymity: -** The event that the person is unknown, even in a crowd of people], [**Reserve:-** A situation where a person employs psychological barriers to control unwanted intrusion].*

A lot of privacy leads to feelings of social isolation,but a little privacy leads to feelings of self Crowding.so it is important to adjust the surroundings of behavior sitting, and the number of users should be appropriate for behavior consistent pattern, as well as the people have enough personal space and

control territoriality on what is important to them[33, 146-147]. Ali Namazian in his study (Psychological Demands of the Built Environment, Privacy, Personal Space and Territory in Architecture) he sees that we must design responsive environments that allow alternately between the state of separation and a state of teamwork. also, the designer responds to the changing user wishes [37, 109-113]. Based on these concepts it was extracted standards by researchers, according to figure No.(4-A,5).

B. **Proxemic Theories:-** they are a set of theories and studies within ecological psychology, and environmental psychology affected by many cognitive fields. Introduced several concepts, such as Personal space , intimate space(16-18 inches or about 45 cm) ,personal space(4 feet or about 1.2 m), social space(12 feet or about 3.6 m) and public space(25 feet or about 7.2 m), as well as discussed how humans relate to each other in the urban environment, and how they control it. Their concepts were not translated into behavioral measures to assess the urban environment. these studies and theories are (Edward T. Hall: Proxemic Theory, 1966), (Robert Sommer, Personal Space theory1969), (Kurt Lewin: Field Theory), and behavior sitting theory) see Figure no. (1). [15,4],[23,29],[33,147],[21, 160-176],[8, 134-136], Some of these concepts are:-

- **Life Space:-** Kurt Lewin introduced the concept in field theory.It confirmed Behavior is an interaction between the environment and man. life space is variable according to the degree of consciousness or unconsciousness. It is possible for an individual to share life space with others and It changes as their consciousness changes. theory defined the concept and did not give clear measurement indicators [24, 204-205],[8,122].
- **Personal Space:-** Robert Sommer introduced the concept in his Personal Space theory1969. he confirmed "*Personal space refers to an area with an invisible boundary surrounding the person's body into which intruders may not come., people like to be close enough to obtain warmth and comradeship but far enough away to avoid pricking one another. Personal space is not necessarily spherical in shape, nor does it extend equally in all directions*"[33,147].
- **Behavior setting:-** Roger Barker introduced the concept in his Behavior settings theory. Behavior settings are considered a constant mix of activity and place. Consists of recurring activity, a durable pattern of behavior, and specific planning for the environment, an identical relationship between the two, and a specific time period. The limits of behavior settings when the behavior stops by physical limit prevents behaviour from entering and exiting, or the lack of vision and sound clarity or a symbolic limit such as a change in the texture of the floor can be identified for some individuals or any sign. So when the behavior limits are unclear, problems with the definition of boundaries occur [33, 113-115],[10,30-48], [24, 252-254] ,[8, 122-123].

6.2. indicators of Social behavior nature

There is a set of social theories that characterize the nature of human behavior within the urban environment. one such study of (Mark S. Granovetter \ 1977), And the study of (Thomas J. Allen \ 1984). As well as Bill Hillier referred to this character in his study (Space is the machine1996), and (Huan Yang / 2007) in his study (Campus landscape space planning and design using QFD).As shown in Figure(2)[52,6-7],[26, 196-197] .

1- **Thomas J. Allen \1984** in his study(Managing the Flow of Technology) About communication and innovation in science and engineering organizations, showing how human and organizational systems can be restructured for better productivity, and better communication between people. Allen put forward the **(chance meetings)** in producing new knowledge, [7, 182-206],[4,68].

2- **Mark S. Granovetter\1977** in his study (The strength of weak ties) discusses the prevailing systems in society. The study included the role of spatial organization in generating a network of weak

connections that society is highly dependent on, also he suggested patterns of interpersonal relationships in a mathematical manner by introducing the idea of two **(strong ties)** and **(weaker ties)** among members of society. The prevailing relationships are usually three between friends and knowledge bridges it comes from indirect relationships, and through the special relationships of each individual in the triple relationship, so any relationship to people connected indirectly. Strong ties are close between friends who know each other,as well as the meetings are intentional and planned. As opposed to weak ties, linked to acquaintances of friends it is characterized by being previously unplanned. considering this type of relations bridges the cognitive world of the individual.these ties are measured through four indicators such as **(intimacy or mutual confiding, emotional intensity,reciprocal services, and time).** According to these four indicators determine the strength and weakness of relationships [4,68],[19, 347-367] See Fig. No(2, 3,)

7. Case Study

Universities play a major role in changing society for a better future. The campus is the major urban projects that have a significant impact on cities. Campus areas are important and should not be designed or treated as residual distances from buildings. So the users should be part of the project and be included in the decision-making process [5,13].so the University environment was elected at the University of Babylon to apply search indicators. The University of Babylon went through several evolutionary stages, led to the creation of diverse urban spaces in functional, ecological and physical quality. So six spaces were observed by (Plane spark). It was done field observation during the academic year (2018-2019).

8. The Results

The results of the examination showed the following: -

1- **1st stage: -** The quality of the urban environment was determined for the observed urban spaces as shown in Table no (3) .space (S3) achieved the highest environment quality(85%), whereas the spaces have achieved varying environmental quality, but the lowest spaces were (S4, S10).

2- **2nd stage:** - The observed behavior patterns were identified in the elected urban spaces, space (S4) achieved the highest rate of repeat complete isolation behavior pattern (A) by students, followed by spaces (S3, S7, S2). In contrast, space (S5) achieved the highest frequency of very high intimacy behavior pattern (I), high intimate behavior pattern (B), and. achieved crowding in this space. whereas in the rest of the spaces no repetition of these patterns of behavior was recorded but was characterized by the repetition of diverse behavioral patterns. as shown in fig. (18,19) and Figures (6.7,8,9,10,11).

3- **3rd stage: -** It was determined to repeat the degree of the relationship between students through programming for the AutoCAD program. It shows the highest average of strong relationships was in space (S5) then space (S2), while it was at its lowest in space (S3).in contrast, very weak relations were recorded highest in space (S5) than spaces (S7, S2).as shown in fig.(18,19) and figures (6.7,8,9,10,11).

4- **4th stage:-** test hypotheses search through Pearson correlations, and regression stepwise. The following shows: -

   a) **1st Test the relationship among behavior patterns, behavior nature and the urban environment quality:-** Through (Pearson correlations) test, the relationship of behavior patterns with ecological and physical environmental quality,it shows:-

      - There is a high inverse relationship between urban environmental quality (Physical and ecological quality), and the behavior pattern (Total isolation (A)) and with significant level

(0.01), but there is an inverse weak relationship and not significant with a (very high intimacy behavior pattern (B, I)). also there are medium to weak relations among the urban environment quality and behavioral pattern (H, G, F) insignificant level (0.01) and (0.05). As shown in fig. (12).

- There is a weak inverse relationship (not significant) among the sensory and cognitive relationship pattern (1 Total isolation, high intimacy 6, very high intimacy 7), and urban environment quality. Also, there is a positive relationship (weak and not significant) among the relationship pattern (2,3,4,5) and urban environmental quality. as shown in fig (13).

b) **2nd Test the relationship among behavior patterns, behavior nature, and the ecological quality indicators:-**

- There are various relationships between ecological quality indicators, and behavior patterns in significance levels (0.001,0.05). the Indicators (ECO.B1, ECO.C3, ECO.C5, ECO.C6, ECO.C7) are the most influential indicators of achieving various levels of privacy. They achieved inverse relationships with (Total isolation pattern (A)), and (very high intimacy (I)) insignificant level (0.01). also, they achieved positive relationships with the other of the behavioral patterns insignificant level (0.01).as well as the (ECO.B1) Indicator is a very important indicator that influential in achieving various number of behavior patterns. as shown in fig No. (14).
- The results of the test showed that there are various correlations with a significant level (0.01) among all ecological quality indicators, and sensory as well as cognitive relationship levels. they are contributing to the increase and diversity of these relationships in urban space. as shown in fig. (18,19).

c) 3rd Test of the relationship among behavior patterns, behavior nature, and the Physical quality indicators:-

- Through (Pearson correlations) test, shows the physical quality indicators (PHD1-4, PHE2, PHE5, PHF2-9, PHF11, PHG1-3) have inverse relationships with the behavioral pattern (A total isolation pattern) insignificant levels (0.01) and (0.05). they are affected by other behavioral patterns and behavior settings (No.B.S.) with significant level, as well as they are influenced in the diversity of behavior settings within urban space. As shown in fig. (15).
- The physical quality indicators achieved significant relationships in levels (0.01) and (0.05) With sensory and cognitive relationships in urban space vary between strong and medium. Also, the indicators (PHD3-4, PHE2-3, PHE6, PHF3, PHF6, PHG13) Contributing major effectively in the realization of diverse of these relationships. As shown in fig. (16).

d) **4th Stepwise Test** through taking this test to identify the most urban environmental quality indicators influential in sequence in behavioral characteristics (functional quality). It shows the following in the fig. (17): -

- The most influential indicators in appearing (total isolation pattern (A)) the indicators (PHF3: - a degree of Containment) and (ECO.A1: - protection of wildlife habitats).
- The most influential indicators in appearing ((very high intimacy pattern (I))) the indicators (PHD5: - Accessibility and Distributedness).
- The most influential indicators in the number of behavior patterns the indicators (PHD5: - Accessibility and Distributedness) and (ECO.C1: - Direct link with buildings).

- The most influential indicators in appearing (Weak sensory and cognitive relationships (7)) the indicators (PHD5: - Accessibility and Distributedness).
- The most influential indicators in appearing (Strong (2) and very strong(1) sensory and cognitive relationships) the indicators (PHD5: - Accessibility and Distributedness) and (PHE6: - The barriers).

9. The Conclusions

1- determination of behavioral standards according to observed the behavior Characteristics in the urban environment, contributes effectively to the assessment the quality of environment,and to identify of prevailing social behavior characteristics in communities, as well as, it contributes in development these environments later (in urban design level)in line with the communities orientations.

2- high quality of the urban environment leads to increase the variety of behavioral patterns, and generate sensory and cognitive relationships for users, also it contributes to increasing the number of behavioral patterns within urban space, and thus the diversity of behavior setting in the urban environment.

3- high quality of the physical and ecological urban environment reduce isolated or crowding feeling, also It meets the requirements of privacy through Provide varying degrees of isolation and intimacy required in it.

4- the functional quality in urban spaces increases when the physical and ecological quality increases. So the physical quality indicators ((PHF3: - containment) and (ECO.C1: - direct link with buildings), also And ecological quality indicators (ECO.A1: - protection of wildlife habitats)are most influential on patterns of behavior, nature, and numbers.

5- The most important indicators of the physical quality that are inverse relationships with the (A total isolation pattern), (very high intimacy (I)), affect on other behavioral patterns, behavior setting (No.B.S.) within urban space, and contribute to the creation of good sensory and cognitive relationships are (Containment, district clarity, and use local materials), whereas the least of these factors are (edge clarity, and axes of movement).

6- The most important indicators of the ecological quality that are inverse relationships with the (A total isolation pattern), (very high intimacy (I)), affect on other behavioral patterns, behavior setting (No.B.S.) within urban space, and contribute to the creation of good sensory and cognitive relationships are (protection of wildlife habitats).

10. Recommendations

1- Conducting experimental tests to assess the functional, ecological and physical quality of existing urban environments before starting to prepare new designs through investment the proposed behavioral standards.

2- Supporting experimental research in universities, and research centers by providing laboratories with modern technologies through which get urban environments plans with human and physical elements to provide greater opportunities to examine the special organization and identify their characteristics consistent with different cultures and societies.

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Appendix

Figures

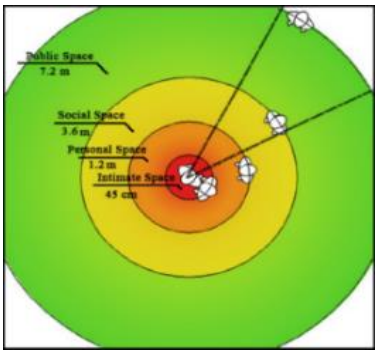


Figure no. (1):- Shows the types of spaces in which individual relationships are made According to the Hall Edward T. theory
Sucre: (Hall,2007,PP.160-176)

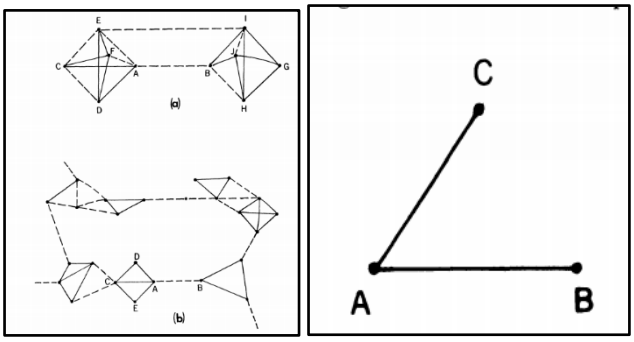


Figure No. 2: Patterns of relationships proposed by Granovetter in his study
Sucre: (Granovetter,1977, p347-367

1. Patterns of behavior based on Behavior setting, Proxemic, and territoriality Theories

1) Individual relationships
- **Type (A) one person within an area of more than (12 * 12) m 2 .... completely isolated**
- **Type (G) one person within an area of (12 * 12) m 2 .... partially isolated**

2) Double relationships
- **Type (B) Two persons within an area of (0.5 * 0.5) m2**
- **Type (C) two people within an area of (1.2 * 1.2) m2**
- **Type (D) two persons within an area of (2.1 * 2.1) m2**
- **Type (E) Two persons within an area of (3.6 * 3.6) m2**
- **Type (F) two people within an area of (6 * 6) m2**

3) Small groups (3-12 persons)
- **Type (H1) Three people within an area of (9 * 9) m2**
- **Type (H2) three people within an area of (6 * 6) m2**
- **Type (H3) Five people within an area of (6 * 6) m2**
- **Type (H4) Twelve people within an area of (6 * 6) m2**

4) Collective or crowd behavior (≥ 13 people)
- **Type (I) ≥ 13 people within an area of (9.25 * 9.25) m2**

2. Behavior Nature based on the (Mark S. Granovetter \ 1977), and (Thomas J. Allen \ 1984) study

Very strong relationships(1) ,Strong relationships(2), Medium relationship to some extent(3) ,Medium relationship(4), The relationship is weak to some extent(5), Weak relationship(6), Very weak relationship(7)

3. Behavior setting

1. (No..B.S:-):- number of Behavior setting (#)
2. (B.B.S:-):- The degree of boundaries clarity (-15 gradients) as follows:- (Clear physical border (4)), (Less visible physical border)(3) , (Somewhat clear physical border (2)),(Symbolic border only (1)) ,(No border (0))

3. Method of calculating patterns and nature of social behavior Calculated by: -
- **Observation**
- **Dropping relations on the plan**
- **Programming (ATUCAD)program**
- **Extract the results**

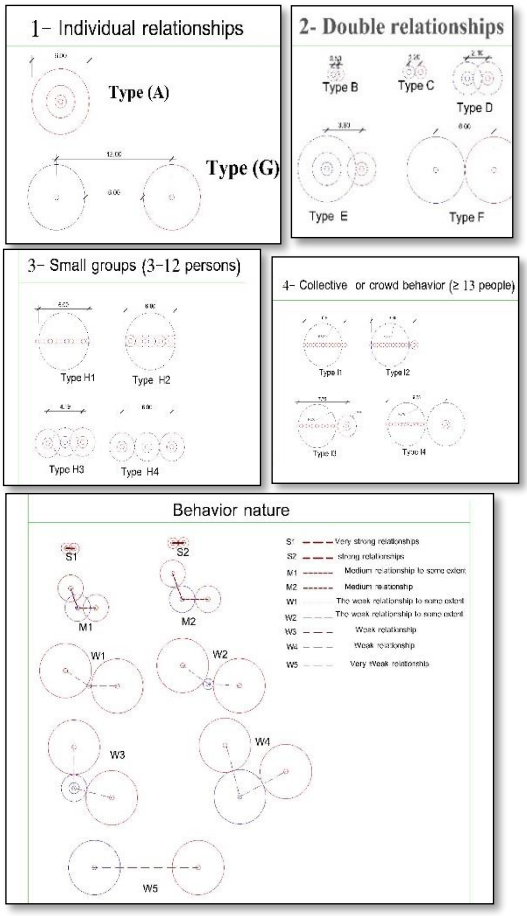


Figure No. (3): - Indicators of patterns and nature of social behavior
Source: Researcher based on previous literature

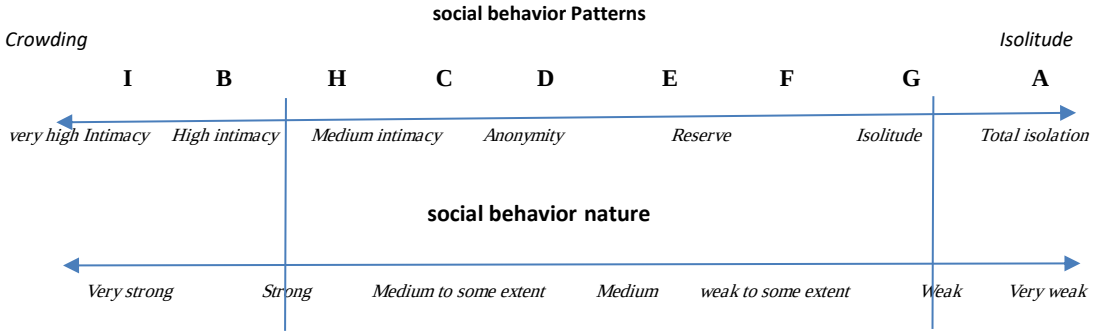


Figure No.(4-A):- The proposed scale to assess the urban environment and social behavior
Source: Researcher based on previous literature

1. If the (A) pattern prevails In urban space with increasing strong and medium relationships, that means that the urban environment is not responsive with privacy requirements, and the human relationship with the environment characterized In Total isolation , and poor functional quality
2. If the (I,B) pattern prevails In urban space with increasing Strong and very strong relationships , that means that the urban environment is not responsive with privacy requirements, , and the human relationship with the environment characterized In Crowding and ,uncomfortable , and poor functional quality
3. If a balance in the distribution of diverse patterns and behavioral relationships in the urban space, , that means that the urban environment is responsive with privacy requirements, allow alternating between the state of separation and the status of Teamwork , and the human relationship with the environment characterized In high functional quality

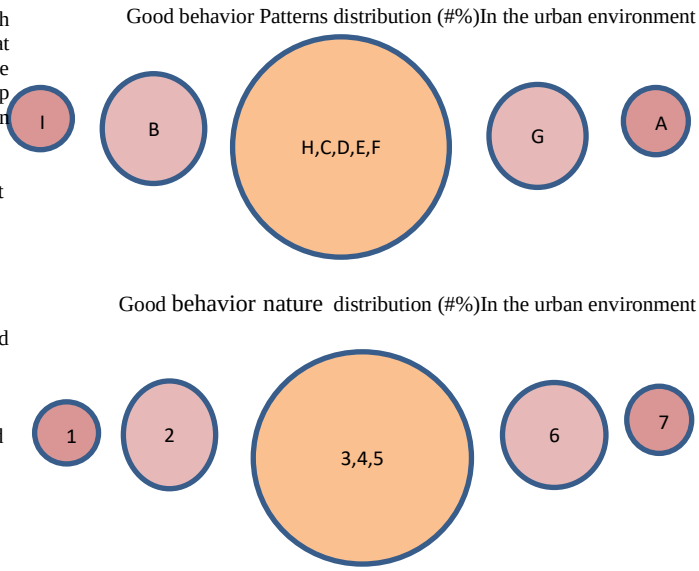


Figure No.(4-B):- Good behavior Patterns& nature distribution (#%)In the urban environment
Source: Researcher based on previous literature

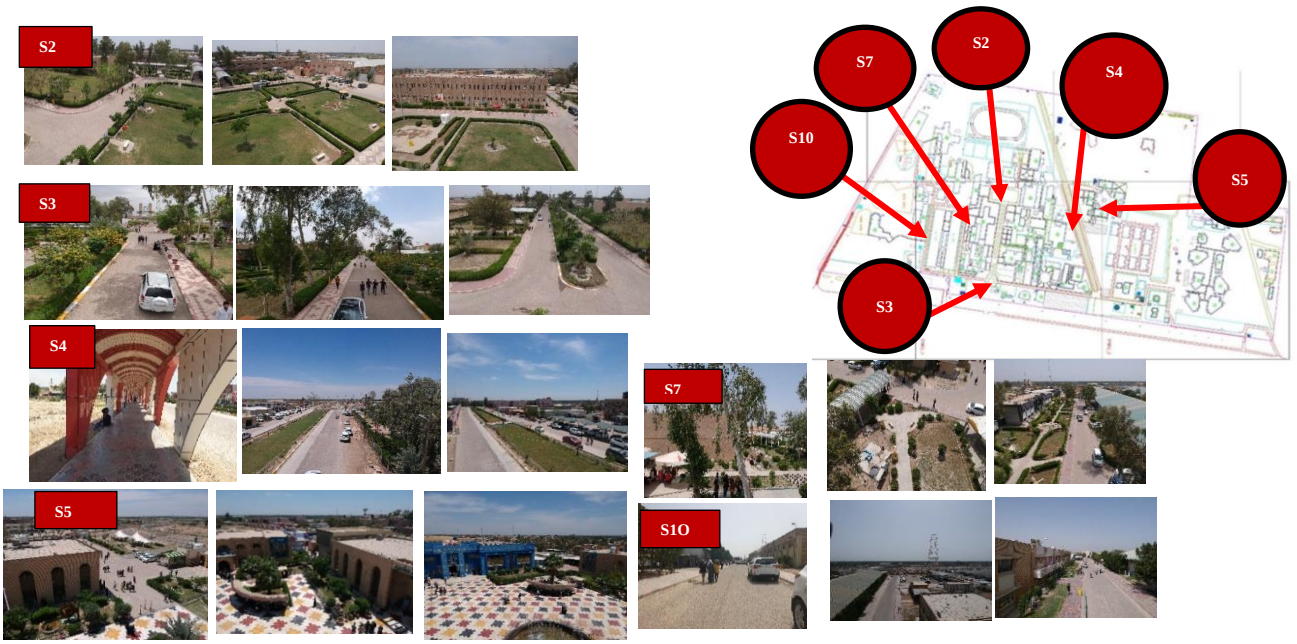


Figure No.(5):- Show observeing patterns of behavior in the elected spaces With the University website
URL:- https://satellites.pro/Iraq_map

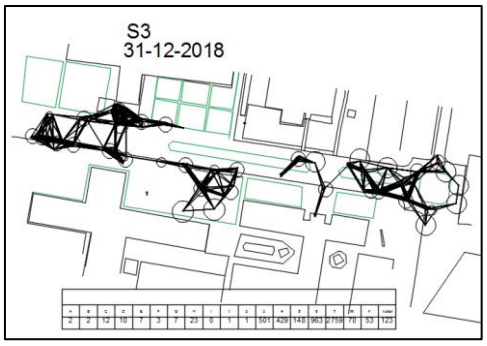


Figure No.(7):- Show observing space No(S3)

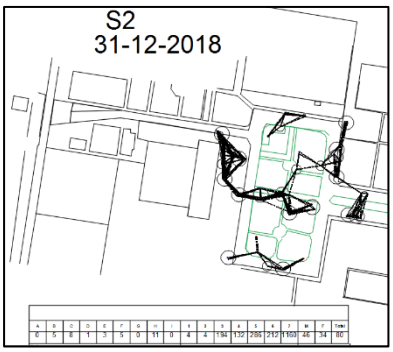


Figure No.(6):- Show observing space No(S2)

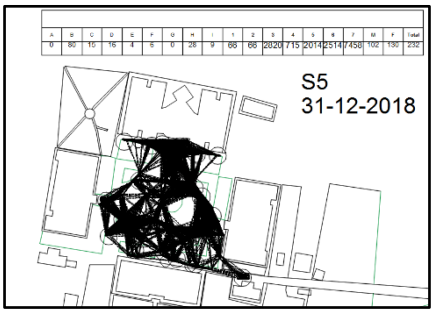


Figure No.(9):- Show observing space No(S5)

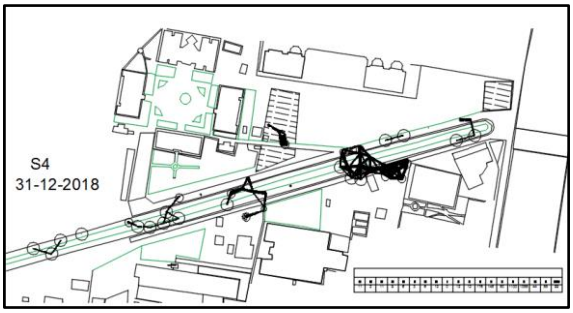


Figure No.(8):- Show observing space No(S4)

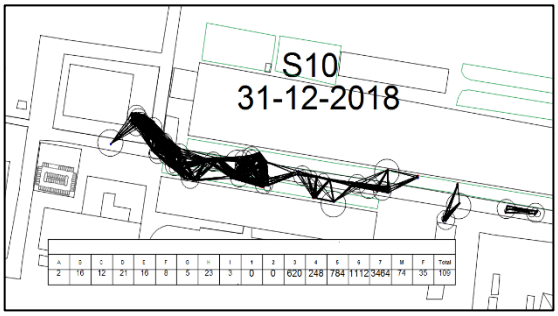


Figure No. (11):- Show observing space No(S10)

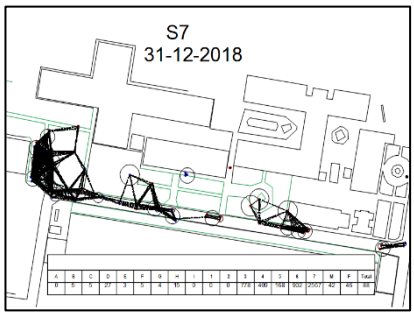
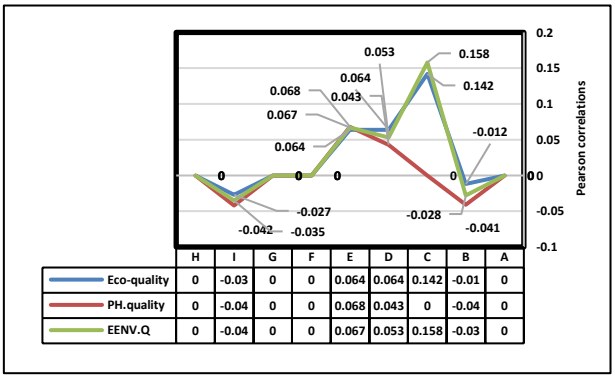
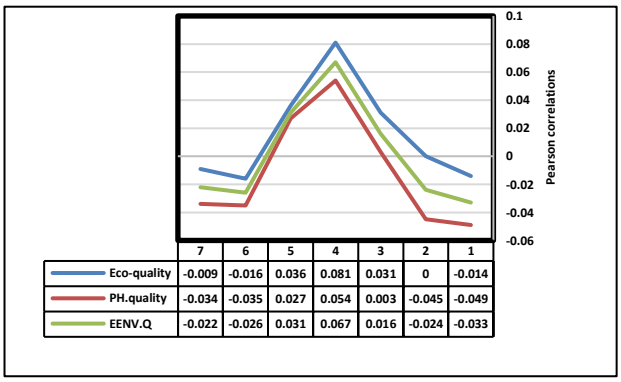


Figure No.(10):- Show observing space No(S7)



	H	I	G	F	E	D	C	B	A
Eco-quality	0	-0.03	0	0	0.064	0.064	0.142	-0.01	0
PH.quality	0	-0.04	0	0	0.068	0.043	0	-0.04	0
EENV.Q	0	-0.04	0	0	0.067	0.053	0.158	-0.03	0

Figure No. (12):- Shows Results of Pearson correlations between the quality of the urban environment and observed social behavior patterns



	7	6	5	4	3	2	1
Eco-quality	-0.009	-0.016	0.036	0.081	0.031	0	-0.014
PH.quality	-0.034	-0.035	0.027	0.054	0.003	-0.045	-0.049
EENV.Q	-0.022	-0.026	0.031	0.067	0.016	-0.024	-0.033

Figure No.(13):- Shows Results of Pearson correlations between the quality of the urban environment and observed social behavior nature

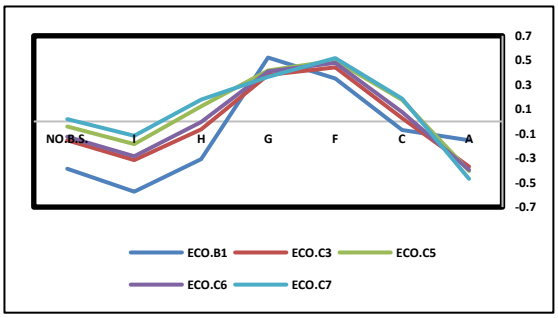


Figure No. (14):- Shows Results of the correlations among indicators of ecological quality, and social behavior Patterns

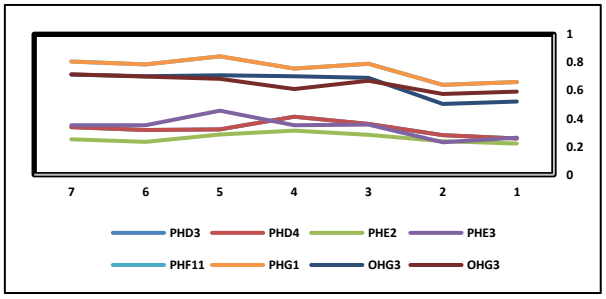


Figure No.(15):- Shows Results of Pearson correlations between indicators of Physical quality, and behavior nature

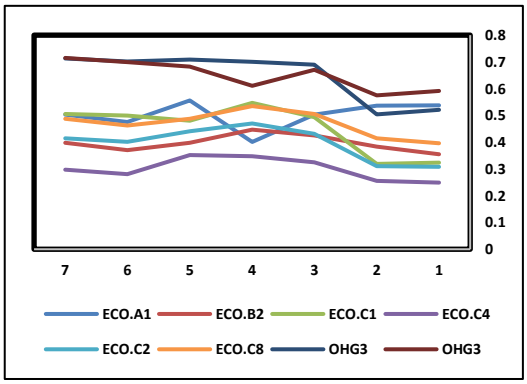


Figure No.(16):- Shows Results of Pearson correlations between indicators of ecological quality, and numbers of observed social behavior

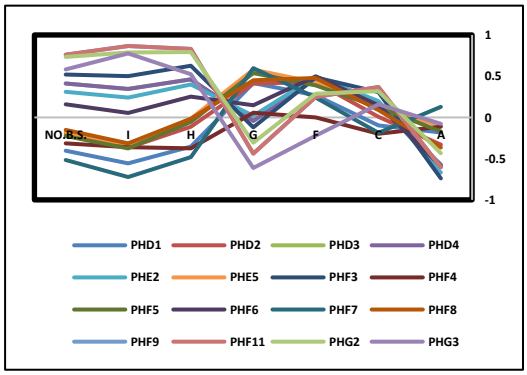
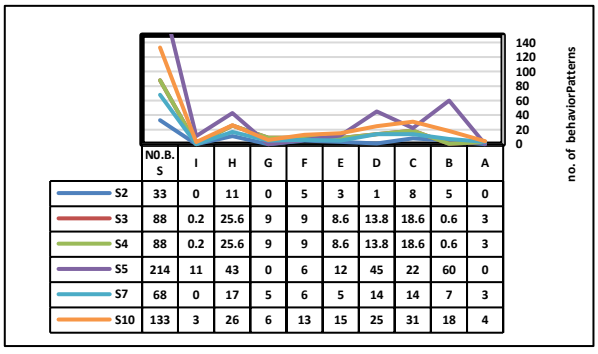
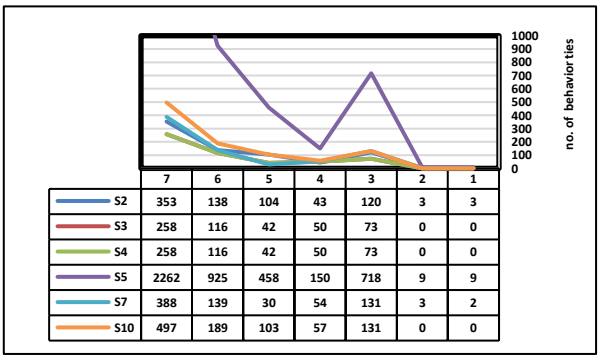


Figure No.(17):- Shows Results of Pearson correlations among indicators of Physical quality, Patterns, and numbers of observed social behaviour



	NO.B.S	I	H	G	F	E	D	C	B	A
S2	33	0	11	0	5	3	1	8	5	0
S3	88	0.2	25.6	9	9	8.6	13.8	18.6	0.6	3
S4	88	0.2	25.6	9	9	8.6	13.8	18.6	0.6	3
S5	214	11	43	0	6	12	45	22	60	0
S7	68	0	17	5	6	5	14	14	7	3
S10	133	3	26	6	13	15	25	31	18	4

Figure No.(18):- Shows Shows Results of observation Patterns In the urban environment



	7	6	5	4	3	2	1
S2	353	138	104	43	120	3	3
S3	258	116	42	50	73	0	0
S4	258	116	42	50	73	0	0
S5	2262	925	458	150	718	9	9
S7	388	139	30	54	131	3	2
S10	497	189	103	57	131	0	0

Figure No.(19):- Shows Results of observation ties of social behavior In the urban environment

Tables

Table no. (1) :-Indicators of physical Constituents of university urban environment (Physical and ecological quality); Influencing on the social behavior characteristics

Impossible values Within the limits of the current search	Possible values	symbols	Detailing vocabulary & symbol	Main Vocabulary & symbol	ت
a) Climate control and lighting	1) Protect wildlife habitats	ECO.A1	ECO.A- Protect the natural environment & sustainability of their resources	**ecological quality Eco.Q**	1
b) Pressure environmental, anxiety environmental, and stress environmental,	2) Clear and distinct green spaces	ECO. B1	ECO.B- Show environmental design concepts		
	3) Methods to reduce energy cost	ECO.B2			
c) Responsiveness (speed and response time)	4) The direct link with buildings	ECO.C1	ECO.C Visual quality (content and art show)		
d) Aesthetic preference	5) color	ECO.C2			
	6) Scale	ECO.C3			
	7) style	ECO.C4			
	8) Uniqueness	ECO.C5			
	9) Compatibility and regularity	ECO.C6			
	10) Complexity and Diversity	ECO.C7			
	11) Containment & srounding	ECO.C8			
Architectural control through	12) Main rout Network	PH.D1	PH..D variety elements of the physical environment	**Physical quality Ph.Q**	2
e) planning flexible	13) Walkways	PH.D2			
f) territoriality	14) interconnected squares	PH.D3			
g) impression	15) Open surrounding space with buildings in site	PH.D4			
	16) Accessibility and Distributedness	PH.D5			
h) sense of social belonging	17) path	PH.E1	PH..E:- Visual quality through formal language		
i) mental maps (orientation, find the way, achieve emotional safety,Sense of ownership)	18) district	PH.E2			
	19) landmark	PH.E3			
j) Meaning: It includes social, cultural and individual values.	20) edge	PH.E4			
	21) node	PH.E5			
k) Identity and sense of place	22) Barriers	PH.E6			
l) legibility	23) Sequential scene	PH.E7			
	24) Repetition	PH.F1	PH.F- Visual quality through content		
	25) Proportionality	PH.F2			
	26) Containment	PH.F3			
	27) gradation	PH.F4			
	28) similarity	PH.F5			
	29) color	PH.F6			
	30) Scale	PH.F7			
	31) style	PH.F8			
	32) Uniqueness	PH.F9			
	33) Symmetry with Neighboring spaces	PH.F10			
	34) Privacy and space depth	PH.F11			
m) Development and historical continuity of designs	35) Use of local materials	PH.G1	PH..G- (Pattern language)		
	36) Employing traditional patterns	PH.G2			
	37) Use traditional decoration	PH.G3			

Table No. (2):- Shows the results of the urban environmental quality inspection And its main vocabulary, indicators and symbols

100 % divided by 37 indicators, so the weighting of One indicator= (2.71% .then we Five gradients are given by Likert scale (Clearly present = 2.71),(Less obviously= (2.162, (Exists to some extent= (1.626,(Is a low degree (1.084, (Not found = 0)							**Detailing vocabulary & symbol**	**Main Vocabulary & symbol**
S10	**S7**	**S5**	**S4**	**S3**	**S2**	**symbols**		
1.084	2.168	1.084	0	2.168	2.168	ECO.A1	ECO.A- Protect the natural environment & sustainability of their resources	**ecological quality ECO.Q the Weighting weight =20.81%**
0	2.71	0	0	2.71	2.71	ECO. B1	ECO.B- Show environmental design concepts	
0	2.168	2.168	0	1.626	1.626	ECO.B2		
1.084	1.626	2.71	1.084	2.71	1.084	ECO.C1	ECO.C Visual quality (content and art show)	
1.084	2.168	2.71	1.084	2.71	2.168	ECO.C2		
1.084	2.71	1.084	0	2.71	2.71	ECO.C3		
1.084	2.168	2.71	0	2.71	2.71	ECO.C4		
0	1.084	1.084	0	2.71	2.71	ECO.C5		
1.084	2.168	1.084	0	2.71	2.71	ECO.C6		
0	2.168	1.084	0	2.168	2.168	ECO.C7		
1.084	2.168	2.71	0	2.168	1.626	ECO.C8		
7.588	23.306	18.428	2.168	27.1	24.39	20.81%	**∑ECO.Q**	
2.168	2.71	1.084	1.084	2.168	2.71	PH.D1	PH..D variety elements of the physical environment	**Physical quality Ph.Q the Weighting weight 70.19%**
1.084	2.71	1.626	1.084	2.71	2.71	PH.D2		
1.084	2.71	2.71	0	2.71	1.626	PH.D3		
1.084	2.71	2.71	0	2.71	1.626	PH.D4		
1.626	2.71	1.084	2.71	2.71	2.71	PH.D5		
1.084	2.71	1.084	2.71	2.71	2.71	PH.E1	PH..E :- Visual quality through formal language	
1.084	2.71	2.71	1.084	2.71	2.71	PH.E2		
0	0	2.71	0	2.71	2.71	PH.E3		
2.168	2.71	2.71	2.71	2.71	2.71	PH.E4		
0	0	0	0	2.71	1.626	PH.E5		
0	1.084	2.71	2.71	2.71	1.084	PH.E6		
0	1.626	0	0	2.168	0	PH.E7		
0	1.626	2.168	2.71	2.71	2.71	PH.F1	PH.F- Visual quality through content	
1.084	2.71	1.084	1.084	2.71	2.71	PH.F2		
0	1.626	2.71	0	2.168	2.168	PH.F3		
0	2.168	0	0	0	1.084	PH.F4		
1.084	2.168	2.168	2.168	2.71	2.71	PH.F5		
1.626	2.71	2.168	0	2.71	2.71	PH.F6		
1.084	2.71	1.084	1.626	2.71	2.168	PH.F7		
1.084	2.168	1.626	1.084	2.71	2.71	PH.F8		
0	1.084	0	0	2.71	2.71	PH.F9		
1.626	1.626	0	1.626	1.626	2.71	PH.F10		
1.084	1.626	2.71	0	0	2.168	PH.F11		
1.626	1.084	2.71	1.084	1.626	1.626	PH.G1	PH..G- Pattern language	
0	0	2.71	0	1.626	0	PH.G2		
0	0	2.71	1.626	0	0	PH.G3		
21.68	47.696	44.986	27.1	57.452	53.116	70.19%	**∑Ph.Q**	
29.268	71.002	63.414	29.268	84.552	77.506	100%	**∑EN..Q**	

Table No. (3):- Indicators of social behavior characteristics (functional quality)

Patterns & nature of social behavior			
Possible values (Measurement indicators)	**Detailing vocabulary**	**Secondary vocabulary**	**Main Vocabulary**
A,G	Individual relationships (One person)	1) (intimate space) :- (45cm) 2) (personal space) :- (12m) 3) (social space):- (3.6m) 4) (public space):- (7.2m)	**patterns of social behavior**
B,C,D,E,F	Double relationships (two person)		
H	Small groups (3-12 persons)		
I	Collective or crowd behavior (≥ 13 people)		
○ number of Behavior setting (#) ○ The degree of boundaries clarity (1-5 gradients)	Behavior setting		
ng & Strong relationships	Relationship between friends and relatives	l& Doublerelationships	**nature of social behavior**
to some extent& Medium relationship	ship between groups which have public relations	Small groups	
some extent, Weak, and Very weak relationship	Relations with strangers (chance meetings)	crowd behavior	

Table No. (4):- Shows Results of Regression Stepwise between the most indicators of physical quality, and ecological quality which effect on patterns and nature of observed social behavior

Notes	**The most Indicators of the quality of the urban environment which affecting human behavior**	**Factors affected**	**Main Vocabulary**
Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).	1) PHF3:- Containment 2) ECO.A1:- Protect wildlife habitats	**Isolation pattern total (A)**	**Behaviour patterns**
	PHD5:- Accessibility and Distributedness	**Very high intimacy pattern (I)**	
	1) PHD5:- Accessibility and Distributedness 2) ECO.C1:- Direct link with buildings	**Number of behavior patterns**	
Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).	PHD5:- Accessibility and Distributedness	**very weak relationships pattern (7)**	**behaviour Nature**
	1) PHD5:- Accessibility and Distributedness 2) PHE6:- Barriers	**strong relationships Pattern (2)**	
	1) PHD5:- Accessibility and Distributedness 2) PHE6:- Barriers	**Very strong relationships Pattern (1)**	

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