Investigation of the Effect of Urban Public Spaces on Human Behavior
(Case study: Vali Asr s.t in Tehran)

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ABSTRACT: This Study has discussed the meaning of public space and has shown that public spaces are an essential part of people's lives. It has also identified the key urban design and architectural ideologies that have influenced the shape of the built environment, and has discussed how each has perceived the value of public spaces. In the following provides an overview of the relationship between people's behavior and experience of public spaces, from an environmental psychology perspective. Methodologies adopted for the study. A combination of both quantitative and qualitative methods of collecting data has been used. The purpose of this study is to explore how public spaces influence human behavior in order to gain an appreciation of the significant role that public spaces play in the daily lives of people. This Study has established that human behavior and experience of public spaces can be influenced by the physical and ambient features of the built environment. It has been identified that physical features may include buildings, streets, landscaping, land forms and architectural elements, and ambient features may include sound, smell, temperature and illumination. It has also been identified that other factors such as age, gender, culture and ethnicity are also capable of affecting the way people respond to the environment. In addition to identifying the perspectives of the users of public spaces through the focus group, the study also identified the role and perspectives of urban planners and consultant designers. These built environment professionals have a significant role in shaping public spaces.

Keywords: Behavior, Public spaces, Architecture, Urban design

INTRODUCTION

Human behaviour, experiences and social interactions in public spaces are believed to be the result of the processes of the mind that are influenced by the different features of these spaces. These features may be physical, social, cultural or sensory but what they share in common is the power to affect people's behaviour in, and experience of the public realm.

Those responsible for designing, producing and maintaining the form and feel of public spaces are professionals such as planners and designers. Public authorities such as local councils, law enforcers and other decision making bodies also have an important role. These figures dictate what public spaces will look like, where they will be located, how they will be enclosed, and in effect, how they will be experienced by the users.

At the same time, the users of these spaces are also capable of influencing their form and feel, by introducing social characteristics and elements such as culture, gender, sexuality, ethnicity and age. These elements, together with the physical and ambient (or non-physical) features of the public space, are capable of having a profound effect on the way that people behave, experience and interact in public spaces.

In a journal article entitled A Theory of Human Motivation, the behavioural theorist Abraham Maslow (1943) identified a number of factors that are essential in motivating people and steering people to behave in certain ways. The theory which came to be known as Maslow's Hierarchy of Needs suggests that the essential factors in motivating behaviour are the physiological, biological or aesthetic needs, the need for safety, the need for love and belonging, and the need for self-

actualisation, status or esteem (Lang, 1991 & Maslow, 1943). By drawing from Maslow's Hierarchy of Needs and considering the relationship of these factors with the built environment, it is reasonable to hypothesise that certain aspects of human behaviour are capable of being affected by the presence of the physical and ambient features of public spaces. The physical features of public 2 spaces may include elements such as buildings, streets, land forms and other people, whereas the ambient features may include elements such as illumination, sound and temperature.

This interest in the complex relationship between human beings and their surrounding environment is not new and is referred to as environmental psychology. It is a field of interest that is not only shared by psychologists, sociologists, geographers and anthropologists, but also by planners, designers and public authorities. Environmental psychology studies how people relate to the built environment, by examining how their mental processes and behaviour affects, or is affected, by their surroundings.

The fundamental concern of environmental psychology is that of the quality of life and the quality of the built environment. The role of the planner, designer and public authority in all of this is ultimately to improve human environments, by devising practical methods, policies and planning, design and educational techniques (Zube & Moore 1987) that are receptive to the findings of environmental psychology.

MATERIALS AND METHODS
Research Methodology
 Methodologies adopted for the study. A combination of both quantitative and qualitative methods of collecting data has been used. The quantitative methods consisted of questionnaires sent to designers and local council planners. The qualitative methods consisted of a community focus group and an interview with an urban designer.

Purpose and Objectives of the Study
The purpose of this study is to explore how public spaces influence human behaviour in order to gain an appreciation of the significant role that public spaces play in the daily lives of people. This will enable built environment professionals and public authorities to comprehend the effects that planning, design and development decisions are capable of having on the social, psychological and emotional wellbeing of people.

Research Question
What are the physical and ambient features of the built environment that shape public spaces, and how do they affect the behaviour and experience of people in public spaces?

Scope and Limitations of the Study
It is important to note that this study is not without its limitations. While the study has focused on a phenomenon that is extensive and complex, there has been an effort to narrow its scope. Nevertheless, given the constraints of time and wording, this has in effect resulted in only passing reference to other research areas that are associated with the present study. Research areas such as personal space or the effects of crowding make important contributions to the behaviour of people in public spaces, however each are capable of forming a separate research project. Although this might be viewed as a limitation of the present study, at the same time it provides an advantage in that it can lead to future in-depth research on this topic.

The present proposition is presented in two sequences from Vali Asr, Tehran, which includes the following sequences: (First sequence: from Valiasr Square to Valiasr crossroad and the second sequence: From the railway field to intersection of Mowlawi).

RESULTS AND DISCUSSION
The Concept of Public Spaces
The popular notion that public space is a stage, and that there is an audience watching is reminiscent of Shakespearean times. Not unlike Shakespeare, French (1978), Whyte (1988), Carr et al. (1992), Engwicht (1999) and more recently Cousseran (2006) also describe public spaces as theatrical stage-like settings. This notion is based on the idea that public spaces by their very nature allow for the unfolding of real-life human dramas and the freedom of personal and social expression for both individuals and community groups, such as that which is depicted in (Figure 1) below (French, 1978; Whyte, 1988; Carr

Fig. 1: street entertainer at a pedestrian mall in Vali Asr s.t, Tehran draws attention from passers-by

et al., 1992 and Engwicht, 1999).

The public spaces of a city, such as its streets, footpaths, waterfronts, parks, plazas, town squares and laneways give form to the ebb and flow of human exchange and interaction (Carr et al., 1992). They are often where people find some of the most stimulating, exciting and worthwhile experiences of their lives (Beattie & Lehmann, 1994). The Oxford Dictionary (1978) defines the term 'public' as:

 of or concerning the people as a whole;

 representing, done by, or for the people;

 open to or shared by the people;

 open to general observation, done or existing in public.

Accordingly, public spaces are places that are provided by public authorities for the shared use by all people regardless of their personal, social or cultural differences. Public spaces should be free to use and access, and should not impose discriminatory burdens on the types of people who can access them nor the purpose for which they can be used.

The Significance of Public Spaces

Most people have a need and desire to maintain links with the rest of the world (Carr et al, 1992). Public spaces are significant because they are able to bridge that link. Carr et al. suggest that aside from bridging this link, public spaces are important because they provide avenues for movement, a means of communication, and a common ground for enjoyment and relaxation. The ability of public spaces to educate and offer knowledge is also a significant aspect, particularly when those spaces play an important role in the history of the city and the social life of its citizens (Madanipour, 2003).

Overtime many public spaces have been the epicentre of social life by providing people with opportunities to gather and socialise, to celebrate, for children to play in, and for the undertaking of economic, cultural, religious and political activities (Engwicht, 1999; Beattie & Lehmann, 1994). An examination of the patterns of historical urban settlements such as that of the Ambo people and the Omarakana Village depicted in (Figure 2) below show that the most significant places of their settlements were literally located at the centre (Beattie & Lehmann, 1994).

Despite the changing nature of modern neighborhoods and communities, public spaces are still an essential part of life because they provide opportunities for different people – young, old etc, to experience a variety of human encounters.

How Public Spaces are Made

The creation of public spaces can be driven either directly as a result of a government decision, or indirectly, as a result of private developments; the need to provide better services; or by urban redevelopment. Direct decisions to create new public spaces occur infrequently (Mossop & Walton, 2001; Winikoff, 2000).

Regardless of what drives the decision to improve an existing public space or create a new one, the figures involved in the complex process will generally be the same. The process will need to involve communication between planners, designers, builders, place managers, policy makers, and the public users.

The initial stages of the process will include the gathering of information, evaluation and consideration of alternative options. This is then followed by transferring the information into a concept design plan which is followed by the decision-making (Carr et al., 1992). Accordingly, the early stage of the process is the most critical time for considering and understanding the potential impacts of the designs on the experience of users of public spaces.

The Relationship between Public Spaces and Behaviour

People have a significant relationship with public spaces because they use and experience them on a daily basis. The urban ideologies suggest that the attention given to the form of public spaces has ultimately been driven by the desire to improve the quality of life. As the modernist and post-modernist influence of architecture has shown, this desire has not necessarily always been achieved.

Built environment professionals and public authorities, particularly local councils, recognize that public spaces are significant. They understand that creating attractive, well-designed and maintained spaces that provide a variety of opportunities for users can promote a sense of community as well as generate economic benefits. When these figures
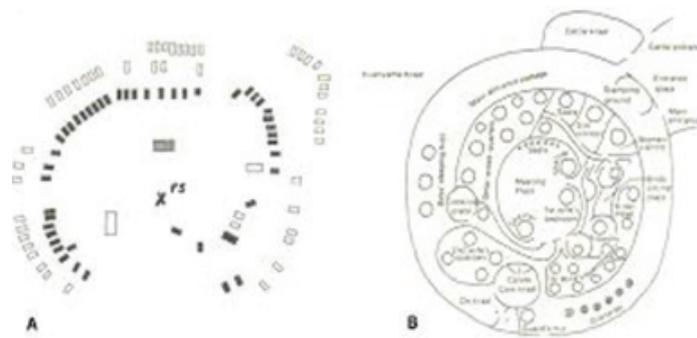

Fig. 2: Plan of an Omarakana village depicting the public space at the centre, and B) plan of the Ambo people's settlement depicting the Meeting Place also at the centre (Source: Lawrence, 1989).

refer to the built environment in terms of being 'humanistic' or at a 'human scale', it shows that they understand that the environment can have a fundamental impact on how people feel in, and experience the environment.

Terms such as 'feel' and 'experience' convey the complexities of the human mind and emotions. In order to appreciate how the environment impacts how people 'feel' and how people 'experience' the environment, it is necessary to understand people's physiological and psychological processes. Perhaps when built environment professionals and public authorities appreciate how the environment affects people's behaviour, only then can a truly 'humanistic' environment be seen.

The Nature of Human Nature: An Examination of the Behavioural Sciences

This part examines the literature on environmental psychology and theories of human behaviour. It also explores the ambient and physical features of the built environment. In doing this, the part addresses the central research question: what are the physical and ambient features that shape public spaces, and how do they affect the behaviour and experience of people? Rather than discussing behaviour in relation to public spaces, the part refers to behaviour in terms of the 'environment'. This mirrors the way in which it is discussed in the literature. The final parts of this part draw together the behavioural theories and discuss how they can be affected by the features of the environment.

What is Environmental Psychology

The relationship between the environment and human behaviour has been recognised for a long time. In order to explain its significance, psychologist Kurt Lewin (1951) argued that behaviours (B) are not only a function (f) of personal factors (P), but also of the environment (E) in which they take place. Lewin expressed this relationship in the formula $B = f(P, E)$. At its core, the study of environmental psychology is concerned with understanding the dynamic relationship between human and environmental factors (Mac, 1993).

The study of environmental psychology does this by drawing from the research findings of behavioural scientists, psychologists, sociologists and ecologists who have been able to demonstrate that the built and natural environment can facilitate, modify or hinder certain human behaviours (Speller, 2006; Canter, 1977). The relationship between people and the environment is examined by focusing on how the physical and ambient stimuli (or features) of an environment affect behaviour and emotions (Mehrabian & Russel, 1974).

Theories of Human Behaviour

In contrast to most other scientific fields that are based on theories and scientific models, the study of environmental psychology lacks a unifying theory that can be applied to all types of environments consistently (Gifford, 2002; Mac Andrew, 1993; Bell et al, 1996; Pomeranz, 1980). The term 'environment' alone is so vast, and the techniques that are used to study it so varied, that it is considered to be resistant to any theoretical unification (Mac, 1993).

In spite of this, behavioural theorists and psychologists have speculated on various environment-behaviour models. A review of the literature suggests that these can be summarised as five main theoretical perspectives. These are as follows:

1. arousal theory;
2. stimulus load theory;
3. behaviour constraint theory;
4. adaptation level theory;
5. environment stress theory;
6. perception or cognition theory.

These theories are relevant to the query of this Reaserch and will be briefly examined in the following section.

The Arousal Theory

Arousal theories relate to how psychologically aroused people are as a result of environmental stimulation. Bell et al. (1996) explain that "arousal is a heightening of brain activity by the arousal center of the brain, known as the reticular formation" (Bell et al, 1996). It is characterised on a scale which features
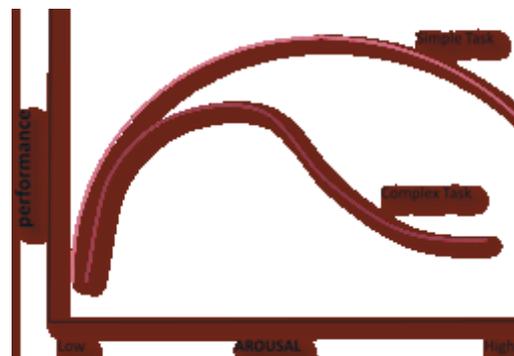

Fig. 3: Yerkes Dodson Law – arousal above the optimal leads to decrements in performance (Source: Veitch & Arkkelin, 1995).

sleep at one end, and excitement at the other end (Mac, 1993; Mehrabian & Russel, 1974).

Theories of arousal have generally been concerned with the relationship between a person's state of arousal and their behaviour or performance. This relationship is referred to as the Yerkes-Dodson Law and is usually depicted as a curvilinear relationship as in (Figure 3) below (Mac, 1993). According to this Law performance is at its best when arousal levels are at a moderate level. Performance progressively worsens as the arousal levels either fall below, or rise above the optimum level. The relationship between arousal levels and behaviour and performance has been shown in various studies (Bell et al, 1996). In a study of personal space (the comfortable distance between people) in the men's lavatory, it was found that where personal space invasions occurred, close interpersonal distances caused delays in urinating (Middlemist et al., 1976). This study suggested that arousal associated with personal space invasions produced physiological changes in heart rate, respiration rate, blood pressure and adrenaline secretion (Middlemist et al., 1976; Mehrabian & Russel, 1974).

The Stimulus Load Theory

The Stimulus Load Theory conceptualises the environment as a source of sensory information (referred to as stimulus or stimuli), that provides people with psychological stimulation (Gifford, 2002; Veitch & Arkkelin, 1995). These stimuli can range from simple ambient features such as light, sound or temperature, to complex physical features such as buildings, streets, land forms and the presence of other people.

The Stimulus Load Theory is based on the notion that people have a limited capacity to process environmental stimuli. When faced with an excessive amount of stimuli, or 'stimulus overload', people have a propensity to ignore some features and give more attention to those that are perceived as more important to the task at hand (Bell et al, 1996; Veitch & Arkkelin, 1995).

In a physical environment, a similar situation may occur when a person is in a crowded situation, in an unfamiliar city with towering buildings and lost. Attempts at trying to find the way may be hindered by an overabundance of stimuli such as signs, street patterns, people, cars and buildings. In situations where the more important stimuli are ignored, in this case finding the way, rather than concentrating on getting through the crowd, a person's performance is rendered suboptimal. (Veitch & Arkkelin, 1995) explain that the behavioural after-effects may include errors in judgement, decreased tolerance and frustration, and ignoring others who may need assistance. In contrast to environments with stimulus overload, monotonous environments that are stimulus-deprived lead to boredom and behavioural deficiencies (Bell et al., 1996). This suggests that under-stimulation can be just as detrimental as overstimulation. (Figure 4) below illustrates types of environmental stimulation.

The Behaviour Constraint Theory

The focus of behaviour constraint theories is on the real or perceived restrictions that are imposed on people by the environment, and the perceived degree of control that people have, or want to have, on an environment (Gifford, 2002; Veitch & Arkkelin, 1995). These theories posit that the environment is capable of preventing, interfering with, or limiting the behaviours of individuals (Speller, 2006; Veitch & Arkkelin, 1995).

Where people perceive that they have lost some degree of control over their environment, their first experience is of discomfort, which is then followed by an attempt to reassert their control (Bell et al, 1996). This reaction is described by Veitch and Arkkelin as psychological reactance. It can occur in different situations. For example, to avoid crowding, people may erect physical or social barriers to shut others out (Bell et al., 1996). In dark and deserted streets people may alter their movement patterns or avoid such places altogether.

When attempts to regain control of the environment are unsuccessful, learned helplessness can develop (Gifford, 2002; Veitch & Arkkelin, 1995). This is where people begin to believe that what they do has no effect on the environment and that whatever happens is out of their control. This can result in a sense of despair and feelings of alienation about the environment. In contrast, when people perceive that they have some control over their environment, it has been found that environmental problems such as littering and graffiti are

Fig. 4: Examples of environmental stimuli in the streets of Vli Asr s.t in the form of buildings, streets, buses, signs, colours, signs, images and other people

reduced.

The Adaptation Level Theory

The adaptation level theory maintains that excessive environmental stimulation, or too little environmental stimulation, can have a detrimental effect on people's emotions and behaviours (Gifford, 2002; Bell et al, 1996; Veitch & Arkkelin, 1995). This suggests that a moderate level of environmental stimulation is the most desirable.

Adaptation level theorists assert that the relationship between people and their behavioural response to the environment is comprised of two processes – adaptation and adjustment (Veitch and Arkkelin, 1995). People either adapt by changing their responses to the environment, or adjust by changing the environment where they are (Veitch and Arkkelin, 1995). Either way, the process results in bringing the person back into equilibrium with his or her environment.

To illustrate this concept, an example of adaptation to an extremely noisy street may include physiological responses such as tinnitus ('ringing ears'), constriction of blood vessels, neuromuscular tension (nerve and muscle tension), or vibrations in the ears. An adjustment to the environment may include wearing earplugs or building soundproof walls or windows as a barrier to the noise.

The Environment Stress Theory

The theory of Environmental Stress focuses on the role of physiology, emotion and cognition within the person-environment relationship (Bell et al. 1996). Environmental features are believed to impinge on human senses, causing a stress response where those features exceed an optimal level (Veitch & Arkkelin, 1995; Insel & Lindgren, 1978). Pollution, extreme temperatures, traffic, noise and crowding are typical environmental stressors (Gifford, 2002; Bell et al., 1996).

Environmental Stress theorists believe that once environmental features are recognised as threatening, part of the behavioural response is automatic and begins with an alarm reaction. This reaction causes the affected person to experience alterations to their various physiological and psychological processes (Gifford, 2002; Veitch & Arkkelin, 1995). What follows is a resistance to the stress and attempts to alleviate the stress by drawing on coping strategies (Bell et al., 1996). If there is prolonged exposure to stress, coping strategies diminish and a state of exhaustion sets in. This can lead to mental disorders, lowered resistance to stress or diminished interaction with others (Gifford, 2002; Veitch & Arkkelin, 1995).

The theory also emphasises the role of 'cognitive appraisal' in a person's psychological or emotional stress response (Gifford, 2002; Bell et al, 1996; Winett, 1987). The term 'cognitive appraisal' refers to how a person assesses the seriousness of the situation. Further, it suggests that behavioural responses to stress vary from person-to-person due to individual perception. This may be an indication of why some people are better able to deal with stress than others.

The Perception or Cognition Theory

Cognition theory focuses on people's perception or cognition, rather than the behaviour that they overtly display (Veitch & Arkkelin, 1995; Mac, 1993; Low, 1987; Canter & Stringer, 1975). Unlike the previous theories, Cognition theory is not grounded in science. It concentrates how people perceive the environment according to their learned experience, cultural differences and personality traits (Veitch & Arkkelin, 1995).

Gifford explains that cognition is how "we acquire, store, organize, and recall information about locations, distances and arrangements in buildings, streets and the great outdoors" (Gifford, 2002). Jakle et al (1976) highlight another aspect of the cognition process to do with assigning meaning to the environment. The concept of 'assigning meaning' has been examined extensively by Amos Rapoport (1982), a prominent thinker on the topic (Jakle et al., 1976; Rapaport, 1982).

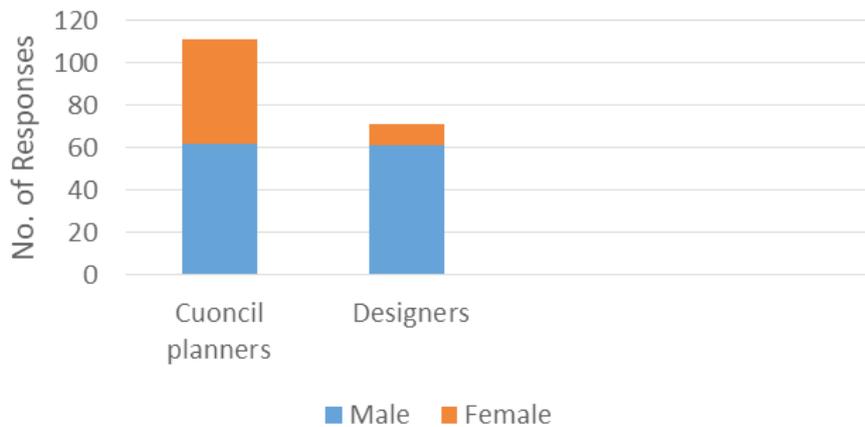"Seeing comes before words…it is seeing which establishes
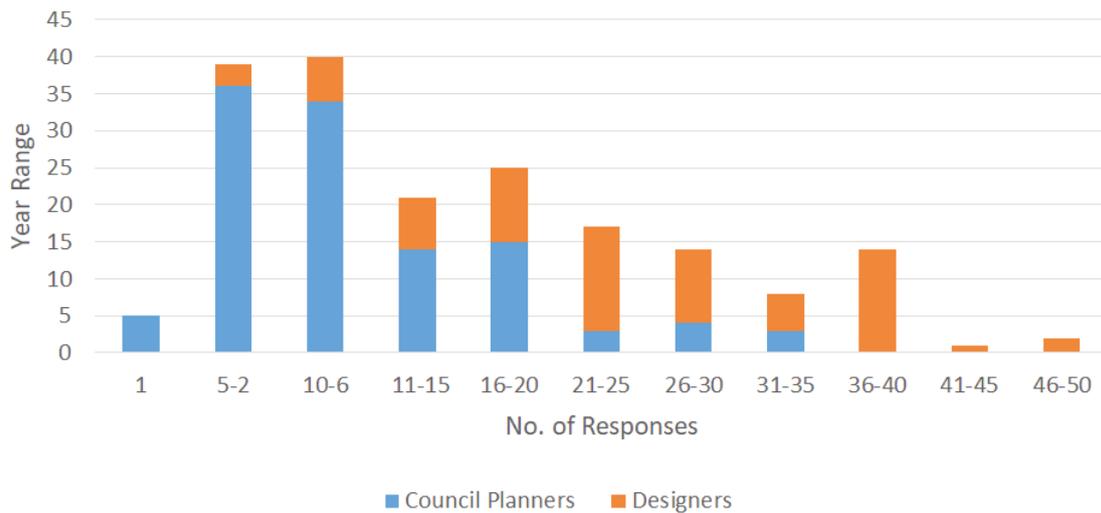

Fig. 5: Number of Responses Based on Gender.

Fig. 6: Years of Experience in Current Position.

our place in the surrounding world; we explain that world with words… The relation between what we see and what we know is never settled" (Berger, 1973).

Although this quote expresses the concept of perception literally, it can also be considered figuratively. This is because although sight is indeed a primary indicator in terms of perceiving and cognising the visual aspects of city form, visually impaired people are still capable of having a perception of an environment, by drawing on senses other than sight. Accordingly, in addition to perception and sight, the relationship between a person and their environment can also be affected by touch, hearing and smell which are facilitated by the physical and ambient features of the environment.

Findings from the Questionnaires: The Matters Considered in the Design and Assessment of Public Spaces

This section presents the findings of the questionnaire and discusses the matters that planners and designers consider in designing and deciding about public spaces. It focuses on their perspectives of the impact of public spaces on people's mental and emotional responses; the ambient effects on the human senses, the impact of physical features on privacy and personal space needs; and the incorporation of cues and their effect on people. The focus is given to these matters because although they have significant impacts on people, it was believed that they may be issues that receive less attention by professionals. The 114 urban planners who responded to the questionnaire included 65 male and 49 female planners (Fig 5). The majority of respondents identified their positions as either assessment planner or strategic planner. In comparison, the designers included 62 male and 10 female designers, and the majority of them identified their positions as either architect or director.

Whereas 61 per cent of planners indicated that their professional experience in their positions ranged between two to ten years, 78 per cent of designers ranged between 15 to 50 years (Fig. 6). The next section discusses their responses.

CONCLUSION

This Study has established that human behaviour and experience of public spaces can be influenced by the physical and ambient features of the built environment. It has been identified that physical features may include buildings, streets, landscaping, land forms and architectural elements, and ambient features may include sound, smell, temperature and illumination. It has also been identified that other factors such as age, gender, culture and ethnicity are also capable of affecting the way people respond to the environment.

The review of the literature on environmental psychology and the theories of behaviour have revealed that the features of public spaces affect behaviour because of people's physiological and psychological processes. Mehrabian and Russel (1974) showed that physical and ambient stimuli affect behaviour and emotions in predictable ways, but the details of how it does this vary from theory to theory. The prevalent theoretical perspectives suggest that behaviour is associated with people's:

• levels of arousal (heightening of the brain activity);
• capacity to process physical and ambient stimuli;
• real or perceived degree of control over the environment;
• ability to adapt or adjust to the environment;
• responses to environmental stress;
• perception of their surroundings.

Many of the themes that emerged from the focus group demonstrate obvious links between the participants'

experiences and these behavioural theories. The focus group established that the physical and ambient features of public spaces can facilitate crowding, affect personal space needs, create places that are desirable and attractive, deter people through unpleasant sounds and smells, and cause behavioural changes in response to perceptions of safety.

In addition to identifying the perspectives of the users of public spaces through the focus group, the study also identified the role and perspectives of urban planners and consultant designers. These built environment professionals have a significant role in shaping public spaces. Whereas the designers design the environment, planners assess their designs and the Urban organizations decide on those designs. The decisions of these professionals can have considerable effects on the behaviour and experience of people.

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