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Factors of Social Interaction at Waterfront Open Spaces - Jeddah Waterfront as a Case

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Abstract

Public Open spaces represent a significant element of the urban structure of cities. Its importance lays on its ability to provide a place that encourages social interaction in order to strengthen the social life of the city residents. Jeddah as a coastal city known as "The Mermaid of the Red Sea" has a great potential to use its waterfront as a successful public open space that motivates the residents to socially interact, engage, and communicate as well as to strengthen their bond with the sea. In spite of this strong potential, previous studies show a gap in utilizing it effectively. This paper tries to investigate the different factors could be essential on enhancing the social interaction within the public open spaces focusing on the waterfront sites through theoretical review and examination of international case-studies. Accordingly, a scaling model will be created to evaluate the importance of these factors based on the users' perception of Jeddah's waterfront development in terms of social interaction aiming to introduce concluding recommendations for enhancing the social interaction capacity of Jeddah's waterfront.

Keywords: Open Public Spaces, Social Interaction, Social Life, Water-front Development.

1. INTRODUCTION

Research is replete with evidence of the vital role played by social contact community cohesion. A cohesive community is built on shared values and a combined effort to reduce social disparities. By actively interacting with one another, members of a community can identify and rectify the determinants of disparities in wealth, health, and income. In this way, individuals develop a sense of being engaged in a common enterprise, shared challenges, and shared identity. Thus far, human interactions remain a critical component of a satisfactory and unifying life. This sentiment is particularly shared in the realm of urban design [1]. The design of urban spaces to promote social connections has been elaborated subsequently.

Public open places provide several ecological and environmental values, such as the conservation of biodiversity in flora and fauna. These open spaces further contribute to the management of urban climate by allowing temperature regulation, thereby abating the urban heat islands. They also improve the quality of air and by allowing space for carbon sequestration and noise reduction. Apart from the mentioned environmental benefits, urban spaces also promote social interactions and the associated community cohesion. It is through the urban spaces that people move and interact on personal and social levels to facilitate community integration.

Urban spaces ostensibly attract people and facilitate social interactions by providing a broad range of values, as listed by Rad and Ngah [2]. These include a) comfort and relaxation- urban spaces satisfy users' primitive need of freedom from the mental and psychological stressors. This feature is a precursor for the inter-personal relationship as people become at ease of interacting with one another when they do not feel burdened by their immediate environment. b) Active occupation- open spaces provide a direct experience with the natural environment. Depending on the shape and size of the available physical environment, people can engage in different social activities, including competitions, sport, entertainments, reunions, and walking. c) Passive

occupation- public open spaces also provide the people with the capacity to watch others take part in active occupations. Passive occupation is also among the primitive human needs associated with social interactions.

II. SOCIAL INTERACTION IN THE PUBLIC OPEN SPACES

Given the crucial role played by public open spaces in promoting community cohesion, many scholars have investigated the different elements of designing urban open spaces to facilitate social interactions. Rad and Ngah [2] noted that the urban designers always include physical spaces for sitting, pausing, and staying comfortably in the open areas. Similar findings were shared by Hajmirsadeghi et al. [3], who added that designers intentionally create focal areas that would attract people's gathering, for instance, the bus station, parks, and playgrounds. Another scholarly work provided that there are visual entrances that are physically inviting and provide unlimited access to the open spaces such as parks [4]. The fourth element evident in the previous research are practical features that promote physical activity, such as merry-go-rounds, soccer posts, and volleyball courts [5]. Fifth is the instructional design and security parameters that control the pedestrian and motorists' access to the open spaces [6]. Salih and Ismail [7] also provided that there are proper spatial connections evident in the design of pedestrian pathways that control the people's movement within the open spaces. Urban designers further provide definitive facades and their respective identities [5]. The eighth element of urban design that facilitates social interactions is the complementary transport systems that connect people to the common areas [8]. Lastly, researchers such as Bishop and Marshall [9], noted that urban designers purposefully adorn the open spaces with aesthetic features to promote attractive social activities such as photography and video shooting. Together, these design elements promote the social use of public open spaces and ultimately facilitate social cohesion.

Although many different researchers and scholars tried to explore the different factors affecting the encouragement of social interaction in public spaces, yet, there is still a remaining need for organizing and classifying these factors to be able to measure the social interaction in public spaces. Towards this goal, various classifications have been explicitly discussed in the available literature. Scholars have endeavored to provide an in-depth understanding of how various design concepts can be integrated into urban design to achieve a stronger and more positive social interaction in public open spaces. Researchers have intricately examined how each of the factors interacts with each other to meet certain objectives. Gehl [10] discusses the prospect of optimal design of public open spaces by introducing 12 criteria useful to urban planners and designers in achieving critical outcomes [11]. The author divides the concepts into three main sections, including protection, comfort, and amenities.

Gehl [10] supposes that protection is an integral factor when designing an urban setup, especially those to be used by members of the public. The concept aims at limiting the adverse effects of environmental stimuli to make the spaces not only habitable but also pleasant. The protection ensures that individuals are not unnecessarily endangered and that the structures are designed to improve their welfare. Urban planning and design should ensure that dwellers are protected against traffic and accidents. The structures should endeavor to minimize crowding as it presents numerous challenges, including limited ventilation and general discomfort. Public open spaces should also be well able to reduce the possibility of confusion which minimizes usability. Additionally, the facilities should minimize the prospect of crime and violence. Users should feel safe and not be exposed to the prospect of harm from other users or the environment.

Gehl [10] proposes that crime and violence can be minimized through effective lighting and the integration of security measures such as street watchers and CCTV cameras. The author also proposes the overlapping of functions in space and time. The use of the space will be limited to specific times and schedules to reduce the predictability of traffic, thus, recognize any unusual patterns that may represent a threat to the well-being of other occupants. The individuals will also be sufficiently protected from unpleasant sensory experiences, including noise, glare, dust, pollution, cold, rain, draft, and heat. In terms of comfort, space should provide adequate room for walking and should be sufficiently maneuverable. Aesthetic and functional services should be integrated, including pleasant facades to improve the overall experience of the occupants. The structure should also favor standing and sitting. Defined spots for specific functions such as resting should be included to encourage prolonged stays.

Al Ameri et al. [12] also presents an insight into four primary themes, including safety, accessibility, comfort, and vitality. The authors note that in the conventional design environment, public spaces must only be functional but also but aesthetic. Al Ameri et al. [12] suppose that a positive human experience should be the ultimate goal in any urban renewal or design project. The recommendations are mirrored by Hajmirsadeghi et al. [3], who classifies the factors into four major factors, including physical, behavioral and psychological, managerial, and geographical. The authors maintain that the spaces should be conducive to accomplish certain economic, political, cultural, and social requirements. The structures ought to promote interaction between people while offering the most optimal experience. Salih & Ismail [13] present their perspectives on the ideal factors of public open space and social interaction. The authors suppose that there are six primary indices that should be utilized in urban design to promote a positive experience, including management and maintenance, safety and security, accessibility and linkage, crowd and noise control, quality of the space, activities, and design and image.

III. FACTORS AFFECTING SOCIAL INTERACTION IN PUBLIC OPEN SPACES

Through the exploration of previous efforts in defining the factors of social interaction in public places; the researches tried to establish a new classification for these factors combining the different conclusions brought by previous research outcomes. This proposal relies on classifying these factors into four main categories, including physical, psychological, management, and geo-spatial (Table 1).

Physical Aspects	Psychological Aspects
▪ Accessibility ▪ Facilities ▪ Landscape Features (Furniture, Lighting, Finishing ▪ Safety Measures ▪ Space Morphology (Shape, Size, Proportions, Divisions, Human Scale, …)	▪ Comfort ▪ Encouraging Communication ▪ Gathering Spaces ▪ Pedestrian Oriented ▪ Sense of Relaxation & ▪ Tension-Free Space ▪ Positive Sensory Impressions
Management Aspects	**Geo-spatial Aspects**
▪ Security & Safety ▪ Hard/Soft Control ▪ Hazards Protection ▪ Managing Multi-Functions ▪ Availability & Management of Services (Toilets, ▪ Vending Outlets (Food, Drinks, Flowers Kiosks, …)	▪ Location ▪ Connectivity to the City ▪ Surrounding Mixed-use ▪ Visual & Physical Accessibility

Table 1: Classifications of Proposed Factors; Authors.

A. Physical Aspects

Physical aspects of urban spaces consist of tools and facilities to serve the daily needs of people, and they are immensely important in determining the design of a public place. The factors which are part of the physical aspect include accessibility, facilities, landscape features, safety measures, and space morphology. Accessibility is the characteristic of a given place to be utilized by individuals with varying capabilities. The concept is commonly invoked in urban design when examining the prospects of diversified usage and features numerous aspects aimed at assisting optimal habitation. In the conventional design environment, accessibility is integral to the construction of structures in both public and private spaces due to its ability to define the degree of comfort presented by the facility.

Landscape features significantly influence the adaptability of a given space to achieve a given design outcome. The geological forms determine the number of resources required to accomplish a given design objective. Harsh terrain may present a huge problem during the adaptation of the space for constructive use. As such, an in-depth analysis of the environment is required to determine the level of design and resources needed to develop the area. Other landscape features such as the availability of adequate finishing materials, lighting, and furniture also play an integral role in defining the design characteristics of the space and assist in making it encourage social interaction among users. The furnishing of the space should be appealing to improve the quality of the experience. Artificial and ambient natural lighting should be favored to increase accessibility and limit the prospect of discomfort. The safety measures that can be integrated into the given area, including

railing, fire suppression, and anti-earthquake protection, also markedly determine the nature of structures in the region. However, space morphology is one of the most critical factors in urban planning determined by human scale, divisions, proportions, size, and shape.

B. Psychological Aspects

Psychological aspects of urban spaces consist of the essential physical, mental and social human needs that has direct effect on place satisfaction. The factors which take part of the psychological aspects include positive sensory impressions, tension-free space, names of relaxation and recreation, comfort, encouraging communication, and pedestrian orientation. There ought to be minimal sensory disturbances such as excessive light, heat, or noise on the user. The urban designer has the inherent responsibility of minimizing exposure to any harmful or uncomfortable stimuli that may compromise the quality of the environment. One of the key ways of achieving this includes integrating adequate suppression mechanisms, including air conditioning, blinders, and shades. The spaces should also be tension-free. Essentially regions that require some degree of privacy, such as lavatories, must feature increased security redundancies, including door locks and appropriate signage to minimize tension and confusion during use. Effective communication should be encouraged through public address systems the overall value of the space to the user. The psychological aspect aims to increase social interaction. The space should encourage genuine interaction between inhabitants and promote sustained use of the available facilities.

C. Geo-Spatial Aspects

The geo-spatial perspective of design discusses aspects such as physical and visual accessibility, surrounding and mixed-use, connectivity to the city, and location. Gehl [10] observes that the designing of public spaces should factor in unhindered views through structures such as windows and other facilities that promote visual comfort. Occupants should be able to converse comfortably with a reasonable sense of privacy. The concept also features lower noise levels with adequate separation techniques. Physical activities such as entertainment and multi-seasonal are defining factors of the ideal design. The dimensions of the buildings and spaces should promote their intended use and encourage desired behavior to provide a favorable experience to the occupants and a return on investment to the proprietors [4]. Positive aspects of climate, including ventilation, warmth, and shade, should also be enjoyable. Gehl [10] summarizes by noting that space should integrate an aesthetic quality, including elaborate vistas and exquisite detailing.

D. Management Aspects

The management aspect examines the actors that determine the overall comfort of the space and covers the way that the public space is managed. This includes: ventilation, multi-functions, entail vending outlets, availability and managing services, hazard protection, soft and hard control, and safety and security. The primary key of any development of public space is to ensure usability and comfort. One of the key ways through which this is achieved is the integration of amenities aimed at improving the quality of the experience of the user. Vending outlets provide the occupant with sufficient nourishment, thus, enhancing the livability of the space. Hazard protection limits the level of exposure to potentially harmful elements that may cause pollution, including environmental agents such as noise and light. Space should be adequately secure with limited access to unauthorized persons. The security system should be redundant and geared towards eliminating any possible threat to the well-being of the users.

The researchers tried to organize these factors in a structured model as presented in the following figure.

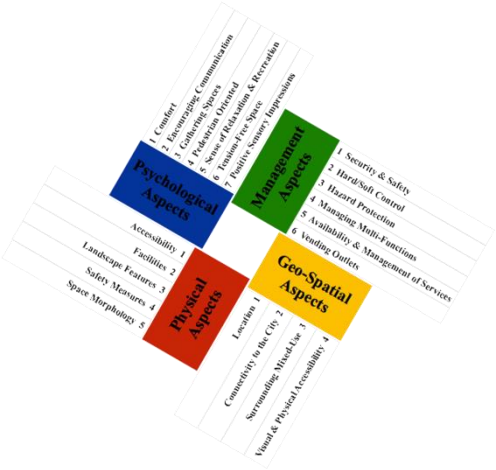

Fig. 1: Prelinemary Structure of the Proposed Model; Authors.

IV. MODEL UTILIZATION WITH THE LOCAL CONTEXT

Jeddah is a coastal city in Saudi Arabia's Makkah province. The Metropolitan region is a strategic commercial center with a population of about 4.7 million people [14]. Jeddah is often regarded as the gateway to the holiest sites in Islam, with Medina being situated about 220 miles north and Mecca, 40 miles west [14]. The metropolis is the second largest in the country and eighth in the entire Middle East. The port is among the busiest and is widely responsible for much of the economic activity in the region. Jeddah is a critical financial in Saudi Arabia and the entire Middle East due to its intense focus on developing capital investment and spurring engineering and science. The region has an immense cultural value to its people, considered one of the most foreigner-friendly cities in the country (Figure 2).

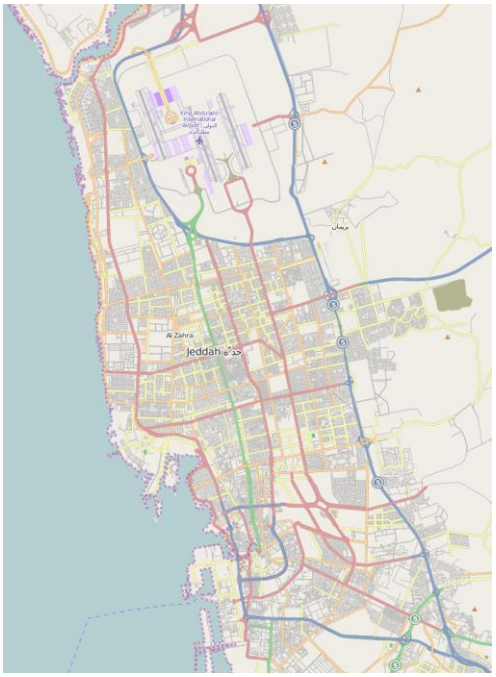

Fig. 2: Jeddah Map; [15].

The Jeddah Corniche is one of the most important centers for cultural exchange in the city. The recreational area is situated on the 30-kilometer strip along the Red Sea and features numerous attractions, including the King Fahd's Fountain, massive sculptures, pavilions, and a coastal road [16]. The region also hosts the Al-Rahman Mosque, a popular tourist site for local and foreign visitors (Figure 3).

Fig. 3: Jeddah waterfront; [17].

Jeddah Corniche plays a critical role in promoting cultural interaction through facilities such as blossoming gardens, dancing fountains, hotels, cultural centers, aquariums, retail outlets, and restaurants. The area enjoys relatively favorable weather due to its coastal location and regularly hosts events such as the Saudi Arabian Grand Prix, which not only brings together people of the city but the entire country and the Middle East, resulting in extensive social and cultural exchange (Figure 4).

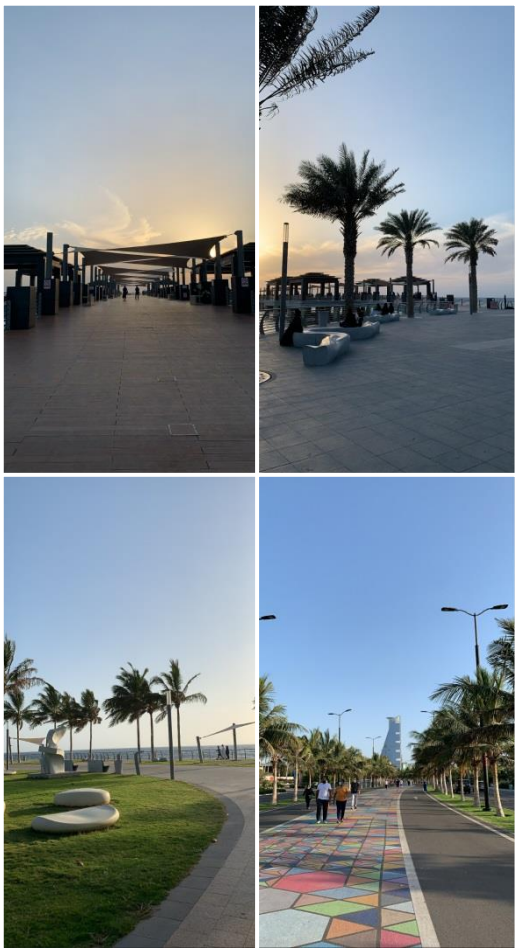

Fig. 4: Features of Jeddah waterfront; Authors.

A quantitative method was adopted in this study in terms of a survey by using questionnaires to assess the users' perception about the factors affecting social interaction in public open spaces with more focus on water-front open public spaces in Jeddah city. This paper aims to investigate the level importance of the proposed factors to increase social interaction of the residents in Jeddah Corniche open spaces. The researchers used 31 rating-scale questions to measure the users' perception about the importance of the proposed factors. The questions were designed to investigate the user's opinion in an indirect way. The questions were linked to the proposed factors according to the following illustrated matrix (figure 5).

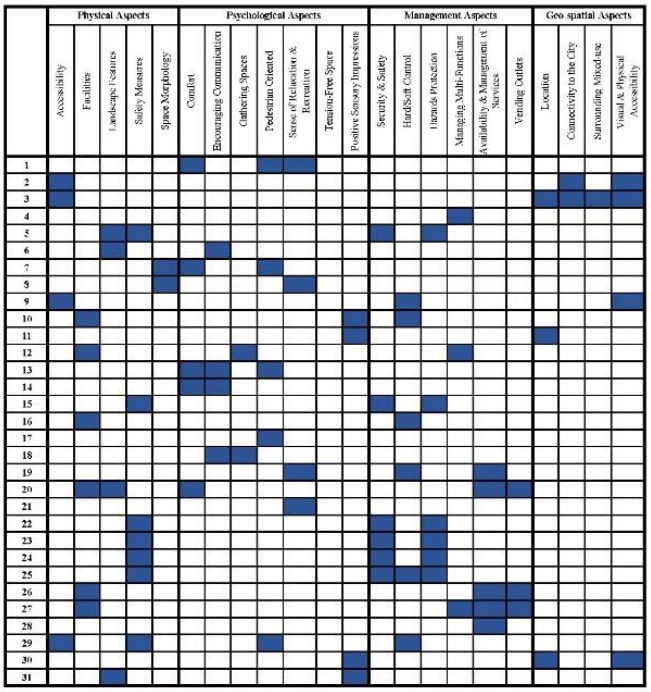

Fig. 5: Correlation the proposed factors and survey questions; Authors.

V. RESULTS AND DISCUSSION

A random sample of 122 respondents from Jeddah residents participated if filling the online questionnaire. The gender balance of the respondents was reasonably fair. 36% of the respondents were between 15-25 years, 52.6% were between 25-40, while 10.5% were between 40-60, and only 0.9% were above 60 years. The relative majority don't have a fixed rate for visiting the Corniche (47.4%), while 21.9% visit it on a monthly rate, 17.5% weekly, and 13.2% rarely visit the space. Visiting the space with family represented the higher percentage of the responses (48.3%), while 19.3 of the respondents visit the space with friends, few people visit it alone (2.6%) or as couples (3.5%), and a percentage of 26.3% visit the space with all types of company.

The responses of each question were collected and the importance value was calculated separately, the values were correlated according to the matrix presented in (Figure 5) to calculate the relative importance of each factor. This+96+++* was followed by calculating the importance of each category based on the average of the values of its factors. The following tables show the analysis of the results of the model categories respectively.

Table 2: Results of evaluating Physical Aspects;

Physical Aspects				
Accessibility	Facilities	Landscape Features	Safety Measures	Space Morphology
77.16%	81.90%	79.24%	83.67%	75.88%
79.57%				

Authors.

The results show that "Safety Measures" comes on the top important factors (83.67%) followed by "availability of Facilities" (81.9%). Factors of "Landscape Features" (79.24%), "Accessibility" (77.16) and "Space Morphology" (75.88%) respectively come on the second level of importance among the Physical Aspects Category.

Table 3: Results of evaluating Psychological Aspects;

Psychological Aspects						
Comfort	Encouraging Communication	Gathering Spaces	Pedestrian Oriented	Sense of Relaxation & Recreation	Tension-Free Space	Positive Sensory Impressions
76.26%	74.34%	75.44%	80.23%	77.92%	77.92%	75.18%
76.76%						

Authors.

Only one factor "Pedestrian Oriented" (80.23%) comes on the top important factors of the Psychological Aspects. The majority of the factors: "Sense of Relaxation & Recreation" (77.92%), "Tension-Free Space" (77.92%), "Comfort" (76.26), "Gathering Spaces", and "Positive Sensory Impressions" (75.18%) respectively come on the second level of importance. While "Encouraging Communication" (74.34%) comes on the third level among the Psychological Aspects Category.

Table 4: Results of evaluating Management

Management Aspects					
Security & Safety	Hard/Soft Control	Hazards Protection	Managing Multi-Functions	Availability & Management of Services	Vending Outlets
83.36%	79.07%	83.36%	81.92%	85.26%	86.79%
83.29%					

Aspects; Authors.

Most of the factors of the Management Aspects comes on the top important factors: "Vending Outlets" (86.79%), Availability & Management of Services" (85.26%), "Hazards Protection" (83.36%), and "Security & Safety" (83.36%) respectively. And only one factor "Hard/Soft Control" (79.07%) nearly moves to the second level of importance among the Management Aspects Category.

Table 5: Results of evaluating Geo-spatial Aspects;

Geo-spatial Aspects			
Location	Connectivity to the City	Surrounding Mixed-use	Visual & Physical Accessibility
70.13%	74.78%	65.94%	74.63%
71.37%			

Authors.

None of the factors of the Geo-Spatial Aspects comes on the first level of importance, while half of them comes on the second level: "Connectivity to the City" (74.78%) and "Visual & Physical Accessibility" (74.63%). The rest comes on the third level: "Location" (70.13) and "Surrounding Mixed-use" (65.94%).

According to the above results; very important factors like: Availability & Management of Services, Hazards Protection, Pedestrian Oriented, and Safety Measures are distributed among the categories except the Geo-Spatial Aspect. All the tested factors are evidently influential on public open space design and all of them must be taken into consideration to achieve social interaction in the public open space (Jeddah Corniche). The factors ranged between important to very important factors from the users' perspective.

The researchers used the records of evaluation of the importance of the proposed factors, based on the users' perception, to develop the representation of the proposed model to show the relative importance of the factors (Figure 6). This arrangement could be helpful for designers and decision-takers to set priorities of design decisions and action plans.

Fig. 6: Classified Structure of the Proposed Model, Authors.

Dark Colours represent the most important factors, while light colours represent the least important factors

VI. CONCLUSION

The proposed factors are important means to achieve sound social interaction in public open space. The results indicated that Management Aspects are most important category scoring 83.29% of importance. The factors of Physical & Psychological Aspects appear as moderate important factors with scores of 79.57% & 76.76% respectively. While the Geo-Spatial Aspects were highlighted with low importance (71.37%). Considering all these factors in designing, construction, and management of the open urban spaces is essential to enhance social interaction, which will lead to enhance the quality of life of the city residents.

The results of this study could be helpful for urban design professionals, decision-takers, social psychologists, and researchers in this field. The arrangement of the factors enables the decision-takers to set priorities of action plans without ignoring the comprehensive process.

The research opens the door to future studies in terms of enhancing the accuracy of the results by engaging more respondents and including the experts' views. As well as conducting more in-depth qualitative analysis of the responses.

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