

Individual Action and Social Interaction in the Built Environment: An Analytical View

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Abstract: The previous studies were relatively failed to identify multiple types of actions that individuals engage in during the process of creating social interaction as an important aim of providing a healthy built environment. Based on individuals' location and the type of their presence in the built environment, this study suggests classifying individuals' actions into four typologies. In addition, two categories of social interaction are introduced regarding the types of individuals' actions. The proposed typologies allow researchers to better consider and classify the effective factors in the social interaction process among individuals in a built environment.

Key words: Individual action, built environment, social interaction, healthy built environment, environmental information, action typology, affordances

INTRODUCTION

Improving social interactions among individuals is an important aim and determinant of providing a healthy built environment. Healthy built environments have typically been investigated using four domains including the relationships between the built environment and physical activity, the built environment and mental health, the built environment and social capital and the built environment and obesity (Renalds *et al.*, 2010). With regard to those studies on the relationship between social capital and the built environment, in particular, social capital refers to the connections between at least two individuals in society (Carpiano, 2006). Thus, identifying the effective foundational factors that increase the level of social capital in the built environment can lead to appropriate utilization of these factors and can promote public health. Figure 1 shows that one of the most important factors involved in the formation of social capital is social interaction among individuals (Browne-Yung *et al.*, 2013; Nogueira, 2009; Nyqvist *et al.*, 2013; Scheffler and Brown, 2008).

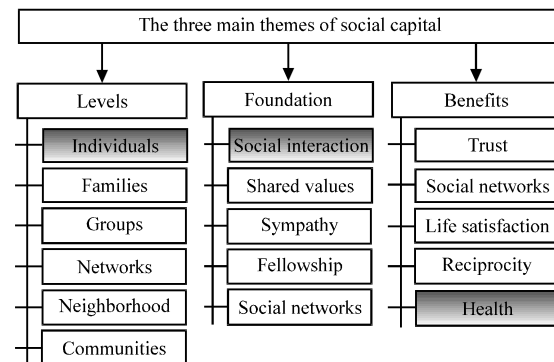


Fig. 1: Main themes of social capital

The well-known relative failure to identify the effective factors in social interactions occurs because there are multiple types of individual actions involved in the process of creating social interaction. In addition, it is not settled which of these actions in the built environment are affected by which factor(s). In this regard, the built environment as an aspect of social life (Hillier, 1996), acts as a factor that might predict social interaction

(Brown *et al.*, 2009). Although, the built environment, social interaction and action are closely connected to one another, few studies have considered all three related subjects together; instead, most studies have focused on two of the three subjects. Therefore, the current study proposes an analytical explanation of and identifies the effective factors in the complex process of people engaging in social interaction in the built environment.

DISCUSSION

The built environment and action: In this study, the built environment is defined as those places and spaces built or modified by people in the physical world (not in the virtual world) such as buildings, parks and transportation systems. Since, human actions are affected by myriad factors including the characteristics of the built environment, people and tasks (De Oliveira *et al.*, 2009), individuals sometimes perform different actions in the same built environment (Kim *et al.*, 2011). Studies from different perspectives have been conducted in various fields to clarify the relationship between the built environment and individuals' actions. In this regard, some studies have emphasized 'context' defined as the environment in which communication may happen or take effect as an important factor in creating interpersonal communication. Knapp and Daly argued that it is essential to study and understand context to acquire in-depth knowledge regarding interpersonal interactions. Although, the environment has been considered an important element in some theories related to interpersonal communication, the process of executing an action by an individual in the built environment has been explained directly through two essential theories: the theory of affordances and Norman's theory. While both theories consider the same approach regarding the relationship between the built environment and engaging in an action (Fig. 2 and 3), they focus on different aspects of this process.

The theory of affordances focuses on the link between the sources of environmental information and its impact on people's actions. Indeed, affordances are qualities or properties of a perceived environment that allows a person to perform an action (Gibson, 1978). The sources that create information consist of not only the objects in but also the properties of the built environment. This information includes a large collection of data that can be observed by human beings through the five senses. A variety of scientific disciplines can create this environmental information (e.g., architecture, urban design, civil engineering and electrical and mechanical

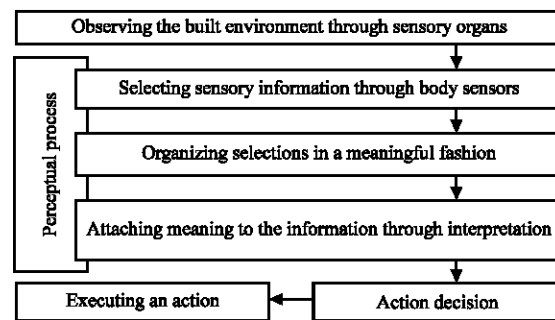


Fig. 2: The process of executing an action based on the theory of affordance

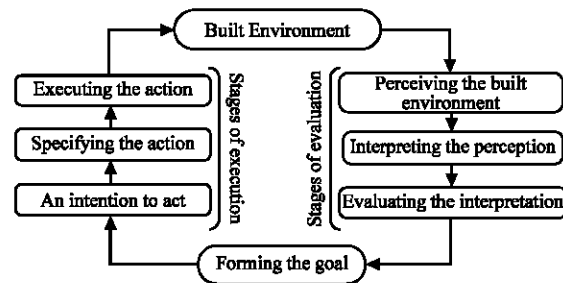


Fig. 3: The process of executing an action in the built environment based on Norman's theory

installations). Kim *et al.* (2011) introduced the following perceptual process grounded in the theory of affordances: first, the sensory organs observe the information; second, body sensors select the sensory information; third, the selections are organized in a meaningful fashion and fourth, meaning is attached to the information. This perceptual process leads to action decisions before the execution of an action and is presented in Fig. 2.

Likewise, Norman (1988) considered the process of engaging in an action by an observer in the world through seven stages including one stage for goal creation, three stages for evaluation (perceiving the state of the world, interpreting the state of the world and evaluating the outcome) and three stages for execution of the action (forming an intention, specifying an action and executing the action). According to Norman's theory, since the built environment is part of the world, the seven stages can be illustrated to explain exactly what happens when someone performs an action in a built environment (Fig. 3).

Although, the theories identify different details in the processes of executing an individual's action in the built environment (Fig. 2 and 3), the theories share a common attitude which involves the creation of an individual's action through a perceptual process in his/her mind based on information that is observed. Indeed, 'perceptual

properties of the environment have functional significance for an individual'. This psychological process is obtained by analyzing and synthesizing knowledge derived from the comprehension of information in the human mind (Ackoff, 1989; Bierly III *et al.*, 2000; Davenport and Prusak, 1998) and culminates in an individual's action. Therefore, any effective factor in this psychological process affects this action.

Action and social interaction: Action is the basic mechanism of social processes (Freese and Burke, 1994) and social interactions consist of the acts, actions or practices of two or more people that are performed toward one another and the responses they lead to in the other (Centelles *et al.*, 2013). Indeed, social interaction consists of all the acts, actions and practices that implicate more than two agents and influence or take into account other agents' activities, experiences or knowledge states (Nguyen and Katarzyniak, 2009). Furthermore, according to Scheffler and Brown (2008), social interaction consists of the social connections that occur either between similar individuals (bonding) or dissimilar individuals (bridging). Likewise, these connections can cross various levels of social status (linking). These social interactions can be obtained from social networks and social support and are based substantially on the nature of individuals (Al-Homoud, 2003; Crenson, 1978; Hsieh, 2008).

Although, social interaction is a type of action between at least two persons regarding their awareness of one another, it does not necessarily require being together or directly behaving in response to one another. For instance, telephone contact and letter-writing are two types of social interaction. In other words, the type of behavior, the physical relation or the physical distance does not explain social interaction.

The built environment and social interaction: Built environments may facilitate social interaction in a variety of ways including face-to-face meetings, telephone contact, exchanging email/text messages and internet chats (Wang and Lin, 2013). Indeed, individuals are most likely to engage in social interaction regularly with others who are in the same or different environment. Although, the presence of two individuals in the built environment facilitates social interaction between them, the absence of one of them in that built environment does not necessarily mean that there will be no social interaction between them. However as argued above, the built environment affects an individual's action before he/she has decided to engage in social interaction with another. An example

illustrates the possibility of creating several social interactions among individuals regarding their locations in the built environment. Figure 4 shows that person A in the built environment can create social interaction with persons B and C while one is inside and the other outside of the particular built environment. Regarding the effect of the built environment, the following individual actions and social interactions can be recognized: in the process of creating social interaction between persons A and B:

- The actions of A are affected by the built environment before the creation of social interaction with B
- The actions of B are affected by the built environment before the creation of social interaction with A
- Social interactions between A and B are affected by the built environment

In the process of creating social interaction between persons A and C:

- The actions of person A are affected by the built environment and the presence of person B before the creation of social interaction with person C
- The social interaction between A and C is an action in a situation in which only A is affected by the factors presented in the built environment

In essence, the built environment provides various opportunities for an individual to engage in social interactions with another. In addition, individuals in these locations are affected by different factors related to environmental information and the presence of (an) other individual(s).

In this regard, two issues should be considered: first, the effect of the built environment on an individual's action before the possibility of creating his/her social interaction with another person and second, whether the second individual involved in the social interaction is either inside or outside of that built environment. To understand how previous studies considered these issues, the following review was conducted (Table 1).

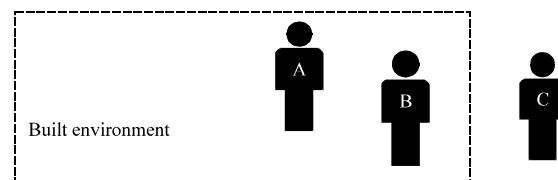


Fig. 4: Individuals inside and outside of the built environment

Table 1. The list of studies that investigated the effects of environmental factors on social interaction in the built environment

Researchers (year)	Case study	Environmental factors and the sources of environmental information which affect social interaction	Q1*	Q2**
Uslu (2010)	Residents of a neighborhood in an urban transformation area (Ankara, Turkey)	Some factors related to landscape design including the presence of at 4-5 story-high buildings (at most), parks in walking distance, common gardens and entrances and structures like clubs	No	No
Al-Homoud and Tassinary (2004)	Residents of single-family homes in city blocks (College Station, Texas, USA)	Most important factors were territorial markers consisting of landscaping, decorating (yard furnishing), signs and fencing	Yes, the effect of the built environment on some actions by individuals (e.g., sitting and standing) was considered***	No
Mansor <i>et al.</i> (2012)	People in a town park (Taiping, Perak, Malaysia)	Suitable networks of greenery and open spaces	Yes, the effect of the built environment on some actions by individuals (e.g., walking, jogging, sitting and enjoying the environment) was considered***	No
Lee <i>et al.</i> (2010)	Residents of a public apartment complex (Kwangju, South Korea)	The development of plans in housing units, floor plans, corridors, common halls and entrance spaces on the first floor	No	Yes
Hickman	Residents of six deprived neighborhoods (England, Scotland and Wales)	The existence of local places such as local shops, pubs and cafes	No	No
Abu-Ghazze	The residents of six patterns of residential buildings (Abu-Nuseir, Amman, Jordan)	The layout of the physical plan in residential neighborhoods regarding the design of outdoor spaces with attention to some components, including accessibility, connection, space quality and design details	Yes, the effect of the built environment on some actions by individuals (e.g., walking, sitting and looking) was considered***	Yes
Sharmeen <i>et al.</i> (2014)	Dutch population and a number of university students (Netherlands)	Geographical distance with alter and accessibility to facilities and transport infrastructure	No	No
Huang (2006)	Residents of three high-rise buildings (Taipei, Taiwan)	Existence and integration of design elements such as seating facilities with shade, plants, water features, artworks and sculptures with space types	Yes, the effect of the built environment on some actions by individuals (e.g., walking, sitting and watching) was considered***	No
Zemke and Shoemaker (2007)	Adult residents of the Las Vegas area at various commercial "locals" casinos (Las Vegas, Nevada, USA)	Ambient scent in space	Yes, the effect of the built environment on some actions by individuals (e.g., looking and moving chair for sitting) was considered	No
Neutens <i>et al.</i> (2013)	Residents of three metropolitan regions, Brussels, Antwerp and Ghent (Flanders, Belgium)	Some factors related to the urban spatial structure such as the proximity to major city centers, distance to transportation infrastructure, density, diversity, the job-housing balance and the proximity of city locations to the economic nexus of the area	No	No
Al-Homoud and Abu-Obeid (2003)	University students in the setting of two zones in courtyards at Jordan University of Science and Technology (Irbid, Jordan)	Some environmental functions (e.g., kiosks and public cafeteria) for increasing pedestrian flow in enclosures	Yes, the effect of the built environment on some actions by individuals (e.g., walking and sitting) was considered***	No

*Question 1 (Q1): did this study consider the effect of the built environment on an individual's action before creating social interaction?; **Question 2 (Q2): did this study consider whether the second individual involved in the social interaction is inside or outside of that built environment?; ***This study did not consider the effect of actions by individuals on social interaction

First, we searched for keywords consisting of social interaction with the built environment, environmental, housing, architecture, urban, design, building, place, space, residential, neighborhood, apartment, area and residents in English in several databases such as the Web of Science and Science Direct, based on the contents of titles and abstracts. A total of 158 titles were identified. Then, to eliminate non-relevant items for purposes of this paper, 144 titles were excluded and some entries were added (7 items) through reference mining based on

eligibility criteria. The focus was on sources that were published after 1990. Eleven eligible studies remained (Fig. 5).

Table 1 shows that the various effective environmental factors in the process of executing social interactions among people have been addressed in several studies; however, only a few of these studies considered which factor(s) affect(s) which type(s) of an action(s) by individuals and how these actions lead to social interaction among people inside or outside of the built environment. Thus, the following typologies are

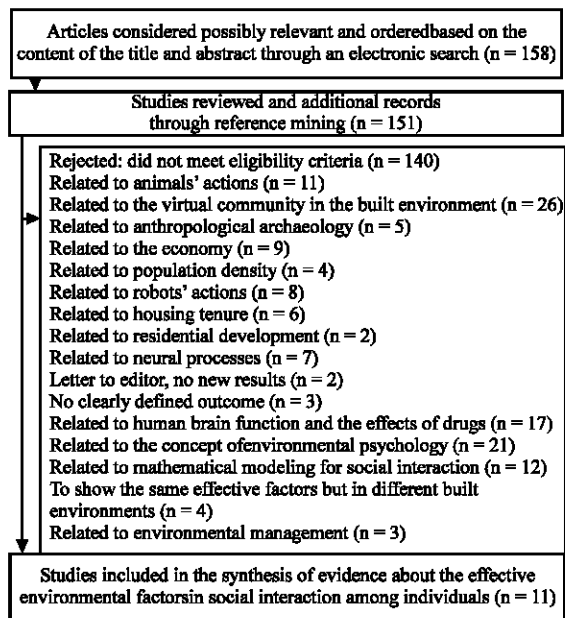


Fig. 5: Review flow diagram

suggested to consider and classify the effective factors in the process of social interaction among individuals based on different individual's actions in the built environment.

Typologies of individual's action and social interaction in the built environment: Regardless of whether social interaction results from either social support or social networking or from different ties with different types of social interactions (bonding, bridging and linking), the setting should provide individuals with opportunities for contact and a reasonable distance to cover to achieve social interactions (Van den Berg *et al.*, 2012; Wang and Lin, 2015; Unger and Wandersman, 1982).

Regarding the above-mentioned subjects, an individual's action in the built environment is typically influenced by the presence or absence of another individual in that built environment. Moreover, every individual action has knowledge content, evaluation information and invitational form dimensions that influence creating social interactions with another person (Chiu, 2000). Depending on the type of presence that an individual maintains in the built environment, his/her action is an essential determinant and affects his/her social interaction with other individuals. Regarding the psychological process of executing an individual action, the presence of an individual in the built environment can be considered from the two following main perspectives:

The physical presence of an individual in the built environment: The physical presence of a person in the

built environment may limit the opportunities of another individual to select spaces to engage in an action in that built environment. This factor is called the "physical presence" of an individual in the built environment. For example, a person cannot sit in a chair that is already occupied by another person.

The perceptual presence of an individual in the built environment: When person A has personal information about (or is familiar with) person B, the presence of B affects the perceptual process of A in engaging in an action in the built environment (Reis *et al.*, 2011). Additionally, the shared history between individuals who know one another often provides common knowledge and psychological expectations that may or may not be receptive to strangers. Thus, a person may interpret and respond to a friend's action differently than to the identical action under taken by a stranger (Schiffman, 1984). For instance, person A may prefer to go to another place because she/he is not interested in meeting person B in that place. This factor is called the "perceptual presence" of an individual in the built environment.

Based on the types of presence in the built environment (physical or perceptual), six types of actions by individuals in the built environment are proposed (it should be noted that to better explain the types of actions, the same action (the action of "sitting" as the most popular action in previous studies (Table 1) for a male individual) was used as an example in all categories. Certainly, any action or gender could be selected).

Solitary action (type 1): The first type of solitary action is a type of action executed by an individual in the built environment without attention to the physical and perceptual presence of another person in that built environment. In other words, the physical and perceptual presence of an individual does not influence another individual's actions. For example, when a person wants to sit in a reserved chair in a place, the physical presence of another person does not affect his action (sitting in this chair). In addition, because he does not have any feelings toward or information about other people upon his arrival in that place, perceiving their presence does not impact the perceptual process of his actions in this place. However, social interactions can be created between him and the others after sitting which is related to types E and F.

Solitary action (type 2): In this type of action, an individual engages in an action in the built environment without paying attention to the physical presence of another person in the same environment; however,

attention to the perceptual presence of that person is not able in the execution of his action. For example, when a person wants to sit in a reserved chair in a place, the physical presence of another person in that place is not relevant to his action (similar to type 1) but the perceptual presence of another person in that place is an effective factor because he might already have negative feelings toward another person who is in that area and does not want to create interaction with that person while in that place.

Solitary action (type 3): This type of action is engaged in by an individual in the built environment who is paying attention to both the physical and perceptual presence of another person in that same built environment. For example, when a person wants to sit on a chair, the physical presence of another person may cause a limitation as to which chairs can be selected. Moreover, because he knows the person currently sitting in that place and prefers to sit near (or far from) him/her, the choices of chairs could be affected and eventually limited.

Solitary action (type 4): This type of action is engaged in by an individual in the built environment in which only the physical presence of another person in that built environment is significant. The perceptual presence of another individual is irrelevant. For example, when a person wants to sit in a chair, the physical presence of another person may limit the choices of chairs. However, because he does not have any positive or negative feelings toward anyone near him, the perceived presence of another does not affect his actions. Therefore, he is free to sit in any vacant seat.

Types E and F are actions created between two individuals. They are called "Nonsolitary Actions" which means that they are types of social interactions. There are various types of social interaction derived from different conditions including conventional social situations (e.g., shaking hands, asking someone to sit down, waving goodbye, bowing/curtseying, being caught while falling down, pointing upwards, pointing downwards and hugging, among others), emotional situations (e.g., being told off, sharing happiness, crying and being comforted, being happy to meet another, scaring someone, being sent off and calling someone to reveal a secret) and scenes from games (e.g., playing football, playing children's games, dancing, fencing and greetings in judo, among others (Centelles *et al.*, 2013).

Indoor-social interaction (non-solitary action type 1): This type of action occurs between at least two individuals who act in relation to one another and involves the

responses they create as a result. In this type of action, both individuals are present in one built environment. Moreover, each executes a type of solitary action and then social interaction between them can be created.

Outdoors-social interaction (non-solitary action type 2):

This is a type of action between at least two individuals in which one is not present in the built environment. Because social interaction occurs strictly when people are aware of one another and is not defined by physical distances, it can be created between individuals even when one individual is not present in a place. For example, a person sits in a place and this place affects his calmness. This positive feeling may persuade him to call his friend to speak with him and may explain his feeling in that place, sharing his positive feeling with his friend. In this type of action, the individual present in the built environment executes a type of solitary action which leads to the creation of his social interaction with another individual outside of that built environment.

CONCLUSION

To analyze how different factors affect social interactions among people in a built environment, this article introduces a typology of individual actions and social interactions in detail and in their entirety. Organizing individual actions and social interactions among individuals provides a foundation for researchers to consider which factors influence which type of actions by individuals in the built environment. Furthermore, the simplicity of the typology increases the tractability of coding for reviewing various data obtained from different studies and helping researchers to study the levels of individual action and social interaction. These dimensions also provide the theoretical underpinnings of the relationship between social interaction and the built environment. Furthermore, the new typology organizes types of individual actions and types of social interaction and explains how specific individual actions constitute parts of specific social interactions in the built environment.

RECOMMENDATION

These classifications of social interactions and individual actions enable researchers to test several hypotheses. Thus, empirical studies in different built environments will provide more details and attributes for this typology. In addition, studying the relationship between the built environment and social interaction among families and other social groups on this basis is also suggested.

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