

THE IMPACT OF PHYSICAL ENVIRONMENT ON PERCEIVED SAFETY OF URBAN PUBLIC SPACE IN BAGHDAD, IRAQ

Shahad R. M. Hajiyat ¹, Marek Kozlowski ¹ and Nor Azlina Abu Bakar ^{1*}

¹Faculty of Design and Architecture, Universiti Putra Malaysia,
43400, UPM Serdang, Selangor, Malaysia

*Corresponding author:

ab_azlina@upm.edu.my

ABSTRACT

This paper aims to analyse the perceived safety in existing urban public spaces (UPS) in a war-torn city of Baghdad. One of the detrimental impacts of war is the destruction of the urban environment where it usually involved maximum physical damages which ultimately impacting the quality of life of its residents. Therefore, this study analyses the user's perceived safety of three major UPS in Bab Al-Sharqi, Baghdad city (Tahrir Square, Alumma Park and Tayeran Square) in order to investigate the impact of war on UPS. The method used in this study is a mix method of qualitative and quantitative approaches that include a questionnaire survey, where the quantitative data explored using means ranking, ratios, and correlation tests. While qualitative data, of primary and secondary data collection, descriptively analysed. The study focuses on the three paradigms of the physical urban environment; legibility, permeability and the visual image, and their impact on the sense of safety. The findings reveal that the sense of safety at UPS in Baghdad is strongly determined by elements of the physical environment which were identified by the people, significant in the linear regression test, as being rickety (-2.584), visually dull (0.043) and physically incompatible (0.033). The perception of safety is also perceived differently by women than men. The sense of fear and apprehensiveness is larger among women respondents. This study contributes to identify set of strategies for UPS in terms of safety which can mitigate the impact of conflict and civil unrest in an urban setting.

Keywords: Legibility; Permeability; Perceived Safety; Urban Public Places; Visual Image

1. INTRODUCTION

War related activities always caused human loss and destroyed the physical urban environment. Since the Second World War the theatre of war conflict has extended from the battlefields to the urban environment impacting the daily life of ordinary citizens. In many cases, the destruction of the urban environment was a winning strategy in a war as it commanded maximum physical damages on the enemy territory (Kozlowski, 2019). The degree of such extensive damage is often proportional to the intensity of urban environment. As a result, higher urban densities create more attractive targets. The war activities destroy the buildings and damage the urban infrastructure which has a negative impact on the economic, social and cultural environments (Piquard and Swenarton, 2011). In modern times, the use of new weapons on cities brought almost instant destruction to the urban environment and its community.

New weapons including air missiles and remote sense drones have created havoc in some cities around the world (Kozlowski, 2019). Urban guerrilla warfare and terrorist attacks have become the new phenomenon of contemporary war conflicts bringing devastation to the urban fabric (Kozlowski, 2019). Examples of massive urban destruction due to civil wars can be seen in numerous places such as in Sana'a, Gaza, Aleppo, Raqqah, Mogadishu, Tripoli, and other places. The war and destruction of the cities has a devastating impact on the urban community and on the physical and social environment of the urban public spaces. The conflicts in Iraq brought the destruction of the urban environment, (Sinan, 2018). As a result, Iraqi cities became dysfunctional and dangerous creating every daily life difficult for a great majority of its citizens, (Callimachi and Coker, 2018). It created a huge level of uncertainty among the local community in Baghdad who also became highly apprehensive about venturing outside in public areas.

This uncertainty and a high degree of apprehensiveness had a profound impact on the functioning of major urban public spaces in the city. The public places in Baghdad such as public parks, streets, squares etc. that were embodied with Iraqi art and architecture in its form or core, that reflect or symbolize; a civilization era, country events, culture, traditional art, even a tale or myth, a scholar or ruler etc. However, the once-thriving and vibrant public areas became empty and obsolete. Today, due to the continuous conflict in Iraq, public open spaces in cities like Baghdad are unsafe for people. The quality and the value of these public places had diminished due to the long-term conflicts. This research investigates the perception of sense of safety among the users of UPS in the post war city of Baghdad, Iraq.

2. THE IMPORTANCE OF SENSE OF SAFETY TO CREATE HEALTHY RELATIONSHIP BETWEEN PEOPLE AND SPACE

Safety has a restorative effect on users of UPS and it fulfills their psychological needs (Shaftoe, 2008). Thus, urban design professionals such as Oscar Newman and others had addressed and defined the idea of “safe places” as “defensible space” (S.-K. Kim et al., 2013; Mawby, 2017; Newman, 1996) where safety in these spaces focused on identifying the physical features of the environment. According to them, if these physical features are incorporated in a designed space, then it would create, psychological effects in users such as, sense of safety in a place, regardless of the environment’s settings. The mutual relationship between people and space highlights the subjective reactions of human to space’s design or its physical setting and image. Many studies have been carried out exploring the many different perspectives but in particular the physical elements of UPS. These have more short-term and long-term influences on the community. The role of public places in cities makes it crucial in the way they are visually appealing to people where the visual characteristics, or the physical setting qualities, attract social interactions. Thus, the people’s perception of safety is related to users’ activities and the spatial attributes of legibility and permeability. The physical characteristics of the place, including building heights, tree densities, texture, spaces configurations etc. are examples of delusions, frequently related to crime and the feeling of danger. The impact of feeling unsafe on users psychology involves both social aspects and the physical settings of a place, (Frosdick, 2010). As the broken window theory state, “disorder signals a lack of neighborhood control, sparks fear of crime, and sets off a chain reaction ultimately resulting in crime” (Gau et al., 2014). Thus, this study focuses on

the social perception of feeling safe that is related to; users’ activities and UPS physical qualities including legibility, permeability and the visual place image. These social activities are part of the formula to create ‘sense of a place’ that will ultimately create ‘sense of belonging’ and place attachment among its users (Carmona et al., 2003).

2.1 Legibility

One of the crucial qualities of UPS safety is openness, referring to visibility as the ‘legibility’. Legibility is the visual qualities of being clear enough to be understood (Lynch, 1960). Clarity of spaces offers not only a strong sense of protection but also the possibility of having “an attachment” a meaningful human experience as users interact with one another (Lynch, 1960). The layout of a city and its elements is a key factor contributing to users’ orientation. Being clear and familiar about or being attached to a space gives the users a feeling of safety (Larice and Macdonald, 2013). Public perception of safety in UPS environment is also driven by the physical qualities that are attached to or related to the characteristic of identity of the structures as in the mental image of a user’s perception (Lynch, 1960). Nevertheless, an image of a place is not easily formed by the physical setting and appearance of structures or as an outcome of qualities, but as the combination of all these (Relph, 1976; Samir et al., 2019).

2.2 Permeability

Good accessibility and physical connectivity is a crucial attribute of a well-functioning public space, as it permits users to move easily from one point to another. Permeability within its physical setting provides opportunities for more uses and this create a safer feeling in users of the spaces (Frosdick, 2010). In the extent of which urban forms permits the movement of pedestrians, cyclists or vehicles in different directions (Moughtin, 2016; Moughtin et al., 1999). Therefore, the physical permeability influence ‘land-use intensity’, as a sub-indicator of safety in public spaces. Feeling safe is related to the presence of people and public surveillances, methods including the principle of “eyes on the street” (Mehta, 2014). Jacobs identified “third places” including restaurants, cafes and stores as basic component allowing for public surveillance (Jacobs, 1993; Simões Aelbrecht, 2016). The network design, flow and physical features in UPS can indicate ‘sense of safety’ for users, in the form of designed structures, fences, trees height and density, materials used, signages. The main consideration of user’s in the sense of safety is visual permeability. Elements of visual permeability will include the ecological design of; fences designs, trees heights and density, materials used,

signages, and so on. Public space soundscape, is another factor of importance in creating a sense of safety among users, (Sayin et al., 2015; Yang and Kang, 2004). It is also proven that protecting space users from adverse sensations affects their feelings of being safe in these public spaces (Badiora et al., 2020; Kozlova and Kozlov, 2017). Among the adverse sensations mentioned are the weather, noise, light, dirt, or pollution, etc.

2.3 Visual Image

From relationships of UPS environment and public perceptions, 'sense of safety' is also driven by the physical qualities, that are related to the characteristic of identity of the structure as in the 'mental image' of a user's 'perception' (Lynch, 1960). The place's image is not formed easily by the physical setting and structure appearance, nor as an outcome of qualities, but as the combination of both (Relph, 1976; Samir et al., 2019). One of the most important indicators for the sense of safety is the visual appearance of public spaces which includes buildings and structures, landscape areas, streets, and public spaces. Visual image is related to legibility, as the revealing of clarity does offer not only a strong sense of protection but also the possibility of having a meaningful human experience, or called 'Place Experience' as interacting users (Lynch, 1960). Even being in control of movement, clear and familiar about space, gives the users a feeling of safety (Duany et al., 2007; Lynch, 1960). Decayed buildings, obsolete public spaces and poor infrastructure can have a detrimental effect on the popularity of the UPS among the residents and visitors, (Husseini, 2015). The presence of litter, graffiti, vandalism and poorly maintained buildings has a negative effect on the perception of safety (Frosdick, 2010; Kuo et al., 1998; Mehta, 2014). The connection between the perception of fear and urban public spaces are a common phenomenon of urban areas (England and Simon, 2010). People fearsome public spaces because of their reputation as it lacks 'security' cause high crime spots, notorious incidents of racial and sexual abuse. Due to the lack of both public surveillance and space control, as they are important elements of Crime Prevention through Environmental Design (CPTED), that the safety monitoring depends on the physical settings of the public place (Hedayati Marzbali et al., 2012). Therefore, the visual doubts in UPS users resulted from poor physical settings, indicate place insecure. As the image of an inferior quality urban physical environment can only increase the perception of fear. UPS where the built form is severely damaged by conflict and civil unrest discourage the people from using them, and the businesses from operating around their perimeters.

2.4 Individual's Characteristics

Human perception is not always inherently positive such as fear (Apo et al., 2019). However, these are generated in the same way as a positive feeling within the environment of legibility, permeability and visually in a particular place. These indicators can contribute to the perception of fear and create a negative image and reputation for a public space. A negative image and reputation is an issue that deters many people from attending places, (Holland et al., 2007), or it can further led to social disorder or exclusion behavior "unwelcome place for some people" in UPS, (Carmona and Wunderlich, 2013). While the negative reputation has many dimensions, the focus is on 'physical appeal', place attraction and infrastructure, and 'social appeal', and public perception (Insights, 2017). The UPS reputation occurs due to events such as place setting, which can eventually bring the good or wrong meaning of the place. As if the fear of danger is more common than the danger itself, it impacts on people's behavior and influences the choice of whether to use or not to use a specific place, (Badiora and Odufuwa, 2019). It is an inverse relationship the less fear the more people, are encouraged to use the place. Considering the individuals' differences in perceiving UPS safety as a relevant comparison for many reasons. The gender differences could still affect a person daily activity, (S. K. Kim and Kang, 2018), age or a past self-experience (Sreetheran and Van Den Bosch, 2014). As women tend to avoid public places that they regarded as dangerous places (Shaftoe, 2008). Women tend to focus on many physical features in UPS such as lighting, landscaping, visibility, motorized and pedestrian traffic, accessibility, etc. Despite their negative perception of public spaces, their increased presence in these places increase sense of safety in UPS (Khameneh and Ebrahimpour, 2014). Thus, the relationship between the users of UPS and the physical characteristics of UPS is intimately correlated.

2.5 Conceptual Framework

Urban environmental design can play a role in improving the negative image of an obsolete and decaying urban space. The concept, sense of safety, is still crucial to define, the relationship between UPS' environment, visual appearance and accessibility. Moreover, the visual-spatial properties of legibility of the UPS environment have a correlation effect with the UPS users, as the physical characteristics relate to the mental image of the observer, (Lynch, 1960). The 'visual space quality' triggers the user to develop an impression. Indeed, permeability correspondingly offers a positive contribution to space users, (Yavuz and Kuloğlu, 2014). As in the light of spatial qualities, (Yavuz and Karadeniz, 2012), permeability in the physical attributes of being accessible allows interlinked pedestrian flows and convenient mobility in space. It is a quality in

the UPS that contribute to the users' opportunities moving in the space, that increases the public surveillance, space use and interaction. Furthermore, the perception of being legible and permeable are essential in UPS environment settings, that involves the meaningful, recognized, accessible, safe and comfortable, with diversities appealing to the emotion of the users. All these elements can contribute to the perception of safety encouraging people to use a specific urban space. Relating the permeability and legibility properties to the concept 'sense of safety', a connection of variables can be the key to linking two viewpoints 'environmental psychology', (Panov, 2017) and the phenomenological aspect. These variables include;

- Permeability, referring to physical accessibility, physical properties.
- Legibility, referring to place clarity, sense of orientation.
- Visual image of the built environment.

Referring to the perception process, place characteristics and social activity should be analyzed. In the deliberated issue, it means the impact of the conflict has on these UPS in its physical environment and at the same time public use influenced by their perception of safety. In (Figure 1), the conceptual framework in the extended diagram was developed based on the evaluation and implementation of the discussed studies in this paper's literature, with an emphasize on relevant works of (Carmona and Wunderlich, 2013; Yavuz and Karadeniz, 2012).

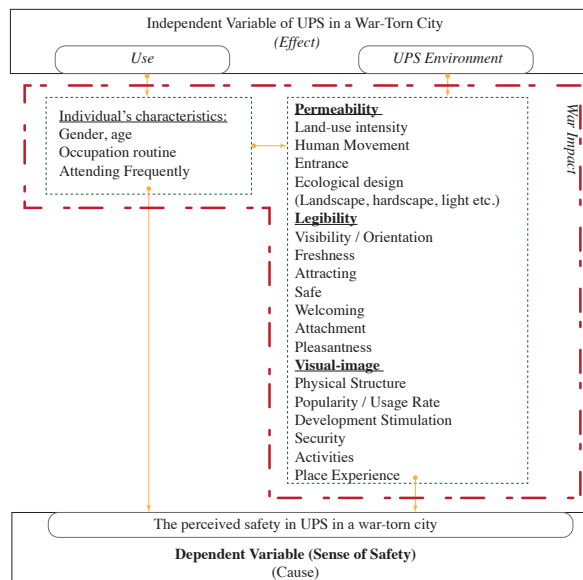


Figure 1: The Research Conceptual Framework Developed Based on the Context of Literature.

METHODOLOGY

The main objectives of this study are centered around the physical built environment and how its elements including legibility, permeability and the visual image have an impact on the users' perceived sense of safety. This study is based on an in-depth analysis of the perceived sense of safety in a Baghdad city. Sense of safety is taken in the study as a concept affecting the UPS user's perception. Defining the perceived sense of safety in Baghdad city may be explained with the study assumptions that depend on the physical and visual properties. The study approach is mix method of qualitative and quantitative. Qualitative methods used in the study include archival analysis, observations and questionnaire surveys. The questionnaire survey used in this study is an attempt to elicit the perceived safety of users in UPS of Bab Al-Sharqi. This method allows for an extensive amount of information collected from the public regarding the sense of safety in UPS in a cross-sectional manner (Wang and Groat, 2013). As this survey is aimed at seeking information on the UPS' users, therefore, the public is the unit of analysis. The advantages of undertaking a survey, over other means of gathering social data, are that in a cross-sectional survey the data is collected within a reasonably short-time. The online questionnaire survey was carried out for a month, in February 2019. The responses were collected mainly through social media by spreading the link and 'through online platform'. The study used 3D visualization software by Autodesk (Revit-V19.0.1.1), to illustrate the observed context of Bab Al-Sharqi. Meanwhile, Statistical Package for Social Science (SPSS) version (V26.0-2019) was used in the statistical analysis of quantitative data.

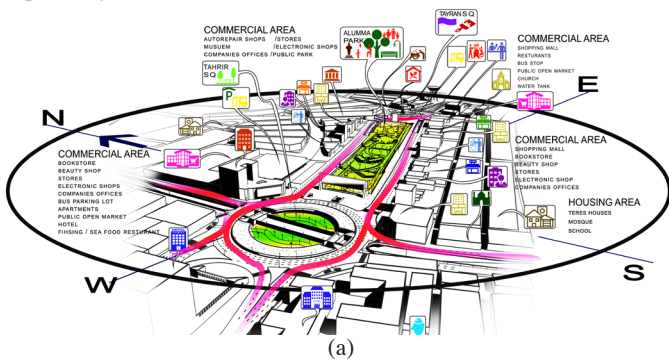
3. STUDY AREA

To demonstrate the complexity of the perception of safety in Baghdad, the capital city of Iraq, a middle-east country as shown in (Figure 2), a case study is used in this paper. The case study approach is strongly promoted by (Yin, 2003), who indicates that it allows for a better understanding of the physical, social and economic phenomenon (Wang and Groat, 2013).



Figure 2: (a) Location Map of Baghdad City in Iraq NTS, Source: (Rikar, 2017); (b) Baghdad City Centre Layout NTS, with the Study Area Location of Bab Al-Sharqi.

Bab A-Sharqi, also known as the old Baghdad centre, is laid out with major paths and linkages. It is also situated at the Al-Rusafa districts or the *Rasafa* zone, which sits along the eastern side of the Tigris river bank. A number of bridges link the *Al Rusafa* to *Karkh* districts, the western side of the Tigris river. One of these that connect the Bab Al-Sharqi directly to *Karkh* districts is the Jumariyah bridge. The study focuses on three UPS; Tahrir Square, Tayeran Square, and Alumma Park at Bab Al-Sharqi, as visualized in (Figure 3). The site went through a series of changes, in its structure and form related to its place identity and visual memories, within the physical setting and image. The Bab Al-Sharqi is largely a commercial area due to its location in the centre of Baghdad. It also attracts both the local population as well as international tourists and shoppers. This influenced the image and place identity of the district which experienced the development of public spaces, roads, facilities, and transportation lines in the 90s. The life in Bab Al-Sharqi was regularly occupied with numerous public event, festivals, daily public interaction and other programmed activities. However, all these took turn for the worse, when Iraq was engulfed in the long-term war trauma. The place reflecting memories of Iraqi history, culture, and art, suffered considerable destruction.



(b)



(b)



(c)

Figure 3: Illustrations of Bab Al-Sharqi- Baghdad; (a) the Site Context; (b) perspective view of Bab Al-Sharqi from Tahrir Sq.; (c) All the Three Squares as Group Public Places in Baghdad Center.

4. DATA COLLECTION

The components which are considered to assist defining the safety concept are questioned. The inquiries were directly questioning; time, attending frequency, their safety perceptions, opinion, reasons, criticisms. Also, UPS characteristics related, to legibility, permeability and visual image were inquired. Perception or sense of safety was extracted through multiple questions types in the questionnaire such as open-ended, the rating scales, the Likert's Attitude Scale, etc. Also, there are some considerable differences and demographic data were collected, as shown in (Table 1).

Questionnaire Content	
Demographic Data	
Age / Gender / Education level	
General Use Inquiry	
Attending frequency time of each UPS / Attending as individual or group	
Attending purpose(s) / Liking & Criticized feature(s) in UPS	
Wish(s) to change anything in these UPS at Bab Al-Sharqi	
UPS Environment Inquiries	
Base on the following features, please rate the environmental setting of UPS: Place safety as user / Green coverage / facilities / Place maintenance	
What is the strong character of these UPS at Bab Al-Sharqi?	
Please rate how you see these qualities of UPS at Bab Al-Sharqi; attractiveness & arousing interest / pleasantness & relaxation / freshness & cleanness / easy to go to the place	
As a user at Bab Al-Sharqi, what do you think about UPS; visibility of the place from distance / access and walking without physical obstacles, blocks, or issues / transportation	
Who do you think will not feel welcome there?	
How do you perceived safety in these UPS as; the implementation & use of technology / public movement restriction & freedom / safety practice	
How do you describe UPS at Bab Al-Sharqi in term of; stimulating social interactions or attending / existing activities / individual experience within the UPS	

Table 1: Questionnaire Content of this Study

All the questionnaire items, related to UPS use and environment inquire, were developed to define the perceived safety with the use of adjectives as attributes for the data evaluation as presented in (Table 2). With such use of the adjectives, as the previous study of (Yavuz and Karadeniz, 2012), it can define and determine the relation of “perceived safety” the study concept with each sub-variable. Thus, the obtained data can be determined and analysed with a systematic differentiation scale, (Osgood et al., 1957). That has a linguistic origin and it can demonstrate attributes of both positive and negative data.

	'Sense of Safety' Aspects	Qualities / Adjectives
Permeability	Land use intensity	Crowded - Calm
	Human Movement	Congested - Fluent
	Entrance	Difficult - Easy
	Ecological design (Landscape, Hardscape, light etc.)	Incompatible - Compatible
Legibility	Visibility / Orientation	Narrow - Wide
	Freshness	Dull - Lively
	Attracting	Ordinary - Attractive
	Safe	Disturbs - Peaceful
	Welcoming	Repulsive - Inviting
	Attachment	Stranger - Familiar
	Pleasantness	Unpleasing - Pleasing

	'Sense of Safety' Aspects	Qualities / Adjectives
Visual image	Physical Structure	Rickety - Robust
	Popularity / Usage Rate	Inactive – Active
	Development Stimulation	Few Opportunities - Lots of Opportunities
	Security	Insecure - Secure
	Activities	Unlively – lively
	Place Experience	Inconvenience - Convenience

Table 2: Adjectives Pairs Elected, Based on the Covered Literatures, reflecting on previous study of (Yavuz and Karadeniz, 2012) with adjustment made, to Define the Perceived Safety Data in the Questionnaires.

An online survey, is an attempt to elicit the perceived safety of users, concerning three UPS: Tahrir Square, Tayeran Square, and Alumma Park in Bab Al-Sharqi. The online survey was running through social media platform, regularly updating it every two days throughout February 2019. For one month, the online survey obtained 50 responds from Iraqi participants. Due to research limitation to obtain more number of response from the Iraqi public, as the difficulties of obtaining the data on the field of study and due to the specific situation (peculiarities) in Iraq. This research was limited to use the number of online survey participants, as the sample size. As not everyone could access or willing to participate in the survey. In this survey, the 50 respondents are 48% female and 52% male. The selection of the participants was based on the probability sampling.

5. RESULTS

5.1 Public Spaces Usage and Activities

In the first and the second sections of the survey, participants are asked few general questions about the UPS at Bab Al-Sharqi. It was meant to obtain data on their general impression of the sites. From the first two sections are as follows; 60% of the participants indicated that they frequently attend the Tahrir Square, while 58% said that they rarely use the Alumma Park. Indeed, others sometimes attend the park by 40% which is only 8% less than public attending of Tayeran Square. The results are shown in (Figure 4).

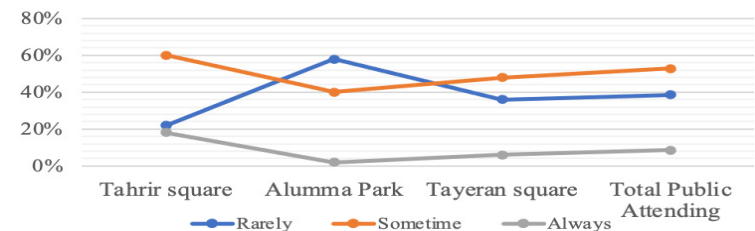
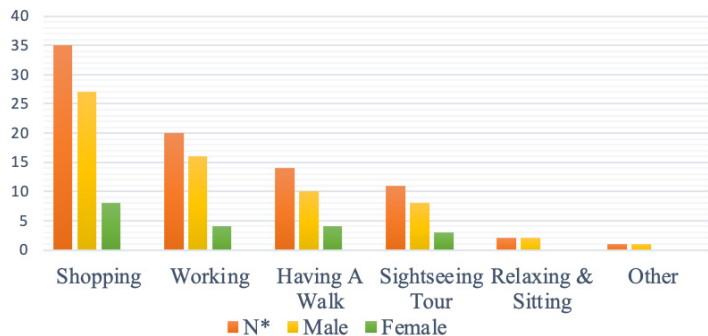


Figure 4: Public Attending Frequency at Each UPS at Baghdad Centre.

The response from this section revealed that more men are inclined to use the public spaces at Bab Al Sharqi. Female usage of the public spaces is 24% than male usage. In terms of the users, a large proportion of them (40%) go to Bab Al Sharqi for shopping and 24% for working purposes. About 16%, use the space for social engagement purposes and 13% simply tour the area. Only 2% use it for relaxing and resting. The usage information is shown in (Figure 5).



N*: Number of participants who do the activities at the site

Figure 5. (Social Activities at Bab Al-Sharqi.)

The participants were further asked, about their preferred time to visit the public spaces the data shows that 68% prefer morning hours, and only 8% use it in the evening. Equal trends, of time attending, were noticed from both genders. Respondents were also requested to indicate the strong characteristics of the UPS. Most respondents indicated the centrality of the UPS within the city as the most important characteristic and followed by the historical value of the sites. For the question about the strong characteristic the site has, 42 of the participants pointed the location as the centre of Baghdad, followed by the historical value of the area, and the architectural landmarks seemed to be the least significant as shown in (Figure 6).

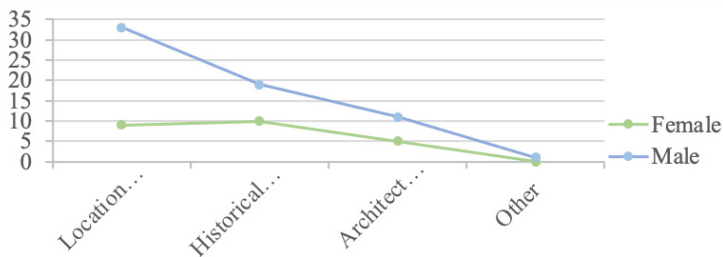


Figure 6: Site Stand-Up Characteristics Based on Participants Answers.

The following question revealed respondents' criticisms of the sites influencing their frequencies and times of visits. Most of both genders (94%) seem to agree that the large crowd is the most irritating thing they had to encounter in the UPS. This is followed by site uncleanliness (6%), discomfort (2%), and 8% mentioned the site is "bad and rickety".

5.2 People at Public Spaces

The respondents were asked for their opinions on who they thought would feel most unwelcomed in the study areas. This question may seem confused, but it actually can indicate design failure or social excluding behaviour or disorder, (Carmona and Wunderlich, 2013). The disabled and children topped the list with 32% (n=16) each, followed by older people (22%; n=11) and women (14%; n=7). The poor people were thought to be the least unwelcome group (8%; n=4). However, (24%; n=12) gave the answers for no one is feeling unwelcomed. Respondents were also asked which group of people they found most in the UPS. A large majority (48%; n=24) thought that scammers were the largest group found in the UPS, followed by the homeless people (20%; n=10) and poor people (8%; n=4). An open-ended item format was used to find out what respondents like in the UPS in the Bab Al Sharqi. In (Table 3), it lists their likings even though some respondents did not answer this question.

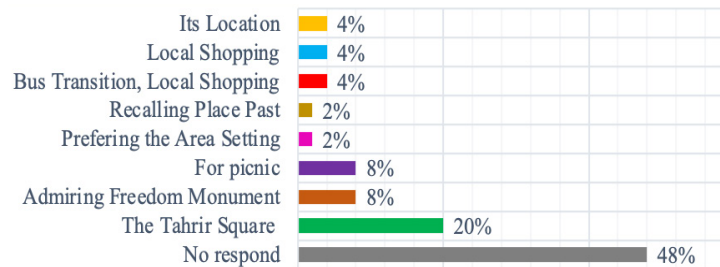


Figure 7: Participants' Likings of Public Spaces at Bab Al-Sharqi.

5.3 Defining Safety in Public Spaces

Respondents were presented with a list of adjectives in a semantic differential scale describing the sense of safety in the UPS at Bab Al Sharqi. The results are as shown in (Table 3).

Aspects	Positive Adj.	(+%)	Mid %	(-%)	Negative Adj.
Land use intensity	Calm	34%	-	66%	Crowded
Human Movement	Fluent	38%	54%	8%	Congested
Entrance	Easy	2%	44%	54%	Difficult
Ecological design	Compatible	2%	38%	60%	Incompatible
Visibility / Orientation	Wide	70%	-	30%	Narrow
Freshness	Lively	12%	30%	58%	Dull
Attracting	Attractive	28%	42%	30%	Ordinary
Safe	Peaceful	44%	-	56%	Disturbs
Welcoming	Inviting	24%	-	76%	Repulsive
Attachment	Familiar	26%	62%	12%	Stranger
Pleasantness	Pleasing	10%	28%	62%	Unpleasing
Physical Structure	Robust	14%	24%	62%	Rickety
Popularity / Usage Rate	Active	14%	36%	50%	Inactive
Development Stimulation	Lots of Opportunities	14%	36%	50%	Few Opportunities
Security	Secure	4%	44%	52%	Insecure
Activities	lively	14.7%	70%	16%	Unlively
Place Experience	Convenience	2%	-	98%	Inconvenience
Sense of Safety		42%	-	76%	

Table 3: Users Definition of Sense of Safety in UPS at Bab Al-Sharqi

The adjectives selected by the respondents may hint at the possible roots of the sense of safety of users of the UPS. These adjectives are grouped according to physical settings, images, and activities. A correlation analysis was then done to study the relationships of these adjectives. Those with significant relationships are taken as the independent variables for the sense of safety in the UPS. In (Table 4), the correlated adjectives, with ** characters, at the significance level of 0.01, based on this table are further tested with the regression test, where the adjectives express 'sense of place' are found.

	Sense of Place	Female-Sensing	Male-Sensing	Gender Differences
Crowded	-0.271	-.918**	-.536**	-.418
Congested	-0.3	0	-.372**	-.372
Difficult	-.599**	-.836**	-.724**	-.112
Incompatible	-.627**	-.861**	-.754**	-.107
Narrow	-.28	-.525**	-.452**	-.127
Dull	-.760**	-.845**	-.828**	-.017
Ordinary	-.544**	-.747**	-.537**	-.21
Disturbs	-.607**	-.558**	-.836**	-.322
Repulsive	-.228	-.723**	-.672**	-.149
Stranger	-.379**	0	-.449**	-.449
Unpleasing	-.659**	-.902**	-.746**	-.244
Rickety	-.815**	-.918**	-.859**	-.141
Inactive	-.667**	-.874**	-.708**	-.166
Few-Opportunities	-.667**	-.874**	-.708**	-.166
Insecure	-.733**	-.845**	-.777**	-.132
Unlively	-0.227	0	-.360*	-.36
Inconvenience	-0.232	-.903**	-.743**	-.24
Sense of Safety	1	.903**	.722**	-0.219

**Correlation is significant at 0.01 level

Table 4: Correlation Test of Permeability, Legibility and Visual image Adjectives by Users Describe Sense of UPS Safety in Bab Al-Sharqi, Baghdad.

The results indicate that the correlation between "permeability" and variables are highly significant at $p=0.01$. The sense of safety in UPS at Bab Al-Sharqi is determined to be negatively correlated with the following adjectives: difficult, incompatible, dull, ordinary, disturbs, strange, unpleasing, boring, inactive, few opportunities and insecure. Results also seem to show negative correlation (range varies from -0.017 to over -0.400) among females than males. However, this relationship needs to be interpreted with caution due to the unequal number of female and male correspondents. Nevertheless, even if the samples were equal, female are expected to evaluate the UPS negatively due to their higher concerns for safety. The significant correlation indicates the sense of safety is primarily correlated with these adjectives. The order of importance can be listed in an order of importance from physical, visual, and use or functional properties respectively. It can also be said that the lower the existence of such adjectives, the lower is the sense of safety. The three highly correlated variables with the sense of safety are incompatible ($r=-.627$), dull ($r=-.760$), and boring ($r=-.815$). These variables were then subjected to a regression analysis as shown in (Table 5).

Variables	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
(Constant)	.224		7.042	.000
Incompatible	-.106	-.223	-2.196	.033
Dull	-.142	-.301	-2.076	.043
Rickety	-.204	-.424	-2.584	-.2584
N= 50 R=.845a R 2= 0.715 Adjusted R2=0.696 F= 38.388(Sig.= 0.000)				

Table 5: Linear Regression Analysis of the Scoring on Explanatory of Perceived Safety in UPS at Bab Al-Sharqi.

According to the test, the three models defining the perceived UPS safety with a 0.00 significant level are given above. Based on (Table 5), the best model to define the ‘sense of safety’ includes rickety, dull, and incompatible altogether. These qualities are, indeed, determined to be statically significant ($p \geq 0.01$). Where each of them is related to one of the permeability properties that are found to be matched in the ‘sense of safety’ framework. With these results, the three components to define ‘sense of safety’ through physical environment of UPS are perceived to defined each, properties they relate.

6. DISCUSSION

The UPS that were the subject of the questionnaire survey have traditionally been the main public domain of Baghdad. Interlinked, with each other they constitute one of the main activity spines of the city. It used to be a vibrant node featuring diverse activities and attracting a wider spectrum of the local community. However, the long-term conflict and civil unrest have changed this status injecting a feeling of apprehension among its everyday users. Its current visual image featuring decayed buildings and poorly managed public areas only adds to a degree of uncertainty among its end-users. The questionnaire survey revealed that the concept of ‘sense of safety’ in a physical setting is determined and interlinked by a range of dependent variables related to legibility, permeability and the visual image of the place. The findings show that the UPS adjectives defining the sense of safety, of the three UPS of Bab Al-Sharqi, include ‘rickety’, ‘incompatible’ and dull respectively. Based on that, the studied senses of safety concept, incorporating permeability, legibility, and the visual image, have a tangible impact on UPS users of war-torn cities. A high percentage of 38.6% of users rarely attend the UPS at Bab Al-Sharqi. Depending on such attendance infrequent, it can be stated and that less perception of safety in UPS of war-torn cities. That is similarly found in parallel with the direction of such user behavior to use the space or not, (Badiora and Odufuwa, 2019). In this study, the observed physical properties are defining the ‘sense of safety’ of the UPS at Bab Al-Sharqi by expressing

negative sense, as indicated in (Table 5). The users often define the properties of being rickety, dull and incompatible. These properties can match the concepts of legibility, permeability and the visual image, as factors that found affecting the perception of safety founded in related to public places that suffered from physical destruction, (Husseini, 2015). That the perceived safety in a Bab Al-Sharqi is strongly associated with the physical spatial properties, due to the severely damaged on the UPS built environment by conflict and civil unrest. Such definition overlap with (Arango, 2018) description that “before the blast walls and checkpoints circumscribed the urban geography, and before so much violence altered the city’s character, and changed the relationship between citizens and their public spaces”. That contribute to stressed out and dull feelings with fewer opportunities and limited outstanding features. It further creates an environment for criminals, thus, it increases in a bad reputation and public criticisms, with this comparable consequences, decrease the user’s perception of safety as found in any other UPS, (Holland et al., 2007, p. 48; Carmona & Wunderlich, 2013, p. 171). Socially, public activities are limited to transiting, due to crowding, and limited shopping, due to very limited entertainment opportunities and less vibrant commercial activities. Indeed, the absence of safety, convenience, enjoyment and attractions discourage women from coming to these places. It became clearer, to UPS in war-torn cities, that female users are more apprehensive about the perceived safety than their male counterparts, (S. K. Kim and Kang, 2018; Shaftoe, 2008).

7. CONCLUSION

The findings in this study conclude that the conflict negatively impacts the sense of safety as it defined through the physical settings and users of UPS of Bab Al-Sharqi, Baghdad city. The sense of safety as perceived by the users is interrelated with the quality and image of the surrounding built environment is more negatively perceived by women than man, which is confirmed by this study data and findings. This conclusion is related to the view that “place affects people’s reaction’ by their understanding of the environment and what is going on in there” (Silavi et al., 2017). This shows that ‘sense of safety’ can be defined with use and physical settings as; the accessibility concept and incompatible term within the physical properties’ context. This study revealed that each public place case should be considered individually and could be preceded by similar or addition inquires methods of observations, site analysis, questionnaire surveys, interview etc. Thus, future studies can be set up prospectively, on improving the sense of safety in public places of cities devastated by conflict and civil unrest. As there is no simple remedy that can address all the cases. Looking into general recovery strategies in

strengthening the community and the urban fabric, such as incorporating aspects of Crime Prevention through Environmental Design (CPTED) and physical Anti-Terrorism Design (ATD) into the planning and design of the spaces. Considering the visual effect of these elements may be in the form of a harsh militaristic anti-terrorism design, with concrete barriers and reinforced fences, it creates an atmosphere of fear and tension. Therefore, further studies on designing public places for people by making the community friendlier, safer and more comfortable, as it is one of the basic precepts of creating sustainable urban planning and design. Obtaining the opinions and preferences of end-users regarding their perception of safety in a public space. The nature and needs of UPS in war-torn cities differ from the standards approaches and vary according to the complexity of the cases influenced by social scenarios and geographies.

REFERENCES

- Apo, P., Lindsey, E., Stender, O., Maxwell, C., Taum, R., and Kaupu, C. (2019). *What does “sense of place” mean to you?* Definitions.Net. Retrieved from <https://www.definitions.net/definition/sense+of+place>
- Arango, T. (2018). Picturing Iraq in a Bygone Era. *The New York Times*. Retrieved from <https://www.nytimes.com/2018/07/16/lens/old-iraq-photographs-baghdad.html>
- Badiora, A. I., and Odufuwa, B. O. (2019). Fear dynamics in public places: a case study of urban shopping centers. *Journal of Place Management and Development*, 12(2), 248–270.
- Badiora, A. I., Wojuade, C. A., and Adeyemi, A. S. (2020). Personal safety and improvements concerns in public places: An exploration of rail transport users’ perception. *Journal of Place Management and Development*, 13(3), 319–346.
- Callimachi, R., and Coker, M. (2018). *ISIS Claims Responsibility for Baghdad Bombings*. The New York Times. Retrieved from <https://www.nytimes.com/2018/01/17/world/middleeast/iraq-baghdad-isis-bombing.html>
- Carmona, M., Heath, T., Oc, T., and Tiesdell, S. (2010). Public places-urban spaces: the dimensions of urban design. Oxford: *Architectural Press*.
- Carmona, M., and Wunderlich, F. M. (2013). *Capital spaces: The multiple complex public spaces of a global city*. Oxford: Routledge.
- Duany, A., Plater-Zyberk, E., Speck, J., Scheer Case, B., Rowley, A., Bentley, I., McGlynn, S., Murrain, P., Knox, P., Ozolins, P., Brand, S., Lynch, K., Bosselmann, P., Hillier, B., and MacCormac, R. (2007). *Urban Design Reader* (M. C. and S. Tiesdell (ed.); 1st ed.). Architectural. DOI: 10.1007/SpringerReference_12454
- England, M. R., and Simon, S. (2010). Scary cities: Urban geographies of fear, difference and belonging. *Social and Cultural Geography*, 11(3), pp. 201–207. DOI: 10.1080/14649361003650722
- Frosdick, S. (2010). *Policing , safety and security in public*. 12(1), 81–89. DOI: 10.1350/ijps.2010.12.1.161
- Gau, J. M., Corsaro, N., and Brunson, R. K. (2014). Revisiting broken windows theory: A test of the mediation impact of social mechanisms on the disorder-fear relationship. *Journal of Criminal Justice*, 42(6), 579–588.
- Hayati Marzbali, M., Abdullah, A., Razak, N. A., and Maghsoodi Tilaki, M. J. (2012). Validating crime prevention through environmental design construct through checklist using structural equation modelling. *International Journal of Law, Crime and Justice*, 40(2), 82–99.
- Holland, C., Clark, A., Katz, J., and Peace, S. (2007). Social interactions in urban public places. *In Water* (Vol. 12, Issue 1). DOI: 10.1186/1745-6215-12-264
- Husseini, M., & Mahdian Behnamiri, M., & Sedighi, a. (2015). Measuring and analyzing the safety in public parks (Case Studies of Kohsangi and Basij Parks in Mashhad). *Journal of Geography and Regional Development*, 13(1 (24)), 43-47.
- Insights, P. B. (2017). *Place Image and Reputation*. 8–11. Retrieved from <https://placebrandobserver.com/theory/place-image-reputation/>
- Jacobs, J. (2016). *The Death and Life of Great American Cities*. New York: Random House
- Khameneh, Y. T., and Ebrahimpour, M. (2014). Social safety ’ s women in urban public space (Case study : Mashhad metropolitan). *American Journal of Engineering Research (AJER)*, 3(8), 227–233.
- Kim, S.-K., Lee, Y. M., and Lee, E. (2013). The defensible space theory for creating safe urban neighborhoods: Perceptions and design implications in the United States and South Korea. *Journal of Architectural and Planning Research*, 30(3), 181–196.

- Kim, S. K., and Kang, H. B. (2018). An analysis of fear of crime using multimodal measurement. *Biomedical Signal Processing and Control*, 41, 186–197.
- Kozlova, L. V., and Kozlov, V. V. (2017). Principles of Improvement of Large City Public Space (by Example of Irkutsk City). *IOP Conference Series: Materials Science and Engineering*, 262(1).
- Kozłowski, M. (2019). Comparative Analysis of Post-Second World War Urban Environments in Western and Central Europe and Southeast Asia. In J. Suchoples, S. James, and B. Törnquist-Plewa (Eds.), *World War II Re-explored: Some New Millenium Studies in the History of the Global Conflict* (1st ed., pp. 696). Bern: Peter Lang Publishing.
- Kuo, F. E., Bacaicoa, M., and Sullivan, W. C. (1998). Transforming Inner-City Landscapes. *Environment and Behavior*, 30(1), 28–59.
- Larice, M., and Macdonald, E. (2013). *The urban design reader*. Oxford:Routledge.
- Lynch, K. (1960). *The Image of The City*. Massachusset: M.I.T. Press.
- Mawby, R. I. (2017). Defensible Space. In *Oxford Research Encyclopedia of Criminology and Criminal Justice*. DOI: 10.1093/acrefore/9780190264079.013.6
- Mehta, V. (2014). Evaluating Public Space. *Journal of Urban Design*, 19(1), 53–88.
- Moughtin, C. (2016). Urban design: Street and square. In *Urban Design: Street and Square: Third Edition* (3rd ed.). Routledge. Retrieved from https://books.google.com.my/books?id=oOJ9jwEACAAJ&source=gbs_book_other_versions
- Moughtin, C., Cuesta, R., Sarris, C., and Signoretta, P. (2012). *Urban Design: Method and Techniques*. Oxford: Routledge.
- Newman, O. for C. D. A. (1996). *Creating Defensible Space*. HUD and Justice. Retrieved from <https://doi.org/DU100C00000596>
- Osgood, C. E., Suci, G. J., and Tannenbaum, P. H. (1957). *The measurement of meaning*. Illinois: The University of Illinois Press.
- Panov, V. (2017). From Environmental Psychology to Subject-Environment Interactions. *Proceedings of the 2nd International Conference on Contemporary Education, Social Sciences and Humanities (ICCESSH 2017)*, 1135–1139. DOI: 10.2991/iccessh-17.2017.265
- Piquard, B., and Swenarton, M. (2011). Learning from architecture and conflict. *The Journal of Architecture*, 16(1), 1–13.
- Relph, E. C. (1976). *Place and Placelessness (Research in Planning and Design)* (1st ed.). Pion. Retrieved from <https://www.amazon.com/Place-Placelessness-Research-Planning-Design/dp/0850860555>
- Rikar, H. (2017). *Baghdad, Iraq map*. VOA. Retrieved from <https://www.voanews.com/extremism-watch/kurds-accuse-iran-cross-border-shelling-northern-iraq>
- Samir, H., Samargandi, S., and Mohammed, M. F. M. (2019). Placemaking as an approach to foster cultural tourism in heritage sites. *WIT Transactions on the Built Environment*, 191, 321–338.
- Sayin, E., Krishna, A., Ardelet, C., Briand Decré, G., and Goudey, A. (2015). “Sound and safe”: The effect of ambient sound on the perceived safety of public spaces. *International Journal of Research in Marketing*, 32(4), 343–353.
- Shaftoe, H. (2008). *Convivial urban spaces: creating effective public places*. Earthscan in association with the International Institute for Environment and Development. Retrieved from <https://www.routledge.com/Convivial-Urban-Spaces-Creating-Effective-Public-Places/Shaftoe/p/book/9781138966703>
- Silavi, T., Hakimpour, F., Claramunt, C., and Nourian, F. (2017). The Legibility and Permeability of Cities: Examining the Role of Spatial Data and Metrics. *ISPRS International Journal of Geo-Information*, 6(4), 101. <https://doi.org/10.3390/ijgi6040101>
- Simões Aelbrecht, P. (2016). ‘Fourth places’: the contemporary public settings for informal social interaction among strangers. *Journal of Urban Design*, 21(1), 124–152. <https://doi.org/10.1080/13574809.2015.1106920>
- Sinan, A. (2018). Fifteen Years Ago, America Destroyed My Country. *NY Times (The New York Times)*, 1. Retrieved from <https://www.nytimes.com/2018/03/19/opinion/iraq-war-anniversary-.html>
- Sreetheran, M., and Van Den Bosch, C. C. K. (2014). A socio-ecological exploration of fear of crime in urban green spaces - A systematic review. In *Urban Forestry and Urban Greening* (Vol. 13, Issue 1, pp. 1–18). Urban & Fischer. <https://doi.org/10.1016/j.ufug.2013.11.006>

- Wang, D., and Groat, L. N. (2013). *Architectural Research Methods* (2nd ed.). Wiley. <https://www.amazon.com/Architectural-Research-Methods-Linda-Groat/dp/0470908556>
- Yang, W., and Kang, J. (2004). Acoustic comfort evaluation in urban open public spaces. *Applied Acoustics*, 66(2), 211–229. <https://doi.org/10.1016/j.apacoust.2004.07.011>
- Yavuz, A., and Karadeniz, N. K. (2012). A Research on Permeability Concept at an Urban Pedestrian Shopping Street A Case of Trabzon Kunduracilar Street. *Artvin Coruh UEniversitesi Orman Fakueltesi Dergisi*, 13(1), 25–39. <https://doi.org/10.17474/acuofd.33758>
- Yavuz, A., and Kuloğlu, N. (2014). Permeability as an indicator of environmental quality: Physical, functional, perceptual components of the environment. *World Journal of Environmental Research*, 04(2), 29–40.
- Yin, R. K. (2003). Case Study Research: Design and methods. *Thousand Oaks, Calif*: Sage Publications.