



Identifying the Relationship Between Urban Design Qualities and Sense of Place - With Special Reference to Baghdad Street, Cairo, Egypt

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Abstract. The study investigates the correlation between the urban design qualities and the sense of place on streets. A case study was conducted for the aim of this research, where a survey questionnaire that involved rating tasks of the different urban design qualities and the dimensions of the sense of place of Baghdad street, Cairo, Egypt was used as the tool for data collection. SPSS statistical analysis tool was used to analyze data collected from the survey questionnaire. Results and findings of the correlational data revealed key urban design attributes that can potentially create positive sense of place: (1) degree of vandalism, (2) degree of enclosure, (3) buildings' heights, (4) transparency, (5) sidewalks' materials, (6) sittability, (7) environmental comfort, (8) readability, (9) wayfinding, (10) connectedness, (11) car speed restrictions, (12) opportunities to linger and mingle, (13) friendly, (14) diversity, (15) opportunities for social interactions, (16) opportunities to watch other people doing other things, (17) Vitality, and (18) activity.

Keywords: Sense of place, streets, urban design qualities, placelessness

1. INTRODUCTION

Public spaces are considered an important part in the daily life of city inhabitants [1, 2, 3, 4]. Public spaces can play a significant role in fulfilling, satisfying and protecting cities' socio-cultural meaning [5]. According to Lynch (1981), a good or successful public space is defined by the level to which the function, human needs, and activities are maintained and reinforced by the physical design of the space [6]. Furthermore, a public space becomes a place when people's physiological, leisure and entertainment needs are fulfilled, also known as the sense of place [7].

There is an ongoing interest by scholars on investigating the notion of creating lively street designs, and reclaiming streets as places for people [8, 9, 10, 11, 12, 13, 14]. This strong attention came from the understanding and recognition of the streets' value as places that can offer opportunities for social interaction for residents and general users [2, 10, 12, 13]. In

addition, streets are considered as areas for civic and public social life, along with their role in reflecting the character and sense of place of cities [2, 10, 15, 16, 12]. Thus, the creation of sense of place in streets are considered one of most influential factors that can contribute to creating successful urban places [8, 17]. If sense of place is present in the space, the place will be livelier, and people will be more interested to come back and visit the place again. Thus, sense of place can be considered a catalyzer for changing spaces into places [18]. Moreover, sense of place is created due to the interaction of a person with physical and social settings of the place. Consequently, urban designers, architects and urban planners should give more attention to the quality of public spaces in order to enhance the sense of place [16, 15]. Researches indicate, that there is lack of the sense of place in many public spaces worldwide [19]. The current state of the unmanaged urban growth, changes in the lifestyle of people, and the development of new

technologies in modern societies; has created meaningless and insignificant places that lead people to develop a sense of 'placelessness' [16].

In Egypt there is a growing need for well-designed public spaces that meet people's everyday needs. Scholars suppose that public activities in Cairo should be located in outdoor environments, since Cairo is one of the cities that is distinguished by its good weather, facilitating outdoor pedestrian activities throughout most of the year [20]. Currently one of the major problems that Cairo is facing is that streets are designed for cars and not for people. This has occurred due to poor urban planning, high-density sprawl, the loss of the city image and transformations in different land uses [21, 22]. Furthermore, Cairo suffers from high population and congestion which in turn leads to pollution and traffic. In addition, there is scarcity in open spaces and the public space area per person provided is less than the standards (the available public space area per person in Cairo is 0.94m², while the international standard stated that the minimum standard should be 32m² per person) [23]. In addition, "the physical public arena of Cairo is in a state of contemporary crisis [22]. The outdoor public spaces in streets of Cairo have deteriorated, and most of the outdoor activities have become reliant on "planned formal places", mainly in privatized or indoor spaces like shopping malls [24].

Furthermore, according to Abdel-Hadi, et.al (2009), "street life in Cairo as a socio-cultural context is one of the significant features of the Cairene identity that is losing its qualities" [21]. Despite the significant importance of presence of high sense of place in streets, the relationship between sense of place and the urban design qualities is not widely tackled [17]. This gap in the literature is also present with reference to studies on the context of Cairo, Egypt, which justifies the need to increase the knowledge on this field. Therefore, this study sought to identify the urban design qualities that can potentially contribute in creating a positive sense of place in streets in Cairo. In addition, the study aimed to understand the urban design qualities and their implications on sense of place.

2.SPAC, PLACE AND PLACELESSNESS

The experience of place is considered one of the most significant factors of the sense of place [25, 26, 27, 15]. According to Relph (1996), a

space is not just an empty void that holds people together, but rather a meaningful place is created due to the attachments that people develop through time as a result to distinct kinds of activities that occur within a space [28, 26]. Moreover, the best way to study a space is by understanding people's spatial experience [26]. In other words, exploration of a space is strongly associated with the way people experience and use it. Place is where a dimension is formed by people's relationship with physical settings, individual and group activities, and meanings [16, 29]. Furthermore, a space is transformed into place when distinct values, meanings, and messages are transported and sensed or felt by people through the physical characteristics and the character of the space. These special and distinct meanings or messages are interpreted and felt due to the fact that people experience and perceive spaces in different ways, according to their own involvements, motives, and prospects [30].

The literature review discloses that due to urban growth, changes in peoples' lifestyle, and the development of new technologies in modern societies; places no longer express meanings or significance. Consequently people have developed a sense of 'placelessness' [16, 13]. Placelessness is strongly associated with the settings that do not have a unique character or sense of place [26, 15]. Placelessness could be expressed as the physical characteristics or qualities of "non-place". These physical qualities or characteristics generally lack identity and culture [16]. Accordingly, Relph (1976) stated that disregarding the emotional qualities that these places convey would eventually make places lose their sense of place and thus develop a mood of placelessness [26].

2.1Sense of place (SOP)

Fritz Steele (1981) claimed that sense of place is defined as a unique person-place experience that takes place in a particular setting, such as feeling stimulated, excited, joyous, and expansive [25]. Such experience is created as a result of the built environment surrounding the person that encompasses both physical and social factors. Constructing a SOP encompasses understanding how people develop place attachment and feel that they are part of the physical and social context. This SOP is usually dependent on a community's cultural response to

features present in the environment (landscape, smell, sound, etc.), to historical meanings rooted in the place to the role that a place plays in fulfilling human needs, and to the opportunity provided for groups of people or individuals to identify with the space [31, 18, 33, 17]. If SOP is developed, people will contribute in preserving and caring for the space [31]. Besides, notwithstanding that SOP is usually considered to be a unique feeling adopted by the experience of individuals' in a place, it is also considered to be feeling that is being shared and experienced by all people who are experiencing a particular place [34]. This general sense obtained after perception and judgment in relation to the specific environment in individuals is named sense of place [26].

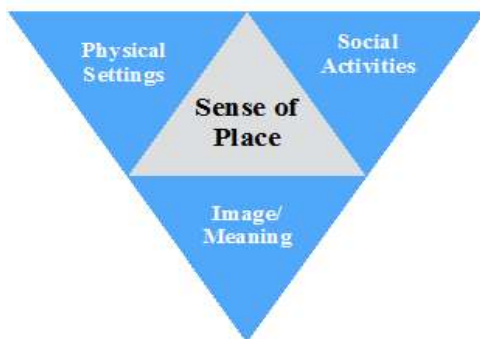


Fig 1 Factors of sense of place Adapted from [26, 36, 37, 8]

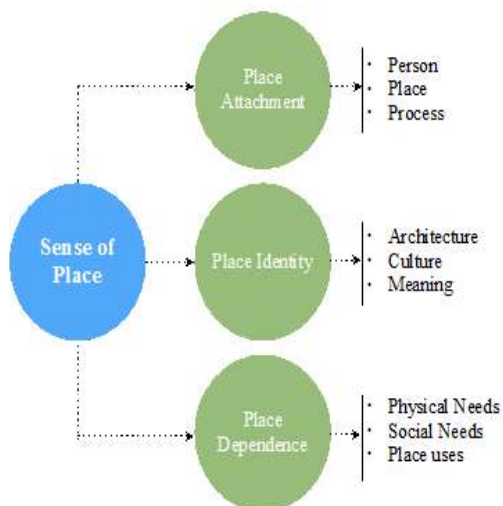


Fig 2 Variables of the different dimensions of the sense of place. After [36, 37, 8]

Over the last years, a lot of epistemological theories have been developed over the frameworks or factors affecting sense of place. Sense of place in the early theoretical writings has been defined as “genius loci.” This theory claimed that a SOP is only related and affected by

the physical qualities of the space and that the environment or the settings of a space is viewed and perceived by all the users of the space alike. The recent positivistic theory argued that SOP is a multidimensional human response to the physical settings that is created due to the developed meaning [35, 32]. According to the model of “John Punter”, the three main factors of sense of place are the physical factor, the social activity factor, and the image and meaning factor (see figure 1) [36]. Punter’s model is very close to Canter’s model of the components of place [37]. Therefore, In order to create or enhance the sense of place, the design of a space should consider not only the physical setting of the space, but also the needs of people and their expectations toward the place, communication patterns with the place, “qualities of activities”, people’s attendance in the place, and “social interactions” [18]. Besides, place is the combination of the physical and the social aspects, but having a distinct place that is overloaded with meanings is what sense of place is about [36].

2.1.1 Measuring sense of place

Scholars in a diversity of fields, such as geography, psychology, sociology, and anthropology, have tried to define the most important dimensions of SOP [39, 40, 17]. A diversity of factors was examined both on the individual and community levels, in addition to physical factors that could help encourage emotional feelings of a place and people–place relationship. The debate around the dimensions of SOP is mainly derived from various perspectives of different disciplines [39]. Research indicates that the most important dimensions related to sense of place are chiefly divided into three groups; place attachment, place dependence, and image and identity as shown in figure 2 [16, 41, 42, 32]. Place attachment is defined as the emotional bond or relationship that people develop with a place [43]. While, place dependence is more concerned with the degree to which the setting and the activities of a place serves or satisfies the needs of the users. In other words, it’s the degree to which the place is considered unique when compared to other alternatives [44, 45]. Moreover, place identity is mainly associated with the factors that is linked to the self that define an individual’s or community’s identity in a particular physical setting. It consists of complicated pattern of “conscious and unconscious ideas, beliefs,

preferences, feelings, values, goals and behavioral tendencies and skills” related to the place, and how the physical environment or settings develops meaning to life [44, 46].

3. STREETS AS URBAN PUBLIC SPACES AND THEIR SOCIAL SIGNIFICANCE

Almost everybody lives on a street [47]. Gehl (1989) claimed that, public places are places for everybody, arguing that public place is the easiest accessible place where one can meet people [48]. Public places play an important role in providing people with the public life they need [48]. Moreover, public spaces play a significant role in expressing, sustaining, and protecting cities’ socio-cultural meanings [5]. Streets with their sidewalks are any city’s main public places and the utmost vital and vibrant organs. They are the places where children get in close contact with the outside world, where neighbors can meet; they are considered the cities’ social centers [47]. “Think of a city and what comes to mind? Its streets. If city’s streets look interesting, the city looks interesting; if they look dull, the city looks dull” [2].

Streets are considered as the largest and most openly accessible “public space network”. One can understand and get a complete overview of the city and the society by exploring its streets. Streets around the world take different forms and shapes and comprise diverse characteristics; these diversities and differences create the sense of place and identity of cities [1]. Streets are considered as constitute of the social and physical qualities of a living environment; it’s the place where the communal life takes place and where the activities of the urban life takes place. Streets should be pleasant enough to welcome people and should encourage various moods of activities [49].

3.1.1 Types of streets (classifications)

Along the literature, there are numerous types of streets. Streets are classified according to the vehicles’ speed, street width and the buildings’ types (zoning). Streets are mainly divided into two main types, i.e., roads and local streets. Roads are streets that connect two different places, such as roads that connect between two towns. Nevertheless, local streets are those found in the city and lined with houses, and shops [50]. Municipal or local streets are divided into three main categories; which are, Downtown commercial streets, Neighborhood main streets,

and Residential only streets as seen in figure 3 [51].

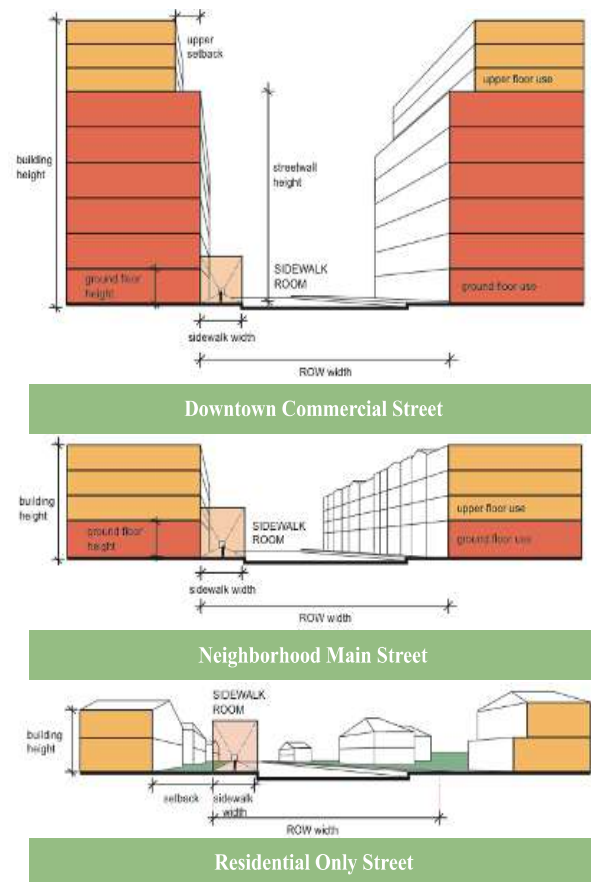


Fig 3 Municipal Street types [51]

For the purpose of this study, the research focuses more on the neighborhood main street, due to its nature that facilitates activities such as, shopping, recreational, social and other living-related activities apart from vehicles’ movement. This street type typically has sidewalks that range from 1.5 to 3.5 meters wide (clear path) and narrower streets in comparing to Downtown Commercial Streets. The neighborhood main street usually has buildings that are often one to four floors height. This type of streets is similar to Downtown Commercial Streets in that there are no setbacks for the building’s walls; the sidewalk is near and aligned with the property line. The buildings are usually mixed use buildings with shops at the ground floor [51].

3.2 Urban design qualities in urban places

“Successful spaces have people lingering in them... public spaces are about people” [52]. The idea of urban design qualities and sociable public spaces is one of the main issues that have been

widely addressed in urban literature. People presence is vital for the success of any public space. People's interaction and social presence are vital aspects in the success of any public space [3]. People's presence in its own acts can be a catalyst for people's attraction to the place. Gehl (2001) claimed that being present in a place

where one can watch and hear other people talking and doing other things is eventually what entices or attracts people to a place [3]. According to the literature the most important urban design qualities or the most essential findings can be summarized in the following table as follows.

Table 1 The urban design qualities attributes, adopted from [8, 53, 54, 25, 55, 56]

Urban Design Qualities		Attributes
The physical factors	Comfort and image	Safety, charm, history, attractiveness, spirituality, cleanliness, enclosure and human scale, sittability, visual diversity, building conditions, environmental comfort, identity, transparency and lighting
	Access and linkage (legibility)	Readability, walkability, reliability, continuity, parking spaces, accessibility and connectedness
The Social Factors	Sociability	Opportunities to linger and mingle, friendly, interactive, welcoming, diversity
	Uses and activities	Opportunities to watch other people doing other things, active, vital, celebratory

4.METHODS

This research follows a case study methodology, based on a single case study, that is based on identifying the relationship between urban design qualities and the sense of place that were concluded from the literature. More precisely, the study investigates the correlation between the main four urban design qualities and their related attributes, and the three dimensions of the SOP. The implemented methodological procedure of this study aims to achieve the research objective by utilizing a quantitative research approach that uses a survey questionnaire to identify the urban design qualities related to SOP of the street under investigation. The research design is linear analytical (descriptive, exploratory, explanatory) that contains problem statement, literature review, methods, and results. The case study selected for this study is Baghdad street in Heliopolis, Cairo. It was selected based on criteria that included selecting an outdoor commercial street in Cairo that has diversity and a variety of urban design qualities, was initially designed in order to accommodate both cars and pedestrian movement on the sidewalks, and has a variety of shops that encompass various shopping experiences and is considered a neighborhood main street.

4.1 Case study background

At the end of the 19th Century, the Belgian entrepreneur Baron Empain planned Heliopolis in a "Garden City" type. El Korba, the heart of Heliopolis, is one of the most beautiful places in Egypt, with its history and amazing architecture. The neighborhood was originally planned as a new healthy and clean satellite city away from the capital. El Korba area, where the case study is located, is considered one of the most important commercial, administrative and governmental areas of Heliopolis [57, 58]. The architectural style used in Korba and Heliopolis is a mixture of the Moorish, Arabic and European styles. The design of Heliopolis was not designed to have radial streets, however they emerged due to all the connections and intersections of the main streets. El Korba is famous for its commercial activities, unique shops and unique shopping environment. Furthermore, El Korba was originally designed as a commercial street, where all the shops were to be located at the ground floor level [20]. The number of floors of the buildings across the street ranges from 4 to 5 floors, and the buildings conditions are of good quality.



Fig 4 Baghdad Street View (source: author)

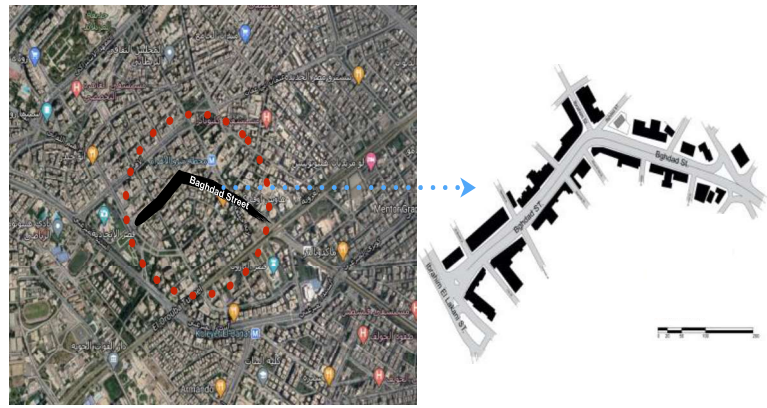


Fig5 Baghdad Street within Heliopolis Map (Source: Google maps)

4.2 Procedure

The data collection and analysis of this paper are based on the analysis of a survey questionnaire that was undertaken by users of Baghdad Street. The aim of the survey is to gather insight on people's perception towards the urban design qualities and the sense of place of the selected street in order to help identify the correlation between both aspects. The paper measures the sense of place according to the dimensions of sense of place that were deduced from the literature which are, space dependence, space attachment and place identity. SPSS statistical program was used to analyze the data collected from the survey questionnaire. Moreover, an in-depth analysis of the urban design qualities and its correlation with SOP was done in order to identify the most significant urban design qualities that can potentially affect the sense of place in the context of Cairo. Spearman correlation was also used to explore differences in averages and the relationship between sense-of-place and the different urban design qualities present in the street. Spearman correlation helped in identifying the significant level between the average sense of place and the different urban design qualities in order to identify the most significant qualities in creating sense of place. Moreover, insignificant correlations were neglected from the results. In the correlation analysis section, p will be set to 0.01 due to the small sample size. Findings are discussed in relation to what have been studied in the literature on the relationship between the urban design qualities and sense of place.

4.3 Survey and sampling method

The survey questionnaire instrument is designed to gather perspectives from the street users on the extent, and scale of place connections, environmental behavior, outdoor activities, and demographic characteristics. The instrument addressed aspects of place identity, dependence, attachment, and dimensions of urban design qualities (comfort and image, access and linkage, sociability, and uses and activities)—Many of the survey items were based on studies by [45, 46, 8, 53, 25, 59, 60]. The survey is based on rating tasks of the different sense of place measures and the different urban design qualities present in the street.

The study developed a sense of place index based on Likert five-point scale; where 1 (strongly disagree) and 5 (strongly agree). The urban design qualities questions were also based on rating tasks of the different qualities on Likert five-point scale. Participants were selected on a convenient basis. All the samples selected were architects ranging from 5 to 10 years of work experience in order to ensure the understanding of the urban design qualities present in the survey. In addition, they are frequent users of the street in order to keep their familiarity with each space on a relatively similar and low level to ensure relatively fair judgments among different spaces (validity and reliability of answers). In total, 30 samples were collected. The samples covered different age groups (young, youth, and adults) with approximately equal numbers of males and females.

5. RESULTS

5.1 Sense of place measures

The analysis of sense of place was mainly based on a multidimensionality of the place relation expressed with components associated with place attachment, place identity, and place dependence, which comprised both social and physical bonds to the place as shown in figure 2.

Measuring sense of place was done by providing the respondents with three groups of question that tackled the main important measures of the sense of place. The first group tackled the place attachment to the place, the second group tackled the place identity and the third group tackled the place dependence. Moreover, average rating of each respondent for the three dimensions (16 items) were calculated in order to get the overall sense of place of each respondent independently [61]. Among the responses, users had quite strong and positive place connections and sense of place with the average scores on the sense-of-place items being well over the neutral 3-midpoint. (These were measured on a scale of 1 to 5, with 3 being neutral, as described in the Surveys section of the methodology). The data were positively skewed in overall sense of place, with the majority of respondents having a positive sense of place with $M=4.308\pm 0.678$ with a minimum of 3 and a maximum of 5 on a 5-point Likert scale.

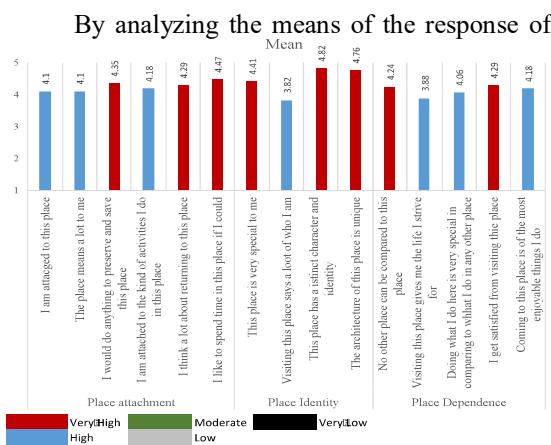
5.1.1 The different dimensions of sense of place

Moreover, by comparing the means of the different dimensions of place attachment, place identity and place dependence as shown in Chart 1, one may find that almost all the dimensions show high and positive measures. Place attachment measures shows that participants have a high place attachment and bond to Baghdad Street with almost all the means lies between 4 (agree) and 5 (strongly agree) point scale with small standard deviations that ranges from ± 0.702 to ± 0.849 . The place identity measures show that participants see Baghdad Street as having high place identity with almost all the means is above the 4-point scale with a standard deviation that ranges from ± 0.437 to ± 0.795 . However, “visiting this place says a lot of who I am” is the only question with a small mean and big standard deviation ($M= 3.82\pm 1.074$). Moreover, almost all the place dependence measures show that participants see Baghdad Street as having high to strong dependence with almost all the means range from 3.88 to 4.29 and standard deviations that ranges from ± 0.772 to ± 1.054 .

Studying the correlation between the demographic characteristics and the SOP showed that among all the three dimensions, females showed higher and strong sense of place measures than males with an overall SOP for females equals to 4.54 ± 0.47 and for males equals to 3.97 ± 0.82 .

Chart 1 Mean values of the dimensions of the sense of place

5.2 Urban design qualities measures



almost all comfort and image attributes were perceived as positive, and differences mainly existed at the level of positive perceptions (above the 3-midpoint scale). However, signs of vandalism, sittability along the sidewalks, the availability of trees and shrubs, and cleanliness of the street showed negative ratings with $M=2.59\pm 1.064$, 2.53 ± 1.068 , 2.94 ± 0.827 , and 2.71 ± 1.047 respectively. Moreover, the results of the rating tasks of the access and linkage attribute show that most of the attributes were perceived as positive (above the 3-midpoint scale). Nevertheless, reaching the street on foot, and the availability of parking spaces showed negative ratings with $M=2.94\pm 1.144$, and 1.82 ± 1.425 respectively. Furthermore, the results of the rating tasks of the sociability factor show that all the attributes were perceived as positive (above the 4-midpoint scale) with the highest percentage of participants' ratings is on the 5th point scale. In addition, uses and activities attribute showed positive ratings of means ranging from 4 to 4.65.

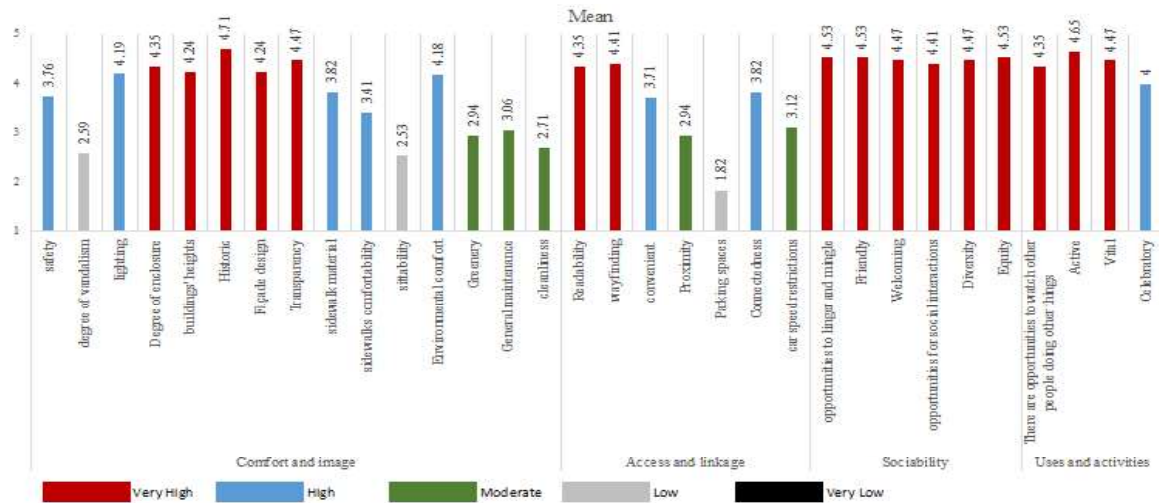


Chart 2 Means of the different attributes of the Urban Design Qualities

5.3 Correlation between the SOP and the urban design qualities

The predictive validity of the sense of place was calculated using Spearman correlation based on the urban design qualities attributes as the independent variables. Table 2 presents the results of the analysis. Results indicate a positive correlations between the different predictors of sense of place and most of the attributes of the urban design qualities. For the place attachment dimension, the analysis shows that the strongest positive correlations are with buildings' heights, degree of enclosure, historic, sidewalk materials, sittability and environmental comfort with $r(30)=.796, .785, .635, .697, .644, \text{ and } .893$ respectively, $p<0.01$ and $r^2=.633, .616, .403, .485, .414, \text{ and } .797$ respectively. Moreover, there is negative strong correlation between the place attachment and the degree of vandalism with $r(30)= -.607, p<0.01$ two-tailed and $r^2=.368$. Furthermore, the correlation with the rest of the attributes of the comfort and image quality shows weak or no correlation with the place attachment, since they did not fall into the critical region of $p<0.01$. Likewise, among the access and linkage attributes, readability, wayfinding, connectivity, and car speed restriction showed the strongest positive correlation with the place attachment dimension with $r(30)=.903, .797, .653, \text{ and } .641$ respectively, $p<0.01$ two-tailed and $r^2=.815, .635, .426, \text{ and } .410$ respectively. However, the rest of the attributes of the access and linkage showed no correlation with the place attachment. Moreover, the strongest correlations with the place attachment among the sociability attributes are opportunities to linger and mingle, friendly, opportunities for social interactions, diversity

with $r(30)=.864, .673, .606, \text{ and } .656$ respectively, $p<0.01$ two-tailed and $r^2=.746, .452, .363, \text{ and } .430$ respectively. While, the correlation with the rest of the attributes were not significant enough to fall under the critical region of $p<0.01$ two tailed. Besides, all the uses and activities attributers showed strong correlation with the place attachment with $r(30)$ ranging from .703 and .851, except celebratory that showed no correlation.

Furthermore, the results also suggest that there are strong positive correlations between place identity and buildings' heights, degree of enclosure, transparency, sidewalk materials, sittability, environmental comfort and general maintenance attributes of the comfort and image quality with $r(30)=.722, .788, .664, .718, .671, .834, \text{ and } .613$ respectively, $p<0.01$ two-tailed and $r^2=.521, .620, .440, .515, .450, .695, \text{ and } .375$ respectively. While there is a negative strong correlation between the place identity and the degree of vandalism with $r(30)=-.610, p<0.01$ two-tailed and $r^2=.371$. However, the rest of the attributes of comfort and image showed weak or insignificant correlations with the place identity. Similarly, among the access and linkage attributes, readability, wayfinding, connectivity, and car speed restriction showed the strongest positive correlation with the place identity dimension with $r(30)=.842, .760, .639, \text{ and } .636$ respectively, $p<0.01$ two-tailed and $r^2=.690, .577, .408, \text{ and } .404$ respectively. However, the rest of the attributes of the access and linkage showed no correlation with the place identity. Furthermore, analyzing the correlation between the uses and activities attributes (independent variables) and

the place identity (dependent variable) showed that the strongest correlations with dependent variable were among opportunities to linger and mingle, friendly, opportunities for social interactions, and diversity with $r(30)=.799, .673, .650$ and $.617$ respectively, $p<0.01$ two-tailed and $r^2=.638, .452, .422,$ and $.380$ respectively; whereas the rest of the attributes were not significant enough to fall under the critical region of $p<0.01$. Besides, vitality and activity showed the strongest correlations coefficient with the place identity, where $r(30)=.732$ and $.703$ respectively, $p<0.01$ two-tailed and $r^2=.535$ and $.494$ respectively. However, the rest of the attributes showed no correlation with the place identity.

Moving to the correlation between place dependence and the four urban design qualities, the analysis showed that there are positive strong correlations between place dependence and the four comfort and image attributes. The attributes are, buildings' heights, degree of enclosure, sidewalk materials, and environmental comfort with correlation coefficients of $r(30)=.679, .761, .723,$ and $.804$ respectively, $p<0.01$ two tailed and $r^2=.461, .579, .522$ and $.646$ respectively. Moreover, within the access and linkage attributes, only readability and wayfinding showed correlation (positive and strong correlation) with the place identity of correlation coefficients of $r(30)=.814$ and $.700,$ $p<0.01$ two-tailed and $r^2=.662$ and $.49$ respectively. Moreover, all the attributes of the sociability factor showed significant correlation with the place identity. However, only friendly, welcoming, and opportunities for social interactions showed the strongest correlation coefficients, where $r(30)=.799, .609, .642$ respectively, $p<0.01$ two-tailed and $r^2=.638, .365$ and $.398$ respectively. Nevertheless, the correlation coefficients of the rest of the attributes were not significant enough

to fall under the critical region of $p<0.01$. Additionally, there are strong positive correlations between all the attributes of the uses and activities and the place dependence with correlation coefficients ranges between, except celebratory attribute that showed no correlation. The uses and activities attributes that showed strong positive correlations with the place dependence are, opportunities to watch other people doing other things, vitality and activity with $r(30)=.695, .695$ and $.703$ respectively, $p<0.01$ and $r^2=.483, .483$ and $.494$ respectively.

Moreover, correlation between the average SOP and the different attributes of the comfort and image shows that, buildings' heights, degree of enclosure, transparency, sidewalk materials, sittability and environmental comfort are strongly correlated with the average SOP with positive correlation coefficients of $r(30)=.750, .800, .614, .750, .668$ and $.843$ respectively, $p<0.01$ two-tailed and $r^2=.562, .642, .376, .562, .446$ and $.710$ respectively. While the rest of the attributes show weak or no correlation. Moreover, within the access and linkage attributes, readability and wayfinding are the only attributes that showed correlation (positive and strong correlation) with the place identity with correlation coefficients of $r(30)=.855$ and $.767,$ $p<0.01$ two-tailed and $r^2=.731$ and $.588$ respectively. Among the sociability attributes, opportunities to linger and mingle, friendly, opportunities for social interactions, and diversity showed strong positive correlations with the average SOP with correlation coefficients of $r(30)=.826, .641, .642$ and $.609$ respectively, $p<0.01$ two-tailed and $r^2=.682, .410, .412$ and $.370$ respectively. Besides, among the uses and activities factor, only activity and vitality showed positive strong correlation with the overall SOP with correlation coefficients of $r(30)=.735$ and $.703$ respectively, $p<0.01$ two tailed and $r^2=.530$ and $.494$ respectively

Table 2 Results of SOP correlation with The Urban Design Qualities attributes
(Significant correlation coefficients values)

Urban qualities Factors /SOP dimensions	Attributes	Place attachment	Place Identity	Place dependence	Average SOP
		Comf ort and image	safety	.531*	
	degree of	-.608**	-.610**	-.594*	-.572*

	vandalism				
	lighting				
	Buildings' heights	.796**	.722**	.679**	.750**
	Degree of enclosure	.785**	.788**	.761**	.800**
	Historic	.635**	.539*	.596*	.585*
	Façade design	.556*	.495*	.554*	.532*
	Transparency	.603*	.664**	.531*	.614**
	sidewalk material	.697**	.718**	.723**	.750**
	sidewalks comfortability	.574*	.554*	.543*	.562*
	sittability	.644**	.671**	.592*	.668**
	Environmental comfort	.893**	.834**	.804**	.843**
	Greenery				
	General maintenance	-.610**	.613**	.534*	.587*
	cleanliness	.570*	.570*	.515*	.579*
Access and linkage	Readability	.842**	.842**	.814**	.855**
	wayfinding	.797**	.760**	.700**	.767**
	convenient				
	Proximity				
	Parking spaces				
	Connectedness	.653**	.639**	.557*	.602*
	car speed restrictions	.641**	.636**	.527*	.596*
Sociability	opportunities to linger and mingle	.864**	.799**	.799**	.826**
	Friendly	.673**	.673**	.605*	.641**
	Welcoming	.500*	.507*	.609**	.562*
	opportunities for social interactions	.606**	.650**	.642**	.642**
	Diversity	.656**	.617**	.537*	.609**
	Equity	.556*	.541*	.507*	.535*

Uses and activities	There are opportunities to watch other people doing other things	.851**		.695**	.549*
	Active	.773**	.732**	.659**	.735**
	Vital	.703**	.703**	.703**	.703**
	Celebratory				

** . Correlation is significant at the 0.01 level (2-tailed)

* . Correlation is significant at the 0.05 level (2-tailed)

6. Discussion

After conducting the survey questionnaire in Baghdad Street, several findings can be concluded. This study revealed three sense of place components, place attachment, place identity, and place dependence, which produced all the components of SOP with similar strength and dimensions. Through measuring the sense of place in Baghdad Street, almost all components of SOP showed high measures, which means that people believe that Baghdad street has a high SOP. Throughout the survey questionnaire, females showed higher ratings than males, thus indicating that females tend to perceive the sense of place differently and higher than males. Moreover, most of the attributes of each factor of the qualities of urban design were rated as good, thus indicating that the street is well designed. Moreover, socializing was rated higher than the other attributes, thus indicating that socializing is a very important factor.

Findings of this research indicate that that designing a successful or good street that is well designed in terms of physical and social features is crucial for encouraging people to use the outdoor environment and enhance the sense of place [31, 26, 32, 38]. The study also shows that sense of place is subjective, and it depends mainly on human's perception [34]. This was evident, because despite that some of the attributes of urban qualities were rated as bad, still the sense of place is rated as high.



Fig 6 Rich Facade design (Source: author)

6.1 The Physical Factors

The findings demonstrate that the most important attributes of image and identity that created the positive average sense of place are the degree of enclosure, building heights, façade design, sidewalk materials, transparency, sittability, and environmental comfort (see figures 6, 7 and 8). The results show that they are high predictors of the average SOP with percentage of variance that ranges from 37% to 71%. It is evident also that the same attributes are strong predictors of place attachment, place identity and place dependence. However, the study showed that the degree of vandalism is a high predictor of place attachment and place identity with percentages of variance of 36% and 37%. This aligns with data studied in place identity literature that indicate that a place with a good sense of place reflects the values and the identity of the person him/herself and not just the identity of place [44]. This means that a person likes to associate him/herself with places that reflect positive behavior. Moreover, this shows that a person develops sense of attachment, if he/she perceive the space as a space free of negative behaviors. Moreover, results also show that the environmental comfort is the strongest predictor of the overall SOP and the different dimensions of SOP of Baghdad street. This is due to the arcaded sidewalks that cover part of the street that is subjected to direct sunlight; thus, people feel comfortable while walking in the street at any time of the day (see figure 8). Likewise, it is evident that the degree of enclosure is one of the strongest predictors of the overall SOP and the three dimensions of SOP of Baghdad street. This shows that in order to create a positive sense of place in a street, the buildings' heights should create a sense of enclosure. This will give people the feeling that the street is human scaled and make them comfortable while walking and shopping (see figure 8). In general, the perception of people towards the different comfort and image's attributes differed according to the quality of each

attribute and how the place provided it. Moreover, the study revealed that readability and wayfinding are very strong predictors of the average SOP of Baghdad street. They have high percentage of variance (73% and 58%). They also showed strong high degree of prediction of the three dimensions of the SOP. This is because the availability of landmarks throughout the street that facilitates wayfinding. This discloses that the sense of place is highly affected by people's perception of the navigation through their journey in the street. Therefore, it's important that the street is perceived as readable and easy to navigate through. People prefer places where they can visually recognize their position at any certain time during their journey in the street in order to feel comfortable. Moreover, the results revealed that connectivity and car speed restriction are high predictive of the place attachment and place identity, since they show high degree of variance. This supports what have been mentioned earlier in the research problem that one of Cairo's main problems is the over congested and car dominated streets [21]. Therefore, by restricting the car speed by reducing the street width as in Baghdad Street, people will have the opportunity to enjoy the public life without the fear of getting hit by a car.

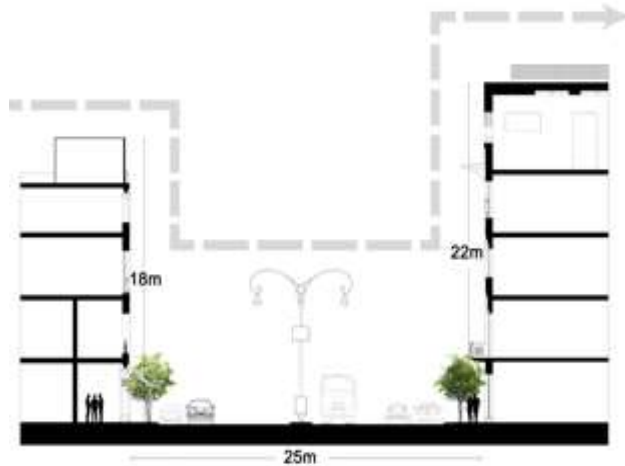


Fig 7 Street section and degree of enclosure (source: author)



Fig 8 Arcaded sidewalk (source: author)

6.2 The Social Factors

The results of this study have confirmed what was previously researched on the importance of the social factor and sociability in creating a positive sense of place [26, 36, 37, 8, 25]. In Baghdad Street, sociability attributes have showed very strong correlations with the sense of place dimensions. Thus, indicating that in order to develop a positive sense of place, the place should provide people with a setting that can act as a catalyst for social interaction. Moreover, findings revealed that the opportunities to linger and mingle, friendly, diversity, and opportunities for social interactions are strong predictors of the average SOP with high percentage of variance (more than 37%). Besides, they are also strong predictors of place attachment and place dependence. This proves that having the ability to hear people talk, and the presence of people of different age groups and genders are significantly related to a positive sense of place in streets (See figure 9). Moreover, the study shows that people will get more connected to the street and develop a positive sense of place, if activity and vitality attributes are present, since they are strong predictors of the average SOP with degrees of variance of 53% and 49%. Besides, results indicate that opportunities to watch other people doing other things are strong predictors of place attachment and place dependence. This is due to the availability of cafes, restaurants, and shops that act as facilitators of social interactions between users of the street, shop owners, and pedestrians especially those that spillover to the sidewalk (see figure 10). One of the things that make Baghdad Street distinct is the different types of shops. Having a variety of shops that can sell different kinds of products is one of the things that attracts people to the place and creates a social bond and a sense of place.

To summarize the significance of social and physical components (urban design qualities) to sense of place and urban space perceptions, this study suggests that all of the four factors of the urban design qualities have attributes that are related to positive sense of place. However, significance differed according to each attribute. Furthermore, it should be noted that the relationships people form with a place are always dynamic and develop

with their identity towards it. Both the sense of place and people's perception of the urban space evolve together with the design of the space and people's identity.



Fig 9 Children in Baghdad street (source: author)



Fig 10 Cafe in Baghdad street and spillover of seating on the sidewalk (source: author)

7. Conclusion and limitations

This study was set out in order to explore the key factors of urban design qualities that can potentially contribute in creating a positive sense of place in commercial streets. The study has also sought to define space, place and sense of place, and understand the urban design qualities and their implications on the sense of place in Cairo's context using a single case study (Baghdad Street). Data was collected through a survey questionnaire. Findings indicate that Baghdad Street has a positive sense of place measures and that the three dimensions of the sense of place also showed positive measures. Regarding the urban design qualities, the overall results of the sociability and uses and activates showed higher rating than the other two attributes of the urban design qualities. Results also indicate that the most important attributes of the four urban design qualities that are significantly related to creating positive sense of place in commercial streets are; degree of vandalism, degree of enclosure, buildings' heights, transparency, sidewalks' materials, sittability, environmental comfort (comfort and image quality). For access and linkage factor, the attributes are; readability, wayfinding, connectedness, and car speed restrictions. For Sociability factor, the attributes are; opportunities to linger and mingle, friendly, diversity, and opportunities for social interactions. For uses and activities factor, the attributes are; opportunities to watch other people doing other things, vitality and activity. Therefore, in order to create or design a commercial street in the context of Cairo that gives people a high sense of place, the previously mentioned features must be taken into consideration.

In conclusion, a few limitations of this study are highlighted to provide a better opportunity for future research. Only one case was investigated due to time limitations. In future research, more than one street could be analyzed from different locations across Cairo and Egypt to see if there are similar results and patterns. This would also help in generalization and in increasing the validity of the results. Furthermore, it also might be useful in future research to conduct a more detailed survey questionnaire and field observations in order to understand people's perspective towards the factors studied for greater reliability and validity as well. In addition, the sample size could be increased in order to enhance the validity and generalization of the findings. A comparison could also be made with streets in different countries to identify possible commonalities between the perception of sense of place amongst different culture.

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