

ABSTRACT

OZDEMIR, AYDIN. An Exploratory Study of Interpersonal Distances and Perceived Spaciousness and Crowding in Four Shopping Malls across Two Cultures. (Under the direction of Fatih Rifki, Professor of Architecture).

This study is an exploratory and descriptive study of shopping malls in two cultures. The purpose of this dissertation is twofold: (1) to explore and describe the conditions of malls relevant to people's perception of space and their interactions with others; and (2) to investigate the relationship between variables such as type of perceived enclosure, density and lighting, and perceived spaciousness and crowding, and interpersonal distance. Four shopping malls in Turkey and the United States were selected for case studies. Based on users' subjective responses to openness and closeness, two areas inside each mall were defined where interviews and observations were conducted.

During interviews, a total of 337 users were asked to rate the spaciousness and crowdedness of the open and closed mall areas. Density and lighting conditions of each area were measured. Observations were employed with time-lapse photography to measure interpersonal distances between users in the areas where interviews took place. A total of 3072 distance measurements were made in all cases.

The relationships between variables were tested by Spearman's correlation coefficients. Most of the analysis included descriptions with percentages. It was intended to develop hypotheses for the benefit of future research. The results were compared across two cultures and discussed in relation to the defined and measured conditions of mall areas.

The description of the mall characteristics pointed to the both similarities and differences among layout, location, frequency and time of visit, activities, and users' definitions of areas. Overall comparisons and descriptions provided evidence about cross-cultural differences in interpersonal distance and perception of crowding, but not in perception of spaciousness. Most of the users in all cases perceived the areas as spacious. Turkish mall users felt more crowded than American mall users, pairs in Turkish malls interacted closer than those in American malls, and male-female pairs interacted more closely than male-male and female-female pairs.

**AN EXPLORATORY STUDY OF INTERPERSONAL DISTANCES
AND PERCEIVED SPACIOUSNESS AND CROWDING IN
FOUR SHOPPING MALLS ACROSS TWO CULTURES**

by

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CHAPTER 1. FOCUS OF THE STUDY

1.1. Introduction

This study includes a thesis on person-environment interaction and examines the role of type of perceived enclosure, lighting, and density, which are related to the changes of interpersonal distance, perception of spaciousness, and crowding. Physical, behavioral, and perceptual information that is obtained by the data collection techniques aims to answer the questions of how people perceive the mall areas and how they interact with others in those areas. The data include both the objective and subjective definitions of the spatial characteristics of mall areas and the characteristics of users.

The information needed for this study was collected using questionnaires and observations of four shopping malls in Turkey and the United States. A shopping mall is an ideal setting to study environmental features and people's responses to those features. On a design basis, the shopping mall with its street-like character is spatially differentiated into separate functional zones that lend themselves well to the analysis of research variables.

The primary strategy of data collection is case study containing interviews with mall users and measurements of interpersonal distances (Yin, 1989; Stake, 1995). The case study approach typically involves the systematic observation and analysis of the "case" or unit. According to Yin (1993), the case study can be employed to compare and analyze multiple cases. The choice of multiple cases should be based upon replication logic, which suggests that more than one case should be investigated within the same study with the possibility of extending its generalizability beyond the context of the particular study.

The major outcomes of the study provide insight into perceived spaciousness and crowding, and interpersonal distances between mall users in two cultures. The cases are compared based on description of conditions and relationships between research variables. Comparisons of cases draw conclusions to answer research questions and to further develop hypotheses for implications and future research.

1.2. Purpose of the study

Shopping malls are one of the common public spaces in urban environments in which frequent social interaction between users occurs. Currently, many shopping malls are built around the world with similar design characteristics to serve the main goals of consumption in a recreationally oriented, enclosed environment. How people in different cultures, with different personal characteristics, perceive those environments, has not been systematically investigated through environment-behavior perspectives. In addition, the degree of interaction between individuals in such settings in different cultures has not been addressed in previous research.

The mall setting is an artificial, enclosed environment that incorporates the characteristics of town centers, shopping streets, and in some cases, traditional markets. Primarily in the United States, new types of shopping malls are currently being built with an alternative layout that combines the functionality of an indoor environment with the features of an outdoor public setting. The hybrid relations between these two styles of settings aim to attract more users for marketing purposes (ULI, 2005). However, previous research has not considered people's responses to the spatial characteristics of these hybrid malls. There is a need to identify features of these built environments that may lead to an understanding of users' perceptions of these features. Therefore, this study aims to provide empirical information to understand the relationships between characteristics of mall environments, and user perception and interpersonal interaction. In addition, this research aims to provide useful information for future design and reasoning in related fields of research.

Dissertation outline

The first chapter of this dissertation describes the purpose and the problem areas. The second chapter presents the literature review, which describes the theoretical underpinnings of the research and provides conceptual background for the present study's major constructs.

Chapter 3 provides a review of the research questions and hypotheses and suggests measures for research variables. The conceptual model presented in this chapter

establishes a necessary context for the operational definitions of the variables of the present research.

Chapter 4 includes the discussion of the research strategy, which describes instruments and procedures used to elicit data. The methodology employed in this study includes a questionnaire instrument that is administered through face-to-face interviews with closed and open-ended questions, as well as a systematic observation technique—taking digital pictures of scenes that capture interpersonal interactions. As a part of this chapter, the strategy for data analysis is described.

Chapter 5 describes the spatial characteristics of cases. For each case, general characteristics of the selected malls and open and closed areas inside those malls are described. The findings of the study are introduced in two separate chapters. The first, Chapter 6, describes the characteristics of users who participated in the interview sessions. This chapter also includes respondents' agreement with spaciousness and crowding of the areas and the description of the relationships between variables. The second, Chapter 7, presents the results of the investigation of interpersonal distances between users in open and closed areas of each of the malls.

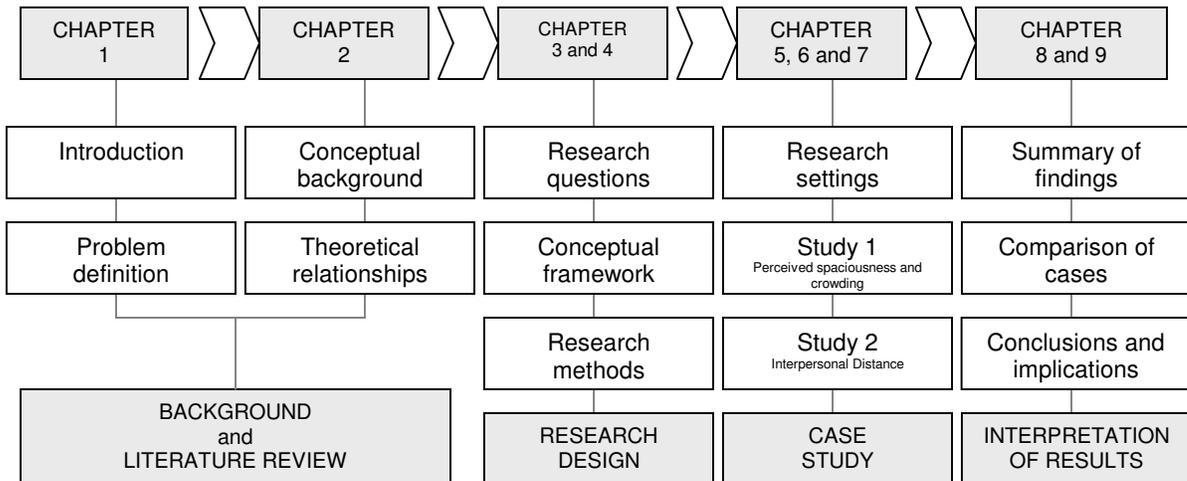


Figure 1.1. Dissertation structure and outline

In Chapter 8, results of the study are summarized and compared across cases. The descriptions point out the nature of the sample and the conditions of cases, perception of the mall areas, and the relationships among research variables. Chapter 9 discusses the major findings and suggests directions for future research.

1.3. Problem definition

The problem area of this research is structured in two parts. The first part, general problem definition, includes a discussion of the effects of built environments and their features on users' perception of space and behavior. An outline of the main research goal is drawn as a conclusion. The second part, specific problem definition, provides problems in theoretical, methodological, and context-specific areas of the study. As a conclusion, a general framework of the specific research problem is defined.

1.3.1. General problem

There is a relationship between environment, design, and behavior. In this relationship, perception of environment plays an important role in changing behavior. People behave differently based on whether they perceive an environment as threatening or friendly. Therefore, people's perception of their environment needs to be investigated in order to understand their response to environment.

People in different cultures or in different age and gender groups will respond to environmental features differently. However, designers and planners provide typical and standard environmental styles that may fail to satisfy user needs. Designing and building these typical places that are used by different user groups can create a problem with regard to changes in the perception of space. In this context, the analysis of these features provides clues for the study of perception of space and human behavior. The relationship between environmental features and perception is a critical concept necessary to understand the mechanisms that shape behavior.

Environmental features also shape interpersonal interactions. Research that focuses on the perceptual and behavioral dimensions of space planning should concern itself with these interactions. In this process, usable information should be provided to designers

so that they can understand how people interact with others in different environments. Depending on this assumption, design variables of built environments like shopping malls are studied that are related to interpersonal interactions between the users. Information gained from these studies including investigations in various cases would improve the design of these environments.

Zeisel (1984) stated that a structure for looking at environmental behavior useful to designers results in data that helps them make decisions that improve spaces for users. The better the information designers have about the people for whom they design the physical settings and how those people relate to other people, the better the designers can control the behavioral side effects of the decisions they make (Zeisel, 1984). As an example, architecturally well-defined settings would support more cooperative behavior, a higher degree of engagement in activities, and more social interaction among people. Therefore, there is an important need to understand the vital role that environmental mechanisms play in regulating interactions. Understanding the ramifications of the physical environment on user interaction is crucial for designing an environment that simulates conditions psychologically and physically in the environment. Designers can configure the space and its elements in order to support interpersonal contacts and facilitate the desired social interactions.

1.3.2. Specific problems

This section illuminates the problems of previous research that included only narrow perspectives and a limited number of concepts in order to understand people's perception of their environments and their interpersonal distances with others. Generally, fundamentals of personal space, such as interpersonal distances between people in various conditions, investigated in laboratory settings in which researchers manipulated the environmental conditions where a very limited number of environmental variables were included. Furthermore, most of the perception studies to date have used simple drawings and pictures of scenes as instruments to understand people's responses to the characteristics of the environments that are already present in the real settings.

Studies to date have not included extensive inventories of the physical properties under investigation. Researchers have investigated environmental features separately in order

to determine their relationships to the perception of space in building scale (such in dormitory buildings) and large open areas (such as urban parks). However, these same relationships have not been investigated with regard to the enclosed public space, such as that in shopping malls; therefore, the need is real for a study that explores and describes the conditions of real settings and their relationships to people's perceptions of those settings.

In perception studies, most of the previous research has not addressed the users' subjective definition of environmental characteristics in a comprehensive manner. Studies that include enclosure as a variable define the term based on objective measurements such as "width and height ratio (W/H)" (Im, 1987, p. 136) or the definition of the positions of architectural surfaces that are named as "space establishing elements (SEEs)" (Thiel, Harrison and Alden, 1986, p. 231). How the actual users of those environments define and classify these terms has been neglected.

Reviews of the literature indicate richness in research as related to perception of space in American culture. However, very little research has investigated the environmental factors relating to the perception of space and interpersonal interaction in other cultures. Little is known about how users in these cultures interact with each other under the influence of changing environmental factors such as density, lighting, and enclosure.

Most of the research to date on shopping environments has dealt with users' behavior from a marketing perspective. There has been very little attempt to focus on users' perception of the environmental features of shopping environments. An environment-behavior approach would be adopted to address the problem of environment and users' behavior. Specifically, environmental perception study can provide insight into how users view shopping mall settings and how they interact with others in those environments. Therefore, this research aims to explore and describe the conditions in mall areas and associations between variables such as type of perceived enclosure, density, lighting, perceived spaciousness and crowding, and interpersonal distance.

CHAPTER 2. REVIEW OF THE RELATED LITERATURE

In response to the problems defined in the previous chapter, it is necessary to provide insight into the significance of related research approaches that aim to identify and understand people's perceptions of their environments. Therefore, these research approaches will be discussed based on their relationship to the research components, study models, theoretical explanations, and cumulative findings.

The next section includes descriptions of the models and approaches to study person-environment interaction that are consistent with the context of this study.

2.1. Components of environment-behavior studies

According to Rapoport (1990), the environment-behavior model allows both cumulative and a large variety of findings that draw conclusions about the differences of perceptions among people and provides insight into how people experience the environment, the meanings that they define, and how they relate to these environments and to each other. From a perceptual perspective, meanings that pertain to the environment would be related to changes in behavior (Rapoport, 1990).

Environment-behavior (EB) studies investigate human behavior—specifically, reaction to environment. As a part of EB studies, environmental perception research focuses on how people see and relate to their environments. The perception approach has been widely used in different scales in the environmental design field. The outcomes have provided valuable insight in understanding person-environment relations, which have been studied to develop useful information for designers and researchers in related fields.

People's response to the environment depends on the information derived from the immediate environment (Kaplan and Kaplan, 1983). Images, signs, and properties of specific environments provide mainly non-verbal information (Rapoport, 1990) that is recognizable and can be combined with stored visual information. People are able to distinguish different characteristics of the environment such as spatial configurations, physical contents, and environmental conditions. This outcome is mainly used to

function properly in an environment (Kaplan and Kaplan, 1995). Several researchers have defined these characteristics in order to study human response to environments. Kaplan and Kaplan (1995) defined the spatial qualities of environment such as open-closed, wide-narrow, and deep-shallow that are distinguishable by the observers. Kaplan (1979) identifies four types of spatially based categories to evaluate people's perception of natural environments: Settings that lack spatial definition are defined as *open-undefined*, settings that contain landscape elements in organized structure as *spacious-structured*, settings that contain screened and protected areas for hiding that affords refuge as *enclosed*, and lastly, settings that have limited visual access as *blocked*. Based on these definitions and classifications of spatial qualities, some common concepts such as openness-closeness and enclosure would be defined for the study of human perception of the built environments.

People's perception of both familiar and unfamiliar environments can be examined through their reactions to stimuli. In previous research, these reactions were typically tested using photographs and drawings. People's overall judgments were operationalized to describe their ways of perceiving the environment. The use of photographs and drawings of actual environments is simple and practical. Although there are strong similarities between perception of space in photographs and perception of space in actual settings (Stamps, 2005), researchers ideally should study subjects' responses to the environment in real settings. However, research in real environments has some negative consequences, such as the unlikelihood of selecting a random and statistically large enough sample from the general population using the actual settings, and most importantly, the lack of ability to manipulate environmental factors.

In the study of person-environment relations and perception of environment, some useful models would be employed to gather information. The models that are consistent with this study, exploratory and descriptive models, are described in the next section.

2.1.1. Study models in case study research

Literature reveals the use of several different types of case methodologies. Yin (1993) listed several examples along with the appropriate research design for each case, making suggestions for a general approach to designing case studies, along with

recommendations for exploratory, explanatory, and descriptive case studies. Each of these three approaches can be used for either single-or multiple-case studies.

Exploratory studies can help identify aspects, factors, and characteristics of environments that contribute to the perception of space. The objective of the exploratory model is to find meaningful patterns from the available data. In exploratory studies, researchers can carry out fieldwork and data collection prior to formulating research hypotheses, and pilot projects can be very practical to determine the final procedure for a particular study. According to Yin (1989), survey questions can be added or removed, based upon the conclusions reached in a pilot study. Exploratory studies are most commonly used to generate hypotheses and to clarify or better define questions and concepts that may be used in future research (Yin, 1994).

Explanatory studies, conversely, are more suitable for causal studies and arguments; these studies attempt to explain why things are as they are and to determine the causes and reasons for certain behaviors or conditions (Yin, 1993). These case studies focus on describing a how a particular phenomenon has occurred or why it has occurred; they establish the links between causes and effects over time (Yin, 1993, 1994).

Descriptive studies require that the researcher begin with a descriptive theory that must cover the depth and scope of the case under study. The description can include historical background, development and design strategies, and similarities and differences with other related environments, which together provide the most complete picture of the conditions and concepts (Yin, 1994). Descriptive research is usually conducted to characterize one or more variables within a population, particularly in relation to person, place, and time. Similar to the exploratory model, the descriptive model is also used to generate hypotheses (Yin, 1993, 1994).

This study aspires to describe and explore the conditions of cases without defining the direct causal relationships between research variables, such as type of perceived enclosure, density and lighting, perceived spaciousness and crowding, and interpersonal distance. The goal is to develop constructive hypotheses that are transferable to similar studies with similar conditions. Hence, this is a descriptive and explanatory case study.

2.2. Conceptual background

This section provides the background context for the problem. The issues related to environment-behavior interaction in built environments, all of which establish the background for this dissertation, are defined. In order to build a conceptual model, the social systems approach (Altman and Chemers, 1980) is defined. The components of this model are described to develop the research framework, which will be introduced in the next chapter. The second part focuses on the definition and importance of the personal space concept in the study of person-environment interactions. In the third part, the concepts of enclosure and spaciousness are defined.

2.2.1. Socio-cultural aspects of person-environment relations

Concepts and sets of variables involved in the study of person-environment interaction have socio-cultural aspects (Rapoport, 1980). In this context, basic concerns are the characteristics of societies that are related to the way in which built environment is shaped, the way in which each person perceives the environment, the relationship between environment and behavior, and type of person-environment interaction (Rapoport, 1980). The key to understanding these issues is to examine the characteristics of the physical environment that are related to the changes in perception of space and human behavior (Barker, 1968; Sundstrom and Altman, 1976).

One angle of studying perception of environment is to focus on the visual character of the environment. It is believed that the visual character of our surroundings has important impacts on human experience that can lead us to make inferences about places and people. By evaluative images (Nasar, 2000), we can learn how people see their own environments. Nasar's (2000) conclusion is that we can improve the evaluative image by learning more about both person (observer) and the physical environment. In this context, research has been done by directly observing the physical environment (Heise, 1970), by evaluating judgments of environment (Canter, 1969), by emotional measures of physical environment (Ward and Russell, 1981) and by comparing emotional meanings of urban scenes (Nasar, 1988). In all these research studies, the focus is on the relationship between the physical variables and people's feelings about those variables.

In discussing the visual characteristics of environment, Nasar (1994) distinguished between content and structure of space. According to Nasar (1994) content has symbolic meaning to an observer, while structure is associated with formal aesthetics—architectural proportion, scale, building form and size, all contributing to overall physical appearance. Furthermore, Nasar (1994) emphasized that formal variables such as enclosure, complexity, and order are significant to humans' spatial experience. From these categories, researchers can ascertain the concepts of spatial characteristics that are relevant to people's perception of space.

Walsh, Craik, and Price (2000) aimed to answer the question of how best to formulate and examine relationships between people and their everyday environments. Their study aimed to investigate people's activities and their interactions that are consistent with their personal characteristics. Interaction with environmental variables may change certain types of behavior (Magnusson and Torestad, 1992), which can be related to changing patterns of personal and environmental factors (Wapner and Demick, 2000).

One of the significant characteristics of person-environment interaction is the fact that interaction varies according to socio-cultural experience and individual characteristics. Because of shared cultural variables, people will inevitably exhibit some similarities in their response to the physical features. In order to understand these responses, researchers have provided some models to illustrate the relationships between related concepts. Altman and Chemers (1980) proposed one of these models, which is outlined and described in the following paragraphs.

It is known that the environment has different values for people with different life experiences (Moore, 1979). This assumption, therefore, directs studies in cross-cultural analysis. Such studies have been conducted in Western and Eastern cultures and in different societies with different cultural perspectives (Kluckhohn, 1953; Tuan, 1977), and they conclude that people's relationship with environment is culture bounded.

In general, culture has been defined as set of beliefs and perceptions, values and norms, and customs and behaviors of a group or society (Aiello and Thompson, 1980). There is a real need to make a link between these beliefs and behaviors and the environment. How the different facets of culture are related to the features of the

environment is the question to be answered in cross-cultural investigation of perception of space and interpersonal distance.

According to Altman and Chemers (1980), the main strategy to study this interconnectedness between culture and environment would be to adopt a cross-cultural perspective to see how different societies relate to their physical environment. Altman and Chemers (1980) illustrate this perspective by linking concepts of physical and natural environment, psychological processes, and environmental worldviews to each other, which in turn are related to behavioral processes (Figure 2.1). Within any given physical environment, the individual does certain things, adapts to the environment, acts and behaves in certain ways, which can all be characterized as behavioral processes. As a result, behavioral outcomes occur that give clues to the differences in environment-behavior interaction in various settings and cultures.

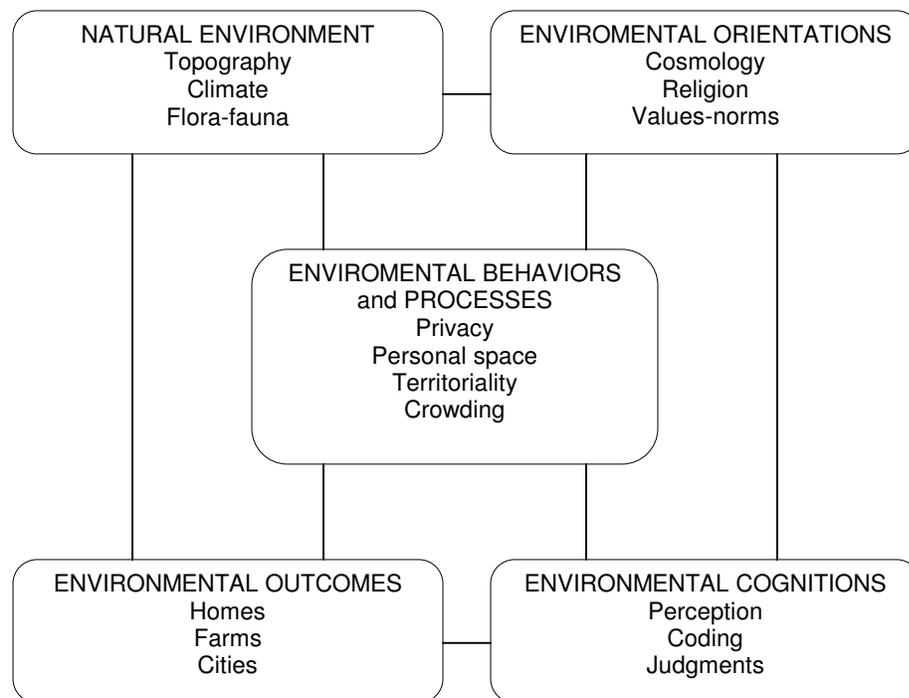


Figure 2.1. Model with components of social systems approach

In the model shown in Figure 2.1, environmental behaviors and processes can be the result of perceptions and cognitions, cultural factors, environmental factors, and effects of ongoing behaviors. Environmental cognitions or psychological processes are the way

people feel about the environment and are related to behaviors and actions that people perform with respect to the environment (Altman, 1975).

Environmental behaviors and processes include people's responses to their environments; these responses in turn are fundamental aspects of behavior that are related to person-environment interactions through cultural perspective. In this model, privacy is an interpersonal boundary regulation by which a person or group regulates or even limits interaction with others. The concepts of personal space and territorial behavior are viewed as social-behavioral mechanisms by which people regulate their privacy. As a result, personal space and territoriality function to create a desired level of openness or closeness to others (Altman, 1975). The concept of personal space is of particular interest to this study; therefore, the term will be described in the next section.

2.2.2. Proxemics and the concept of personal space

Studies of how people utilize and experience physical space in interpersonal interaction generally follow Hall's conceptual framework, *proxemics* (Hall, 1966). Individuals have varied limits regarding personal space; there are limits beyond which individuals may not approach each other without at least one feeling some emotional or mental discomfort. All people require some minimal amount of unviolated space at all times; this space is commonly referred to as personal space (Barefoot, Hall, and McClay, 1972). It is characterized by a zone that varies for each individual and in different circumstances under certain conditions.

Researchers and designers had typically assumed that behavioral processes are related to individuals' notion of personal space, which relates to the distance that separates the individuals (Aiello and Thompson, 1980). Sommer (1979) defines personal space as "an area with an invisible boundary surrounding the person's body into which intruders may not come" (p. 26). The distance chosen or desired depends on the relationship of the interacting individuals, how they feel, how they perceive, and how they are engaged in activities. In addition, distances can vary according to "environmental factors," since an abnormal situation can bring people closer to each other than they usually feel comfortable with (Hall 1959, p.116). This, in turn, leads to the argument that people have

different perceptions of environment depending on their personalities and the characteristics of the settings.

Leather (1978) defines the personal space related to distances between individuals as a "relational concept, typically measured in terms of how far one individual is from the other" (p. 87). Individuals naturally create behavioral patterns to change their interaction distances with others; the distance varies according to the nature of the particular social interaction. Hall (1966) classified four types of distances: intimate, personal, social, and public. Each of the four types of distances reflects a different relationship between given individuals (Altman, 1975; Gifford, 2002; Altman and Vinsel, 1977), and these varied preferences for personal space and relationships are greatly influenced by environmental, personal, and cultural factors.

Intimate distance (<45cm) is for comforting, protecting, and other full contact activities; people who are emotionally close employ this type of distance. Personal distance (45-120cm) is used in social interactions between close friends and acquaintances. Social distance (120-350 cm) is this zone used more for interaction between unacquainted individuals, and here, there is little sense of friendship. Lastly, public distance (350 cm and over) is the zone that is used less often between two interacting individuals than by speakers and their audiences. This distance would occur between a lecturer and a crowded audience.

People may change their distance from one zone to another in changing spatial conditions and in different types of social relationships. The distance, then, will likely be greatly influenced by the environmental conditions, and the observer may be able to ascertain these conditions by examining the type of distance between individuals. Therefore, it may be useful to investigate interpersonal distance in environments with different spatial conditions, as well as in different cultures.

According to Hall (1966) there are definite interpersonal distances at which an individual feels comfortable when interacting with others, and he contends that stress results when the appropriate distance is violated. During the violation of personal space, individuals feel uncomfortable and show unexpected behaviors, such as the avoidance of eye contact, shifting of body position, and escape from the scene. Therefore, we can assume

that not only environmental factors but also violations of personal space are related to people's feelings of discomfort.

How people behave in and perceive the environment would depend on the spatial characteristics of environment. The openness of the space, which is discussed in this study, is one of those important spatial features. The next section describes this concept with definitions found in literature.

2.2.3. Enclosure and spaciousness

There are many components of the built environment that have been studied for their relationship to human response and people's response to the environment. One of them, enclosure, is an important feature that is related to people's perception of the environment. Physical characteristics of the environment, such as the proportion of closed to open surfaces, would influence the way people experience enclosure.

Enclosure can potentially influence the need for privacy; it also functions as a buffer, providing physical and psychological protection against intruders. Space can be designed to provide more privacy, which may encourage seclusion, or less privacy, which may encourage personal interaction. For example, designs that encourage interaction include paths; designs that discourage interaction include walls (Gibson, 1979; Lang, 1987). A complete enclosure affords the greatest degree of seclusion (complete privacy). However, it is important to differentiate between barriers, on the one hand, and screens, on the other, that form enclosures. Barriers may limit physical access but not visual penetration, and therefore, seclusion; screens, conversely, may provide access and visual penetration depending on the material of the surfaces and, therefore, promote interaction (Gibson, 1979; Lang, 1987).

Hayward and Franklin (1974) considered the architectural variables that determine the perception of open and closed space. It is known that the organization and characteristics of surfaces, such as walls, define an open or closed area, and that these surfaces separate the open space from an enclosed space. In addition, these surfaces may block both vision and motion, which can create negative feelings. In another

scenario, glass surfaces and windows might block motion but not vision (Stamps and Smith, 2002).

Thiel, Harrison, and Alden (1986) suggest that enclosure is a combination of surface elements that are configured in various numbers and positions. Architectural enclosures generally include “below,” “above,” and “vertical” (Thiel et al., 1986, p. 232) surfaces to create a closed type of enclosure in order to distinguish inside from outside. According to the literature, the number of and distances between these surfaces define the type of enclosure (Figure 2.2). In an architectural space where all surfaces exist, full enclosure is formed.

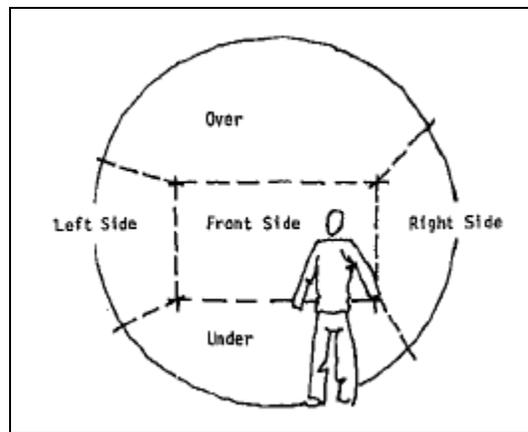


Figure 2.2. Different positions of space establishing elements

Note: From “The perception of spatial enclosure as a function of the position of architectural surfaces,” by Thiel et al., 1986, *Environment and Behavior*, 18, p. 233

In another study, Spreiregen (1965) opposes the idea that perceived openness-enclosure is related to the size of space. He suggests that perceived enclosure is determined by the relationship between height of the surface located on the frontal field of view and the distance between observer and this surface. Hayward and Franklin (1974) use the term “H/D ratio” (p. 39) to study this relationship by using perspective drawings of outdoor architectural surfaces.

Garling (1970a, 1970b) suggests that the perceived openness-closeness of an architectural space is a function of its physical size. For example, observers can reliably judge the degree of openness-closeness of outdoor spaces based on size (Garling, 1969). On the other hand, Hayward and Franklin (1974) contest this assumption and

suggest that increases in H/D ratio are accompanied by increases in perceived enclosure, and that regardless of size and scale, perceived enclosure is similar for spaces that have similar H/D ratios.

Stamps (2005) defined enclosure as the degree of surrounding, not as the size of space. The degree of enclosure is related to “purpose, physical sizes, and sensory capabilities” (p.128). He suggested that enclosure is directly related to restriction of movement in space. In his most recent article, Stamps (2005) found that perceived enclosure is related to the distance between observer and surfaces, lighting level of the space, and environmental features that block motion. He concluded that perceived enclosure is a function not only of “solid surfaces” (p. 108), but also of “permeability” (p. 128) of the space, which permits or allows something to pass through. He listed factors that relate to the impressions of enclosure: proportion of view covered by surfaces (walls, ground, and ceiling), actual depth of view (distance of surfaces from the observer), overall lightness of the scene, and number of sides open at the front. These factors indicate that solid surfaces have strong connections to the impressions of enclosure (Stamps, 2005).

Herzog (1992) defined spaciousness as “the feeling of openness or room to wander” (p. 238). According to this definition, spaciousness is a subjective rather than a physical variable. Conversely, Coeterier (1996) correlated spaciousness to the physical characteristics of the environment. According to Coeterier (1994), perception of spaciousness is developed by the integration of physical cues such as the size and form of open space, the height of the elements in the landscape, the texture of the ground and other surfaces, and the arrangement and positions of surfaces. A space may be perceived as larger because of finer texture and transparent surfaces such as screens.

One of the important clarifications made by Stamps (2005) was the difference in the definitions of “spaciousness” and “enclosure.” He stated that “spaciousness” and “enclosure” are different terms with different meanings. There is obviously a lack of consensus regarding the definition of these terms, as evidenced by the suggestion made by Skjaeveland and Garling (1997) who asserted that the words “spaciousness” and “enclosure” are similar terms based on “prospect-refuge theory” (Appleton, 1975, p. 73). Enclosure, in this context, is understood as some type of edge, screen, or shelter that provides an opportunity to see others (prospect) while affording one the opportunity to

hide (refuge) (Appleton, 1975). This prospect-refuge theory uses the term “enclosure” as a definition of shelter in which organisms can separate themselves from the outside.

Based on these definitions, enclosure can be understood as more a physical term that is defined by the spatial features of the environment. However, in this study, enclosure is defined based on people’s subjective impressions of openness-closeness of given spaces. Thus, the term “enclosure” indicates perceived quality of the environment. On the other hand, spaciousness is a subjective concept that is related to openness of the settings.

2.3. Theoretical Relationships

The following section establishes the theoretical relationships between research variables including enclosure, perceived enclosure, density and lighting, perception of spaciousness and crowding, and interpersonal distance. A summary of theoretical relationships is listed in Appendix 1.

2.3.1. Enclosure, spaciousness, crowding, and interpersonal distance

Enclosure has been shown to be an important factor affecting environmental perception in a number of previous studies (see, for example, Ward and Russell, 1981), and the term has been used as a physical variable to study people’s responses to the spatial characteristics of environment in various ways.

Thiel, Harrison, and Alden (1986) suggested that type of enclosure is defined by the positions of surface-establishing elements such as ceilings (overhead), floors, and walls (vertical) that might influence people’s perception of enclosure. Subjects in their study were asked to arrange the perspective drawings of interiors, ranging from most enclosed to least enclosed. The overhead surface (ceiling) was consistently perceived as the most enclosing, while the floor surface was rated the least enclosed. These results support the assumption that people’s perception of enclosure can be determined by observing the position of surfaces that establish the space.

Pedersen and Topham’s (1990) study also showed that for a large interior space, the number and positions of surfaces establishing the space could predict the sense of

relative spatial enclosure. Varying the positions of these surfaces would create different feelings of enclosure (Figure 2.3). Their study included line drawings, which differed in the absence or presence of surfaces (walls, floors, and ceilings), to test the hypothesis that perceived enclosure is dependent upon the positions of the architectural surfaces. Subjects rated these drawings from least enclosed to most enclosed. The findings revealed which surfaces might be emphasized to design a comfortable space—one that is not too open or enclosed. It was suggested that as space gets larger, people actually perceived the space as less enclosed (Pedersen and Topham, 1990).

Studies of enclosure were also conducted by using images of larger spaces. Im (1984) used slides of courtyards enclosed by university dormitory buildings. Subjects evaluated the photographs of selected spaces according to whether they liked or disliked them. Then, visual preference values for images were computed through the Scenic Beauty Estimation (SBE) technique (Daniel and Boster, 1976), which provides interval scale values for each site. Based on the results, Im (1984) suggested that visual preference for enclosed urban spaces could be predicted from the linear combination of three ratio variables—height ratio, ground slope, and vegetation coverage. In another study, Im (1987) used perspective drawings and slides of campus and apartment settings. A positive linear relationship was found between the width and building height with regard to perceived enclosure. Im (1984) concluded that providing wider enclosed spaces was visually preferable in a campus or a residential setting.

Al-Homoud and Abu-Obeid (2003) assumed that increasing spatial enclosure on university campuses influences students' social interaction or seclusion within a group. Students rated the physical qualities and closeness of courtyards located on different parts of the campus. The results showed that perception of seclusion increased when spatial enclosure occurred. Al-Homoud and Abu-Obeid (2003) suggested that outdoor space enclosure could be formed by the ground and the surrounding architectural surfaces such as walls and buildings.

Coeterier (1994) used slides of landscape images that varied in one or more items to be tested, such as the height of the boundary wall, texture of ground surface, and the size of the floor space. However, Coeterier's (1994) study focused on the perception of space size. The intention was to investigate whether the perception of space size is identical to

the perception of depth. The results supported the idea that perceived size changes the size of the floor space.

Previous studies found relationships between enclosure and perceived crowding. In one of those studies, partitioning enclosed spaces and making them more enclosed, such as in office cubicles, reduced the degree to which people in the space felt crowded (Sundstrom, Burt, and Kamp, 1980). In another study, Desor (1972) tested the level of interpersonal distance and the perception of crowding in two settings, one rectangular and the other a more square room. Subjects used miniature figures to place in experimental rooms. Desor (1972) proposed that different physical and architectural features, such as the presence of partitions, mirrors, and doors, influence feelings of crowding. The results showed that subjects placed more figures in a space bisected by partitions than in an identical space without partition. It was concluded that, with all other factors kept constant, making a room more rectangular decreased the feeling of crowding and increased the mean interpersonal distance (Desor, 1972).

In addition to the type of enclosure, size of space is related to perceived crowding. Stokols, Rall, Pinner, and Schopler (1973) studied students' perception of crowding in experimental rooms and assumed that females interacting in an area of limited space would experience less crowding than males in the larger room. The amount of space was manipulated by varying the size of the room—large and small. Subjects were asked to rate the size of the room on a scale ranging from small to large. Analyses revealed that subjects in a small room perceived the setting as smaller, experienced a greater degree of crowding, and felt more uncomfortable than did subjects in the larger room. The results also indicated that females, as compared to males, perceived the room to be relatively more confined.

Baum, Davis, and Valins (1979) suggested that physical factors such as room size, characteristics of building design such as long or short corridors, intensity of daylight in the room, view from the window, and floor height influence the spatial perceptions of residents and the feeling of being crowded. They used structured questionnaires to assess students' perceptions of their room conditions and found that students living in buildings with longer corridors experienced more crowding.

In a related study, Kaya and Erkip (2001) examined the effects of floor height on perception of room size and crowding in dormitory buildings. They used a survey research technique, similar to the one used in Baum et al.'s (1979) study, and asked students to rate the conditions of their rooms. The rooms selected were identical in size and were located on the lowest (first) and highest (fifth) floors of the building. The results showed that residents on the highest floor perceived their rooms as larger and felt less crowded than those on the first floor.

Mandel, Baron, and Fisher (1980) investigated the effects of height and view, and density of dormitory rooms on students' perception of their rooms. For this purpose, Mandel et al. used questionnaires that contained scales to assess students' perception of their room size, crowdedness, view, and amount of light. The results indicated that perceived room size was related to differences in height but not view.

Skjaeveland and Garling (1997) studied larger environments and examined the relationship between physical features of neighborhoods and social interaction among residents. Skjaeveland and Garling administered questionnaires to residents concerning the perceived spaciousness. The researchers evaluated the residents' self-reports regarding their physical environments, along with expert ratings of spatial characteristics. The outcome of this study indicated that objective and perceived spaciousness were highly correlated in neighborhoods. The findings of the study support the notion that spaciousness has behavioral relevance (Kaplan et al., 1989; Herzog, 1992; Nasar, 1994).

It would be assumed that enclosed and partitioned spaces promote more privacy. In an enclosed space, people may feel more privacy than in an open space; on the other hand, a more open space may facilitate more social interactions. A number of studies have been conducted to assess these assumptions in various settings. Baum, Reiss, and O'hara (1974) observed and recorded behavior of individuals by two architecturally different drinking fountains. One was built into a wall so as to have a wall screening the fountain from the hallway, while the other was placed against a wall and had no screens around it. Observations revealed that subjects tended to avoid drinking at a water fountain if an experimenter was standing within five feet (1.5 m) of the fountain in an unscreened setting, and those who chose to drink spent less time at the fountain than

those drinking while no one was near the fountain. Based on these results, it is reasonable to expect that variations of architectural elements in a given situation, such as partitions that make a setting more enclosed, will influence whether or not an individual will or will not approach the location.

Studies on the relationship between type of enclosure and people's perception of space in office settings have been more common. In one such study, Sundstrom, Town, Brown, Forman, and McGee (1984) used questionnaires to investigate the effects of office space enclosure, which was defined by the number of enclosed sides in the space, on employees' job satisfaction, and privacy. Employees rated the physical qualities of their workspace on a 7-point scale. Results showed that the physical enclosure was strongly related to perceived privacy and job satisfaction in an office environment—employees rated enclosed office spaces highly.

In another article, Hedge (1982) suggested that open-plan offices often decrease employee satisfaction and productivity. In open areas, the increase in the loss of privacy along with the increase in the noise and distractions would affect people's behavior, social interaction, and mood. In another study, Oldham (1988) found that in an open-plan design, the use of partitions could increase desired levels of privacy and job satisfaction.

2.3.2. Density, crowding, and interpersonal distance

Crowding needs to be distinguished from density, because these terms are often used interchangeably. Stokols (1972) identified the basic distinction between density and crowding: density is a physical condition involving space limitations (the amount of physical space per person), whereas crowding is a subjective, psychological experience that is associated with a feeling of lack of control over the physical environment. Stokols (1972) used density as a necessary but insufficient condition for the feeling of crowding. Based on these definitions, it was assumed that people do not always feel crowded, even if density is quite high.

Freedman (1975) also concluded that high density did not always result in the feeling of crowding. Findings of laboratory studies, which manipulated the room density, indicated

that high density was not generally related to the occurrence of crowding and stress (Stokols, 1976). Experimental evidence suggested that subjects in a highly dense room felt confined and sometimes crowded; however, adaptation to spatial restrictions occurred rapidly and subjects started to feel comfortable (Epstein and Karlin, 1975; Kutner, 1974; Sundstrom, 1975). Six, Martin, and Pecher (1983) suggested that physical factors were good predictors of perceived crowding, but density was not always an adequate indicator of discomfort. In their study, number of people had no significant effect on perceived crowding.

As Stokols (1972) stated, “crowding is not the amount of space available to the individual, but the distance between the individuals that determines the degree of stress arising from a particular situation” (p. 31). In this model, appropriate closeness to others, rather than high density, was the necessary condition for perception of crowding. There is evidence that interpersonal distance, not density, is the determinant of the feeling of crowding. Epstein and Karlin (1975) studied groups of people in different sized rooms. The results showed that a person in the center of a group experiences more crowding than a person at the fringes of the group. This might be because the personal space of the individual in the center of the group is more violated than the personal space of the individual at the fringe of a group. The person in the center loses control of his personal space. Based on this approach, it is predictable that an individual may feel crowded in a large room with low density if there are violations of his or her personal space. Conversely, an individual may feel uncrowded in high-density conditions if he or she has control of personal space.

Proshansky, Ittelson, and Rivlin (1970) posited that social interference leads to the perception of restricted freedom, and in the context of density, such restriction is perceived as crowding. High density may be perceived as either good or bad, depending upon the individuals’ current goals and whether the presence of others facilitates or inhibits those goals.

According to Worchel and Teddlie (1976), subjects in close distance groups perceived a higher level of crowding. Altman (1975), Knowles (1980), and Sundstorm and Altman (1976) suggested that discomfort and the feeling of crowding would arise if people expecting to interact with one another were forced to maintain smaller interpersonal

distances. In everyday life, crowding and personal space are often related because crowded settings allow less space between individuals (McClelland and Auslander, 1978).

Two major predictors of perceived crowding are spatial elements and social factors. Spatial elements refer to the physical attributes of the environment, which include the relationships among the objects in the environment (Rapoport, 1971; Rapoport and Hawkes, 1970). The social factors involve the mechanisms that control the level of interaction among people in a given environment (Rapoport, 1976). High density may produce undesirable conditions such as lack of privacy. Eroglu and Harrell (1986) found that an increase in density with the presence of other people, along with the effect of physical aspects of the environment, such as noise, would cause increased feelings of crowding.

Two basic approaches have been used to investigate the contribution of interpersonal distances to judgments of crowding. One is the preference for interpersonal distance between individuals, and the other is being in a low- or high-density setting. McClelland and Auslander (1978) took photos of a variety of natural settings and found that smaller interpersonal distances are likely associated with larger groups and waiting lines, whereas larger interpersonal distances occur in settings with fewer people and visually complex environments. McClelland and Auslander (1978) also concluded that interpersonal distances related to people's perceptions of the crowdedness of the settings. Here, the nearness of the closest other person was a prime determinant of perceived crowding and has received considerable support (Greenberg and Firestone, 1977).

People use environmental cues such as color, size of space, and number of people (density) while perceiving the environment, and these cues in turn are related to behavior. The nature of the cues then determines how people perceive the particular environment. An enclosed space may promote user response to density and subsequent feelings of crowding. Other characteristics may help reduce crowded feelings. A number of studies suggested that some architectural elements such as walls could create a feeling of perceptual separation, which, in turn, were related to perception of crowding (Baum et al., 1974; Desor, 1972).

People behave differently in crowded conditions and respond to these conditions in various ways. The most common reactions to crowding are withdrawal and avoidance of social contact. Baum and Valins (1977, 1979) believed that the feeling of crowding had an effect on withdrawal from social interaction. According to Sundstrom (1975), in order to cope with stress caused by high density, people might physically limit their interaction with others. This might be the result of lack of control or a reaction to social overload, which leads to loss of privacy and motivates users to be involved in fewer interactions. Fischer (1977) noted more withdrawal from interpersonal interaction in high-density conditions, which would be due to social overload. Experiments conducted by Milgram (1970) suggested that when people were confronted with a large number of strangers in everyday life, they tended to withdraw and took less interest in the community in order to protect themselves from overload. Hutt and Vaizey (1966) found that as density increased, preschool children spent less time in social interaction with peers. Socially overloaded individuals experienced crowding when exposed to unfamiliar social contacts, which might create stress (Altman, 1975). As a result, stress and tension caused people to reduce their interactions with others (Stokols and Altman, 1987).

Bloch, Ridgway, and Dawson (1994), Jacobs (1984), and Kowinski (1985) suggested that the physical characteristics of shopping environments such as malls influence users' emotional states, and thereby have important effects on users' behavioral responses. Wakefield and Baker (1998) examined the effects of the physical characteristics of shopping malls on people's excitement by administering questionnaires to mall users. The results showed that physical characteristics such as architectural design, music, layout, and lighting influence people's excitement, and that mall décor influences the desire to stay in the mall for longer periods.

In a study of retail crowding, Eroglu and Harrell (1986) suggested that the physical properties of the shopping environment such as brightness and density, along with shoppers' motives and expectations, influenced the nature and number of environmental characteristics (lightness and density) people perceived in the retail settings. These characteristics then lead to perceived crowding in the environment, which represents the users' favorable or unfavorable appraisal of the situation (Rapoport, 1976).

Eroglu and Machleit (1990) used color slides in a laboratory setting to investigate the determinants of crowding in retail environments. They assumed that retail density and perceived crowding were related. For scenes of crowded retail environments, respondents said they spent less time shopping in the store, purchased fewer items per trip, were less likely to socialize or seek to contact with others, were less receptive to new store layouts, and were more nervous, tense, and confused (Eroglu and Machleit, 1990). These findings were especially true for time-constrained shoppers (Harrell and Hutt, 1976) who aim to purchase an item in their visit to malls. Task-oriented shoppers, ones who make fewer unplanned purchases and spend less time per shopping trip, may also be more sensitive to high-density conditions (Eroglu and Harrell, 1986).

Following Stokols (1972), Harrell and Hutt (1976) distinguished actual shopper density from shoppers' perception of crowding, which increased as density increased (Eroglu and Machleit, 1990). Harrell, Hutt, and Anderson (1980) applied Milgram's (1970) idea that people use behavioral adaptation strategies to cope with environmental information overload in a retail environment. They suggested that shoppers in a crowded store might use coping strategies such as shorter shopping time and less exploration.

Mackintosh, West, and Saegert (1975) intended to determine whether information overload does occur as a result of a large number of people in rather close proximity to each other. For this purpose, female subjects were selected to study the effects of density on performances of cognitive tasks in a department store and a railroad station. Subjects rated the conditions during changing density conditions. The findings of the study supported the assumption that high density does create psychological effects under certain conditions such as: "(1) when the person in a setting scans the environment and moves through it, (2) when high density is attained by increasing the number of people in a constant space, and (3) when the number of people in the setting is relatively large" (p.177).

Burgess (1983) investigated the patterns of proxemic behavior in shopping malls, which were defined as "natural laboratories" (p.15) where spontaneous behaviors can be observed. The study focused on the effects of density on social distances of people walking in malls. The results showed that companions in groups maintained closer social distances toward each other than toward strangers. Distances between walking

companions were inversely correlated with density. Burgess's (1983) findings agreed with the previous descriptive studies. The mean distance to the nearest companions was within Hall's (1966) zone of personal distance (45 cm -120 cm).

In most of these studies, density was related to changes in psychological reactions and in interpersonal interaction. However, there is a lack of consistency in the findings of such research, which may be due to the differences in the social behaviors studied or to changes in both size of space and levels of density.

Most of the studies assumed that there was a linear relationship between density and perceived crowding, and human behavior. On the other hand, Regoeczi (2002) stated that there is a need to explore the nature of crowding effects in terms of possible nonlinear relationships with behavioral outcomes. A group of researchers have theorized that density may have some positive outcomes (Freedman, 1975; Michelson, 1976; Proshansky, Ittelson, and Rivlin, 1970). These positive outcomes may lead to increased social interaction. However, if density does in fact have some benefits, these may be limited to moderate levels of density, thereby suggesting the possibility of a nonlinear relationship. In this context, it is important to investigate the effects of low and high levels of density.

Nonlinearity may be a key factor in explaining the inconsistent findings of past research. The assumption is that there is a threshold effect, and that only after a certain point, density begins to affect users. Up until that point, the addition of extra people either has a negative effect or is in fact advantageous in terms of added social support for social interactions.

Regoeczi (2002) assessed the effects of interior and exterior density on behavioral outcomes. Individuals, who were randomly selected from a representative sample of residential units, were interviewed. Household density was calculated by dividing the number of people in the household by the number of rooms. The outcomes were withdrawal and aggression. Scales were used based upon respondents' self-ratings on the statements. The results revealed that there is an optimal level of household density at which withdrawal will be at its lowest level. Where density is lower or higher than this

point, levels of withdrawal increase. The density threshold for aggression was identical to that for withdrawal: 1.18 people per room in household settings.

Similar thresholds for density were also found in other settings. In a recreational study, Trakolis (1979) in Chambers and Price (1986) revealed that perception of crowding did not increase with higher density until a high threshold level was reached. Users of the recreational environment were asked to define and rate the crowded conditions during their visits. The results indicated that users obviously enjoyed crowded conditions in the recreational environment studied.

In another recreational study, different results were found. Chambers and Price (1986) conducted surveys in a recreational site to collect data on several factors related to crowding. One of these factors, density, was defined and measured in two groups. Overall density was measured based on logs of arrival and departure times of visitors. Visible density, on the other hand, was measured by number of people on sight. The outcome of the study, perceived crowding, was measured by user ratings of conditions with the use of scales. According to the results, there was a statistically significant inverse relationship between satisfaction and measures of crowding. Chambers and Price (1986) suggested that both overall and visible density have a very small impact on user satisfaction in the recreational setting.

Zacharias, Stathopoulos, and Wu (2004) conducted an observational study of user behavior in San Francisco plazas to investigate the effects of climate and the presence of others on behavior. They suggested that when a threshold density was reached, users opted for less ideal conditions such as more sunlight and heat, and moved into their preferred condition when space became available. In one of the cases, density was treated as a dependent variable in regression analysis. These researchers concluded that there were upper limits to crowding in the most favorable conditions such as more sunlight and less wind, and users were more tolerant to crowding in such conditions. The study questioned whether there is a difference in density between areas in the shade or in sunlight. The highest density was defined as the condition in which there were as many as 15 people seated facing the sun. The shortcoming of this study is that it included density measurements of seated individuals as opposed to those walking and standing, as in shopping malls and other built environments.

In another study, Leger (1988) investigated perceived crowding and illness complaints in open dorms of a prison. Leger found that physical conditions of open dorms were associated with higher rates of illness complaints and perceived crowding. Leger (1988) defined density as the number of prisoners in dorm units of a prison. Density was operationalized by assigning ranks to the dorms according to the resident population. Thus, the dorm with the largest population was given a value of four; the smallest dorm was given a value of one. Perceived crowding was measured by asking subjects to rate their environment through a series of adjectives arranged as semantic differentials. Leger found that physical conditions of open dorms were associated with higher rates of illness complaints and perceived crowding.

Lee and Graefe (2003) studied perceived crowding at an arts festival where thousands of people were gathered in an open space. The study used two techniques: on site and mail questionnaires. Perceived crowding was measured using a 5-point scale during the festival, and density was estimated daily by counting the number of attendees. The results confirmed that density is an important predictor of perceived crowding in festival settings. However, the study did not question the relationship between the number of people and people's comfort. Therefore, it is not clear in this study whether people enjoyed being in a crowded condition or not.

2.3.3. Preference for interpersonal distance and crowding

Some researchers have considered individuals' personal space preferences as predictors of feeling of crowding (Aiello et al., 1977; Cozby, 1973). Gormley and Aiello (1982) found that the nature of interpersonal relationships could influence perception of crowding and control over social interaction. Gifford (2002) suggested that individuals who liked to be with others tended to have a higher tolerance for crowding. Sundstrom (1975) and Kutner (1974) concluded that subjects who interacted with intrusive companions felt less comfortable. They also found that high levels of physical contact might cause crowding stress in high-density conditions.

Cozby (1973) studied the effects of room density, type of activity, and personality variable (personal space) and whether or not subjects liked their rooms in a campus building. For this purpose, first, personal space between subjects and an intruder were

measured inside a real room. After completing the measurements, subjects were shown a scale model room and asked to place pins, which represented subjects and other people in the room, based on their preferences for interpersonal distance. The results revealed that high density implies close interpersonal distances, and people with a “close” personal space would prefer high density settings, while others with a “far” personal space would prefer low density settings. Cozby (1973) also asked subjects’ background information and suggested that this information is related to people’s reaction to crowding—those subjects from more rural backgrounds will stand farther from others than subjects from urban backgrounds.

Knowles (1983) provided a model that explains the connection between crowding and proximity. According to this model, judgment of crowding closely parallels a proximity index and is a function of density and preferred interpersonal distance. Individuals with a preference for “far” personal space felt more crowded in high-density conditions than those with a preference for “close” personal space (Knowles, 1983). Sinha and Sinha (1991) also found similar results in their study of the effects of density and interaction distance on feelings of crowding. They manipulated the density in an experimental room by varying the number of subjects and used the stop-distance technique to measure personal space. In the stop-distance technique, subjects walked toward the experimenter and stopped at the point of discomfort. The resulting interpersonal distance was taken as the measure of personal space (Sinha and Sinha, 1991). Their results revealed that subjects with “far” personal space under high-density conditions evaluated the room as most crowded.

According to Six, Martin, and Pecher (1983), judgments on crowding and discomfort were related when people close to the subject were perceived as strangers. People near a stranger experienced the space as more crowded. These researchers noted that as people got closer to strangers, they felt more crowded.

Bloch, Ridgway, and Dawson (1994) suggested that occupants of a built environment, such as consumers in shopping malls, have different goals for their actions. Researchers used a survey methodology to examine behavioral patterns of mall users. Users who are recreationally oriented displayed different patterns of behavior than those who have a functional and economic orientation. Persons seeking social benefits engaged in more

interpersonal activities. Based on the results, changing goals and activities were related to perceptions of space. People with more desire for contact with others perceived the area that they occupied as less crowded and more spacious.

In recreational research, crowding has been defined as a negative evaluation of a certain density (Graefe, Vaske, and Kuss, 1984; Gramann, 1982). Negative evaluations occur when the presence of others in a setting interferes with goal achievement or creates a level of social stimulation which exceeds that desired by the individual (Gramann, 1982). Gramann (1982) suggested that increases in density causes increased interaction among individuals or groups, and that people feel more crowded as interaction rates increase. Subjective psychological factors, as well as objective characteristics of conditions, are likely to influence a person's evaluation, because crowding by definition involves a value judgment that there are too many people (Shelby, Heberlein, Vaske, and Alfano, 1983).

2.3.4. Lighting, crowding and interpersonal distance

A limited number of research studies have examined the effects of lighting on people's perception of the environment and resultant social interaction. In Areni and Kim's (1994) field experiment, shoppers examined and handled more of the merchandise when the area was bright, but the effects of lighting on shoppers' interaction with each other were not reported in the study. In the shopping mall case, only Wakefield and Baker's (1998) study examined the lighting effect on social interaction. They concluded that lighting had no reported effect in generating more interaction among shoppers.

Nasar (1984) examined the effects of natural lighting on perceptions of spaciousness, and crowding among students living in a dormitory building. The hypothesis of Nasar's (1984) study was that rooms with low levels of lighting were expected to be judged as smallest and most crowded. Students' ratings of their rooms were evaluated, and the results supported the relationship between lighting, perceived spaciousness, and crowding. As expected, students perceived brighter rooms as larger than darker rooms.

Schiffenbauer, Brown, Perry, Shulack, and Zanzola (1977) focused on the design elements of an environment that might lessen the negative effects of high density and

used a survey questionnaire to ascertain students' perception of crowding and density of their rooms. They found that perception of crowding and lighting are influenced by the amount of natural lighting in the room, and that perceived size of space and feeling of crowding were unrelated. These researchers assumed that brighter dorm rooms would seem larger and less crowded than dark rooms. As a result, rooms that received more sunlight were judged as less crowded by the students than rooms that received less sunlight. But these brighter rooms were not seen as larger. This study though has a major weakness: it was conducted using only female students.

Mandel, Baron, and Fisher (1980) included both males and females and found that natural lighting has an effect only among women who have different perceived size and crowding based on changing lighting conditions. For both men and women, however, density correlated with perceived room size.

Inui and Miyata (1973) studied the perception of enclosure in interiors. They investigated the effect of interior lighting conditions, room and window size, and lighting levels. This study shows that perception of enclosure is related to room size and lighting condition.

Gifford (1988) investigated the effect of lighting level on interpersonal communication and assumed that brighter conditions would stimulate more general communication, and lower lighting levels would encourage more intimate communication. The method included subjects' ratings of the conditions of experimental room settings with changing lighting conditions. Subjects also rated the intimacy level on scales (not intimate and extremely intimate). As a result of the findings, Gifford (1988) suggested that more interpersonal interactions could be accomplished in a setting with normal bright light. However, this study too was conducted among only female subjects. A broader study is required that includes male subjects and with other types of communication.

Veitch and Kaye (1988) proposed that low levels of lighting in architectural environments are related to quietness and intimacy. They studied the effects of high and low lighting levels on conversational sound levels, which were measured by an acoustic analyzer. The results showed that, contrary to the expectations, there was a lower conversational sound level in the high lighting condition.

2.3.5. Culture and interpersonal distance

Hall (1966) presented detailed descriptions of behavior in physical settings and uses of space during interaction, which related cross-cultural differences in behavior among contact (Arab and Japanese) and noncontact (German, English, North American) cultures. Contact cultures have been described as people who are more likely to live in close physical contact and exhibit close interaction distances. In contrast, noncontact cultures display larger interaction distances. According to Hall's (1966) classification of cultures, individuals from contact cultures who prefer closer social interaction and maintain smaller interpersonal distances would have more tolerance for crowded living conditions than non-contact cultures. Evans, Lepore, and Allen (2000) conducted in-depth interviews to determine whether ethnicity is related to one's ability to cope with the adverse effects of high-density living conditions among the contact (Vietnamese American and Mexican American) and noncontact (Anglo-American and African American) ethnic groups. The results supported Hall's framework that contact cultural groups perceived their home environments as less crowded than noncontact groups.

Six, Martin, and Pecher (1983) studied the effects of density, interpersonal distance, acquaintance level, and gender on measures of crowding and discomfort between German and American subjects. Students were shown diagrams of simulated crowding conditions. The researchers found that at large interpersonal distances, Germans tended to feel more comfortable than Americans when they had more people around them.

Not all the researchers agreed with the above conclusions. Nasar (1984) assumed that students from Mediterranean (contact) cultures judge their rooms as more crowded than do students from Asian (non-contact) cultures. Kaya and Weber (2003) examined the cross-cultural differences in the perception of crowding and privacy regulation between American and Turkish students in similar residence hall settings (long-corridor type). Students were asked to respond to questionnaires consisting of scales to measure individuals' perception of crowding. The results showed that Turkish females perceive their residence hall rooms as more crowded than American females do; and American male students perceive their physical surroundings as more crowded than Turkish male students do, which partially support Nasar's (1984) assumption. Kaya and Weber (2003) explained this difference by the nature of the roommate relationships and the ways in

which male and female students obtained the degree of openness-closeness to others. They also found that students in the United States felt more crowded than students in Turkey, even though American students had larger rooms.

Keating and Keating (1980) argued that cross-cultural comparisons of interpersonal distance should be based on observations made within subjects' own cultural settings to avoid confounding influences such as anxiety and suspiciousness, which are often produced by unfamiliar surroundings. They investigated how interpersonal relationships affect seating distances within a culture. It was assumed that acquaintances maintain smaller distances than strangers. The study included observations, which were captured in photographs, of bench seating behavior and comparisons of spacing patterns of acquaintances and strangers in two parks located in Kenya. Interpersonal distances between subjects were defined by measuring the horizontal distances between heads and torsos. As expected, acquainted pairs sat closer to each other than unacquainted pairs on benches, but the distances were similar to those observed in the United States in other studies (Mazur, 1977).

Shuter (1977) observed and measured the interactions of subjects in Italy, Germany, and the United States and provided some support for cultural variations relevant to gender. The results showed that Italian subjects interacted more closely to each other than German and American subjects. Noesjirwan's (1978) study of nonverbal communication of Indonesians and Australians also provided mixed support for cultural differences. Using reactive chair replacement techniques, Noesjirwan (1978) noted that Indonesians selected closer distances and touched each other more than did the Australians.

Sussman and Rosenfeld (1982) investigated interpersonal distances between seated Japanese, Venezuelan, and American subjects. The goal was to explore the effects of culture, gender, and language spoken on conversational distance. For this purpose, during the conversations between subjects, an acquaintance sat at particular distances from the groups. The distances at which the subjects placed their chairs relative to the seated acquaintance were treated as a dependent variable. Distances were measured based on grids drawn on the floor prior to the experiment. The results supported Hall's (1966) distinction between cultures in terms of their personal spaces. Venezuelans,

representing a contact culture, adopted closer conversational distances than did Japanese and American subjects.

Only a small number of studies that included these concepts have been done in Turkish society. In one of the studies, Rustemli (1992) conducted two experiments to determine the personal space needs of Turkish males and females. Subjects were presented with diagrams that simulated several social conditions in which interpersonal distances, density, gender, and friendship were varied. The results showed that females had the largest distances next to male subjects, and male-male pairs used larger distances than females. Rustemli (1992) stated that Turks act less reserved in their interactions and stand closer to each other than most Northern Europeans and North Americans do. The Physical structure of Turkish cities and especially the social structure of the Turkish family provide for high-density living. Therefore, crowding effects of density are expected to be less evident among Turks (Rustemli, 1992). But this research was limited to the residence hall setting, investigating responses of only university students.

Rustemli (1986) hypothesized that a female's approach distance to a male would be larger than to a female in Turkish culture. To test this hypothesis, Rustemli (1986) conducted experiments in which seating distances between subjects were measured. For same gender pairings, a larger distance for males than females was expected. The results showed that Turkish males and females were sensitive to distance cues when orienting themselves spatially. In respect to same gender pairings, males had a larger distance (46.7 cm) than females (40.7 cm). Rustemli's (1986) findings are incompatible with reported findings in American culture (Evans and Howard, 1973).

2.3.6. Gender and interpersonal distance

According to Stokols and Altman (1987) personal space requirements vary with gender; males have larger personal space needs than females. Six et al. (1983) found that subjects felt more crowded with males than with females. Rustemli and Kokdemir (1993) suggested that Turkish females have higher means for social intimacy with friends and lower means of isolation than Turkish males.

A number of studies showed that female dyads, whether sitting or standing, interacted at closer distances than did opposite-sex or male dyads (Hayduk, 1983). Other research found different results in same sex interactions (Patterson and Edinger, 1987; Burgoon, 1989). Baxter (1970) observed that cross-sex pairs stood closer than did same sex pairs. Hartnett et al. (1970) and Leibman (1970) suggested that females have smaller personal space zones than men and that, in general, male-female pairs had smaller zones than same-sex pairs. Females interacting with females have also been found to exhibit smaller personal space zones than males interacting with males (Horowitz et al., 1970).

Freedman (1970) proposed that under conditions of limited space, the interpersonal relationships within female groups were more intimate and friendly than those observed in male groups. Ross, Layton, Erickson, and Schopler (1972) in Stokols et al. (1973) suggested that identical perceptions of available space are interpreted differently by males and females because genders differ with respect to their expectations regarding personal space. Stokols et al. (1973) discovered that males found interpersonal distances in a small room too close for comfortable interaction, while females found the same distance comfortable. Conversely, a large room provided interpersonal distances that were comfortable for males, but not for females.

2.3.7. Age and interpersonal distance

Several studies have documented a linear relationship between interpersonal distance and age up to the 20s (Hayduk, 1983). Meisels and Guardo (1969) have found that children generally use more space as they grow older. However, research on adults is much less clear. Liebman (1970) found no age difference in spacing patterns among subjects when they were seated on occupied but spacious benches. In one of the studies focusing on age, Burgess (1983) observed people walking the corridors of shopping malls and downtown sidewalks in the United States and concluded that young adults stood closer together than middle-aged adults; senior adults maintained the greatest distances.

Raddick and Mullis (1997) examined the difference in interpersonal engagements between teen-teen and teen-adult dyads in a mall setting. They observed behavioral

activity, physical proximity and position, emotional expression, conversation, and evidence of shopping. The findings of their descriptive study showed that adolescents were more engaged with other adolescents than they were with adults; adolescents associate less often with adults and more frequently with peers.

2.4. Theoretical explanations and cumulative findings

This section outlines the summary of theoretical, contextual, and methodological problems in previous research. At the end of each section, the contributions of the current study to gaps in the current literature are introduced. A summary of theoretical relationships discussed in this chapter can be seen in the Appendix 1.

2.4.1. Discussion of theoretical relationships

The design of an enclosed built environment such as a shopping mall can facilitate or hinder social interactions. However, little has been reported in the literature with respect to the relationships between environmental conditions and social interaction (Ng, 2002). This study aims to understand how people perceive their environments and how these perceptions are related to changing environmental conditions.

Based on the previous findings, it can be assumed that preference for interpersonal distance is related to people's perceptions of space; people who prefer near interpersonal distances perceive the space differently than people who prefer far distances. Very few studies included these relationships as a part of their content. Therefore, the relationship between mall users' preferences for interpersonal distance and their perceptions of the space in terms of spaciousness and crowding are defined as one of the outcomes of this study.

Previous research has considered density as the influence of number of people in a particular area. Much of the research that investigated this influence as an environmental variable has centered on the crowding issue. Research has tended to show that perceived crowding has a negative influence on user evaluations of an environment. But very limited research has been conducted that focuses on the

relationship between density and interpersonal interaction of users of built environments such as shopping malls.

The literature suggests that being with others influences perceptions of spaciousness and crowding. Relationships among individuals within a given environment may enhance an individual's sense of control over his or her interactions with others. This sense of control may reduce the feeling of crowding. Therefore, this research includes an assumption that being with acquaintances in a mall would be related to people's perception of the mall area and interpersonal distance.

Little is known about spatial behavior among males and females in other cultures due to the paucity of empirical research. Most of the available research on gender differences in spatial behavior is limited to studies done in the United States (Henley and LaFrance 1984). Thus, the spatial patterns associated with traditional gender roles often found in America were not evaluated in other cultures. More research is needed to examine the relationship between gender and social interaction in other countries. Therefore, this study includes the investigation of the role of demographic variables such as age and gender on perception of space and interpersonal distance in two cultures.

Studies on the relationships between density, perceived crowding, and interpersonal distance were generally limited to single cases. Burgess (1983) suggested that in order to know how behaviors function in the social context, it is necessary to make comparative studies of nonverbal behavior in other related environments. This study, therefore, includes multiple cases to investigate these relationships between two cultures.

2.4.2. Conceptual and contextual summary

Research on perception of space has used many concepts, such as enclosure and spaciousness, to study people's reaction to changing environmental conditions. Although spaciousness was defined as more a subjective evaluation compared to enclosure, researchers have used these terms interchangeably to define similar conditions. Most of these definitions were based on the objective measurements such as the position and number of surface elements, height and width ratios, and area covered by the floor and

overhead space. A very limited amount of research included users' or subjects' own definitions of enclosure.

In studies investigating people's responses to open and closed spaces, there was no consistency in the definition of enclosure. The term was mostly defined based on the manipulation of architectural elements in the environment such as walls and surrounding buildings. Most of these studies eliminated the existing environmental factors, which were assumed to influence subjects' perceptions of the environment. Generally, very limited numbers of physical variables were included in these studies. Since the focus was to investigate people's perception of open and closed space, researchers aimed to concentrate on the definition and manipulation of type of enclosure only. However, people's perception of spaciousness is not only related to the spatial characteristics of environment. Other physical conditions such as brightness or density of the area should be investigated relevant to perceived spaciousness.

Most of the studies on density and crowding defined and measured the density by counting the number of people present in a specific area. Density refers to a physical condition, as opposed to a subjective feeling. At its simplest, density is a number of units in a given area. However, there are no agreed-upon standard definitions of density; rather each profession has come up with different measures.

Some researchers used thresholds for density effects on perceived crowding (Roegerci, 2002; Trakolis, 1979). However, similar studies were conducted in household settings and recreational environments. These specified thresholds are applicable to the environments that have been studied. Users' short-term experiences of crowding in an enclosed built environment such as a shopping mall would be different than those in household and recreational settings. Therefore, more appropriate threshold measurements need to be included in this study. Density can be classified as high, medium, or low based on the previous theoretical assumptions. But it would be more useful to specify density as above and below a density threshold in mall settings to investigate mall users' responses to high and low density conditions.

In studies of human behavior, a typology of environment has not been specified systematically. Although physical features of the environment such as density, color,

music, noise, temperature, and odor have been included in such research, their relationship to perception of space and interpersonal distance has been neglected. Most of these studies have been conducted in small-scale settings such as university dormitory buildings and experimental room settings. More aspects should be covered with more empirical studies in different locations with various sizes.

Another discussion worthy of discussion is the shortcomings of cross-cultural methodologies. Traditional approaches to studying cross-cultural behavior that are typically grounded in a comparative approach have become increasingly inadequate to capture the complexity of cultural influences. The intent is to examine whether similar demographic or socio-cultural groups in different cultures will exhibit similar behavior patterns. In these studies, countries are often used as units in experimental design. Typically, no variables explicitly relating to or characterizing the national culture have been examined (Triandis, 1972; Berry, 1989). Concepts and measurement instruments have initially been developed in one country, often in the United States, and then assumed to be relevant in another country.

Evans et al. (2000) commented that most of the cross-cultural studies on crowding have been conducted within the US. It is necessary to examine the generalizability of findings across a broader range of cultural groups. Therefore, this study was conducted in two cultures, and the instruments for data collection were tested in the American cases first. The terms used in the questionnaire and the exploratory surveys were then translated to Turkish. The instruments were then tested in Turkish cases; doing so was essential to develop understandable and yet representative concepts for all cases. To assure the validity of concepts, colleagues of the researcher were asked to select at least two words in Turkish that best represent the meaning of concepts in English. As a result, words such as “kalabalık” for “crowded” and “ferah” for “spacious” were selected and used in Turkish versions of the questionnaire.

This study attempts to observe user characteristics and spatial features of settings for each case separately. The purpose is to gather information for describing conditions relevant to cultural differences. In particular, the study suggests that people in a contact culture have different perceptions of spaciousness and crowding, and interpersonal

distances, than people in a noncontact culture. How to study these concepts in multiple cases located in two cultures has been defined in the early stages of the research.

A very limited number of empirical cross-cultural studies have been done on the relationship between environmental characteristics and perception of space and social interaction in enclosed built environments such as shopping malls. Therefore, there is a need for a research study of the perceptions of people in different cultures with regard to different built environments. The current study focuses on establishing a basis for practical implications, as well as future research needs based on this context.

To some researchers, shopping malls have been described as environments where behavior in groups can be readily observed and where environmental factors can be investigated and quantified (Burgess, 1983; Bloch et al., 1994). The large size of the mall is a methodological advantage, since most previous investigations of crowding and density examined limited spaces such as classrooms, dormitories, and laboratories. Although a researcher's ability to control environmental conditions in a mall setting is more difficult and nearly impossible, this research aims to investigate users' perception of space and their interpersonal distances next to other users in shopping malls.

The concept of crowding in built environments has major implications for researchers and practitioners alike. From a theoretical perspective, retail environments such as shopping malls can be defined as "natural laboratories" (Raddick and Mullis, 1997, p.314) for examining a variety of individual and group behaviors, and the relationships between physical features of the environment and perceived crowding and spaciousness. The goal of previous research on crowding was to investigate how different numbers of people and amounts of space shape people's behavior and feelings in different conditions. Similar investigations in a shopping mall setting would provide managers, planners, and designers with guidelines for dealing with crowded shopping environments.

According to Im (1984), the environmental quality of an enclosed urban space consists of three major components. The first, physical-ecological quality, refers to the natural environment characteristics such as natural light, climate, and temperature. The second, behavioral-functional quality, refers to the interactions between people and the physical

settings. And the last one, aesthetic-visual quality, refers to individual preferences related to people's reaction to the visual environment. The combination of these three qualities of environmental components has contributed to the impressions of physical space in terms of openness-closeness (Im, 1984). Therefore, it would be reasonable to investigate these qualities in an empirical investigation of person-environment interactions.

2.4.3. Methodological considerations

Previous research in interpersonal distance and perception of space has used various methods to understand the relationship between person and environment. Most of the studies of perceived spaciousness and enclosure have been conducted in laboratory conditions, with the use of pictures and drawings of actual settings. One important reason for this is the researcher's ability to control and manipulate conditions shown in pictures and drawings such as height and size of space, details in drawings, and elimination of other environmental features. However, perception is a complex process that results from the combination of many factors related to people's reactions to what they see, hear, smell, and touch. In an exploratory and descriptive study of perception of spaciousness in changing environmental conditions, the factors that are already present in the settings cannot be neglected. In this context, the study of perceived space would be better if structured in real settings where users are exposed to real environmental factors. Therefore, this study aims to investigate people's perception of spaciousness and crowding in four shopping malls. However, as stated before, the reliability of results will be questionable if the strategy is not systematically operationalized in all cases. In other words, if the methods fail to answer research questions in the same manner in all cases, the findings will not be valid and reliable. This study, therefore, attempts to use the same methods and instruments in all cases. The intent is to compare findings and to describe conditions of cases based on the outcomes.

Research on how people from different cultures orient themselves spatially in social situations has resulted in only a limited number of empirical cross-cultural studies. Procedures in these researches are not always applicable to other cultures, and the procedures themselves may not be easily understood by members of different cultures. In this study, the intention is to adjust procedures based on the changing socio-cultural

character of the environment. For example, questionnaires were tested in both cultures, and respondents were asked in a manner that would enable them to understand every concept in the instrument clearly.

In most of the previous studies of enclosure, subjects rated drawings according to their perceptions of enclosure. These studies do not take into consideration additional variables such as illumination, brightness, and the presence of others, which can possibly be related to subjects' responses. Therefore, this study investigates the conditions of cases and relationships between variables in real settings.

Most of the studies have included drawings and pictures to evaluate people's response to environmental features that can only be seen in those drawings and pictures. Additionally, few studies have asked about people's impressions of spaciousness and crowding while the subjects were in the actual space. Therefore, this study defines the enclosure of mall space based on the subjective definitions of mall users. This process was accomplished by conducting the exploratory survey in the early phases of the fieldwork.

Although there are many studies of interpersonal spacing (Hayduk, 1983), only a few have employed naturalistic observational methods. Generally, selected subjects were observed while interacting with others under different environmental conditions. Subjects were usually aware that they were being watched, and this fact might cause them to behave differently. In order to observe people's regular activities, they should be observed unobtrusively in real settings.

Powell and Dabbs (1976) also observed the lack of studies of interpersonal distance in more truly social conditions. These researchers examined the influence of gender and physical attraction on personal distance in both laboratory settings and on a sidewalk (Powell and Dabbs, 1976). The aim was to compare the results of observations and measurements of interpersonal distances in experiments and in real settings. Therefore, first, distances between subjects and the face images were measured by a tape measure in the experimental condition. Then, on a sidewalk, distances between the interviewer and the respondents were recorded by a camera and measured on photographs. The results showed that, in laboratory conditions, subjects approached

attractive face images more closely, but on the sidewalks, attraction had no effect on interpersonal distance. Based on the results, it would be concluded that people's response to environmental conditions and their interactions with others were different in laboratory conditions and real settings.

According to Velastin et al. (1994), time-lapse photography is extensively used in determining pedestrian densities in urban spaces. This technique also shows that pedestrians attempt to maintain "buffer zones" around them to prevent collisions with others, and pedestrian behavior in various countries may differ according to body structure and cultural conventions. Part of this study includes a time-lapse photography technique to make measurements of both density and interpersonal distances.

Most of the studies on perceived enclosure used structured questionnaires with scales to assess users' responses to environmental conditions. This instrument is useful in obtaining direct responses from the users about their environments. This study includes a similar instrument with various types of questions.

Most of the previous research on enclosure measured and defined the physical stimuli by objective techniques. People's subjective responses and definitions were usually neglected when formulating such definitions. Most of these studies used structured questionnaires with which respondents rated the environmental conditions by scales. In addition, there is no consistent and systematic operationalization in the definition of environmental variables in these studies. Most of these previous studies defined and treated the environmental stimuli as experimental settings and excluded the existing environmental factors other than the variables that were intentionally included.

Most of the settings previously studied were defined as experimental settings. These settings were repeatedly used in various studies such as those of dormitory buildings. Case study was not a preferred method in such studies. Detailed and in-depth definition of study settings was not included in these studies, which is the major goal of the case study approach.

Previous research has measured and defined interpersonal distance in various ways. Most of these methods have been used under the control of the investigator, who might

be biased because of the investigator's influence on people's responses. For example, Duke and Novicki (1973) presented a measure for interpersonal space, the Comfortable Interpersonal Distance scale, a paper and pencil measure in the format of a plane with eight lines radiating from a central core. Subjects are instructed to imagine themselves at the center and to respond to approaching persons and draw a line on the appropriate radius to indicate how close they would allow that person to get. There have been some other attempts to define objective measures of personal space. One of them used human figures to be placed in model settings (Evans & Howard, 1973). Subjects were instructed to place those figures based upon their preferences for personal space zones. The major shortcoming of these techniques is that they fail to define distance in real settings where the interactions and activities occur.

Despite conflicting data and lack of experimental control in much of the personal space research, some conclusions have been reached. It was concluded that personal space is influenced by gender, age and cultural variation. Cross-cultural studies suggested that people from North American and North European countries have larger personal space zones than those from the Mediterranean.

Retail research in mall settings has used intercept surveys that were conducted among sample populations at one or several mall locations to gather in-depth information about consumer behavior, habits, preference, or perceptions. The strategic advantages of consumer intercept surveys are the speed with which they can be conducted, their low cost, and the ability to poll a large number of consumers. The major disadvantage of the consumer intercept survey method is that it entails "convenience sampling," meaning that especially in the case of small samples, results may not be as representative as samples developed through random or stratified sampling. This study used a similar survey technique in mall cases to gather information about user characteristics, their perceptions of the mall areas, places they like and dislike, and their preferences for interpersonal distances.

Shelby, Vaske, and Haberlein (1989) suggested that perceived crowding is usually measured by self-report techniques. Scales are useful because they consider a concept from different points of view and give reliable estimates. Haberlein and Vaske (1977) developed a single-item that asked people to indicate how crowded the area was at the

time of their visits. For the purpose of this study, a similar rating scale is included to evaluate mall users' feeling of crowding in mall areas.

General problems in research literature and the contribution of this study to the research field are listed in Table 2.1.

Table 2.1. Research problems and the contribution of current study

RESEARCH PROBLEMS	CONTRIBUTION OF CURRENT RESEARCH
Theoretical	
Gap in studies linking perceived environmental attributes and properties of the built environment	Exploring the relationships between variables such as density and lighting, and perception of spaciousness, and crowding
Lack of studies that link subjective responses with objective measurements	Use of both subjective judgments of mall users about their environment and measurements of physical variables such as lighting levels
Conceptual and contextual	
Lack of extensive research on interpersonal distance in countries other than the US	Comparison of cases in both US and Turkey
Lack of perception studies in enclosed public spaces	Selecting shopping mall as the site of the study
Lack of consistency in defining concepts	Use of mall visitors' definition of enclosure and a systematic technique to define density
Lack of environmental assessment based on user's own judgments	Use of exploratory survey to define open and closed areas in the mall settings
Methodological	
Lack of sophisticated techniques for monitoring and evaluating interpersonal distance	Use of systematic observation techniques to observe and measure interpersonal distance
Lack of studies of perception of space in real settings	Conducting research in enclosed built environments—shopping malls
Use of pictures and drawings for perception studies	Defining areas of malls to evaluate users' responses to the features of these areas

CHAPTER 3. CONCEPTUAL FRAMEWORK AND RESEARCH QUESTIONS

In this section, the framework of the study, which provides the basis for the selection of variables, for the consideration of the patterns, and for the formulation of the interrelationships within the system, is introduced. Based on the framework, research questions and hypotheses are developed, which are listed in the second part of this chapter.

3.1. Conceptual framework

In the context of the built environment, the general model of environment-behavior relationships specifies that the physical characteristics of a built environment are related to users' perceptions, which in turn determine people's responses to the environment. Furthermore, culture and personal variables, such as age and gender, are related to both perceptions of and responses to environment (Figure 3.1).

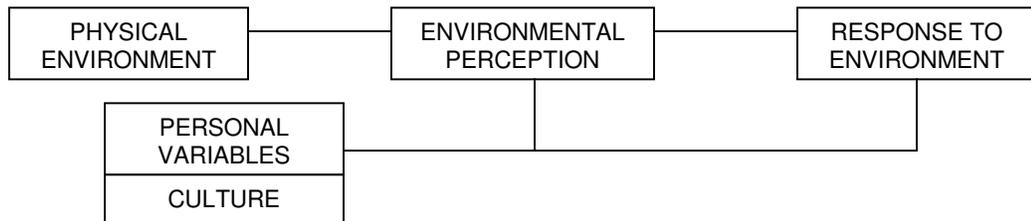


Figure 3.1. Components that relate to people's response to environment

Built upon the preceding model, a similar model was proposed by Altman and Chemers (1980) that is suitable for the focus of the present study (Figure 2.1). This model does not focus on causal relationships; rather the focus is on the continuous relationships between concepts, such as density, lighting, type of perceived enclosure, and behavioral processes and outcomes. Chiefly, the study focuses on the importance of people's responses to environmental conditions, which are assumed to be related to physical attributes of space. The summary of theoretical and conceptual discussion (Figure 3.2) is used in structuring research questions and describing the associations between variables, and the summary of methodological discussion (Figure 3.3) is used in structuring the techniques for data collection.

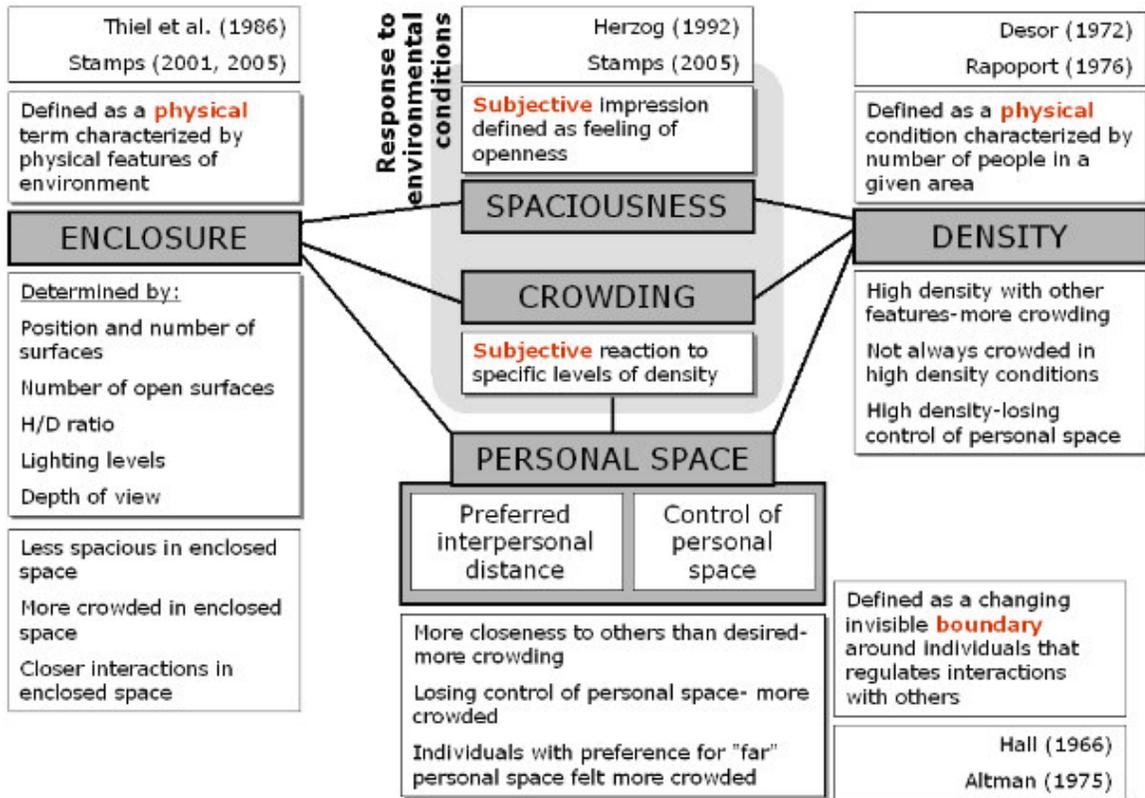


Figure 3.2. Summary of theoretical and conceptual discussion

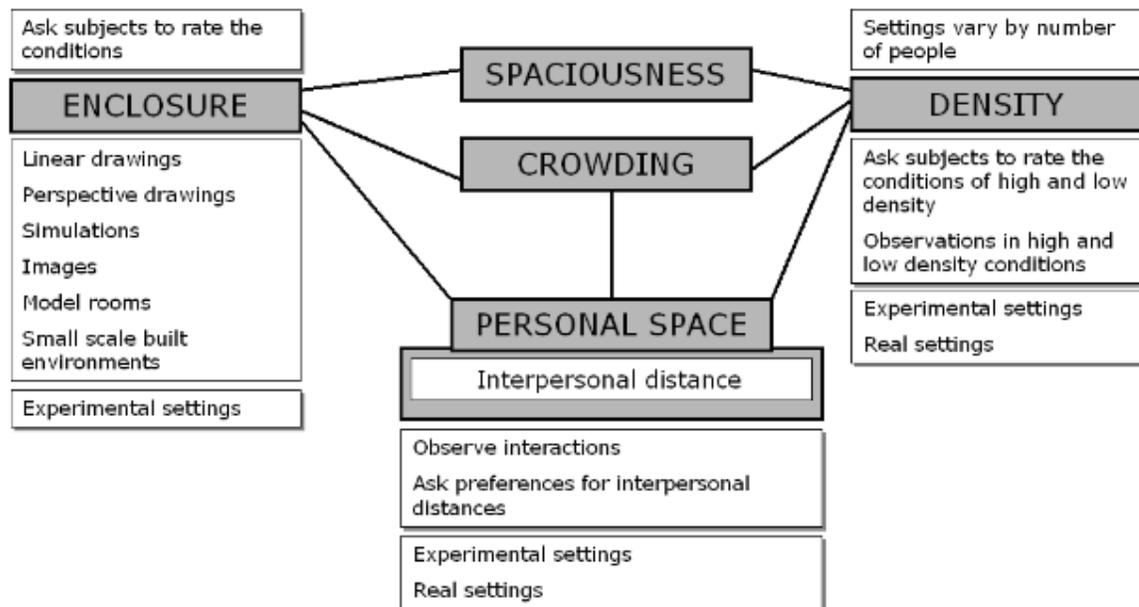


Figure 3.3. Summary of methodological discussion

3.2. Research questions

The exploratory and descriptive nature of this study started with a set of general questions, which were modified during field research. This chapter includes a list of major questions and sub-questions, which are interrelated with potential hypotheses (Table 3.1).

The first objective of this research is to explore the possible relations between type of perceived enclosure, lighting levels, density conditions, and perception of spaciousness and crowding in areas of shopping malls. Answers to the next main question and sub-questions are sought to meet this first objective:

Question 1. Do users' perception of spaciousness and crowding in areas of Turkish and American shopping malls relate to the changes in the type of perceived enclosure, lighting level, and density of those areas?

Question 1a. Do users' perception of spaciousness and crowding differ in open and closed mall areas?

Question 1b. Do users' perception of spaciousness and crowding differ in high and low density conditions?

Question 1c. Do users' perception of spaciousness and crowding differ in bright and dark mall areas?

The second purpose of the study is to examine whether type of perceived enclosure and density are related to changes in interpersonal distance between mall users. This second objective yields the following questions.

Question 2a. Do interpersonal distances between individuals change in open and closed mall areas?

Question 2b. Do interpersonal distances between individuals change in high and low density conditions?

The third purpose is to examine the possible relationships between culture and demographic variables such as age and gender and interpersonal distance and

perception of spaciousness and crowding. It is assumed that people in different age and gender groups and from different cultures perceive the environment differently. In addition, interaction distances between mall users differ based on variations in culture, age, and gender. In accordance with these assumptions, the following questions are asked:

Question 3a. Do users' perception of spaciousness and crowding change according to age and gender of those people?

Question 3b. Do American and Turkish users have different perceptions of spaciousness and crowding in open and closed areas of shopping malls?

Question 3c. Does interpersonal distance between individuals in shopping malls change according to age and gender of those individuals?

Question 3d. Do American and Turkish users differ in interpersonal distances in areas of shopping malls?

Coming alone to the malls, number of people next to the respondents during interviews, and preference for interpersonal distance next to friends and/or family or strangers were defined as user characteristics, which would be related to people's perception of spaciousness and crowding. Therefore, the next question was asked to explore any relation between these variables:

Question 4. Are user characteristics, such as coming alone to the malls, number of people next to the respondents during interviews, and preference for interpersonal distance related to people's perception of spaciousness and crowding?

The next chapter lists research hypotheses that were developed based on the theoretical relationships described in the literature review.

3.3. Potential hypotheses

This study is one of the first that systematically attempts to explore people's perception of mall areas and the relationship between features of mall areas and interpersonal distance. The following major and minor hypotheses were derived from theories in the literature. Rather than explaining the cause-effect relationships, this study aspires to describe and explore the relationships between research variables based on conditions in shopping malls. Therefore, the study does not intend to confirm these hypotheses; rather, these hypotheses are evaluated as bases for structuring relationships between variables in multiple cases.

Major hypotheses

Hypothesis 1. People's perception of spaciousness and crowding change in mall areas with different types of perceived enclosure, lighting levels, and density conditions. People in open mall areas feel more open and less crowded, regardless of brightness. As lighting increases, people perceive the areas as less crowded.

Hypothesis 2. The type of perceived enclosure and density condition of mall areas are related to changes in interpersonal distances between mall users. People interact more closely in closed mall areas with either high or low-density conditions. Interpersonal distance decreases as the number of people increases in a specific area.

Hypothesis 3. Users in different age and gender groups have different perceptions of spaciousness and crowding and interact at different distances with others in mall areas.

Hypothesis 4. People's perception of spaciousness and crowding, as well as their interpersonal distances vary across cultures. Turkish mall users stand closer to each other than American mall users do.

Minor hypotheses

Hypothesis 5. Being with others in malls is related to the perception of spaciousness and crowding. People who come to a mall alone will perceive the closed area as more open. For people who come to mall alone, closed areas in both high and low density conditions will be judged as spacious and less crowded.

Hypothesis 6. Distance between users in malls is related to judgments in dense conditions. People who prefer near distances perceive space differently than people who prefer medium and far distances. People with far personal space preferences under high-density conditions feel more crowded.

Figure 3.3 illustrates the location of research questions in the framework, showing the relationships between research variables.

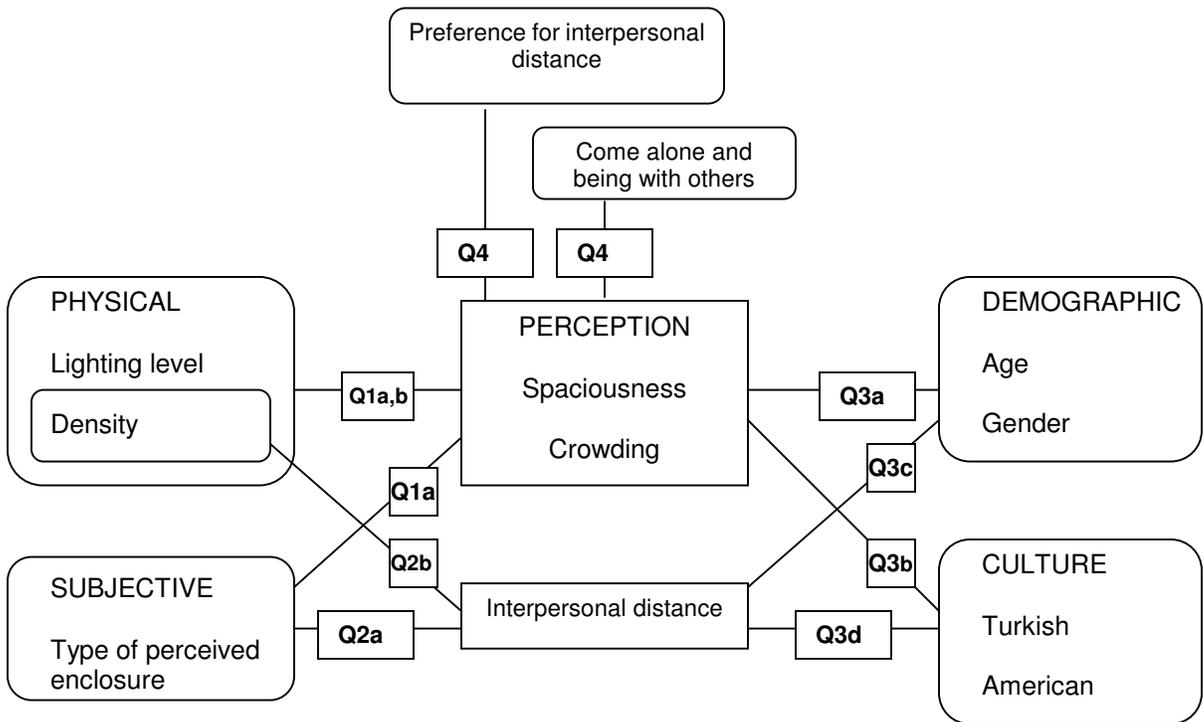


Figure 3.4. Locations of research questions in the research model

Table 3.1. List of research questions and potential hypotheses

RESEARCH QUESTIONS	POTENTIAL HYPOTHESES	DATA COLLECTION	COMPONENTS of ANALYSIS
Relation between density, lighting and enclosure, and perception of spaciousness and crowding			
Do users' perception of spaciousness and crowding in areas of Turkish and American shopping malls relate to changes in the type of perceived enclosure, lighting level, and density of those areas?	People in open mall areas perceive more spaciousness and feel less crowded, regardless of brightness. As lighting increases, people perceive the areas as less crowded.	Exploratory survey Architectural survey Questionnaire	<div style="border: 1px solid black; padding: 5px; display: inline-block;">Mall area Density condition Lighting levels</div> <p style="text-align: right;">Questionnaire Q12</p>
Relation between density, lighting and enclosure and interpersonal distance			
Do interpersonal distances between individuals change in open and closed mall areas? Do interpersonal distances between individuals change in high and low density conditions?	People interact more closely in closed mall areas with either high or low-density conditions. Interpersonal distance decreases as the number of people increases in a specific area.	Exploratory survey Architectural survey Systematic observation (Photography)	<div style="border: 1px solid black; padding: 5px; display: inline-block;">Mall area Density condition</div> <p style="text-align: right;">Distance measurements</p>
Relation between demographic variables and perception of spaciousness and crowding			
Does people's perception of spaciousness and crowding change according to age and gender of those people?	Users in different age and gender groups have different perceptions of spaciousness and crowding.	Questionnaire	<div style="border: 1px solid black; padding: 5px; display: inline-block;">Age Gender</div> <p style="text-align: right;">Questionnaire Q12</p>
Relation between demographic variables and interpersonal distance			
Does interpersonal distance between individuals in shopping malls change according to age and gender of those individuals?	Users in different age and gender groups interact at different distances with others in mall areas.	Systematic observation (Photography)	<div style="border: 1px solid black; padding: 5px; display: inline-block;">Age Gender</div> <p style="text-align: right;">Distance measurements</p>
Culture and perception of spaciousness and crowding			
Do American and Turkish users have different perceptions of spaciousness and crowding in areas of shopping malls?	Perceived spaciousness and crowding are different across cultures.	Questionnaire	<div style="border: 1px solid black; padding: 5px; display: inline-block;">Nation</div> <p style="text-align: right;">Questionnaire Q12</p>
Culture and interpersonal distance			
Do American and Turkish users differ in interpersonal distances in areas of shopping malls?	Interpersonal distance between subjects is different across cultures. Turkish subjects stand closer to each other than American subjects.	Systematic observation (Photography)	<div style="border: 1px solid black; padding: 5px; display: inline-block;">Nation</div> <p style="text-align: right;">Distance measurements</p>
Preference for interpersonal distance, being with others, come alone and perception of spaciousness and crowding			
Are user characteristics, such as coming alone to the malls, number of people next to the respondents during interviews, and preference for interpersonal distance related to people's perception of spaciousness and crowding?	People who come to a mall alone will perceive the closed area as more open. For people who come to mall alone, closed areas in both high and low density conditions will be judged as spacious and less crowded	Questionnaire	<div style="border: 1px solid black; padding: 5px; display: inline-block;">Questionnaire Q13</div> <p style="text-align: right;">Questionnaire Q12</p>

3.4. Definition of research variables

Personal space is the changing invisible boundary surrounding individuals; it regulates how closely people interact with others. In relation to personal space requirements, *interpersonal distance* is described as the distance between individuals while occupying a particular setting. In this study, interpersonal distance is measured between individuals standing in mall areas using digital photographs.

Spaciousness is a subjective impression defined as the feeling of openness (Herzog, 1992). *Type of perceived enclosure* is defined as a subjective term that is characterized by the spatial features of the environment that block or enable movement and vision such as height, width and depth of space, number of sides open at the front, height and width ratio, and number and position of surfaces and openings on the surfaces such as doors and windows. A space that blocks all motion and vision is perceived as fully enclosed. According to Stamps (2005), degree of enclosure is related to physical sizes of the environment. The type of perceived enclosure is defined based upon users' subjective impressions. Perceived spaciousness and crowding are measured by the responses to questionnaire items. These variables are defined as ordinal measures with values attained: 1 (strongly agree), 2 (agree somewhat) and 3 (disagree). Respondents had a choice to select their level of agreement with the spaciousness and crowdedness of the areas.

Lighting is the concept that refers to the amount of light reflected off surfaces and objects. People's response to lighting is often related to the brightness or darkness of the environment. Lighting level is an objective term and was measured by a simple hand tool that showed lighting levels in lux unit.

Density is an objective measure of the number of people per unit space, which can be specified precisely. *Crowding* refers to the subjective reaction of individuals to specific levels of density, that is, the number of people around the individuals, the space available, and organization of space and its elements (Rapoport, 1976).

Density was measured for both interview and observation sessions. During the interviews, the number of people in the areas was counted in the pictures taken before

and after the interviews. For the observations, the number of people was counted in the pictures of open and closed areas taken during the observation sessions. Three types of density conditions were defined: high, medium and low. For the purpose of comparisons, medium density conditions were excluded.

After the description of research variables, the next chapter describes the research methodology for the comparative case study. The chosen methodology of the case study is based on survey and observation techniques. The purpose of the chosen research methodology is to obtain different kinds of information in field settings. This information is used to answer the research questions and develop hypotheses for further research.

CHAPTER 4. RESEARCH METHODOLOGY

This study is structured as a field research exploring and describing the conditions of cases and the relationships between research variables. For this purpose, physical variables such as lighting levels, density conditions, and subjective definitions of enclosure of mall areas are used to evaluate their relationship to interpersonal distance and perception of spaciousness and crowding.

The research was conducted in two phases (Figure 4.1). The first phase of the research aimed to gather data about the physical conditions of the research settings and to map the spatial characteristics of the malls based on the research objectives. The instruments used for the first part of the research design were diverse and included a number of research techniques. These included analysis of documents, media articles, including review of newspapers and magazines, informal interviews with the management, and preliminary observations of malls including photography and participatory observation.

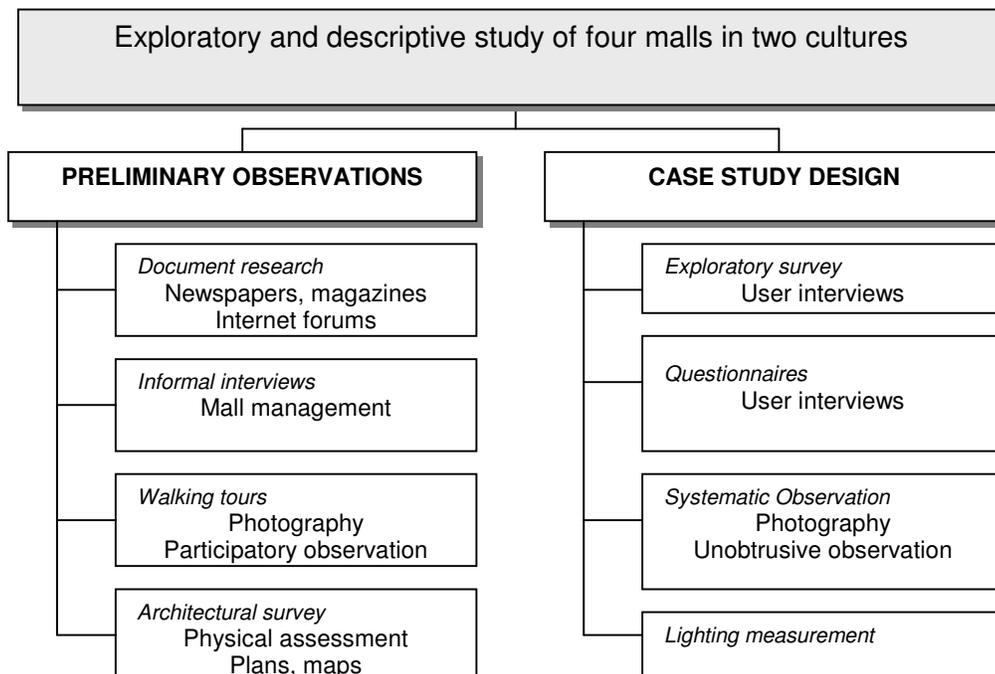


Figure 4.1. Outline of the research design

The second phase adopted a case study approach to identify physical and social attributes, such as type of perceived enclosure, lighting levels and density conditions of mall areas, and the way people perceive these areas in terms of spaciousness and crowding. These attributes were identified based on users' perspectives and opinions as well as measurements taken by the researcher (Figure 4.1).

The case study approach involved the systematic observation and analysis of the "case" unit. The comparative case study was designed so that the collected data would answer the research questions posed by the study. Since one of the main goals of the study was to investigate the conditions of multiple cases, a careful and systematic data collection procedure was carried out to assess users' response to the mall environments (Yin, 1994).

The advantage of case study research is the ability of the researcher and his or her target audience to gain real insights into the nature of the phenomenon in the real settings (Yin, 1994). In mall cases, the goal is to collect data about people's perceptions of the open and closed mall areas, as well as the interpersonal distances between those users. With multiple cases, this study approach plays an important role in the development of theories and hypotheses related to the variables investigated. The literature review contains several different theories related to perception of space and interpersonal distance. However, these theories were developed in various conditions and settings, none of which were shopping malls. It is this study's goal to describe conditions and then explore hypotheses in mall settings.

In order to provide credible results and usable hypotheses, it is vital to follow the same methodological considerations throughout the study (Yin, 1994). Therefore, the same methods were used in all cases. First, the study was conducted in American malls after the pilot tests had been carried out. Then, the questionnaires were translated into Turkish and tested in Turkish cases; this followed the fieldwork in the two Turkish malls. The data gathered in each case aimed to describe the conditions of those cases in which they were collected. Then, the results were compared for similarities and differences in each case in terms of users' perception of open and closed mall areas, and interpersonal distances between those users.

Case studies are preferred when the focus is on conditions present during the fieldwork, but when relevant variables cannot be manipulated, as they can be in experiments. In order to choose the cases for study, it is necessary to consider the investigator's control over actual conditions. In shopping malls, as in other real settings, it is difficult and nearly impossible to control environmental conditions, activities, and events. Research cannot manipulate current conditions and variables such as lighting levels, density conditions, and openness-closeness of the areas. Therefore, because of this limitation, it is not practical to conduct an experimental design in such real settings.

Some benefits of using case studies include (Yin, 1994; Stake, 1995): they may aid the researcher in achieving a detailed view of an event or situation; they are rich in detail and may therefore lead to a more complete understanding of some aspect of a person, group, event, or situation; they may aid in attaining effective information that cannot be collected by other techniques.

4.1. Preliminary investigations

This section describes the early stages of investigations including selection of settings, preliminary observations, informal interviews with mall management, and definition of the general characteristics of malls and their users.

Following identification of the study's subject, three malls in Turkey and four malls in the United States were selected based on the variation in size, location, date opened, accessibility, land use, and function. During this stage, information on the individual malls, their management, and contact persons were collected. Letters of request for participation, along with copies of the Institutional Research Board (IRB) approval letter were sent to the management of seven malls. The management of four of these seven malls, Armada and Migros shopping malls in Ankara, Turkey, and Triangle Town Center in Raleigh, NC, and the Streets at Southpoint in Durham, NC, in the United States, responded positively. Each of these four malls was chosen for data collection.

Prior to fieldwork, meetings with management of these four malls were held. The informal interviews with management provided some basic information on the planning and design strategies, building characteristics and the surrounding environment. These

meetings established friendly relationships with the management, who were essential to obtain formal permission to study the location in more detail.

Although conversations with mall management were spontaneous, some basic questions were prepared in advance in order to direct these interviews. These questions were mainly structured to illuminate the management's own perspective of the design characteristics of the malls. The list of questions included in these informal interviews with mall management is shown in Appendix 6.

The questions intended to gather information about managements' perspective relevant to design characteristics of shopping malls. The manager of Streets at Southpoint expressed his initial thoughts about the design characteristics. He explained the management's involvement in the design process of the mall and described the overall design characteristics and their functions, such as the purpose of using natural material, which was intended to create an outdoor street look inside, the goal of designing the interior space to be open and bright, the reason for designing each store front in conspicuously different styles in order to create the illusion of an outdoor street with distinct buildings, the use of plantings and some small trees, and the curvilinear layout of the mall that increases visibility. The manager also stated that the outside street was the most preferred area of the mall. He shared some user comments, which were overwhelmingly positive. The simple sketches he drew showed some of the basic design characteristics of the mall.

In Armada Shopping Mall, the management was more concerned about how to increase sales by attracting more users to the mall. The management representative presented a slide show that included a user profile, a marketing segment, and basic characteristics of the mall such as size and location.

The Migros Shopping Mall management shared information that they had gathered via user surveys. These surveys showed a general user profile and illuminated some user concerns about maintenance issues, such as the cleanliness of the restrooms. Although smoking is prohibited inside the mall, the fact that some users smoke in the restrooms was a major concern specified by these mall users. The management has decided to more effectively prevent this behavior in the restrooms, and enlarge the capacity of

these restrooms, based upon these responses in the user surveys. This shows that such surveys are helpful in discovering user opinions about mall characteristics. This study includes a similar survey study, which aims to understand users' perception of the mall areas. The results can be discussed and used by management to provide better environmental standards for the mall users.

In the Triangle Town Center, management mentioned general design characteristics of the mall, new store and restaurant openings, and the construction of the outside street. The management representative mentioned the general character of the mall serving as a "town center" of the region and the neighborhood.

Other than informal interviews with mall management in the four different cases, the settings were observed in order to gather information about the environmental features and user characteristics. Based on these observations, the malls are categorized into functional zones such as stores, corridors, seating, and entrance areas. The locations for the exploratory surveys were selected based on this classification.

4.1.1. Defining characteristics of malls and their users

General behavior patterns of mall users such as walking in public, standing in a crowd, and interacting with others were observed in all cases during the preliminary investigations. Notes and pictures were taken to characterize the activities that took place in these settings. In addition, time of day and day of week were noted to determine when more people visited malls.

Spatial characteristics of each mall were documented systematically in terms of the exterior and interior components. An inventory list was developed as an architectural survey to document and describe spatial properties of malls. The survey included space organization, the mall's connection with the surrounding, building style, building information in the form of building materials, indoor lighting conditions, and number of floors (Appendix 2A).

4.2. Case study

Data for this phase of the study were obtained during a two-month period in each of the shopping malls. The research procedures for the first part of case study, which included questionnaires, were pre-tested before being administered to the target participants. Following the pilot testing, the final research procedure for data collection in each mall began.

The next three parts of this section introduce techniques for data collection in case studies. In the first part, the exploratory survey is described. The second part describes the strategy of interviewing with structured questionnaires. The last part describes the technique of observation.

4.2.1. Identifying type of enclosure and exploratory survey

The exploratory survey was planned in the early stages of the study. The objective was to identify type of enclosure of mall areas according to user definitions. For this purpose, users were asked to select the areas that they define as open or closed inside the malls (Appendix 7A).

After preliminary observations and architectural surveys, locations for exploratory survey were defined. Features such as location of entrances and intersections, lighting conditions (artificial or natural), and functions of the space helped the researcher to choose these locations. The main purpose in choosing these locations was to ensure that the researcher could easily observe potential respondents in the crowd and approach them to ask for their participation in the study. In the case of Migros Shopping Mall, the first right entrance area on the first floor, which most people used to enter the mall, was selected. In Armada Shopping Mall, Streets at Southpoint, and Triangle Town Center, the main entrances of the malls were selected as location for this part of the study.

Three simple questions were asked of the respondents. The first question, "*Is this your first visit to this mall?*" determined respondents' familiarity with the mall areas. Respondents who had not visited that particular mall before were eliminated. The

second question “*Can you please name two areas inside this mall, other than restaurants and stores, which are more spacious [open] than other areas in the mall?*” asked respondents to focus on and select areas that they perceived as more open than others. This was, importantly, an open-ended question because it did not provide a list of areas for the respondents to choose from; they were free to name any two areas in order to answer this question. The last question included a list of four mall areas that were believed to be identifiable by users. For the purpose of this survey, users were asked to select the area from the list in the survey that they perceived as more open or closed than other areas. A simple map of the mall was attached to the survey to specify the locations of these listed areas. For every mall, the names of the areas changed, but areas that had similar characteristics such as entrances, center courts, and corridors, were selected and included in the surveys.

During the exploratory survey, users were approached and asked to participate in the study. A total of 52 people (13 in each mall) in malls were interviewed in this part of the study. The researcher stood next to the entrances and on the corner of the center courts to ask questions. It was known that during weekends more people visit malls than during weekdays. The number of people in the malls would affect user responses to the questions; therefore, one weekend day and one weekday were selected to obtain responses of users. Simple pilot tests were also conducted before the actual data collection. During these pilot tests, some problems emerged. According to the strategy, the researcher should select people who were just then entering the mall. But users who had just entered the mall might not have experienced any of the places listed in the survey yet. As a result, the first group of respondents answered the questions in similar ways. For example, they selected only the entrance area as the most open space. To correct this flaw, the researcher changed the strategy and asked people who were already inside the mall and who had probably visited other areas of the mall during that particular visit.

Answers to the questions were listed as a response table. These responses were organized and counted to find the most open and closed areas of the malls that were selected by the respondents. The results of this part of the study are discussed in the results section.

4.2.2. Questionnaires

It was important to collect and combine the objective data from the physical monitoring and assessment of lighting levels, along with density and behavioral monitoring with more in-depth and structured questions assessing the users' perceptions of space. This was achieved through formal interviews (questionnaires) with mall users. The data collected with the questionnaires not only answered the questions regarding the perceptions of mall areas, but also helped the researcher explore different environmental properties observed and perceived by the users.

The intent of the questionnaires was to generate a shopping and perception profile for each mall based on its users' responses to questions about their experiences in these environments. Questions covered topics such as activities, frequency and time of visits, and areas of the malls that respondents liked most and least. A pre-test of the questionnaire revealed some difficulties not only with the actual questions themselves, but also with conducting this type of research within the context of a shopping mall. One of the fundamental problems was the resistance of many shoppers to stop and participate in a questionnaire during their shopping trips. Most of the shoppers who were approached stated that they did not have time or did not want to be bothered with answering questions. Despite this difficulty, in a one-hour period, at least ten people were successfully interviewed.

The questionnaire guide was designed to probe the users' responses regarding the characteristics of mall areas, specifically the type of perceived enclosure, lighting and density. The questionnaire primarily consisted of structured questions. Open-ended questions were also included to assess users' comments about the malls; these included their preferences for the setting, why they liked or disliked the areas they selected, things they do while visiting the mall, and any other related comments made about the particular area of the mall (Appendix 8A).

Questionnaires were first prepared in English and tested in American malls. This process prompted the researcher to make some changes in the questionnaire. For example, two of the statements in the last part of the questionnaire, which were not related to research purposes, were eliminated. In the pilot study, respondents did not

easily understand the content of the question assessing user preferences for interpersonal distances. To compensate, figures showing two individuals interacting at different distances were included with those questions. After the completion of the data collection phase in American malls, questions were translated to Turkish (Appendix 8B). Before testing the instrument in the Turkish malls, the researcher showed the translated version to his colleagues who speak both languages. After making slight changes in the vocabulary and grammar, questionnaires were tested in the actual settings and then, the actual data collection procedure was completed in Turkish cases.

At least six people in each mall were selected as subjects for the pilot study in each case. The survey was conducted on at least one weekday and one weekend day; these days were selected randomly. The locations, such as a corner of open and closed areas, were defined before the interviews. It is known that location of the observer is an important determinant of impressions of spaciousness and crowding. Based on the theoretical findings, an observer's station point in the area would affect his or her reaction to the openness or closeness of space and density conditions. All of the interviews for each case took place in the same locations (i.e. one of the corners) where the respondents were observing the entire area for the purpose of describing the space. Respondents were asked to respond to the related questions including their agreement or disagreement with the spaciousness and crowdedness of the areas under consideration.

At least ten questionnaires were completed in each area. At the end of each questionnaire, the researcher measured current lighting level and noted this on the questionnaire sheet. The researcher then asked the first available person crossing a particular point to participate in the study. If that person refused to participate the study, the third person crossing the same point was asked to participate. Once finished asking questions in one area, the researcher moved to the other one in the same mall. It cannot be said with any degree of certainty that this strategy included a random sample of the shopping populations. However, there was enough similarity in the feelings and attitudes expressed by those participants to assume the findings are valid for at least a sizeable and relevant portion of mall users. The questionnaires in open and closed areas of the mall were completed in one day for each case. In all cases, a total of 337 respondents agreed to participate in this part of the study.

4.2.2.1. Defining density

Using photographs, manual counts can be made on a number of still pictures to provide a measure of the average density in a given area. In this study, it was assumed that users in the scene are moving “normally” and that stationary people do not remain completely stationary for any significant period of time.

Density counts were made on the pictures taken before and after the interviews. In American malls, interviews took place on the first floor of the malls. The researcher first stood on the second floor and took pictures of the areas where interviews took place. Then the researcher moved to the first floor and asked questions. When respondents finished the questionnaires, the researcher again stood on the second floor to take pictures of the same scenes. In Turkish malls, it was not possible to observe the areas where interviews took place from the upper level. Therefore, pictures were taken before and after the interviews on the same floor where interviews took place.

Density was defined for each case separately. All areas have different physical characteristics and functions, which may be related to the frequency of use. Some of the areas, such as center courts in American malls, are larger than other mall areas. Because of their size, function, and convenient location, more people use these areas more frequently. It is obvious that density measures will be different among mall areas. Therefore, defining one type of density measure for all areas will be problematic. It is better to use thresholds of densities which will be specified based on the number of people counted and floor sizes for each area separately. For this purpose, first, the number of people was counted from pictures in a given area.

Floor sizes of each area were measured on scaled mall plans. Ranges of the number of people in the open areas are larger than those in the closed areas (Table 4.1). These values were proportional to the floor size, location, and function of the areas. For example, the open area of Streets at Southpoint is located at the center of the mall where two major corridors connect. During their visits, users generally have to pass through this area. The maximum number of people counted, therefore, is greater among other open areas. Other areas, such as the Belk entrance in Triangle Town Center, were used occasionally. As a result, few people were observed in that area. This difference

also affected sample size for each case during distance measurements. There was a higher probability of more users to be selected in center courts as sample groups in observation session.

Table 4.1. Ranges of people counts in each area

Mall	Floor size	Open					Closed					
		Number of people					Number of people					
		Min	Lower threshold	Mean	Upper threshold	Max	Min	Lower threshold	Mean	Upper threshold	Max	
Migros	1 unit	5	12	15.5	19	26	1 unit	4	7	9.5	11	15
Armada	1 unit	3	9	12.5	16	22	1 unit	5	8	8.5	11	14
Southpoint	2 units	3	13	18.5	24	34	1 unit	2	5	7	9	12
Triangle	2 units	2	11	15.5	20	29	1 unit	2	5	6.5	8	11

Based on the people counts, three ranges of density—low, medium, and high—were defined with the use of upper and lower thresholds. Based on the definition of density, as the area increases, density decreases. Open areas of American malls are twice as large than other areas in all malls. Floor sizes of these two areas were defined as two units, and other areas' floor sizes were defined as one unit (Table 4.1).

It was assumed that people do not feel crowded up to a threshold value of density. This study aims to define low and high-density conditions; therefore, medium densities were eliminated. Values between minimum and lower threshold were defined as low, between lower and upper thresholds as medium, and between upper threshold and maximum as high density.

4.2.2.2. Questionnaire instrument

A two-page questionnaire, which consisted of five parts, was administered in each mall. The first part aimed to determine the users' familiarity with the setting, and their characteristics with the questions asking time spent in and frequency of visit to the malls. In this first part, other questions asked how respondents spend their time in the mall, alone or being with someone else during their visits. The next part of the questionnaire included a list of areas within the malls, and respondents would select the areas they

liked most. The same list was used for the next question for which respondents would select at least two areas of the mall that they did not like best. These questions also included a section where reasons for “like” and “dislike” could be written as open-ended responses. In this second part, user comments about the areas were the main goal. For this purpose, respondents were asked to describe the areas in which they were standing in their own words. Respondents were also asked to select the appropriate adjective from the list to evaluate their agreement with spaciousness and crowdedness of the areas where they were standing.

The third part had only one question with two sections, which included figures showing the distance patterns between two people. Respondents were asked to select the one that they prefer when they stand next to a stranger, or a friend and/or a family member. The purpose of this question was to explore users’ preference for interpersonal distance next to friends and/or family or strangers in the mall areas.

In previous studies, preference for interpersonal distance was determined by directly asking respondents of the studies (Cozby, 1973; Knowles, 1983; Sinha and Sinha, 1991). This study also attempted to query mall user respondents regarding their preferences for interpersonal distance in selected areas. It was assumed that users have different preferences for interpersonal distance when they are next to family members and/or friends, as opposed to when they are standing next to or near strangers. Therefore, these two preferences were queried in separate parts of the questionnaire. In the pilot studies, first, only direct statements inquiring about users’ preferences for interpersonal distances were included. However, respondents did not readily understand the content of the question and the differences between the three distance phases (near, medium, and far). The main goal of this question is to investigate the cultural differences or similarities of mall users’ preferences for interpersonal distance. Each culture would have different descriptions and meanings regarding people’s preferences for interpersonal distance. In order to better illustrate and describe the different phases of interpersonal distance, a simple figure of two individuals standing next to each other was included with the statements on the questionnaire. Users in each culture easily understood this figure, and therefore the inclusion of this figure decreased the response time compared to the questions that did not employ such figures.

In the fourth part, respondents were asked for their agreement with eight statements. The questions in the last part of the questionnaire aimed to determine user profile by asking for personal information like age and gender (Appendix 8).

4.2.3. Observations

For the analyses of interpersonal distances between mall users, the observational research method was employed. The use of photographs was found to be the most effective and simple method for analyzing interpersonal distances. In this context, pairs of users were observed and photographed in open and closed mall areas (Appendix 6).

A digital camera that had the ability to capture still pictures of the scenes was employed. The researcher chose the same stationary spot in the mall and took pictures every ten seconds. These images were then transferred to a personal computer.

Before the actual fieldwork, as mentioned previously, some pilot studies were conducted. The researcher took pictures from various vantage points to determine the actual location for observations. These initial pictures were evaluated and compared. The ability to capture the entire scene, distance between observer and the subjects, reflection of sunlight in the area, and the probability of being seen by the subjects, were the factors that affected choice of locations. During these pilot studies, some difficulties emerged. One of these problems was the challenge presented by the architectural design of malls. The American malls each had two floors. There were large openings on the upper level where the researcher observed the lower level; however, there were no similar openings inside the Migros and Armada shopping malls where the researcher could observe the areas on the lower level, as was done in the American malls. The area that was selected as the most open in Migros Shopping Mall was already on the upper level of the mall, so there was no chance to view the floor from one upper level. The only way to take pictures in the Turkish malls was while standing on the same floor where the activities were taking place. This raised the issue of obtrusiveness, which might affect the quality of data; however, very few people seemed to be bothered by the presence of the observer.

When capturing subjects at an unobtrusive distance, the camera was simply pointed in the direction of the subjects. When the subjects were in close proximity to the researcher, such as in the Turkish malls, the researcher held the camera below eye level and continued capturing the scenes so that he did not attract any attention. To the subjects, it might have appeared that the researcher were merely waiting for someone, and he therefore did not attract the attention of users. Observations were intended to be unobtrusive because it was assumed that users might change their actions if they were aware that they were being observed and photographed. Therefore, during the review of the photographs, users who seemed to express an awareness of being photographed (e.g. smiling at the camera) were excluded from data analysis. A very limited number of pictures were eliminated in the Turkish cases, and this did not affect the sample size.

In some cases, there were large differences between the numbers of pairs selected for distance measurements. For example, the center courts of the American malls were the most frequently used areas. On the other hand, entrances to the department stores were used by few people both on weekends and weekdays. During time-lapse photography, it became obvious that more users would be photographed in frequently used areas (such as the center courts).

4.2.3.1. Measuring interpersonal distance

All pictures were transferred to a personal computer and classified based on the time and location. The ones that were of poor quality, such as blurred, out of focus, or in which subjects were unidentifiable, were eliminated. Individuals whose age and gender could be defined and who appeared to be with at least one person were selected. Their age and gender were then identified and noted. Age and gender compositions of samples are listed as a table for reference (Table 4.2).

A rectangle was drawn around each subject, and the middle point of the bottom side of the rectangle was selected as the reference point that was used to locate those points on the scaled area plan (Figure 4.2). The scale of plans was kept constant (one centimeter on the plan represents 60 centimeters in the actual space) for each mall. Floor tiles, which were 30 centimeters in length and width, were used to find the standing points of subjects on the plan. Once the points were located, distances between these

points were measured. These values were then converted into the actual distances by using the scale of mall plans. For example, 1.2 centimeter distance measured on the plan represents 72 centimeters actual distance between the subjects.

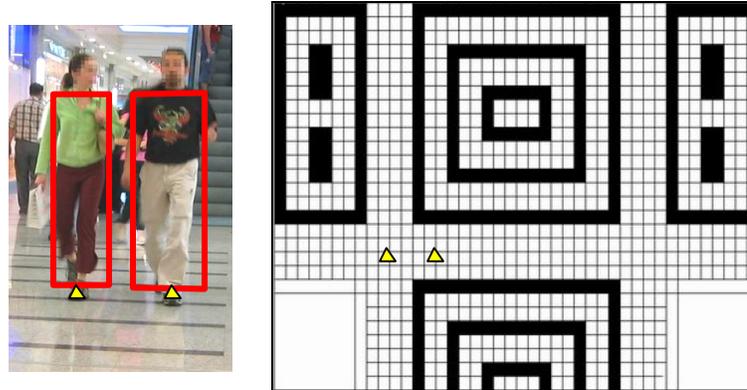


Figure 4.2. Technique to locate stationary points of individuals

The pilot tests helped to ensure the reliability of measured distances. Two of the researcher’s colleagues, who measured the distance between two points in a particular mall area, participated in these tests. The researcher took pictures of his colleagues while they stood on those two points and then measured the distances between them on the area plan. The measured distance was compared with the distance measured by the colleagues. Comparison between actual and measured distances showed that the measurements of interpersonal distances from photographs were reliable. Reliability measures are reported in section 9.4.1.

All data obtained by observation were grouped to form a list used in the statistical analysis. Table 4.2 displays categories that were used to classify data in this list.

Table 4.2. Categories of variables and their values in observations

MALL	AREA	DENSITY	GENDER COMPOSITION	AGE GROUP*	NATION	MEASURED DISTANCE	ACTUAL DISTANCE
ARMADA MIGROS SOUTHPOINT TRIANGLE	OPEN CLOSED	HIGH LOW	Male-Male Female-Female Male-Female	1-1 1-2 1-3 1-4 2-2 2-3 2-4 3-3 3-4 4-4	TURKEY USA	0.4 cm to 2.5 cm	24 cm to 150 cm

* 1 (<18), 2 (18-29), 3 (30-54), and 4 (>54)

4.2.3.2. Defining density

To define the density in each captured picture, the number of people was counted in photographs. The numeric values were used as references to define the density condition. Three categories of density (high, medium, and low) were defined. For comparisons and analyses, the medium density category was eliminated, and other two categories were coded in the observation list. Interviews and observations took place in the same areas, which led the researcher to define density based upon the thresholds used in interview sessions.

4.3. Data analysis

The data analysis aims to describe sample characteristics, conditions of cases, and properties of and possible associations between research variables. First, data is described for each case. Then, the results are compared across cases. Further analysis is used to determine the factors that are most important in investigating interpersonal distance and perceived spaciousness and crowding in malls, as well as to provide meaningful hypotheses for the benefit of further research.

Data were coded for each scale separately. The coding technique and the list of categories are shown in Table 4.3.

Table 4.3. List of categories in the questionnaire and coding technique

Category	Code (1)	Code (2)	Code (3)	Code (4)
Perceived spaciousness	Strongly agree	Agree somewhat	Disagree	-
Perceived crowding	Strongly agree	Agree somewhat	Disagree	-
Preferred distance zones	Near	Medium	Far	-
Age group	<18	18-29	30-54	>54
Gender	Male	Female	-	-

Correlation measures the strength of a relationship between two variables. In this study, Spearman rank-order coefficient (r_s) was used to determine the relationship variables. The value for a correlation ranges from -1 to 1 , with 0 being no relationship, -1 being a perfect negative linear relationship, and 1 being a perfect positive linear relationship (Agresti and Finlay 1997). The Spearman rank-order coefficient is an alternative formula for computing correlation for use with ordinal or ranked data (Sommer and Sommer 1997). The criteria for evaluating the relationships between variables were classified as weak ($r_s = 0 - 0.34$), moderate ($r_s = 0.35 - 0.49$) and strong ($r_s = 0.50 - 1.00$).

CHAPTER 5. DEFINING SPATIAL STRUCTURE OF CASES

In this section, the spatial structures of malls are described in three scales (Table 5.1). In the regional scale, features such as location of each mall in the city, major highways, and accessibility to the malls, are defined. In the neighborhood scale, land use around the malls, traffic flow, adjacent streets, entrances to the malls, connections with surrounding buildings, and use, size, and shape of the parking lots, buildings, and pedestrian streets are listed. The building scale includes a description of both exterior and interior features of the four malls. In this part, other than the general characteristics of the malls, spatial features of open and closed areas inside those malls are also described.

Table 5.1. Classification of spatial descriptions

SCALE	SPATIAL CHARACTERISTICS
REGIONAL	City characteristics such as populated areas in the city, location of malls, major highways, distance from malls to city center
NEIGHBORHOOD	Land use around the malls such as connection with surrounding buildings and use, pedestrian streets, traffic flow, parking lots
BUILDING	Mall characteristics such as layout, size, shape, use, functions, floors, entrances, lighting levels, height, services Area characteristics such as location inside the malls, size, shape, height, materials, color, function, visibility, lighting levels, site elements, connection with other areas

The illustrations such as simple drawings of areas to compare the height of areas proportional to the height of adults and graphs showing the variation of lighting levels inside the areas were included to support the descriptions. Other illustrations included are city maps showing mall locations, plan of function zones in malls, floor plans showing the locations of areas, and plans of open and closed areas (Appendix 2B).

This part also includes respondents' definition of the mall areas. For this purpose, responses to questionnaire items such as the areas that most respondents liked and disliked, and why they liked and disliked these areas are evaluated. The goal is to describe the spatial characteristics of the malls and mall areas using subjective impressions of mall users.

One purpose of this study is to evaluate the subjective impressions of respondents about the areas that they occupy. In order to understand how users perceived each mall area, respondents were asked to define the areas with three words that they picked from their own vocabularies. In this chapter, these responses are described for each case. Responses (words) were clustered into three groups: words related to the openness and closeness, crowdedness, and brightness of the areas. These categories were then ranked based on the number of responses. The relationship between descriptions and type of perceived enclosure are described.

A summary of descriptions of spatial characteristics of each area is shown in Appendix 2. The table lists characteristics such as size and shape of the areas, overall lighting condition, material, presence of seating and escalators, height, visibility, and location in the mall. General spatial characteristics of all of the malls in the study are listed in a separate table (Appendix 2B) that presents exterior and interior characteristics. The characteristics listed in the tables will be described and compared across cases in the final chapters of the dissertation.

The malls are also defined according to their size, design, and tenant mix, which are classified into three groups by Tubridy (n.d.). The first category is the *regional and super regional centers* that are typically enclosed. The walkway or “mall” is climate-controlled and lighted, flanked on one or both sides by storefronts and entrances, with on-site parking usually provided around the perimeter of the center. The second type of mall is the *hybrid center*, which has characteristics of both enclosed common areas and open-air centers, and incorporates elements found in regional centers. Hybrid centers represent a very upscale strip plaza-shopping environment with the combination of an enclosed shopping mall. The last type of mall is the *value-oriented center*, with a pronounced orientation toward outlet and off-price tenants, as well as entertainment elements such as playgrounds (Tubridy, n.d.). The cases in the United States are both super-regional and hybrid malls by their design and size. On the other hand, the Turkish malls in this study can be defined as regional malls.

5.1. Case 1: Migros Shopping Mall, Turkey

5.1.1. General description

Migros Shopping Mall, one of the largest malls in Turkey, has four floors and an enclosed area of 126,600 m² (1.36 million ft²). It is located next to the two of the busiest highways in the city. Either by car or by public transportation, access to the mall is fast and easy. As a result of its central location, a diversity of users from different parts of the city visit the mall.

General land use around the mall is characterized mostly as commercial use. The mall has pedestrian connections to the surrounding buildings such as the police department. The parking lot is located in front of the mall and is a combination of surface and underground parking. At present, the northwest side of Migros is known as the backside of the mall. Deliveries are made at loading docks located on this side, and the mall is not accessible from this side by user. The majority of pedestrians who use the mall come by subway. The subway station is located on one corner of the site and is connected to the parking lot by a pedestrian walkway. Users typically enter Migros shopping mall from one of the levels of the parking structure and through the entrances located on the southeast section.

The mall is formed by a combination of a series of corridors and stores. Floors are connected with escalators and elevators that are located at both ends of the corridors. On all floors, the same materials are used for flooring, which is dominated by light brown marble tiles. The materials, such as glass, metal, and polished marble, create a modern look in the interior. Most of the areas are artificially lighted. The upper floor has a window opening on the ceiling through which natural light penetrates. Until sunset, this area receives natural light.

5.1.2. Respondents' definition of mall areas

Table 5.2 shows areas that are liked and disliked by the respondents in Migros Shopping Mall.

Table 5.2. Areas that respondents liked most and least in Migros Shopping Mall (N=76)

AREAS	LIKED	DISLIKED
Entrance area on the first floor	3	17
Corridor with palms	12	3
Food court	25	9
Restaurants and cafes	35	0
Department stores	24	0
Cinema	6	11

A great number of the respondents liked the restaurants and cafes (n=35), the food-court area (n=25), and department stores (n=24). Although many respondents liked the food court, some respondents described the area as “crowded,” “disturbing,” “narrow,” “small,” and “dark”. On the other hand, one respondent found the food court “relaxing.” He said, “There are many seating places in the food court; you can rest and watch other people.” It is significant that this particular interview was conducted on a weekday, and this fact may have affected this respondent’s perception of the area.

Department stores were defined as “large” and “huge,” where much merchandise would be found without having to visit other stores.

Most of the respondents did not like the entrance area (n=17). Some of the respondents defined the area as “dark” and “congested” due to the design features described by the respondents such as “narrow corridors” and “low ceiling.” Some of the respondents said that they avoided being in that area because of “congestion,” “fast moving pedestrian traffic,” and “low lighting.” One respondent said, “There are no meeting places near the entrance; it is narrow and crowded and you are forced to walk away with the crowd.” Most of the respondents found the whole mall area crowded. One respondent, however, said, “I like to be with other people, and therefore I like crowded areas.”

Some respondents made comments about other areas of the mall, such as the parking lot, which was described as “well designed” and “large.” Many respondents mentioned that they easily parked their cars and entered the mall.

5.1.3. Open and closed areas inside the mall

Food court corridor as an open area: The area, which is connected to the foodcourt and the entrance of the cinema, is located on the upper level of the mall, which has a higher ceiling than other floors. Natural light penetrates through the window opening on the ceiling that illuminates the area throughout the day. As a result, the area looks bright and well lit.

Right main entrance as a closed area: The area is the intersection of two linear corridors. There are entrances to a grocery store and one of the department stores in this area. The area opens to the large parking lot on the outside. Most of the people who come to mall by public transportation (e.g. subway) use this location to enter the mall. Store lights and lamps on the ceiling illuminate the area.

Table 5.3 contains a list of words that respondents used to describe the open and closed areas during the interviews.

Table 5.3. Respondents’ choice of words to describe areas in Migros Shopping Mall (N=76)

	OPEN AREA	N	CLOSED AREA	N
Enclosure	GENİŞ (Wide)	13	FERAH (Spacious)	7
	FERAH (Spacious)	8	GENİŞ (Wide)	4
	BASIK (Low)	1	BÜYÜK (Big)	3
	YÜKSEK (High)	1		
	UZUN (Long)	1		
	BÜYÜK (Big)	1		
Crowding	KALABALIK (Crowded)	14	KALABALIK (Crowded)	4
	HAREKETLİ (Moving)	1		
	CANLI (Live)	1		
	SAKİN (Quiet)	1		
Lighting	AYDINLIK (Bright)	8	AYDINLIK (Bright)	5

Most of the respondents defined both areas as “wide,” “spacious,” “crowded,” and “bright.”

5.2. Case 2: Armada Shopping Mall, Turkey

5.2.1. General description

The shopping mall, located next to an inter-city highway, has six floors and an enclosed area of 125,000 m² (1.35 million ft²) surrounded by a parking lot with surface and underground parking. On one side of Armada, there are large blocks of apartment complexes, commercial, government, and private office buildings. The mall is accessible to pedestrians walking from these locations. The majority of users, however, arrive by car or public transportation. One subway station is under construction across the street from the mall.

There are four entrances to the mall, and the main entrance is connected to an open court located on the front side of the building. Mall visitors can also enter the mall from underground parking. The mall is a rectangular in shape, formed by the connection of four linear corridors. At each of the intersections is a circular area. The ground and walls are covered with light gray polished marble. The areas are mostly artificially lighted.

5.2.2. Respondents' definition of areas

Table 5.4 shows the areas that respondents liked and disliked in Armada Shopping Mall.

Table 5.4. Areas that respondents liked most and least in Armada Shopping Mall (N=81)

AREAS	LIKED	DISLIKED
Circular corridors	14	3
Food court	25	1
Cinema floor	25	5
Department stores	20	2
Stores	21	0
Parking lot	2	16

A majority of the respondents liked the food court (n=25), cinema floor (n=25), stores (n=21), and department stores (n=20). The food court and cinema floor would be perceived as an area of socializing in the mall where users have many choices to eat and see a movie at the same time. Most of the respondents did not like the parking lot

(n=16), which was described as “congested” during weekends, and “narrow” and “small” for this size mall. Respondents mostly commented about the difficulty in finding a particular spot in the parking lot.

Some respondents described most of the stores as “big” and “large,” and said they liked the department stores where they could find many merchandise in one store. Additionally, corridors were described as “narrow.” Some of the respondents said that the floors and corridors look too much alike and that they were difficult to navigate.

5.2.3. Open and closed areas inside the mall

Circular corridor as an open area: The area, which is located at the lowest level of the mall on the intersection of two corridors, has a circular shape and is lighted artificially. Light gray polished marble is used as material on the ground. There are also circular columns in the area that are covered with dark gray metallic material.

Linear corridor on the 2nd floor as a closed area: This area is linear and, hence, narrower than the circular corridor. Escalators are located in the middle of the space and block vision. The area has a low ceiling and is lighted artificially. The lighting level inside the area remains constant throughout the day and night.

Table 5.5 highlights a list of words that respondents used to describe the open and closed areas during the interviews.

Table 5.5. Respondents’ choice of words to describe areas in Armada Shopping Mall (N=81)

	OPEN AREA	N	CLOSED AREA	N
Enclosure	FERAH (Spacious)	9	FERAH (Spacious)	5
	GENİŞ (Wide)	2	BÜYÜK (Big)	1
	DAR (Narrow)	2	KÜÇÜK (Small)	1
	DEVASA (Gigantic)	1	ÇOK KATLI (Multi level)	1
Crowding			GENİŞ (Wide)	1
			DAR (Narrow)	1
	KALABALIK (Crowded)	3	KALABALIK (Crowded)	3
	CANLI (Lively)	1	KARMAŞA (Complex)	1
Lighting	HAREKETLİ (Moving)	1		
	TENHA (Deserted)	1		
	AYDINLIK (Bright)	4	AYDINLIK (Bright)	1

Most of the respondents perceived both open and closed areas as spacious. Two respondents defined the open area as “narrow.” Seemingly oxymoronic word choices, such as “wide-narrow” and “big-small,” were used to describe the closed areas. Most of the respondents felt crowded in both areas, yet they also perceived both areas as bright.

5.3. Case 3: Streets at Southpoint, USA

5.3.1. General description

The Streets at Southpoint is a 1.3-million-square-foot (125,000 m²) super-regional mall located in the center of the Triangle—the tri-city region of Raleigh, Durham, and Chapel Hill, North Carolina—along a major arterial highway that links all three cities. The mall was designed to be reached primarily by car. New residential and commercial developments are built around the mall area. The location was selected because of its close proximity to the main traffic arterials.

A distinct characteristic of the mall is an outside “street” for pedestrians, which reflects a design trend that encourages pedestrian movement. This open public area extends from the traditional enclosed shopping mall to an outdoor marketplace of specialty shops and restaurants. The site creates an outdoor pedestrian shopping street connecting the main entrance of the mall to the cinema.

The mall has a curvilinear shape that is formed by the combination of two linear corridors lined at different angles. At the intersection of corridors, there is a large court that forms the focal point in the mall.

Inside the mall, each shop has a unique storefront resembling an individual building, giving shoppers the feeling of walking through a little town. Higher interior space makes room for old-fashioned billboards and storefronts that evoke a “town” image. In accordance with its artificial image, material, colors, and site elements such as light fixtures and street signs were selected to simulate an outdoor environment in an enclosed setting.

5.3.2. Respondents' definition of areas

Table 5.6 contains a list of areas that respondents liked and disliked in the Streets at Southpoint.

Table 5.6. Areas that respondents liked most and least in the Streets at Southpoint (N=93)

AREAS	LIKED	DISLIKED
Center court	14	0
Food court	8	2
Stores	16	1
Restaurants	10	1
Department stores	7	0
Outside street	31	0
Parking lot	0	12

Respondents mostly mentioned that they liked the outside street (n=31), stores (n=16), and center court (n=14). Generally, respondents liked the mall design with the combination of an outside street, which was described as an open and a refreshing place. One woman said, “. . . the street outside reminds me a village.” One man used similar words to describe the place and said, “. . . street outside looks like a town, and it is impressive.” Another respondent said, “It [outside street] has a fresh town feeling.” The street reminded one respondent of a certain region: “It [outside street] looks like New England where you can walk and shop outside.” Some respondents mentioned that the outside street has a unique character with an atmosphere where people can easily socialize with others. A young woman said, “I like to be with other people and there are more of them outside.” One respondent, an architect, said she liked the street-like character and added, “It has a good scale with buildings lining both sides.” Another respondent liked to be outside and said, “I am not an inside person; therefore, I like the street outside.”

Many respondents also liked the center court inside Streets at Southpoint. They said they liked watching people, and the center court was well designed to see what others are doing. Some respondents mentioned that while they were standing in the center court they could see other parts of the mall such as the ends of the corridors. Another favorite feature mentioned about the center court was its outside-like character. There

are small flowering plants, a tree, sculptures, benches, and the floor was covered with dark gray natural stone. These site elements are used to create a space that looks like an outdoor setting—like the streets of small American towns. Some respondents also made comments about the size of the center court, which is described as large, where there are more options to do and see things such as meeting friends, resting on the benches, and watching the activities of others.

Some respondents mentioned the brightness of the area. One of them said he liked this bright place (center court) and added, “. . . with large windows above and nice architecture, I can easily see around and easily navigate.” In general, the center court was found to be attractive, well designed, modern, bright, well maintained, centrally located, accessible, more decorated than other areas of the mall, and colorful. However one respondent described the center court as plain and somewhat empty and said, “There is something missing inside this place, like a fountain.”

Some respondents expressed their thoughts about the food court. The area was perceived as open and well designed with adequate space for seating. There was a children’s playground next to the food court that families with children found attractive and fun. One respondent said, “While my child plays in the playground, I can relax and eat.” Another respondent liked the food court because there were more people here than in another areas.

Respondents also made comments about the corridors and stores in Streets at Southpoint. One woman said, “The corridors seem to be narrow when crowded.” But she was not disturbed by the crowdedness of the corridors and added, “There are few people on weekdays, but on holidays it is better; I like more people.” Some of the respondents were attracted to the anchor stores like Nordstrom and Hudson Belk and defined them as ‘big,’ “open,” and “comfortable”. One respondent found the corridors too narrow to walk with a stroller and said, “I hate pavilions in the center of the corridors; they block our movement.” Each storefront along the corridors is decorated in a unique style, and found attractive by many respondents.

In Streets at Southpoint, most of the respondents did not like the parking lot (n=12). They found it difficult to find a parking space, especially on Saturdays. Some respondents mentioned a poor traffic pattern that causes difficulties at the exits.

5.3.3. Open and closed areas inside the mall

Center court as an open area: The area has a circular shape and is located in the middle of the mall where two corridors intersect. There is a wide opening above the area that extends to the ceiling. The ground is covered with dark gray natural stone tiles. At one corner, there is a seating area along with plants and sculptures of children at play. This area is the focal point of the mall and is generally used as a place place to socialize.

It is possible to see both ends of the intersecting corridors while standing inside the center court. The wide and open design of the area contributes to an open feeling. The colors are diverse with a combination of dark and light colors on the ground, and white, gray, and red-brown colors on the walls.

JC Penny entrance as a closed area: This area is located at the end of one of the corridors on the entrance level. It has a rectangular shape with a high ceiling and is used as an entrance to the department store. There is a seating area in the middle with more plants and sculptures of children at play. Natural stone with dark gray color is the primary material on the floor. Visibility is limited because of the location of surrounding walls and stores. Only one end of the area is open to the corridor. The area is illuminated by both natural and artificial light.

Table 5.7 displays a list of words that respondents used to describe the open and closed areas during the interviews.

Table 5.7. Respondents' choice of words to describe areas in Streets at Southpoint (N=93)

	OPEN AREA	N	CLOSED AREA	N
Enclosure	OPEN	10	OPEN	10
	BIG	9	SPACIOUS	3
	SPACIOUS	5	AIRY	1
	LARGE	1	MASSIVE	1
	WIDE	1	WIDE	1
	TALL	1	ROOMY	1
Crowding	BUSY	5	CALM	1
	CROWDED	4	EMPTY	1
	LIVELY	1	QUIET	1
Lighting	LIGHTING	3	WELL LIT	3
	WELL LIT	2	BRIGHT	2
	BRIGHT	2	LIGHTY	1
	SUNNY	1	DIM	1
	NATURAL LIGHT	1		

Both the open and closed areas of the mall were defined as “open” by most of the respondents. Other frequent words were “big” and “spacious” for the description of the open area and “spacious” for the description of the closed area. Most of the respondents defined the crowding condition as “busy” in the open area where various activities take place. The closed area was described as “calm,” “empty” and “quiet.” These words refer to the low-density conditions in the area. Respondents would have been influenced by the natural light and sun penetrating through the windows above the areas, and as a result, most of the respondents perceived both areas as bright and well lit.

5.4. Case 4: Triangle Town Center, USA

5.4.1. General description

Triangle Town Center is a 1.3 million square foot (app. 125.000 m²) super-regional mall located on north side of Raleigh, North Carolina. The mall’s concept combines the enclosed mall with an open-air retail village. A major water element designed to look like the form of a river begins in the open-air concourse and then “flows” through the enclosed mall. The center’s outdoor street, which is named Triangle Town Commons, is lined with shops and restaurants and connects the upper-level entrance with a super store. Triangle Town Center is considered the “town center” of the surrounding

neighborhood and is intended to connect the surrounding neighborhood with the mall. However, there is a limited physical connection to this surrounding area.

The mall has a V-shape formed by the connection of two linear corridors. At the connection the two corridors, there is an oval shaped court. The center has a mid-mall food court on its lower level, positioned at the hub of mall traffic. On the upper floor, there are large openings between corridors. There are also windows on the ceiling and on the upper sides of the walls, which makes the area naturally lighted throughout the day.

5.4.2. Respondents' definition of areas

Table 5.8 provides a list of areas that respondents liked and disliked in the Triangle Town Center.

Table 5.8. Areas that respondents liked most and least in Triangle Town Center (N=87)

AREAS	LIKED	DISLIKED
Center court	7	0
Main entrance	7	0
Food court	14	0
Stores	9	2
Department stores	6	0
Outside street	6	0

Most of the respondents liked the food court (n=14), stores (n=9), center court (n=7), and main entrance (n=7). Some respondents said the center court is bright and open where they can sit and watch other people. One young man said, "I like watching people and this [center court] is a nice place to be to watch others;" he added, "I can also see stores at the end of the corridors while standing in this place." Some respondents said that they liked the main entrance because it feels welcoming. One woman said, "The area [main entrance] is the gateway to the mall and you feel that you are inside the mall." Another woman had opinions about the general design of the mall. She described the mall with words such as "symmetrical," "easy to navigate," and "easy to view."

One of the popular locations in the Triangle Town Center was the food court. The view from the food court was described as pleasant. One respondent said, “When I sit here while eating, I can see outside and other people.”

Some respondents perceived the outside street as open, airy, and well designed. But at the time of the interviews, the street outside and the restaurants were under construction. Little access was possible to the outside area; therefore, few respondents made comments about the outside street.

5.4.3. Open and closed areas inside the mall

Center court as an open area: The oval shaped court is located at the intersection of the two major corridors. The area is covered with light brown polished ceramic tiles. Escalators, benches, kiosks, and a fountain are located in the center court, and it has large windows above. The area receives natural light throughout the day.

Hudson Belk entrance as a closed area: This area has a rectangular shape and is located next to the center court on the entrance level. There are baby strollers for the use of patrons, an information kiosk, a seating area, and plantings in the area. Visibility is limited due to the location of walls surrounding the area. The ceiling is high, and both natural and artificial lighting illuminates the area.

Table 5.9 displays a list of words that respondents used to describe the open and closed areas during the interviews.

Table 5.9. Respondents' choice of words to describe areas in Triangle Town Center (N=87)

	OPEN AREA	N	CLOSED AREA	N
Enclosure	OPEN	3	AIRY	4
	BIG	1	NARROW	1
	ROOMY	1	WIDE	1
	AIRY	1	BIG	1
	PLENTY OF SPACE	1	OPEN	1
			SPACIOUS	1
SMALL			1	
Crowding	BUSY	3	QUIET	1
	LOTS OF PEOPLE	2		
	CONGESTED	1		
	QUIET	1		
Lighting	DIM	1	BRIGHT	3
	BRIGHT	1	WELL LIT	3
	GOOD LIGHTING	1	POORLY LIGHTED	1

Most of the respondents described the open area as “open” and the closed area as “airy.” Because of its central location, the center court (open area) was perceived as busy with many people. While the closed area was defined as quiet. Respondents in the center court would have been influenced by the density in the area while defining the crowdedness of that area. Based on the changing lighting conditions in the areas during the interviews, the open area was described as “dim” or “bright,” and the closed area was described as “bright” and “well lit.”

Other than the description of conditions in these cases, this research aims to explore the user characteristics and relationships between variables. For this purpose, the first stage of the research included questionnaires that were designed to gather information about the respondents. The next chapter presents user characteristics, their agreement with spaciousness and crowdedness of the areas, and the relationships between research variables.

CHAPTER 6. STUDY OF PERCEIVED SPACIOUSNESS AND CROWDING

This study aims to describe conditions of mall areas that are assumed to be related to perceived spaciousness and crowding. Responses to questionnaire items that include user characteristics, respondents' preference for interpersonal distances, and respondents' perception of spaciousness and crowding of areas are described in this chapter. The descriptions of relationships between research variables that are employed in this study are described in the last section.

6.1. Description of user characteristics in all cases

Demographic characteristics of respondents, shopping characteristics such as familiarity with the malls, frequency and time of visit, time spent, coming to the malls alone or with someone else, activities, responses to the statements (which evaluated general user characteristics based on purpose of visit), and responses to crowding and attraction to open places are listed in the Appendix 4. This part lists and describes preferred distance zones near strangers as opposed to near friends and family members, and respondents' agreement with spaciousness and crowdedness of mall areas.

In order to understand interpersonal distance preferences of mall users, respondents were asked to select one of the distance zones from the list in the questionnaire. Table 6.1 shows the distribution of responses.

Table 6.1. Respondents' preference for interpersonal distance

	MIGROS (N=76)	ARMADA (N=81)	SOUTHPOINT (N=93)	TRIANGLE (N=87)
Preferred distance (Friend/Family)				
NEAR	72.4	84	77.4	73.6
MEDIUM	27.6	16	22.6	26.4
FAR	-	-	-	-
Preferred distance (Stranger)				
NEAR	9.2	12.4	1	2.3
MEDIUM	43.4	33.3	40.9	63.2
FAR	47.4	54.3	58.1	34.5

*All values are in percentages

Most of the respondents in all of the malls preferred near distance next to a friend and/or family members, and none of the respondents preferred far distance in this category. Other than in the Triangle case, most of the respondents selected the far distance near a stranger.

Table 6.2 shows respondents' agreement with the spaciousness and crowdedness in open and closed areas of the malls.

Table 6.2. Users' agreement for spaciousness and crowdedness in open and closed mall areas

	MIGROS (N=76)		ARMADA (N=81)		SOUTHPOINT (N=93)		TRIANGLE (N=87)	
	Open	Closed	Open	Closed	Open	Closed	Open	Closed
Spaciousness								
Strongly agree	90.9	90.6	80	80.5	94.7	91.7	91.7	79.5
Agree somewhat	6.8	3.1	5	7.3	5.3	8.3	6.3	12.8
Disagree	2.3	6.3	15	12.2	-	-	2	7.7
Crowdedness								
Strongly agree	75	59.4	60	56.1	42.1	5.6	8.3	2.6
Agree somewhat	18.2	31.2	27.5	31.7	22.8	13.9	14.6	10.3
Disagree	6.8	9.4	12.5	12.2	35.1	80.5	77.1	87.1

*All values are in percentages

In all cases, most of the respondents in both open and closed areas of the malls perceived the areas as spacious. None of the respondents felt confined in either areas of Streets at Southpoint.

Most of the respondents in the Turkish malls and in the open area of Streets at Southpoint felt crowded. On the other hand, in the closed area of Streets at Southpoint and in two areas of Triangle Town Center, most of the respondents did not feel crowded.

6.2. Exploring the relationships between variables

The purpose of this study is to explore and describe the relationships between variables such as type of perceived enclosure, density and lighting, and perception of spaciousness and crowding. This section defines the nature of relationships between these research variables. The degree of relationship is presented by correlations. Since all of the areas have different characteristics, relationships are evaluated for each area

separately. The results of the tests will be discussed in relation to type of perceived enclosure of areas.

Table 6.3 shows the results of correlation analysis for the relationships between perceived spaciousness and physical and subjective variables.

Table 6.3. Correlations between perceived spaciousness and listed variables

VARIABLES	MIGROS		ARMADA		SOUTHPOINT		TRIANGLE	
	Open	Closed	Open	Closed	Open	Closed	Open	Closed
Enclosure	0	0	0	0	0	0	0	0
Lighting	-0.19	0.06	-0.08	-0.11	-0.28*	-0.08	-0.03	0.22
Density	0.17	0.17	0	0	0	0	0	0.03
Age	0.01	-0.02	0.14	-0.15	-0.26*	-0.36*	-0.08	-0.46*
Gender	-0.22	-0.14	-0.12	-0.28	0.10	0.15	0.03	-0.23

* significant relationship at the level $<.05$

No relationship has been found between type of perceived enclosure and perception of spaciousness in any mall areas. There is a significant but weak negative relationship between lighting level and perception of the spaciousness in the open area of Streets at Southpoint ($r_s = -0.28$). The age of respondents is significantly related to perceived spaciousness in both open ($r_s = -0.26$) and closed ($r_s = -0.36$) areas of Streets at Southpoint and in the closed area of Triangle Town Center ($r_s = -0.46$). In both open and closed areas of Streets at Southpoint and the closed area of Triangle Town Center, older adults perceive areas as more spacious than younger users do.

Table 6.4 shows the results of correlation analysis for the relationships between perceived crowding and physical and subjective variables.

Table 6.4. Correlations between perceived crowding and listed variables

VARIABLES	MIGROS		ARMADA		SOUTHPOINT		TRIANGLE	
	Open	Closed	Open	Closed	Open	Closed	Open	Closed
Enclosure	0	0	0	0	0	0	0	0
Lighting	0	-0.13	-0.03	-0.09	0.02	-0.56	-0.01	0.19
Density	0.08	0.32	0	0	0	0	0	0.41
Age	0.18	0.09	0.16	0.03	-0.34*	0.27	0.04	-0.39*
Gender	-0.08	-0.17	-0.40*	0.13	-0.01	-0.02	0.11	-0.13

* significant relationship at the level <.05

There is no relationship between type of perceived enclosure and perception of crowding in any cases. The strongest relationship exists between lighting level and perceived crowding in the open area of Streets at Southpoint ($r_s=0.56$); however, this relationship is not statistically significant. The age of respondents and perceived crowding are significantly and negatively related only in the open area of Streets at Southpoint ($r_s= -0.34$) and closed area of Triangle Town Center ($r_s= -0.39$). There is a negative moderate relationship between gender and perception of crowding in the open area of Armada Shopping Mall ($r_s=0.40$), which is statistically significant. In Armada Shopping Mall, females perceive the open area as more spacious than male respondents perceive this same area.

The relationships between coming alone, group size, and preference for interpersonal distance and perceived spaciousness were also evaluated for research purposes. Table 6.5 shows the correlation results between these variables.

Table 6.5. Correlations between perceived spaciousness and user characteristics

VARIABLES	MIGROS		ARMADA		SOUTHPOINT		TRIANGLE	
	Open	Closed	Open	Closed	Open	Closed	Open	Closed
Come alone	-0.03	0.19	-0.01	-0.23	0.13	0.19	-0.11	-0.39*
Groups size	0.01	0.16	0	-0.27	0.12	0.12	0.02	-0.22
Pref. for int. distance ⁽¹⁾	-0.16	-0.27	-0.10	0.18	0.19	0.08	0.14	-0.07
Pref. for int. distance ⁽²⁾	-0.16	-0.27	-0.10	0.18	0.19	0.08	0.14	-0.07

* significant relationship at the level <.05

⁽¹⁾ Next to friend/family ⁽²⁾ Next to strangers

Only in the closed area of Triangle Town Center is there a significant and negative relationship ($r_s = -0,39$) between coming alone to the mall and perception of spaciousness. The data imply that those respondents who were without companions during their visit to the mall (but not necessarily alone during interviews) in the closed area of Triangle Town Center felt more confined than the respondents who came to the mall with someone else. None of the other relationships between variables are significant.

Table 6.6 shows the correlation results of relationships between perceived crowding and user characteristics.

Table 6.6. Correlations between perceived crowding and user characteristics

VARIABLES	MIGROS		ARMADA		SOUTHPOINT		TRIANGLE	
	Open	Closed	Open	Closed	Open	Closed	Open	Closed
Come alone	-0.11	-0.11	0.30*	-0.05	-0.14	-0.16	-0.03	0.45*
Groups size	-0.02	0.02	0.37*	0.03	-0.37*	-0.15	-0.06	0.33*
Pref. for int. distance ⁽¹⁾	-0.29*	0.41*	-0.06	-0.24	-0.01	-0.06	-0.05	0.01
Pref. for int. distance ⁽²⁾	0.10	0.05	-0.23	-0.05	-0.23	-0.19	0.03	0.32*

* significant relationship at the level $<.05$

⁽¹⁾ Next to friend/family ⁽²⁾ Next to strangers

The strongest significant relationship is between coming alone to the mall and perceived crowding in the closed area of Triangle Town Center ($r_s = 0.45$). It is suggested that, in the closed area of Triangle Town Center, respondents who were not alone felt less crowded in the area. A stronger correlation was measured between preferred distance next to friends and family members, and perceived crowding in the closed area of Migros Shopping Mall ($r_s = 0.41$). There is a weak but significant negative correlation between the same variables in the open area of Migros Shopping Mall as well ($r_s = -0.29$). In the Migros case, the preferred distance next to friends and family members is related to perceived crowding; however, these relationships are in opposite directions in open and closed areas of Migros Shopping Mall; when respondents preferred closer distances next to friends and family members, they felt less crowded. On the other hand, as respondents preferred closer distances in the open area, they perceived the area as more crowded.

CHAPTER 7. ANALYSES OF INTERPERSONAL DISTANCES

This chapter introduces the mean interpersonal distances measured between users of shopping malls. The aim of this part of the study is to answer how interpersonal distance changes in open and closed areas of the malls, and in high and low density conditions. In addition, the study focuses on testing the relationships between interpersonal distance and demographic characteristics of mall users. For these purposes, several observations were conducted in the open and closed areas of malls; these observations included taking pictures of mall scenes on various days and at different times.

During the reviewing of pictures, pairs of individuals from different age and gender groups were selected for the measurement of distances between these individuals. Ten age compositions and three gender compositions were defined for this part of the study. The distances measured between individuals were listed and categorized based on demographic characteristics of subjects and type of perceived enclosure and density conditions of the areas. With the use of basic statistical techniques, relationships between variables were measured. This section of the dissertation describes the content and nature of that data and the results of statistical tests.

In the first part, demographic characteristics of the sample are introduced. Measured interpersonal distances were distributed based on age and gender compositions. In the second part, mean interpersonal distances are listed across cases. The lists show the distribution of interpersonal distance between subjects in open and closed areas of the malls. In the third part, the relationships between interpersonal distance and density and enclosure are described.

7.1. Interpersonal distance across cases

This part is organized to describe the variation in interpersonal distance in open and closed areas of the malls. For each case, general distribution of interpersonal distance and distribution by age and gender are listed. The aim is to develop a basis for discussing the variation in interpersonal distance across cases and across different demographic characteristics of subjects.

7.1.1. Case 1: Migros Shopping Mall, Turkey

7.1.1.1. Distribution of interpersonal distance by area

Figure 7.1 shows the distribution of interpersonal distance between users in open (n=680) and closed (n=518) areas of Migros Shopping Mall.

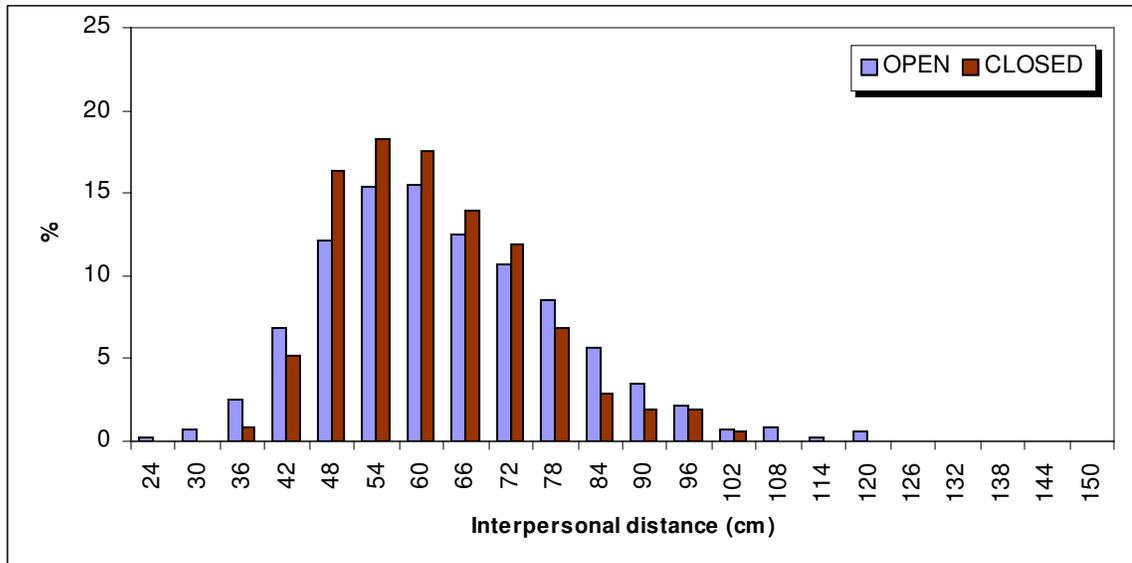


Figure 7.1. Distribution of interpersonal distance in Migros Shopping Mall

In the open area, the distance varies from 24 cm to 120 cm. The distance between subjects ranges between 36 cm and 102 cm in the closed area. In each area, the most common interaction distances were 54 and 60 cm (Appendix 5). As shown in figure 7.1, most of the users in the open area interacted at larger distances than users in closed area.

7.1.1.2. Distribution of interpersonal distance by age and gender

Table 7.1 lists mean interpersonal distances across gender compositions in open and closed areas of Migros Shopping Mall.

Table 7.1. Mean interpersonal distances across gender compositions in Migros Shopping Mall

	OPEN	CLOSED
Gender composition	cm (inches)	
Male-Male (N=316)	68 (26.8)	64.6 (25.4)
Female-Female (N=322)	63.2 (25)	62.1 (24.5)
Male-Female (N=560)	62.4 (24.6)	61.0 (24)

In both open and closed areas, male-male pairs interacted at larger distances than female-female and male-female pairs. Male-female pairs interacted at the closest distances in each area. Mean interpersonal distances between all gender compositions in closed areas are smaller than the interpersonal distances in open areas.

Table 7.2 lists mean interpersonal distances across gender compositions in open and closed areas.

Table 7.2. Mean interpersonal distances across age compositions in Migros Shopping Mall

	OPEN	CLOSED
Age composition*	cm (inches)	
1-1	64.7 (25.5)	67.5 (26.6)
1-2	66.0 (26)	56.4 (22.2)
1-3	66.6 (26.2)	64.2 (25.3)
1-4	-	-
2-2	63.2 (24.9)	60.7 (23.9)
2-3	66.2 (26.1)	66.4 (26.1)
2-4	57.0 (22.4)	-
3-3	65.8 (25.9)	64.4 (25.4)
3-4	65.4 (25.7)	63.6 (25)
4-4	66.0 (26)	67.2 (26.5)

* 1 (<18), 2 (18-29), 3 (30-54) and 4 (>54)

Teenagers with middle-aged adults in open areas (d=66.6 cm) and teenagers with other teenagers in the closed areas (d=67.5 cm) had larger interpersonal distances than other groups in open and closed areas. The smallest interpersonal distances were measured between young and middle-aged adults in open areas (d=57 cm) and between teenagers and young adults in closed areas (d=56.4 cm).

7.1.2. Case 2: Armada Shopping Mall, Turkey

7.1.2.1. Distribution of interpersonal distance by area

Figure 7.2 shows the distribution of interpersonal distance between users in the open (n=164) and closed (n=477) areas of Armada Shopping Mall.

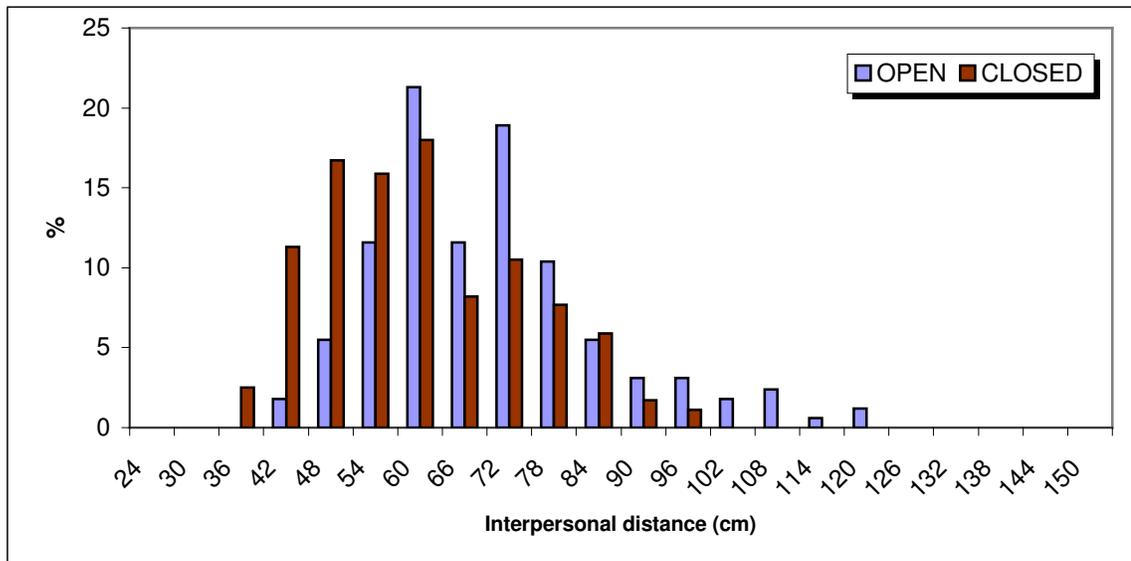


Figure 7.2. Distribution of interpersonal distance in Armada Shopping Mall

In the open area of Armada Shopping Mall, the distances between users vary from 42 cm to 120 cm. The distances between users range between 36 cm and 96 cm in the closed area. In both areas, the most common interaction distance was 60 cm. Users interacted more closely in the closed area (Appendix 5).

7.1.2.2. Distribution of interpersonal distance by age and gender

Table 7.3 lists the mean interpersonal distances across gender compositions in the open and closed areas of Armada Shopping Mall.

Table 7.3. Mean interpersonal distance across gender compositions in Armada Shopping Mall

	OPEN	CLOSED
Gender composition	cm (inches)	
Male-Male (N=136)	73.5 (28.9)	58.9 (23.2)
Female-Female (N=190)	69.6 (27.4)	64.2 (25.3)
Male-Female (N=316)	69.7 (27.4)	58.4 (22.9)

Distance distribution across gender composition was different between areas. In the open area of Armada Shopping Mall, pairs of male users (d=73.5 cm) and in the closed area, pairs of female users (d=64.2 cm) had larger interpersonal distances than other groups. All pairs interacted at larger distances in open area than pairs in closed area.

Table 7.4 shows the distribution of mean interpersonal distances across gender compositions in the open and closed areas of Armada Shopping Mall.

Table 7.4. Mean interpersonal distance across age compositions in Armada Shopping Mall

	OPEN	CLOSED
Age composition*	cm (inches)	
1-1	-	50.0 (19.7)
1-2	-	62.4 (24.6)
1-3	70.3 (27.7)	54.8 (21.6)
1-4	-	78.0 (30.7)
2-2	66.3 (26.1)	57.4 (22.6)
2-3	74.4 (29.3)	66.9 (26.3)
2-4	78.0 (30.7)	87.0 (34.3)
3-3	72.6 (28.6)	63.3 (24.9)
3-4	82.5 (32.5)	61.2 (24.1)
4-4	-	66.0 (25.9)

* 1 (<18), 2 (18-29), 3 (30-54) and 4 (>54)

The largest mean interpersonal distance was between middle-aged adults and seniors in open area (d=82.5 cm) and between young and middle-aged adults in closed area (d=87 cm). The smallest interpersonal distance was observed between young adults in open area (d=66.3 cm). Pairs with teenagers had the closest interpersonal distance in the closed area (d=50 cm).

7.1.3. Case 3: Streets at Southpoint, USA

7.1.3.1. Distribution of interpersonal distance by area

Figure 7.3 shows the distribution of interpersonal distance between users in open (n=572) and closed (n=90) areas of Streets at Southpoint.

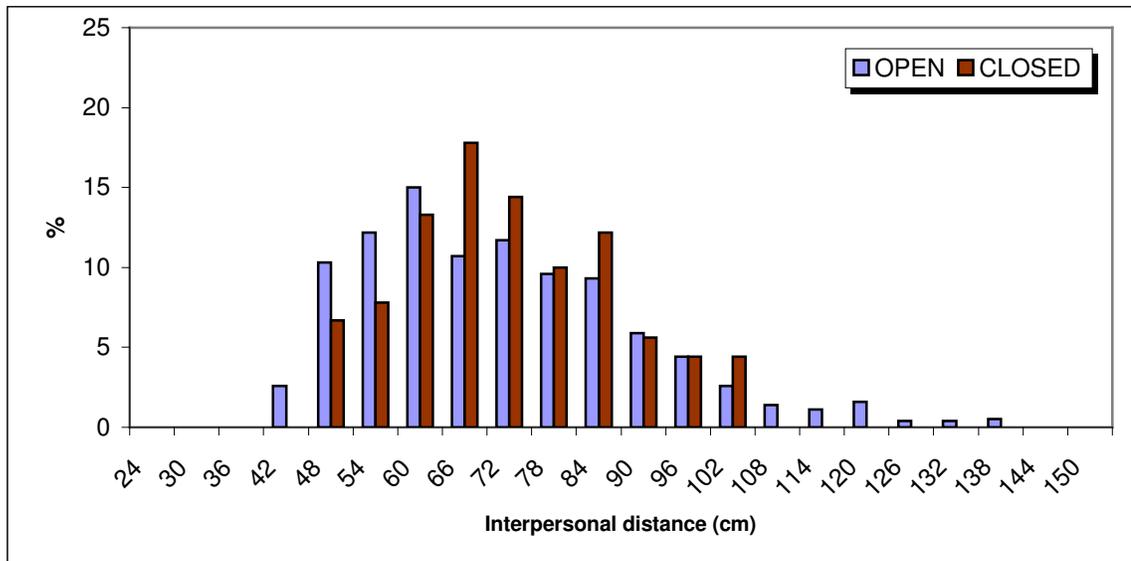


Figure 7.3. Distribution of interpersonal distance in Streets at Southpoint

Distance ranges between 24 cm and 120 cm in the open area and 36 cm and 102 cm in closed area of the mall. More users in open area interact at larger distances than users in the closed area (Figure 7.3). The most common distance measured is 60 cm in open and 66 cm in closed area (Appendix 5).

7.1.3.2. Distribution of interpersonal distance by age and gender

Table 7.5 lists the mean interpersonal distances across gender compositions in open and closed areas of Streets at Southpoint.

Table 7.5. Mean interpersonal distance across gender compositions in Streets at Southpoint

	OPEN	CLOSED
Gender composition	cm (inches)	
Male-Male (N=95)	78.6 (30.9)	76.8 (30.2)
Female-Female (N=302)	72.6 (28.6)	73.1 (28.8)
Male-Female (N=265)	67.6 (26.6)	72.9 (28.7)

In both open and closed areas, males in the company of other males ($d_{open}=78.6$ cm and $d_{closed} = 76.8$ cm) interact at larger distances than male-female and female-female pairs. Males interact with females at the closest distances in all areas of the malls.

Table 7.6 shows the distribution of mean interpersonal distances across age compositions in open and closed areas.

Table 7.6. Mean interpersonal distance across age compositions in Streets at Southpoint

	OPEN	CLOSED
Age composition*	cm (inches)	
1-1	84.0 (33.1)	-
1-2	66.0 (26)	63.0 (24.8)
1-3	64.0 (25.2)	81.0 (31.9)
1-4	-	-
2-2	70.1 (27.6)	72.0 (28.3)
2-3	81.2 (32)	78.5 (30.9)
2-4	-	-
3-3	73.9 (29.1)	73.6 (29)
3-4	96.0 (37.8)	62.0 (24.4)
4-4	62.4 (24.6)	-

* 1 (<18), 2 (18-29), 3 (30-54) and 4 (>54)

In the open area, middle-aged adults interacted at the largest distances with seniors ($d=96$ cm). Teenagers with middle-aged adults have the largest interpersonal distance in the closed area ($d=81$ cm). Pairs of seniors in open area ($d=62.4$ cm) and pairs of middle-aged adults and seniors in closed area ($d=62$ cm) have the smallest interpersonal distances.

7.1.4. Case 4: Triangle Town Center, USA

7.1.4.1. Distribution of interpersonal distance by area

Figure 7.4 shows the distribution of interpersonal distance between users in open (n=455) and closed (n=114) areas of Triangle Town Center.

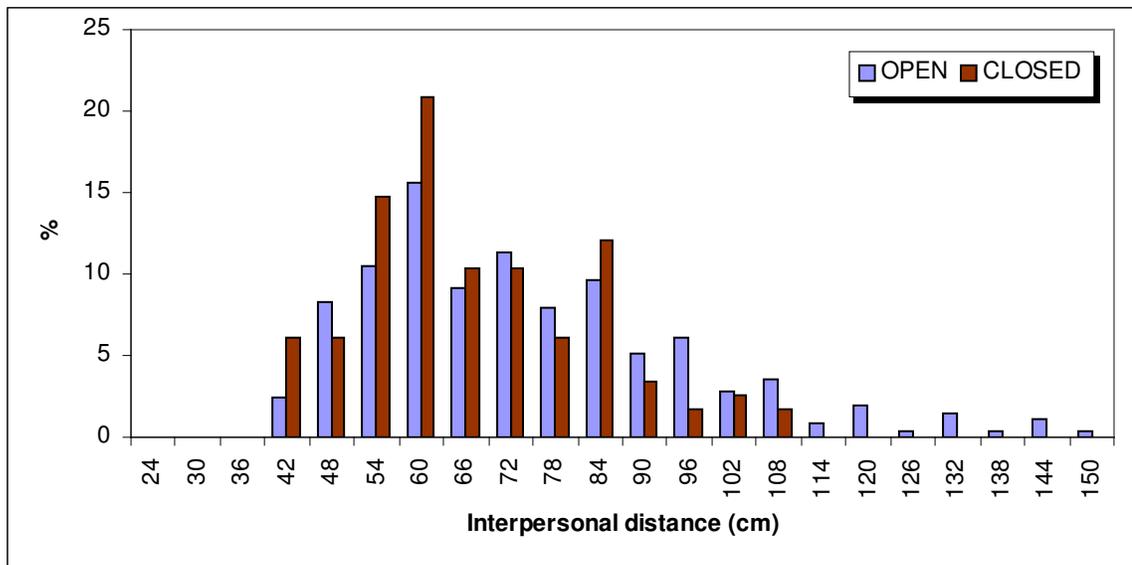


Figure 7.4. Distribution of interpersonal distance in Triangle Town Center

The minimum distance observed is 42 cm in each area. On the other hand, maximum distances across areas are different ($d\text{-max}_{\text{open}}=150$ cm and $d\text{-max}_{\text{closed}}=108$ cm). There are larger distances between users in open area than between users in closed area (Figure 7.4). In each area, most of the users interacted at approximately 60 cm distance (Appendix 5).

7.1.4.2. Distribution of interpersonal distance by age and gender

Table 7.7 lists mean interpersonal distances across gender compositions in open and closed areas.

Table 7.7. Mean interpersonal distance across gender compositions in Triangle Town Center

	OPEN	CLOSED
Gender composition	cm (inches)	
Male-Male (N=100)	78.6 (30.9)	84.7 (33.3)
Female-Female (N=214)	76.1 (30)	70.9 (27.9)
Male-Female (N=256)	73.5 (28.9)	65.7 (25.9)

In the both open and closed areas, males with other males interacted at the largest distances ($d_{open}=78.6$ cm and $d_{closed} = 84.7$ cm), and males with females interacted at the closest distances ($d_{open}=73.5$ cm and $d_{closed} = 65.7$ cm).

Table 7.8 shows the distribution of mean interpersonal distances across age compositions in open and closed areas.

Table 7.8. Mean interpersonal distance across age compositions in Triangle Town Center

	OPEN	CLOSED
Age composition*	cm (inches)	
1-1	61.1 (24.1)	42.0 (16.5)
1-2	67.6 (26.6)	78.0 (30.7)
1-3	69.5 (27.4)	58.9 (23.2)
1-4	-	84.0 (33)
2-2	74.1 (29.2)	68.8 (27)
2-3	78.2 (30.8)	62.5 (24.6)
2-4	-	-
3-3	81.2 (32)	70.9 (27.9)
3-4	75.7 (29.8)	-
4-4	80.4 (31.7)	81.0 (31.9)

* 1 (<18), 2 (18-29), 3 (30-54) and 4 (>54)

In both open and closed areas, interpersonal distance between most of the seniors ($d_{open}=80.4$ cm and $d_{close} = 81$ cm) was larger than the distance in other age groups in the Triangle case. Pairs of teenagers in both open ($d=61.1$ cm) and closed ($d=42$ cm) areas have the smallest interpersonal distances.

7.2. Exploring the relationships between variables

Table 7.9 shows the results of correlation analysis to explore the relationships between physical and subjective variables and interpersonal distance.

Table 7.9. Correlations between interpersonal distance and listed variables

VARIABLES	MIGROS		ARMADA		SOUTHPOINT		TRIANGLE	
	Open	Closed	Open	Closed	Open	Closed	Open	Closed
Enclosure	0	0	0	0	0	0	0	0
Density	0.04	0	0	0	0.16*	0	0.06	0
Age	0.04	0.13*	0.16*	0.22*	0.12*	0.05	0.22*	0.26*
Gender	-0.12*	-0.11*	-0.09	-0.08	-0.20*	-0.06	-0.08	-0.19*

* significant relationship at the level <.05

All of the significant relationships between potential variables and interpersonal distance are weak. Among these relationships, the strongest are between age and interpersonal distance in the closed area of Triangle Town Center ($r_s=0.26$). All correlation coefficients calculated for the relationship between age and interpersonal distance have positive values in all areas. The results show that age has statistically significant positive relationship in six out of eight areas. On the other hand, gender and interpersonal distance is negatively correlated in all areas. This result indicates that males interact more closely than females.

CHAPTER 8. SUMMARY OF FINDINGS AND CASE COMPARISONS

This chapter presents the significant findings of the study and discusses the implications of the study for future design and research. The chapter also includes discussions and recommendations by developing potential research hypotheses for the benefit of future research in related areas. This section is divided into two main parts. In the first part, user characteristics from a cultural perspective and possible reasons for the occurrence of some distinct behavior in malls are described. The second part discusses the results of statistical tests for relationships between variables.

In previous chapters, characteristics of data from questionnaires and observations were described. The results of these descriptions revealed some similarities and differences between user characteristics, spatial characteristics of malls, and distribution of variables across cases. These differences and similarities are described based on the results of case comparisons. The goal is to develop conclusions based on the descriptions of conditions and associations between research variables.

The research is composed of two studies that investigate different variables as outcomes. The first study includes the description of users' response to spaciousness and crowding of open and closed areas of shopping malls. The second study is the investigation of interpersonal distances between subjects in mall areas. The cases were the same; however, the participants and subjects, research instruments, and processes were different. Therefore, the findings of these two studies are summarized in separate sections of this chapter. The outcomes and relationships between variables are described to draw basic conclusions that are related to research questions and purposes. The goal of these comparisons is to describe the conditions of the areas during the time of interviews, as well as observations and characteristics of users.

8.1. Comparison of user characteristics across cases

In this part, characteristics of respondents who participated in the first study are summarized. For purposes of clarity, findings are clustered in two separate cases that are defined as two cultures. Conclusions and assumptions are made based on this distinction.

8.1.1. Shopping characteristics

Table 8.1 shows user characteristics based on time of day and frequency of visit to the malls in Turkey and the United States.

Table 8.1. Shopping characteristics based on time of day to and frequency of visit the malls

	TURKEY	USA
Shopping characteristics*		
Early visitors (<i>morning and noon</i>)	8.3	5.8
Late visitors (<i>afternoon and night</i>)	91.7	94.2
Frequent visitors (<i>everyday to once a week</i>)	45.7	31.6
Infrequent visitors (<i>2-3 times a month and once a month</i>)	54.3	68.4

*All values are in percentages

Most of the respondents in each nation are late and infrequent visitors. A comparison of cases in each culture showed that Turkish respondents were more frequent visitors than American respondents (Table 8.1). There were no everyday visitors in American cases. This could have been because of mall locations. Turkish malls are located near the city centers, which make them highly accessible. People prefer to visit these malls every day for their daily activities such as eating in the food court or purchasing grocery items from the supermarkets located inside these malls. Triangle Town Center and Streets at Southpoint do not have supermarkets.

The comparison of morning shoppers in both nations (See Appendix 4A) showed that more American respondents (3.9% in Streets at Southpoint and 5.9% in Triangle Town Center) prefer to visit malls in the mornings than did Turkish respondents (2.6% in Migros Shopping Mall and 2.1% in Armada Shopping Mall). It is possible to enter the American malls very early in the morning, even before the stores are open. Mostly, it is seniors who prefer to visit these malls early morning to walk and exercise and make social contacts with others.

The number of visitors during the afternoon hours is different among Turkish and American samples (Appendix 4A). There are more respondents in Turkish malls (6.5% in Migros Shopping Mall and 5.3% in Armada Shopping Mall) who prefer to visit malls

during noon than respondents in American malls (1.9% in Streets at Southpoint and none in Triangle Town Center).

Table 8.2 shows the user characteristics based on time spent in the malls in both countries.

Table 8.2. Shopping characteristics based on time spent in malls

	TURKEY	USA
Shopping characteristics*		
Quick (up to 2 hrs)	42.5	72.7
Leisure-driven (2 hrs and more)	57.5	27.3

*All values are in percentages

More respondents in the US (72.7%) tended to be quick shoppers, spending up to two hours in the mall than those in Turkey (42.5%). More of the respondents in Turkish malls (57.5%) tended to be leisurely driven visitors who spend two or more hours in the malls. This difference may be the result of cultural factors. A mall visit in Turkey is more than a shopping activity. As Erkip (2003) states, the shopping mall as a postmodern setting is perceived as a representation of the changing shopping and consumption requirements of Turkish citizens. The mall is a new consumption site for Turkish people; it is a place where many things can be found in one place such as grocery stores, dry cleaning services, branches of banks, cinemas, and playgrounds, which are unique features that most of the American malls do not contain.

The mall is one of the most popular leisure sites in the Turkish city. Ankara, the city in which Migros and Armada shopping malls are located, has limited options for leisure activities; the mall, therefore, is an ideal location to spend time with family and friends.

Table 8.3 shows the frequency of purchase-driven activities in both nations.

Table 8.3. Frequency of purchase driven activities

	TURKEY	USA
Purchase-driven activities*		
<i>(window shopping, visit stores and purchase an item)</i>	46	52

*All values are in percentages

Similar proportions of respondents in both the Turkish (46%) and American (52%) malls indicated that they spend their time on shopping-related activities such as window shopping, visiting stores, and purchasing items. Therefore, respondents in both nations who spend their time on shopping-related activities would be defined as “purchase-driven” users. Although many of the general characteristics of the Turkish and American malls in this study are quite different, for the users, both Turkish and American, these are still malls—places for shopping related activities.

Almost the same proportions of respondents in Turkey and the US participate in similar activities such as walking around, meeting friends, and eating and drinking. The biggest differences were seen in activities including watching a movie, exercising, and watching other people. There were no cinemas inside two American malls in this study; therefore, none of the respondents in the American cases reported that they watch movies during their visits to the malls. The number of respondents in American malls who exercise during their visits to the malls is nearly twice as many as those in Turkish malls. In America, mall space is considered a comfortable place for exercise. Starting in the early morning, people (mostly seniors) gather in malls for walking, and in some malls, the management encourages this by sponsoring and organizing walking clubs.

More American respondents reported that they enjoy watching other people in malls. This might be the result of the function and design characteristics of mall interiors such as open and wide corridors, large food courts, high ceilings, and large window openings, which make the areas brighter and well lit, with better visibility. Some American respondents reported that they could see other areas of the mall while standing in or near the center of the malls. American malls have more seating areas where users would sit and watch their surroundings. This is a typical behavior in public spaces as observed by Gehl (1987) in outdoor public spaces. As suggested by Gehl (1987), the opportunity to see, hear, and meet others can be one of the most attractive aspects of public spaces. He suggested that people and human activity are the greatest objects of attention and interest in those spaces. In conclusion, design features of built environments, such as larger interiors with open courts and wide corridors, along with the seating areas, which are defined as positive spatial attributes of mall design, will promote more social behavior and interaction among users.

8.1.2. Responses to spaciousness and crowding

Respondents' perception of spaciousness was similar in both cultures. In this study, it was assumed that respondents from both countries would have different perceptions of spaciousness in open and closed mall areas. However, most of the respondents—both Turkish and American—perceived the areas as spacious. This might be because all of the malls have different characteristics.

The minimum number of people counted in each case was similar. Among the areas with similar floor sizes, the maximum number of people in both open and closed areas of Turkish malls was greater than in closed areas of American malls (Table 4.1). Regardless of type of perceived enclosure, this difference would be related to users' response to high-density conditions. While both Turkish and American respondents had similar perceptions of spaciousness, responses to crowding were different across the two cultures. Most of the Turkish respondents felt crowded in mall areas, and most of the respondents in American malls did not. This difference might be due to the influence of the openness and brightness of the American malls, or differences in density conditions. Correlation results showed no significant relationship between density and perceived crowding in all cases. However, a general conclusion can be stated based on users' overall judgments of physical characteristics of the malls. As stated before, American malls have different layouts, longer and wider corridors, higher ceilings, fewer floors, and more window openings than Turkish malls. There are also outside streets in the American cases. These spatial characteristics might be related to the overall impression of crowding in all cases.

Regardless of the influence of environmental characteristics, differences between perceived crowding across cultures have been observed in previous research. Kaya and Weber (2003) examined the differences in perceived crowding between American and Turkish students living in residence halls. These researchers asked students about their perceptions of crowding in residence hall environments. Kaya and Weber (2003) suggested that Americans felt more crowded than Turks. On the other hand, Nasar (1984) found that contact cultures feel more crowded than non-contact cultures; this is consistent with the findings of this study. Nasar (1984) asked students about their perceptions of residence hall settings. The aim of using residence halls in these studies

would be to find settings as similar as possible to each other and to include fewer environmental factors that might influence students' perception of space.

The current research was conducted in shopping malls. It was expected that Turkish mall users would feel less crowded than American mall users felt. However, the conditions of the shopping malls in each culture were different. Although correlations did not show any significant relationship between type of perceived enclosure and perceived crowding, the overall characteristics of malls would be related to the feeling of crowding. The higher population and compact structure of the Turkish city as a background influence, along with narrower and darker corridors and areas compared to the corridors and areas in American malls, would be related to people's perception of crowding in the Turkish malls. Furthermore, differences between preferred interpersonal distances next to others (family and friends, or strangers) would contribute to users' reaction to crowded conditions. Although this study did not investigate users' comfort levels in terms of their being in different density conditions, theoretically, it was assumed that when there is enough space around individuals, they can control their interaction with others.

8.2. Comparison of interpersonal distances across cases

In this study, measurements of interpersonal distances between subjects in open and closed areas of malls have been described. This section intends to summarize the findings and compare them across cases. Demographic characteristics of subjects are described in Appendix 4B. Here, the focus will be to describe the variation in interpersonal distance during changing conditions, such as type of enclosure and density.

Much of the literature has suggested that interpersonal distance between people from contact and noncontact cultures are different (Hall, 1966; Shuter, 1977; Hayduk, 1983). People in contact cultures interact more closely than people in noncontact cultures. Similar results were obtained at the end of this study. According to the findings, Turkish subjects interacted more closely than American subjects both in open and closed areas of the malls. This is especially consistent with the findings of Rustemli's (1992) study, which suggested that Turks stand closer to each other than North Americans in residence hall settings.

Another assumption was the presence of a relationship between type of enclosure and interpersonal distance. Although statistical tests did not reveal any significant relationship, differences in interpersonal distances were observed between mall users in open and closed areas. Although the most frequent measured distance between subjects was between 54 cm (21.3 inches) and 66 cm (26 inches) in all cases, subjects interacted more closely in closed areas than did subjects in open areas. Lang (1987) suggested that more enclosure reduces interaction distances. Desor (1972) and Pedersen and Topham (1990) also agreed with this conclusion: as space gets more open, interpersonal distance increases.

In all cases, pairs of male individuals had larger interpersonal distance than male-female pairs and pairs of female subjects. This finding is similar to the results of previous research (Burgoon, 1989; Hayduk 1983; Horowitz et al., 1970; Patterson and Edinger, 1987; Stokols and Altman, 1987).

Most of the studies measuring interpersonal distance between individuals were conducted either in outdoor public areas such as parks and plazas or in laboratory settings. The present study is a contribution to research literature that has investigated interpersonal distance in an environment that has not been studied in this context.

8.3. Comparison of spatial characteristics of malls

Given the differences between Turkish and American malls, it is not surprising to find different types of spatial characteristics in these settings. Consequently, instead of attempting a point-by-point comparison of the four malls, the emphasis of the analyses is on identifying the patterns, as they are unique to each individual mall. Therefore, the question is how differences in design attributes are related to perception of space and interpersonal distances.

8.3.1. General descriptions

One of the main differences between the Turkish and American malls studied is the location of the malls, which may be related to user characteristics as well as frequency, and times of visits. Turkish malls are located on proportionally much smaller parcels of

land than the American malls. While the latter were sprawled out over two levels of shopping with outdoor parking lots surrounding the mall, Turkish malls expand vertically over three floors of shopping and require enclosed, multi-level parking structures. The shape or layout of these malls are different too; the American malls are V-shaped, and the Turkish malls are straight or rectangular forms. In terms of the placement or situation of these malls within larger urban environments, Turkish malls are adjacent to a planned urban core, while American malls in contrast are located next to open areas and established commercial settings.

The malls in Turkey are located in the city center next to major traffic intersections. Some are within a short walking distance to the residential neighborhoods. Depending on their central locations, a diversity of users visits them, including local people and those coming from far regions of the city. With their various services and leisure opportunities, the malls attract users of different ages, gender, and socioeconomic status. On the other hand, malls in the US are generally located at the intersections of highways, in suburbs and on outskirts of the cities.

Another difference between Turkish and American malls is accessibility by car and public transportation. There is very limited access by public transportation to the American malls, and most people drive to these malls in their own cars. On the other hand, public transportation, such as subways, buses and “dolmush” (a mid-size bus carrying up to fourteen passengers) is widely available in Turkey. As a result, more diverse groups of people, such as people from low-income regions of the city, would be expected to visit Migros and Armada shopping malls more frequently.

Migros and Armada shopping malls are surrounded with mixed-use developments that have pedestrian connections to the malls. These developments include a variety of commercial and office buildings and residential settlements. On the other hand, American malls are more isolated from the surrounding commercial and residential environments, which make it nearly impossible to walk to the malls. They are isolated in the middle of vast parking lots, and traffic thereby disconnects the mall from the surrounding areas.

The most significant functional and architectural difference between Turkish and American malls is the presence of an outside street. Triangle Town Center and Streets at Southpoint were designed with the combination of indoor and outdoor shopping areas. Some of the stores and restaurants are located on the outside where visitors enjoy an artificial street-like environment. Migros and Armada shopping malls, however, consist of only enclosed shopping areas.

Most of the respondents in all cases perceived the areas as spacious. This may be the result of conducting two surveys, one to define the type of perceived enclosure in one of the areas (exploratory survey) and the other to evaluate users' perception of spaciousness in open and closed areas (questionnaires). In Turkish malls, which do not include outside streets, few respondents complained about the narrowness of the corridors or limited social activities because of a lack of space to accommodate those activities and events. Shopping malls have been built for more than 50 years in the US, and American social life has long included frequent trips to malls. According to ULI's report, regional shopping centers are important and integral parts of the economic and social fabric of North America. After homes and workplaces, regional shopping centers are the most frequently visited places (Urban Land Institute, n.d.). On the other hand, the modern shopping mall is a new concept in Turkish cities. In Ankara, there are few shopping malls compared to the population of more than 4 million, and the people have less experience comparing these settings with other malls. New malls are being built in and around the city. As they gain more experience with mall trips and use, Turkish users may have more comments about the malls. In addition, unlike many American cities, Turkish cities already include a number of outside shopping streets or districts, as well as traditional markets in their city centers.

According to Ford (2003), American cities lack the structure that gives stability to European cities with an enduring urban sense of place. The character of downtown, once viewed as the heart of the American city (Fogelson, 2001) and the core of local shopping, has changed, and many downtown districts have now been left in the backwater of retail activity (Ford, 2003). Rather than improving the retail activity of current downtowns, the growing trend is building new downtowns and town centers around the hybrid shopping malls—those that combine an enclosed shopping center with an outdoor shopping street.

In a way, though, Turkish cities do not contain hybrid shopping malls. Existing malls are already located in the built infrastructure next to residential and commercial sites within the Turkish city. However, because of the increased traffic congestion, parking shortages in the city center, new suburban-like developments on the outskirts of the city, and improved mobility due to increased use of private cars, Turkish cities may soon embrace the prospect of building more shopping malls with various styles and sizes, and in different locations.

The American malls studied are designed to develop alternative downtowns (as in Streets at Southpoint) or “town centers” (as in Triangle Town Center) by creating a distinctly urban feel and active street environment in remote locations that are usually only accessible by private car. On the other hand, Turkish malls are already located in the existing urban fabric with connections to surrounding use. However, the connections are not strong enough to accommodate continuous pedestrian flow to and from those surrounding locations. Turkish malls are located next to busy traffic corridors, and accessibility by private car is encouraged.

The outside streets in the American cases were perceived as open places where people would enjoy the outdoors while interacting with others. This is a new type of design that combines a street atmosphere with a typical enclosed mall space. The features of the outside street, such as its openness, use of plants, sculptures, and fountains would influence people’s perceptions of interior space. However, comparison of these malls with Turkish malls that do not have outside streets did not reveal different results. In all cases, most of the respondents perceived the areas as spacious and open.

8.3.2. Exterior and interior features

The enclosed spaces of all of the malls in this study were similar in size, but American malls tend to cover more area on land than Turkish malls. Turkish malls are more vertical than American malls as a result of the number of floors. The height between floors of Turkish malls is lower than that of the American malls. Additionally, American malls have large openings on the second floors making the lower levels visible from the upper floors.

As the corridors of Turkish malls are of a “closed” rather than an “open” design, the solid floors and ceilings in each corridor area prohibit visual access to the vertical levels of these malls. It is only from the openings on each floor that all the floors can be seen at one time, and thus an assessment made by a user of where he or she is in relation to other floors.

Several aspects of the architecture within the malls contribute to the problems of visibility and movement. The linearity and symmetry are the basic ordering principles related to the configuration and organization of the mall plans. The simplified plans of American malls reveals that the mall is basically a linear form extending between department stores. With the center court forming midpoints between these department stores, these malls are divided into two generally symmetric halves along this “Y” axis.

In the American malls, there are center courts that are formed at the intersection of at least two wide corridors. Both of the malls have curvilinear shapes, which makes it possible to see the ends of these corridors while standing in the center. On the other hand, there are no public spaces like a center court or large gathering area as focal points in Turkish malls. This might be explained by comments made by management of Turkish malls, who stated that the primary goal was to increase sales by directing people to the stores.

These observations can be described by some of the theories in urban design, which would provide implications for the evaluation of shopping mall design. The settings characterized as shopping malls are a combination of enclosed corridors for walking and public spaces similar to those found in traditional cities (Maitland 1985). Maitland (1985) suggested that the design of shopping malls with a system of corridors, public spaces, and stores are related to theories defined by Lynch (1960) and Alexander (1977).

Most of the malls in the US have similar floor plans and building characteristics, such as department stores anchored at the ends of the corridors, and open courts located at the intersections of two or more corridors. These malls contain most of the elements mentioned by urban design theories such as corridors as promenades or paths, and center courts as activity nodes. On the other hand, the Turkish malls studied can be defined as stand-alone buildings with several stores located on multi-level floors.

Lynch stated that recognizable space with memorable images would be successfully designed if it combined the system of elements such as nodes, paths, and edges. Nodes are conceptually important locations at intersections. Squares in the city or center courts in shopping malls act as nodes. Paths are linear features such as corridors in shopping malls that are connected to special destinations like department stores. Proximity to a special feature of the setting, such as an entrance area inside the malls, often increases the importance of a path. Edges can be defined as both physical and visual borders such as vertical surfaces.

In Alexander's *A Pattern of Language* (1977), patterns such as activity nodes and promenades are related to the layout of shopping malls. Activity nodes create focal points inside the malls where "action concentrates" (p. 163). The promenade links the activity nodes and develops "main points of attraction at the two ends to keep a constant movement" (p. 168). The corridors inside the shopping malls can be considered promenades, with department stores located at each end. The center court is an activity node in the mall, located at the intersection of the corridors.

Maitland (1990) suggested that urban design principles should be employed in the design of successful and sustainable shopping environments. For example, Turkish malls studied in this research have a typical enclosed mall design, which is not connected to outdoor space. The image and functionality of these settings can be improved by incorporating the elements mentioned by Lynch (1960) and Alexander (1977).

Providing more pedestrian connections and bringing more activities and visually appealing features closer to the malls would improve the connections and pedestrian use. Other than stand-alone buildings, more shopping-related activities and entertainment features can be lured to the sites next to the existing malls.

In addition to the general structure of the malls, such as nodes and focal points, lighting plays an important role in users' perception of these settings. Other than on the upper floor of Migros, Turkish malls use artificial lighting. On the other hand, American malls have large window openings above these areas through which natural light penetrates. The center courts of both Streets at Southpoint and Triangle Town Center receive mostly

natural light throughout the day. As a result, these areas look bright. In addition to the openness of these areas of the American malls, the lighting conditions would be related to the impressions of spaciousness and crowding in those areas. Some respondents reported that they enjoyed being in the bright areas where they could see others easily.

Based on these differences between malls, it was expected that users of Turkish malls would perceive these settings as less spacious than American mall users did. However, few mall users reported uncomfortable conditions of the narrowness or darkness of the corridors. In all cases, most of the respondents perceived the areas as spacious.

The location of the cinema was another difference. Migros and Armada shopping malls have cinemas inside the malls, both located on the upper level. There were no cinemas inside the American malls. The Marketing and Retail Manager of Streets at Southpoint said that they had purposefully located the cinema outside in order to prevent teenagers from “hang[ing] out” inside the mall. He said:

“They [teenagers] behave actively, and this may cause the disturbance of other customers. Therefore, teenagers should be outside the mall where they may find many opportunities for entertainment such as watching movies or eating in fancy restaurants” (Personal communication, February, 18, 2004).

The location of cinemas in malls can be related to people’s feeling of comfort and crowding during their visits. On the upper level of Migros, lines in front of the cinema were observed that extended into the corridors. People in line waiting to buy tickets or to enter the cinema blocked the normal pedestrian flow in the corridor.

In Streets at Southpoint, the design strategy was to use the maximum level of natural material with a combination of natural light to create a space that looks like an outdoor street. Texture, color, and permeability of materials would influence users’ responses to their environment that is related to perception of spaciousness. People’s perception of space in Streets at Southpoint would be different than in other malls in which more plain, similarly colored and textured materials are used. However, in all of the malls, most of the respondents perceived the areas as spacious and open. Therefore, the diversity of material and people’s perception of spaciousness and crowding is probably unrelated.

Only few people made comments about the material in the center court of Southpoint in which maximum diversity of materials are observed.

8.4. Relationships between variables and response to research questions

In this part, results of statistical tests that measure the degree of relationships between research variables are described. The aim of conducting such tests was to answer the research questions that were developed at the initial stages of the study. Most of the research questions ask whether there are relationships between research variables. The spatial characteristics of mall areas are different, and subjective definitions of enclosure were defined by different respondents. Each case has unique characteristics that make it difficult to generalize the results to other cases—a relationship that occurs in one case may not be observed in another one. Therefore, the conditions and degree of relationships were tested for each case separately.

The first research question asks the condition of relationships between users' perception of spaciousness and crowding, and type of enclosure, lighting levels, and density of mall areas. Correlation results indicate no relationship between these variables in all areas. Lighting had a significant negative relationship to perceived spaciousness in open areas of Streets at Southpoint. As this area became brighter, users felt more open. None of the relationships between lighting and perceived crowding were statistically significant. In addition, there was no significant relationship between density and perceived crowding in any of the cases.

The second question asks whether interpersonal distances between subjects change in different density conditions and in open and closed mall areas. Correlation results show that there is no relationship between type of enclosure and interpersonal distance. This indicates that there is no significant variation of interpersonal distance between open and closed areas of the malls. The only significant relationship between density and interpersonal distance was observed in the open area of Streets at Southpoint. As the number of people increases in that area, it is significant that subjects interact closely.

The third question asks whether age and gender of people are related to perceived spaciousness and crowding. The results of correlation tests indicate that age is

negatively related to perceived spaciousness in both areas of Streets at Southpoint and in the closed area of Triangle Town Center. In all these areas, older respondents felt more spacious than younger respondents. In open areas of Streets at Southpoint and closed areas of Triangle Town Center, age was negatively related to perceived crowding; older adults felt more crowded than younger adults.

The fourth question asks the condition of relationships between shopping characteristics, such as time and frequency of visit to malls, and user characteristics, such as preference for interpersonal distance next to family and friends, and perceived spaciousness and crowding.

Results showed that coming alone to the mall and perceived spaciousness are related only in the closed area of Triangle Town Center. Perceived crowding and coming alone to the mall are significantly related in open areas of Armada Shopping Mall and closed areas of Triangle Town Center. Moreover, perceived crowding and the number of people next to the respondents during interviews are related in the open areas of Armada Shopping Mall and Streets at Southpoint and the closed areas of Triangle Town Center. Preferred interpersonal distance while next to family and friends is significantly related to perceived crowding in both areas of Migros. Only in the closed areas of Triangle Town Center are preferred interpersonal distances next to strangers and perceived crowding significantly related.

Only in the open areas of Streets at Southpoint was a significant negative relationship between group size and perceived crowding found; this finding can be stated thusly: as the number of acquaintances next to the respondents increase, they felt crowded. Group size and perceived crowding were positively related in the open areas of Armada Shopping Mall and the closed areas of Triangle Town Center. It would be suggested that in these two areas, as the group size increased, respondents felt less crowded. As a result, the reactions to crowding while standing alone or next to a group of companions depends upon the conditions of each mall area. As stated before, each mall area has distinct characteristics that would be related to people's responses to spaciousness and crowding.

None of the relationships between preferred interpersonal distance and perceived spaciousness were statistically significant in all cases. Perceived crowding was negatively related to preferred interpersonal distance next to family and friends in the open area of Migros Shopping Mall. In this area, as respondents preferred larger interpersonal distances next to family and friends, they felt more crowded. On the other hand, there was a positive relationship between preferred interpersonal distance next to family and friends, and perceived crowding in the closed area of Migros Shopping Mall. In this case, respondents who preferred far interpersonal distance next to friends and family felt less crowded.

CHAPTER 9. DISCUSSION, IMPLICATIONS and FUTURE DIRECTIONS

This chapter discusses the results in the context of research findings, as well as the practical and research implications of this dissertation. The chapter is organized into three sections. The first section discusses the major findings in the context of previous research and theoretical explanations. Section two provides implications for future developments, improvements of built environments, and future research opportunities. The last section includes a discussion of quality considerations and limitations of this study.

9.1. Major findings in the context of previous research

At the initial stages of this research, findings from the literature review were used to list some hypotheses. However, this study does not intend to test or confirm these hypotheses. Rather, it intends to clarify and describe the conditions of research settings that were studied as separate cases. The study is an exploratory and descriptive case study that does not endeavor to test the hypotheses. All of the cases have unique spatial characteristics, and so people's responses in these distinct settings are restricted to the characteristics of those particular cases.

Some basic findings such as spatial characteristics of malls and user characteristics are related to cultural differences. With the information gathered during literature review and fieldwork, the conditions of the settings can be described based on these differences.

In order to discuss the findings, information gathered via the questionnaires and observations, as well as informal interviews, need to be considered. In Streets at Southpoint, for example, most of the respondents made comments about the outside street. They indicated that they generally use that area during their visits to the mall. All of these respondents liked this outdoor shopping street. However, the relationship between respondents' reactions to the characteristics of the outside street and open and closed areas of the mall was not tested in this research. Therefore, it would not be possible to draw conclusions about any possible relationship. The findings are limited to the responses to the characteristics of indoor areas in selected cases.

Some respondents in American malls commented on the visibility in the settings, which is an environmental dimension related to people's comfort. In wayfinding literature (see for example Weisman 1981), visibility is related to success in locating areas in an environment. In the context of shopping malls, the ability to see the ends of the corridors from one location, and the elimination of landscape and architectural elements that block views may contribute to people's comfort in these settings. Galper (1987) in Dogu and Erkip (2000) suggested that seeing other parts of the spaces from particular areas is an important element in regard to perception of spaciousness and crowding. The presence of architectural structures such as walls, and landscape elements such as trees that can block vision may contribute to a more crowded and confined feeling. People make instant decisions regarding their destinations and activities, and their perceptions of the surroundings play an important role in this decision (Weisman, 1981). Basic design features of some settings intentionally create a confusing and complex environment specifically designed to keep people on the premises. In shopping environments, the purpose is to attract more users and manipulate them to stay in the environment longer so that they will spend more money (C. Ayrancioglu, personal communication, March, 12, 2004). However, what is best for the users is a plain, clear, and open environment where they can read the signs, process information, and perceive the spatial characteristics easily for better organization of behavior and response to the environment (Dogu and Erkip, 2000).

Respondents' feeling of crowding was different across cultures. Most of the American respondents did not feel crowded in the mall areas; however, Turkish respondents felt more crowded. This feeling of crowding might be the result of different environmental conditions across cases such as openness and brightness of the areas, and density conditions. Although the areas were defined as open and closed based on users' classifications, in several instances, there were some common responses that may qualify for the conclusion. One of them is the occurrence of similar responses in American malls that are related to the openness of the areas such as center courts and outside streets. Features of an outside street such as more openness, brightness, and less density would influence users' emotions and perceptions of spaciousness and crowding.

The changes in perception of areas in terms of spaciousness and crowding would be explained through a cultural perspective, as stated in previous literature. Here, a description of the cultural structure would help to conceptualize the link between people and the characteristics of their environment. The next paragraphs attempt to describe the changing lifestyle in Turkish cities that are related to the Turkish mall characteristics.

Erkip (2003) made noteworthy statements and observations about the issues of changing trends in consumption related to mall developments in Turkish society. She stated that the function of the mall in Turkey is not limited to consumption (p. 3). Her study focused on the nature of mall visits and suggested that the mall, as a new “public space,” is an ideal environment that provides myriad opportunities for the consumption and leisure needs of Turkish urban society. The malls in big cities have been developed to overcome the problems of parking and traffic congestion in city centers and severe weather conditions of outdoor market places. Car ownership has increased tremendously, which has created a highly mobile society. Turkish citizens now demand to consume international brands that cannot be purchased in the traditional marketplace. The result is obvious that a place, the mall—which has been in use in other cultures for many years—should be introduced to Turkish society to satisfy these needs (Erkip, 2003).

The mall introduces a new postmodern architectural element to the older mix of architectural styles in the Turkish urban landscape. In the case of Ankara, the presence of malls in the city structure is not only a striking addition to the changing architectural style of the city, but also an important contribution to the development of a new, contemporary cultural lifestyle. Erkip (2003) states that it is the Turkish city’s new lifestyle rather than its architecture that attracts the Turkish people, who have been awaiting a new outlook on modernity (p. 6).

9.2. Implications

This section discusses both the practical and research implications of this study. Practical implications are defined as the suggestions for future design of similar built environments. These suggestions include strategies for the improvement of both future and existing environments. Research implications include the contribution to the related

research fields, hypotheses developed, the limitations of the study, and recommendations for future research.

9.2.1. Practical implications

The findings of this study reveal some conclusions that can be developed as recommendations for the design of built environments such as shopping malls. These recommendations are defined based on the spatial characteristics of cases that have been discussed in previous chapters. To improve the design of current and future environments, perceived characteristics of cases in this study are identified. The findings suggest some guidelines to design user-friendly environments.

Although no relationship was found between perceived spaciousness and type of perceived enclosure in all cases, respondents' comments about the openness of the mall areas and their reactions to spaciousness do reveal some conclusions. American respondents, especially, seemed to be influenced by the openness of the malls that are connected to outside streets. According to user responses, openness and brightness of the mall areas are defined as positive physical characteristics. Especially in the center courts of American malls, this result was more obvious. Designing wider and brighter spaces in enclosed built environments would contribute to people's comfort in these types of settings.

Based on respondents' comments about their activities and the features of the shopping malls, the findings suggest that people enjoy certain behaviors in enclosed public spaces that afford those activities. Most of the respondents like to wander around and enjoy watching others. Spacious and visually well-connected areas provide opportunities for these activities. Spacious areas in the malls, such as center courts and wide corridors, offer adequate space for social activities other than browsing. These spaces are more suitable for such activities if they are equipped with site elements such as benches, seating walls, and niches.

Research suggests that we feel uncomfortable when we are too close or too distant from another person (Gifford, 2002; Knowles, 1983; Six et al., 1983). Understanding the optimum levels of interpersonal distance for comfort might result in basic design

guidelines. These guidelines can be used during the planning, design, and implementation of user-friendly environments in different cultures. Although this study is not intended to reach conclusions regarding levels of discomfort based on changing interpersonal distances, common patterns of distances would be observed in similar cases. The findings of this study suggest that interpersonal distances between individuals vary across cultures. In addition, most of the respondents interacted more closely in closed areas.

The results showed that in all cases, most of the users interacted at 60 cm (23.6 inches) distance. Turkish users interacted more closely than American mall users (Table 9.1).

Table 9.1. Mean interpersonal distances in open and closed areas across cultures

	OPEN	CLOSED	ALL
	cm (inches)		
TURKEY	65 (25.6)	61 (24)	63 (24.8)
USA	73 (28.7)	71 (28)	72 (28.3)

Although the areas have different characteristics, based on the theories of personal space discussed in the literature review, it would be suggested that Turkish mall users interact with each other more closely than their American counterparts.

Gender differences have been reported in interpersonal distances. In shopping mall cases, male users with other males interacted at the largest distances, and males with females interacted at the closest distances. Understanding these gender differences can help designers to design user-friendly spaces appropriate for the needs of both males and females.

The environment can be understood in terms of shared social and cultural meanings among users of a physical setting (Stokols, 1977). The process of designing similar types of settings in different cultures deserves special attention. Space organization and layout, arrangement of areas that facilitate certain behaviors such as sitting, eating, and socializing, and deciding upon the scale and size of the fixed and semi-fixed elements for those particular activities, would benefit from the recommendations developed by these kinds of studies.

Passini (1984) identified three information-structuring factors that contribute to the legibility and imageability of architectural settings: spatial organization, spatial enclosure, and spatial coherence. Spatial organization is “the principle by which an order among various inside spaces and architectural elements is established” (p.130). Passini (1984) found that the presence of a central open space in a building played a dominant role in organizing the imageability of a setting. This type of an open space increases visual access to the building in both its horizontal and vertical dimensions. It also helps users to understand the spatial relationships and point out the landmarks that can be used for orientation. In the American malls studied, these central open spaces appear as center courts. On the other hand, the two Turkish malls do not contain such spaces. Some of the respondents in the Turkish cases reported difficulty in orientation and wayfinding due to the similitude of the floors. With the help of open areas, users can survey a surrounding, which can help them to understand spatial relationships between architectural components such as floors and storefronts.

According to Weisman (1981) and Evans, Fellows, Zorn, and Doty (1980), architectural differentiation contributes to more effective wayfinding and orientation. This differentiation can be accomplished by separating areas structurally or via colors, graphics, lighting and furnishings. In this context, separating functional zones from each other with transition spaces, such as courts, would be helpful to manage and direct the movement of visitors to other areas of the mall. In Streets at Southpoint, a wide and large entrance area and a center court, and in Triangle Town Center, a large center court that is connected to the entrance area, function as transition spaces. However, Armada and Migros shopping malls do not contain similar areas.

Spatial correspondence or coherence is the extent to which there is image continuity between and within spaces (Weisman, 1981). Transition spaces such as entrance areas inside the malls develop spatial correspondence. An entrance area connects the exterior environment to an enclosed corridor. Users in the entrance areas can observe and become familiar with the surrounding areas. The position of this type of place is important, because users should be able to see the entire surroundings. The transition spaces along the corridors, such as courts, should be placed to allow social interaction and chance of encounters without disrupting the movement of other users. Providing seating at some points where users can easily see the other mall areas would give them

the ability to sit and watch others in those areas. A significant number of respondents reported that they enjoyed this.

A basic site planning and design scheme should be in place to easily recognize and identify the site elements and areas inside the malls. For Turkish malls, which have clustered linear designs, layout of the built environment should maximize the visibility of the surroundings so that identifying other areas would be easily provided. This can be achieved through the use of wide corridors that allow better views so that users can easily see those spaces. This would also allow users to observe others in the setting without being disturbed by the presence of people around.

9.2.2. Research implications and hypotheses development

One of the purposes of this research is to develop basic hypotheses for the benefit of future research. The outcomes of the study, such as the differences in the characteristics of cases and similarities in the people's perception of space in open and closed areas, have been used to develop these hypotheses. These outcomes are introduced in the next paragraphs with their relationship to theoretical explanations defined in the literature.

Hypothesis 1—The feeling of crowding is not always an undesirable condition. People often enjoy crowded conditions in shopping malls.

This hypothesis is discussed with its relationship to processes and mechanisms that account for feelings of crowding, which are defined by crowding models, such as behavioral constraint, control, and overload. The behavioral constraint model proposes that high density restricts movement, which in turn results in reduced freedom and restriction of access to resources (Baum and Valins, 1977, 1979; Evans and Lepore, 1992). Such research suggested that when there are too many people in a given area, individuals often feel uncomfortable and disturbed by the presence of others. However, high-density conditions were not defined as uncomfortable and disturbing in shopping malls. Rather, most of the respondents liked the crowded areas, especially in the American malls. The spatial characteristics of the environment, however, play a role in the feeling of crowding in high-density conditions.

According to the control model, high density reduces people's sense of control of their environments and the way they interact with others (Baum and Paulus, 1987). Simply put, people are exposed to more social contacts than they desire. An increase in unwanted social contacts in high-density conditions can create stress (Baum and Valins, 1977, 1979). With more space around them, allowing them to control their interactions with others without the invasion of their personal space zones, people may feel less crowded (Rodin et al., 1978), and people in these ideal density environments rate their surroundings more positively than those without that sense of control (Evans and Lepore, 1992).

In the overload model, high density generates excessive stimulation that causes overload in the sensory system (Baum and Valins, 1977, 1979). Overloaded individuals express their condition via psychological reactions such as aggressiveness (Evans, 1979), which might cause them to escape or leave the setting. Some respondents in mall cases reported that they were overstimulated by the heavy pedestrian traffic in the entrance areas, and this overstimulation reduced their desire to remain in those areas.

The psychological processes in relation to environmental conditions are believed to mediate the effects of density on the feeling of crowding, and these processes in turn influence human behavior (Desor, 1972; Stokols, 1972). As a result, changing the physical characteristics of a space by designing more spacious settings can result in changes in the feeling of crowding. Based on this approach, as well as on the observations and findings of this current study, the following hypothesis is developed.

Hypothesis 2—Spaciousness and openness of the areas in architectural settings are related to a more positive response to environments.

When there is adequate space for motional and visual response to the conditions, and for personal space requirements, respondents were not disturbed by the presence of others. Some respondents complained about the crowdedness of certain areas such as the food court in Migros Shopping Mall in which they felt disturbed by the presence of other people. The food court was defined as “low,” “dark” and “congested.”

Hypothesis 3—People who are alone perceive the space as less spacious in shopping malls.

This hypothesis was derived from the previous literature, and is supported by the current research findings. Table 9.1 shows the frequencies of responses of lone respondents and respondents within a group with regard to feelings of spaciousness in Turkish and American malls.

Table 9.2. Responses to spaciousness of lone respondents and respondents in a group

	Lone respondents			Respondents within a group		
	Strongly Agree	Agree Somewhat	Disagree	Strongly Agree	Agree Somewhat	Disagree
Nation						
Turkey	21.6	11.1	35.7	78.4	88.9	64.3
USA	20.4	28.6	50	79.6	71.4	50

*All values are in percentages

There is consistency across cultures regarding the agreement of spaciousness of the mall areas. Most of the lone shoppers in these cases perceived the areas as confined; conversely, most of the respondents within a group agreed that the areas were spacious.

Sommer et al. (1992) found a relationship between shopping companions and shopping behaviors such as browsing and purchasing. They found that groups spend more time than lone shoppers. This result, however, does not necessarily address the relationship between group size and the feeling of spaciousness. It can, however, generate conclusions that when people visit the mall as a group, they feel more secure and better enjoy the services of the mall, and these feelings influence them to spend more time inside the mall. On the other hand, users who prefer to visit the mall alone are often easily distracted by the presence of others and environmental conditions because they pay more attention to their surroundings. Therefore, they would define the space as more confined than the individuals within groups.

According to the responses during interviews, people shopping within the groups found that it was easy to navigate, walk around, and even stand in groups without being disturbed by others in American malls. On the other hand, Turkish malls had quite

different, even opposing characteristics, such as narrowness or closeness of the corridors, and these caused difficulty in navigation and motion. In all cases, respondents were attracted to department stores, which were defined as large and open. The size and layout of these stores were related to easy navigation and visibility in those settings. Therefore, the following hypothesis is developed.

Hypothesis 4—Visibility in an architectural environment, which is related to openness of the space, is an important feature promoting personal comfort in shopping malls.

Visibility is an important positive feature related to people's comfort in shopping malls. Some respondents reported that being seen by others and seeing others were important in order to control their interaction with people, as well as for perceived spaciousness and safety. In open areas, people would feel more spacious and more easily see others.

This function would be related to Appleton's (1975) "prospect-refuge" theory, which states that environments that provide a way for an individual to gain a better view of the surrounding are aesthetically favorable. The closeness-openness of environment therefore can be related to "prospect-refuge" requirements. Increasing the number of objects in an environment increases the number of opportunities to hide (refuge) and strengthens the perceived spaciousness. Although the current study did not include variables such as fear or visibility as outcomes, Appleton's (1975) model can be discussed with its relationship to mall users' responses.

Fisher and Nasar (1992) proposed that the characteristics of the environment can support the opportunity to "escape" if confronted by offenders; this is similar to the concepts of prospect and refuge, as discussed above. The features of an environment, such as exits, which provide the opportunity for users to escape a possible threat, would be key factors to help promote a feeling of comfort in the built environment. Fisher and Nasar (1992) propose that people feel uncomfortable due to an increased sense of fear in areas with less enclosure and blocked vision.

9.2.3. Recommendations for future research

This study included a limited number of variables in order to assess their relationship to perceived space and interpersonal distance. Future research should perhaps include physical variables that were not included in this study, such as noise levels and temperature. This would enable a better understanding of mechanisms that have roles in person-environment interaction in real settings.

Previous research on type of enclosure used various definitions and measurements of the spatial terms, which resulted in some inconsistent results. Using common definitions in future research on spatial variables will provide more consistent results. As proposed in this study, users' subjective definitions of enclosure can be included in future research in other settings.

The cases chosen for this study were regional shopping malls in two cultures. Future research should investigate users' responses to environmental conditions in open and enclosed local market places and shopping malls in different scales. As defined by Tubridy (n.d.), there are three major types of shopping malls: regional and super-regional, hybrid, and value-oriented shopping malls. Although this classification has been made for North America, malls in other nations can be classified based on similar characteristics. Users' responses to spatial characteristics of these malls can be compared in future research.

Future research might investigate the relationships between design characteristics of shopping malls and user activities. The role of design elements such as the number and location of seating areas, as well as the visibility and openness of the areas with regard to establishing visual and social contacts between users, should be investigated.

This research is limited to cases that differed substantially in their physical characteristics. Future research should include cases with more similar spatial features, such as classrooms in the same school building, or hospital rooms with similar plans, size, and lighting conditions. People's responses to density conditions in these areas can then be compared. For cross-cultural comparisons, similar built environments in different cultures should be selected.

Investigating users' perceptions of the openness of the outdoor urban space, such as city parks and urban plazas, should be the subjects of valuable future research. User responses to these environments would be compared with the responses of users in enclosed spaces. More research needs to be conducted on the effects of natural landscape elements, such as plants, on user perception of spaciousness and crowding. In addition, the effects of these elements on interpersonal distance should be investigated.

In further studies, not only people from different cultures but also people from different ethnic backgrounds within the same culture should be studied to compare their responses to the built environment.

The present study was limited to the four shopping malls that were defined as medium scale enclosed settings. A more wide-scale investigation of people's responses to the environmental features is needed in larger scales such as urban plazas or city parks.

Still pictures of naturally occurring behavior, which were employed in this study, might not provide adequate information about degree of and reasons for interaction between people. New and improved techniques, such as behavior mapping and participant observation, are needed. Personal journals and in-depth interviews would be included as major data collection techniques to better understand the effects of built environment on space perception and interpersonal interaction.

Future research should also examine different malls in one nation such as shopping malls in western and eastern parts of the United States; this way, responses of people from the same culture who live in different regions can be compared.

Mall employees were not included as a sample group in this study. Future research may include this population to learn more about their responses to the environment in which they work every day. These responses may be compared with the responses of the actual users.

Although this study was conducted in commercial settings, it was not intended to address marketing issues such as purchasing behavior. More research is needed in the

environment-behavior field in terms of its marketing relationship. Lessons that would be gleaned from these studies might be used by businesses to increase sales by incorporating certain design principles.

Future research can include more qualitative methods of assessing users' opinions regarding the design characteristics of discrete but similar settings. Users can share their experiences and opinions with researchers during in-depth interviews and spontaneous conversations. Zeisel (1984) suggested that there are four observational methodologies a researcher can use to gather useful information about the built environments: secret outsider, recognized outsider, marginal participant, and full participant. In a shopping mall, a researcher can sit next to a group of users and listen to their conversations (secret outsider), or participate in part of the conversations by expressing personal opinions about the mall characteristics. Recording these conversations will provide more insight into the problem of perception and use of space.

A researcher may also assume a more participatory role and approach another user, pretending to be having a difficult time finding a store or a particular location inside the mall. During this "spontaneous" conversation, remarks made about the experience in the setting, such as indicating how convenient the mall is, will often be the stimulus for other users to share their thoughts on the subject. These conversations may reveal some information about the design characteristics of the setting that cannot be gathered by interviews.

With regard to more general issues in design characteristics of malls, including user responses to architectural variables, a variety of observational and participant methods would be helpful. Informal, semi-structured, and often spontaneous interviews with security guards and staff in the information kiosks can help gather additional information. These people interact with mall users on a daily basis and hear numerous responses from mall users regarding locations of stores, entrances, scheduled activities, and problems about the design and management of the malls. Their input might prove invaluable.

Another useful technique would be personal journals, which might include the way a shopper spends his or her time in a mall, as well as responses to the design

characteristics in the malls. Users can express their opinions and feelings and provide information about their regular activities such as where they sat, which stores they visited, with whom they interacted, and what they purchased. In addition, a group of people, including design professionals such as architects and interior designers, can visit various malls and define and discuss the mall characteristics during regular meetings.

9.3. Limitations of the study

This research was conducted with respondents in two different cultures, and the findings provide cross-cultural implications. Between these two cultures, respondents had similar perceptions of their environments in terms of spaciousness. However, the cases had unique characteristics, which limit the interpretation of results for cross-cultural comparison. Further research needs to include cases with more similar features to enable better comparisons.

This study only focused on the relationships between a limited number of variables in four malls located in two different nations. The results cannot be generalized to all malls and all cultures. In addition, data for the research was collected during a short period of time, which raises some quality issues regarding the data. Although days for data collection were selected randomly, they did not cover a long period of time. Users who prefer to visit the settings during the days and times when the research was not in progress were therefore not included in the sample. Seasonal changes were not accounted for in the study; this is a significant limitation because it is believed that there are seasonal effects on people's perceptions of space and interpersonal distance. In this study, data was collected during only one season; therefore, people's responses in other seasons could not be evaluated.

The choice of settings was another limitation of the study. American cities differ in many significant ways from Turkish cities. The Turkish malls in this study are located in one of the major cities of the nation with very high population and more urban character than the cities chosen for the American malls. People's perception to spaciousness and crowding, and the interpersonal distance measured between them are influenced by their living conditions in a highly populated city. Cities with more comparable features need to be selected in future research to overcome this limitation.

The type of perceived enclosure was defined by an exploratory survey in the early stages of the study. Respondents selected the open and closed areas while they were standing in different parts of the malls. The way they perceived those areas and their familiarity with the settings played an important role in choosing these areas. During interviews, different groups of respondents were selected to answer questions inside the areas that were defined by participants of the exploratory survey. Differences in personal characteristics would reveal different responses in the perception of space.

Another limitation is created by being inside or outside the area while defining the characteristics of the space. During the exploratory survey, respondents were asked to select the mall areas while they were standing in a different location, for example, the main entrance area. But users responded to questionnaire items while they were inside the actual area. Theoretically, being inside the area would create different images and perceptions than images and perceptions formed while not in that particular space.

Respondents evaluated the spaciousness and crowdedness of the mall areas while standing in one particular location of those areas, such as corners. Throughout the interviews, respondents stood in the same locations. As a result, responses of people while standing in different parts of the areas, such as centers or edges, were not investigated. Future research should ask respondents about their impressions of spaciousness and crowding while they are actually standing in different parts of the similar areas.

This study is based on the investigation of a limited number of variables in mall areas that may be related to impressions of spaciousness and crowding. However, there might be numerous other factors that are related to respondents' responses to environmental features inside the malls; these factors might include the purpose of a visit, being with family or friends, weather conditions, noise levels, and climate inside the malls.

9.4. Quality considerations

The following sections discuss the quality considerations of the research methodology and strategy. For this purpose, these sections define the quality considerations regarding reliability, validity, and generalizability of findings.

9.4.1. Reliability

Reliability is the extent to which a procedure will produce the same results under constant conditions. If a study is to be reliable, one must show that repeated measurements with the same methods, variables, and instruments, under unchanged conditions, will yield the same results (Zeisel, 1984). To ensure the reliability of the design of this research, great care was taken into consideration at the planning, implementing, and analysis stages. For this reason, a clear description of the data sources and methods used to gather those sources is provided.

In all phases of research design, the same strategies were kept constant for reliability purposes. These included the sampling procedure, the research instruments for the survey design such as interviews, questionnaires, and the use of a single observer/photographer for the comparative case study data collection. This strategy assured that the data collection procedures were consistent throughout the study.

The measurement technique of interpersonal distances is believed to be structured. Observed interactions of mall users were measured by placing stationary points of subjects on scaled mall plans. The reference points and actual dimensions of tile sizes, corridor widths, and spaces between columns were used to place points accurately.

Unobtrusive observation of naturally occurring behavior, by using photography, was one of the major data collection techniques in this study. In all cases, the camera was stationed to capture all of the activities in the space. Although there were issues such as architectural challenges (differences in floor plans and views) in the Turkish malls that may concern the process of data collection, these did not affect the selection of samples for distance measurement in the analysis phase.

For reliability purposes, instruments were pre-tested before the actual fieldwork. Questionnaires were tested with at least six users in both Turkish and American cases. This process prompted the researcher to make some changes in the questionnaire; two of the statements in the last part of the questionnaire were eliminated, and figures showing two individuals interacting at different distances were included. Before testing the questionnaires in one of the Turkish malls, the translated version was shown to the

researcher's colleagues who speak both Turkish and English. Only slight changes were made in the Turkish version, and these were primarily vocabulary and grammar changes.

Pilot tests were conducted for interpersonal distance measurements, and this also helps to ensure reliability. For these tests, two of the researcher's colleagues participated by measuring the distance between two points in a mall area. The researcher took pictures of his colleagues while they stood on those two points and then measured the distances between them on the area plan. The measured distance was compared with the distance measured by the colleagues. Twelve measurements were made in two malls. Cronbach's coefficient alpha was used to calculate the reliability of each of the measurements. Alphas were calculated separately for the measurements in one Turkish ($r=0.86$) and one American ($r=0.88$) mall. In both measurements, high coefficients were found, which indicated that the measurements were reliable.

Sample sizes in some areas, such as open areas of American malls, were greater than those in other areas. This difference was related to spatial characteristics and function of these areas. Because of the larger sizes, and the fact that these areas are the focal points in the malls, as well as convenient locations of the center courts in American malls, people use these areas more frequently. During observations, more people were recorded in these areas. Nearly all eligible pairs of users were selected for distance measurements from pictures. This resulted in larger numbers of pairs in some areas.

9.4.2. Validity

A study is valid if its measurements actually measure what they claim to, and if there are no logical errors in drawing conclusions from the data. For case studies that do not intend to make causal inferences, construct validity is more appropriate. On the other hand, internal validity is usually questioned in the cause-effect process, as noted in experiments, which include dependent and independent variables. When there is a lack of internal validity, variables other than the independent(s) being studied may be responsible for all or part of the measured effect on the dependent variable(s). If there is no causal phenomenon under study, internal validity is not at issue. This study includes

a case study approach, which does not aim to investigate causal relationships between variables. Therefore, discussion of construct validity is more relevant in this section.

Construct validity seeks agreement between a theoretical concept and a specific measuring device or procedure. It is about the correspondence between the concepts (constructs) and the actual measurements that are used (Adcock and Collier, 2001). For this purpose, it is important to have clear conceptual definitions of research variables. To ensure construct validity in this study, the variables used were clearly defined, and instruments were structured to assess only those variables (Cook and Campbell, 1979).

Examining the user definitions of the mall areas provided reliability of the concept of enclosure. For this purpose, an exploratory survey was conducted in the actual settings; it included questions that attempted to define the openness and closeness of the areas based on the users' judgments. These subjective responses seem to be reliable in nature since they were based on the perceptions of the users.

It was important to use terms with same meanings in each culture. Some tests and procedures were performed to ensure the validity of concepts used in this cross-cultural research. As stated before, instruments to collect data were first developed, tested, and applied in American cases. Then those instruments were translated to Turkish. During the translations, the researcher's colleagues, who speak both languages, were asked to specify the Turkish translations of concepts such as crowded and spacious. These colleagues were design professionals and were familiar with such concepts. More than two-thirds of them selected "ferah" for "spacious," and "kalabalik" for "crowded." These words were used in the Turkish version of the questionnaires.

9.4.3. Transferability and generalizability of findings

In research involving case studies, a researcher typically assumes that the results will be transferable. Results of a case study are transferable in that the research typically suggests further questions, hypotheses, and future implications, and presents the results as directions and questions. Generalizability refers to the extent to which research findings and conclusions from a study conducted on a sample population can be applied to the population at large. In case studies, transferability allows the researcher the option

of applying results to outside contexts, whereas generalizability is basically difficult because a small group of people studied in cases is not necessarily representative of the larger population. Conclusions drawn in case studies are only about the participants and conditions being observed (Stake, 1995; Yin, 1989, 1993).

This study employed a comparative case study research design to compare and evaluate four shopping malls. Restrictions in the generalizability of findings may apply to its implications. However, the study's methodology and results might be used to inform future designs of spaces like shopping malls. It is the intention of the study to create an overall picture of the case under investigation and conclude research results to inform future research. Limitations exist in this study with regard to its application for evaluating settings other than shopping malls such as other types of buildings and outdoor spaces.

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APPENDICES

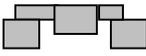
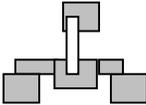
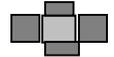
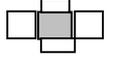
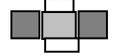
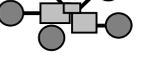
APPENDIX 1. Summary of theoretical relationships

AUTHOR	THEORETICAL FINDING
Enclosure and Interaction	
Gibson 1977; Lang 1987	Enclosure influences need for privacy but more enclosure reduces interaction
Thiel et al. 1986	Similar sense of enclosure is observed between males and females
Pedersen and Topham 1990	As space gets larger, perception of enclosure gets lower
Desor 1972	As space gets larger, interpersonal distance increases; enclosed space reduces feeling of crowding
Density and crowding	
Stokols 1972, 1976	Density is not always related to perception of crowding; interpersonal closeness is a better predictor for crowding
Worchel and Teddlie 1976; Six et al 1983; McClelland and Auslander 1978	People in closer distances felt more crowded
Altman 1975; Knowles 1980; Sundstrom and Altman 1976	If people stay farther than they expect, they feel uncomfortable
Sears et al. 1988	Invasion of personal space increases feeling of crowding
Epstein and Karlin 1975; Kutner 1974; Sundstrom 1975	Adaptation to high density conditions reduces feeling of crowding
Eroglu and Harrell 1986	More people in environment (high density) causes increased crowding
McClelland and Auslander 1978	In high density conditions, smaller interpersonal distances occur; interpersonal distance is related to perception of crowding
Greenberg and Firestone 1977	Interaction with nearest person determines feeling of crowding
Aiello et al 1977; Cozby 1973	Personal space preference is related to crowding
Baum et al 1975; Desor 1972	Architectural features create sense of crowding
Altman 1975; Stokols and Altman 1987	Feeling of crowding affects interpersonal interaction
Fischer 1977; Sundstrom 1975	High density results in withdrawal from interaction
Stokols et al 1987	Stress as a result of crowding reduces interaction
Gormley and Aiello 1982	Interaction affects perception of crowding
Baum and Valins 1977, 1979	High density reduces social cooperation
Kaya and Erkip 2001	Positive interaction reduces crowding
Gifford 2002	Desire to be with others reduces feeling of crowding
Sinha and Sinha 1991	High density affects task performance; as personal space enlarges, crowding increases
Dooley 1974	People with "far" personal space preference experience more crowding
Sundstrom 1975; Kutner 1974	In high density conditions, more interaction creates crowding
Hutt and Vaisey 1966	As density increases, interaction decreases
Six et al 1983	Density did not affect crowding; decrease in interpersonal distance caused increase in perceived crowding; people near a stranger felt more crowded
Harrell and Hutt 1976	Dense conditions create less social contact; density and perception of crowding are not related

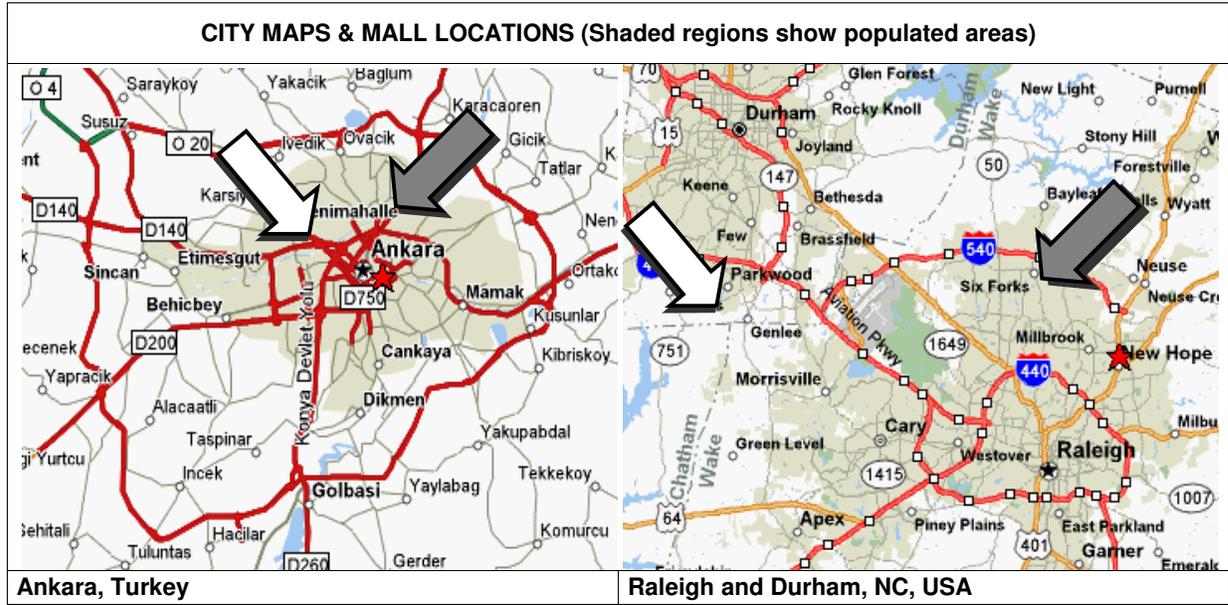
APPENDIX 1 (continued). Summary of theoretical relationships

Eroglu and Harrell 1986	Task oriented shoppers are more sensitive to crowding
Harrell et al 1980; Milgram 1970	People spend less time in crowded conditions
Eroglu and Machleit 1990	As density increases, crowding increases
Burgess 1983	As density increases, interpersonal distance decreases
Lighting and crowding	
Nasar 1984	As lighting increases, perceived size increases and perceived crowding decreases
Schiffenbaurer 1977	Lighting affects judgments of crowding; brighter space would seem larger and less crowded
Mandel et al 1980	Lighting affects perceived crowding and size
Inui and Miyata 1973	Lighting is related to spaciousness
Culture and crowding	
Hall 1966	Contact cultures exhibit closer interaction distances; contact cultures feel less crowded
Nasar 1984	Contact cultures feel more crowded
Altman and Chemers 1980	Perception of space affects interaction and this differs from culture to culture
Kaya and Weber 2003	Americans felt more crowded than Turks
Six et al 1983	At large distances, Germans felt less crowded than Americans
Gender and Interaction	
Hayduk 1983	Female dyads interact more closely than M-M and F-M dyads
Patterson and Edinger 1987; Burgoon 1989	Interaction distance is different between M-M and F-F
Baxter 1970	M-F pairs interact at closer distances than M-M and F-F pairs
Lett et al 1969; Hartnet et al 1970; Leibman 1970	Females have closer distance than males; M-F have closer distance than M-M and F-F
Horowitz et al 1970	F-F pairs have closer distance than M-M
Stokols and Altman 1987	Males use more personal space than females
Age and Interaction	
Hayduk 1983	As age increases up to 20s, interpersonal distance increases
Leibman 1970	Age does not affect interpersonal distance
Meisels and Guardo 1969	As age of children increases, interpersonal distance increases
Burgess 1983	Young adults stay closer than middle aged adults
Culture and Interaction	
Mazur 1977; Keating and Keating 1980	No differences were found between subjects from USA and Spain
Shuter 1977	Some differences were found between subjects from Italy, Germany, and USA
Rustemli 1992	Turkish subjects stand closer and feel less crowded than Americans
Noesjirwan 1978	Indonesians select closer distances than Australians

APPENDIX 2-A. Topics in architectural survey and their components

	COMPONENT	DESCRIPTION	PRESENTATION	
EXTERIOR	Space organization	Block		
		Block and street		
	Building/parking <i>Deck parking includes parking below the surface</i>	Parking around the building	Deck parking	
			Surface parking	
			Deck and surface parking	
	Area <i>Area that the building and the parking covers</i>	Medium size		
		Large size		
Connections <i>Building's degree of connection with the surrounding buildings and/or areas such as commercial, residential and industrial settings</i>	Poor			
	Some			
	Rich			
Style	Modern			
INTERIOR	Typology	Shopping (stores only)		
		Shopping and entertainment (stores and cinema)		
	Space organization	Clustered-linear		
		Clustered-curved		
	Floors	Two levels		
		Four levels		
	Color - texture	Grey - polished		
		Light brown - polished		
		Dark gray / light brown - natural		
		Grey/Light brown - polished		
Lighting	Artificial			
	Natural and artificial			
	Highly natural and some artificial			

APPENDIX 2-B. Summary of spatial characteristics of cases (architectural survey)



	ARMADA SHOPPING MALL	MIGROS SHOPPING MALL	STREETS AT SOUTHPPOINT	TRIANGLE TOWN CENTER
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EXTERIOR

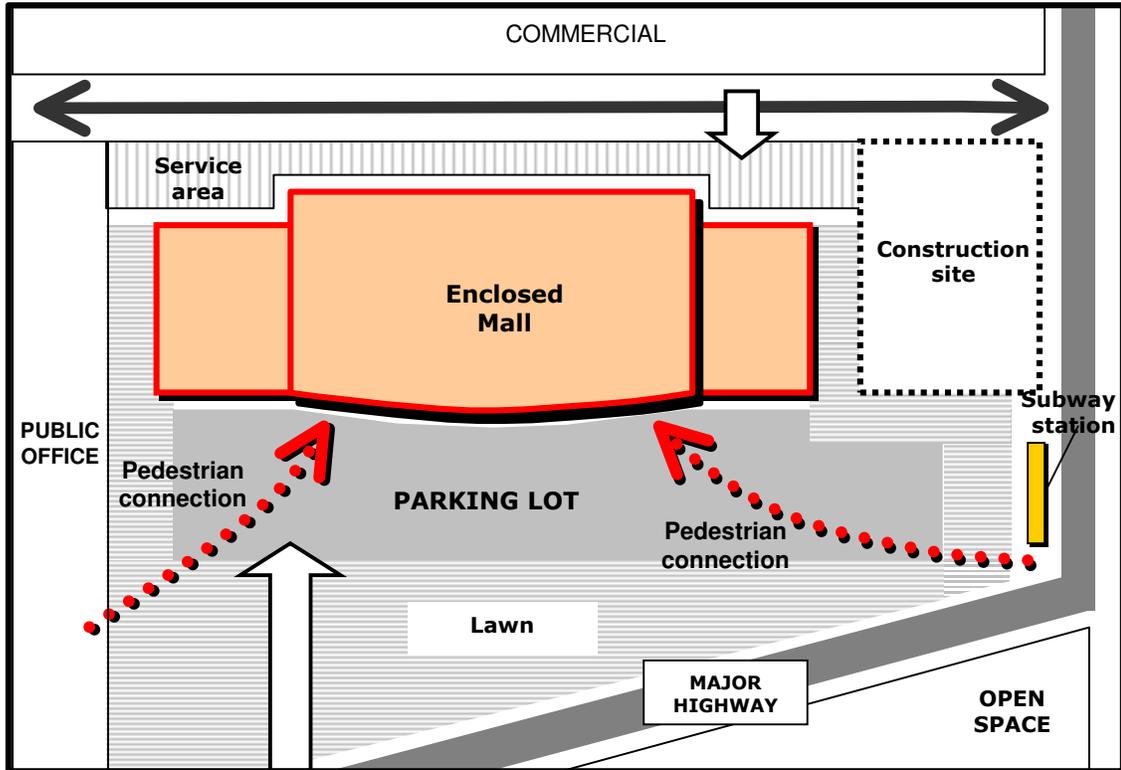
Space organization	Block	Block	Block and street	Block and street
Building / parking	Deck and surface parking	Deck and surface parking	Surface parking	Surface parking
Area covered	1.35 million sq ft	1.36 million sq ft	1.3 million sq ft	1.3 million sq ft
Connections	Some connection	Rich connection	Some connection	Some connection
Style	Modern	Modern	Modern	Modern

INTERIOR

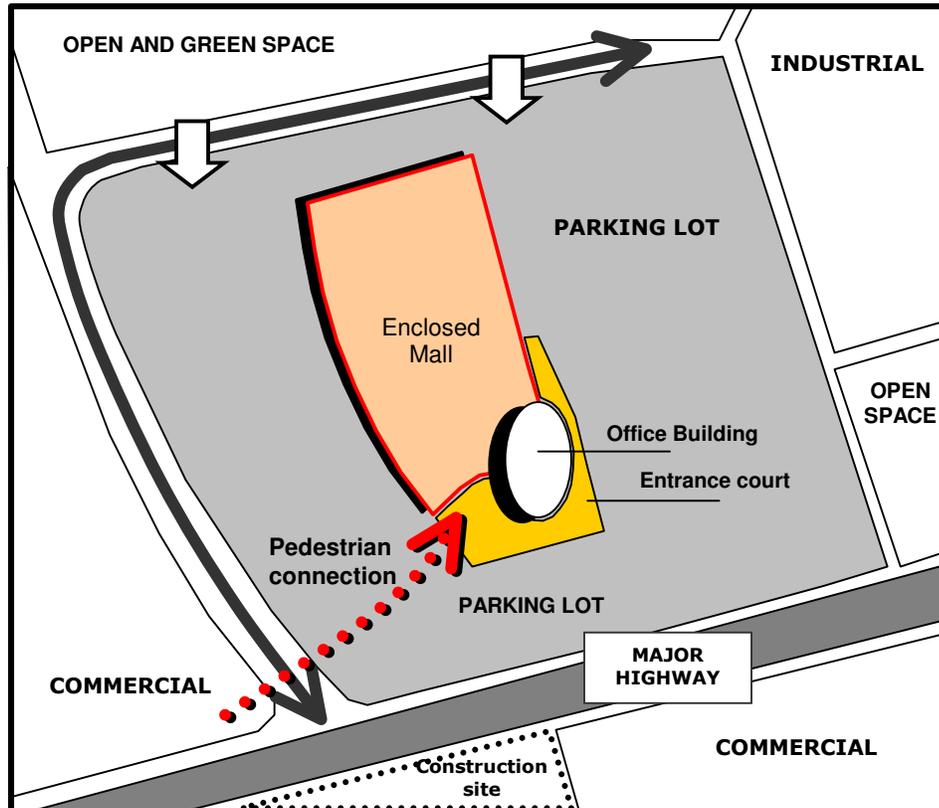
Typology	Stores and cinema	Stores and cinema	Stores	Stores
Space organization	Clustered linear	Clustered linear	Clustered curved	Clustered curved
Floors	6	4	2	2
Color and material	Gray polished	Light brown polished	Dark gray and natural	Light gray polished
Lighting	Artificial	Artificial and natural	Natural and artificial	Natural and artificial

APPENDIX 2-C. Land use around the shopping malls

Migros Shopping Mall

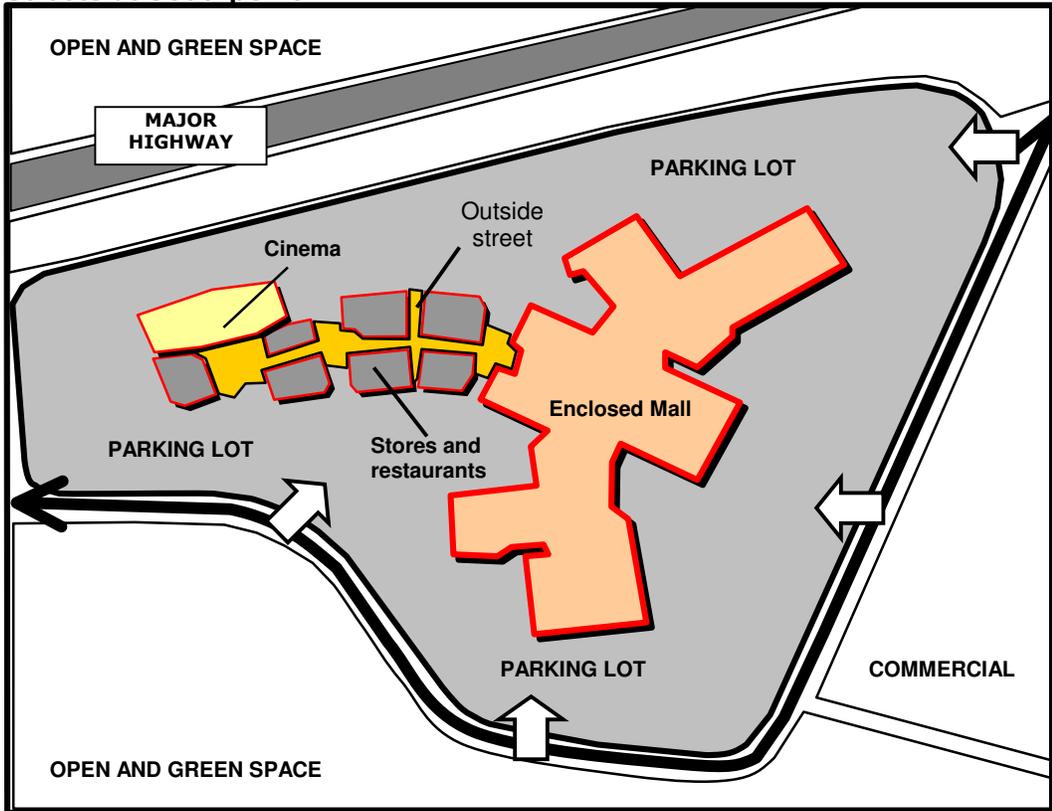


Armada Shopping Mall

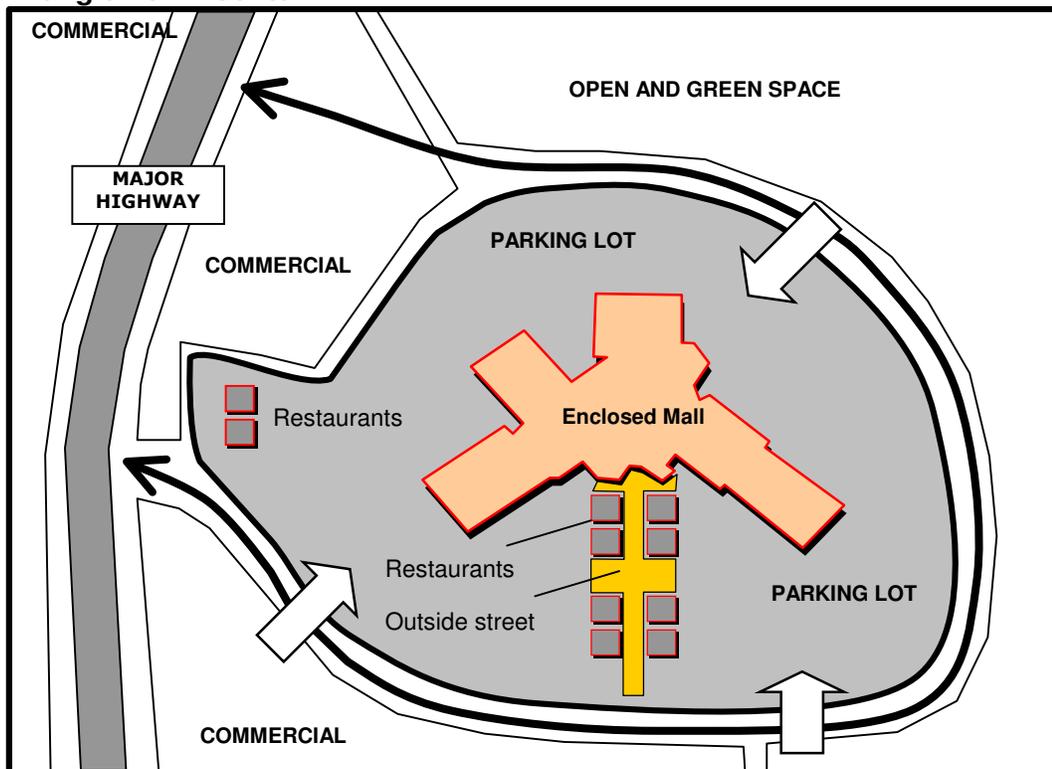


APPENDIX 2-C (continued). Land use around the shopping malls

Streets at Southpoint

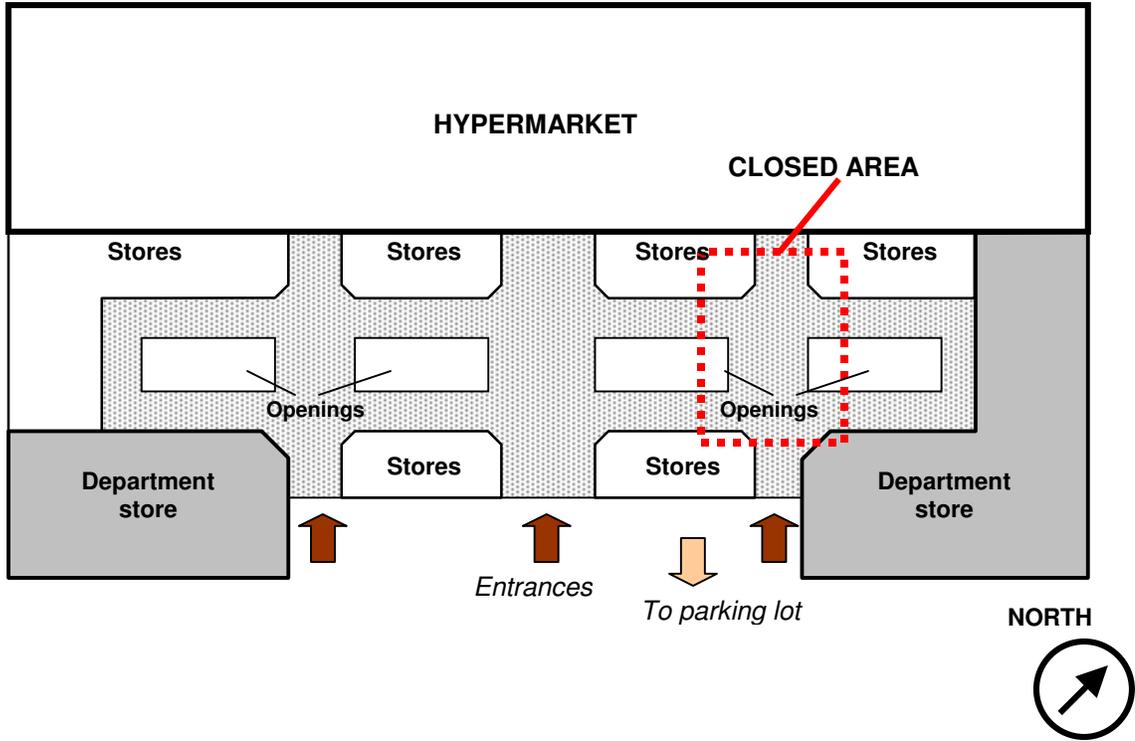


Triangle Town Center

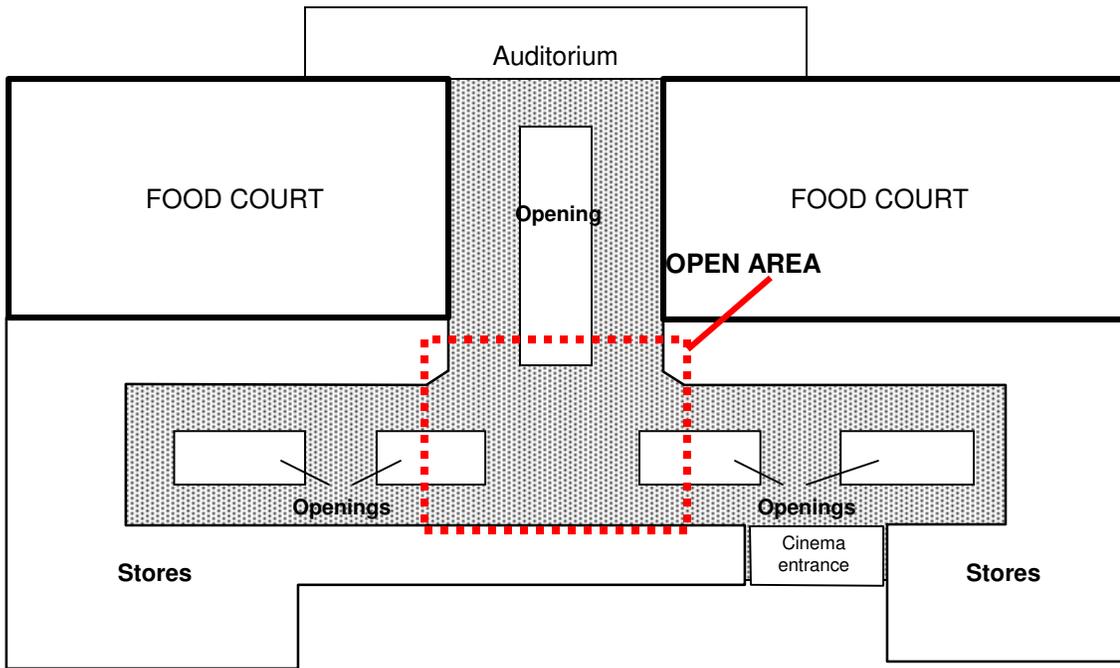


APPENDIX 2-D. Floor plans of shopping malls

Migros Shopping Mall—entrance level floor plan

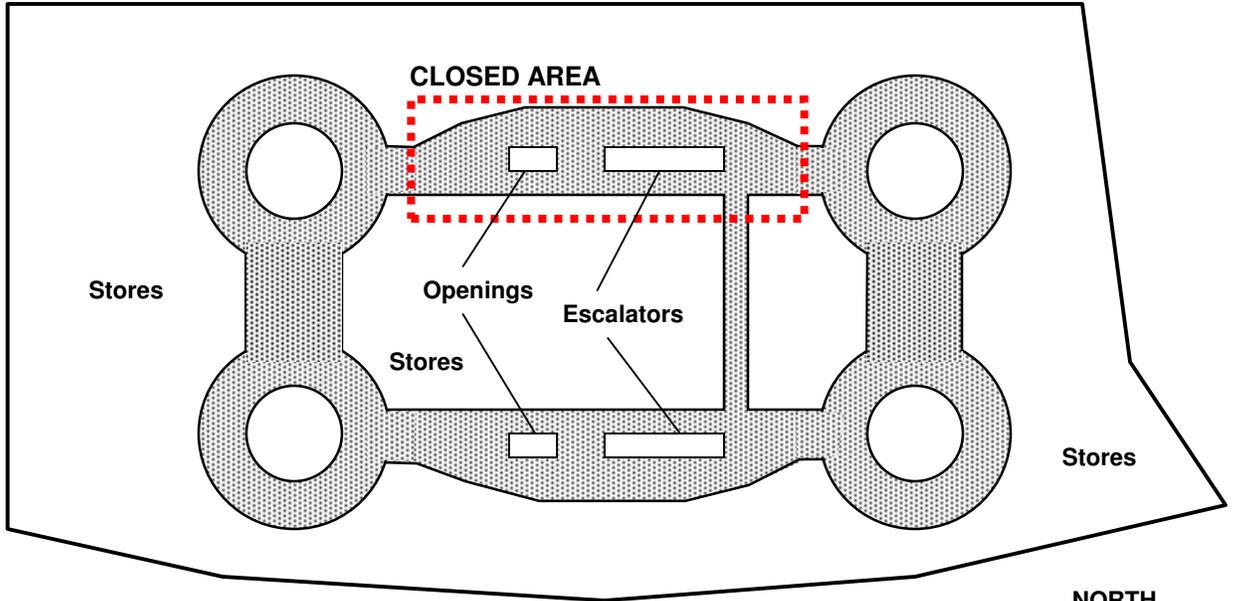


Migros Shopping Mall—second level floor plan

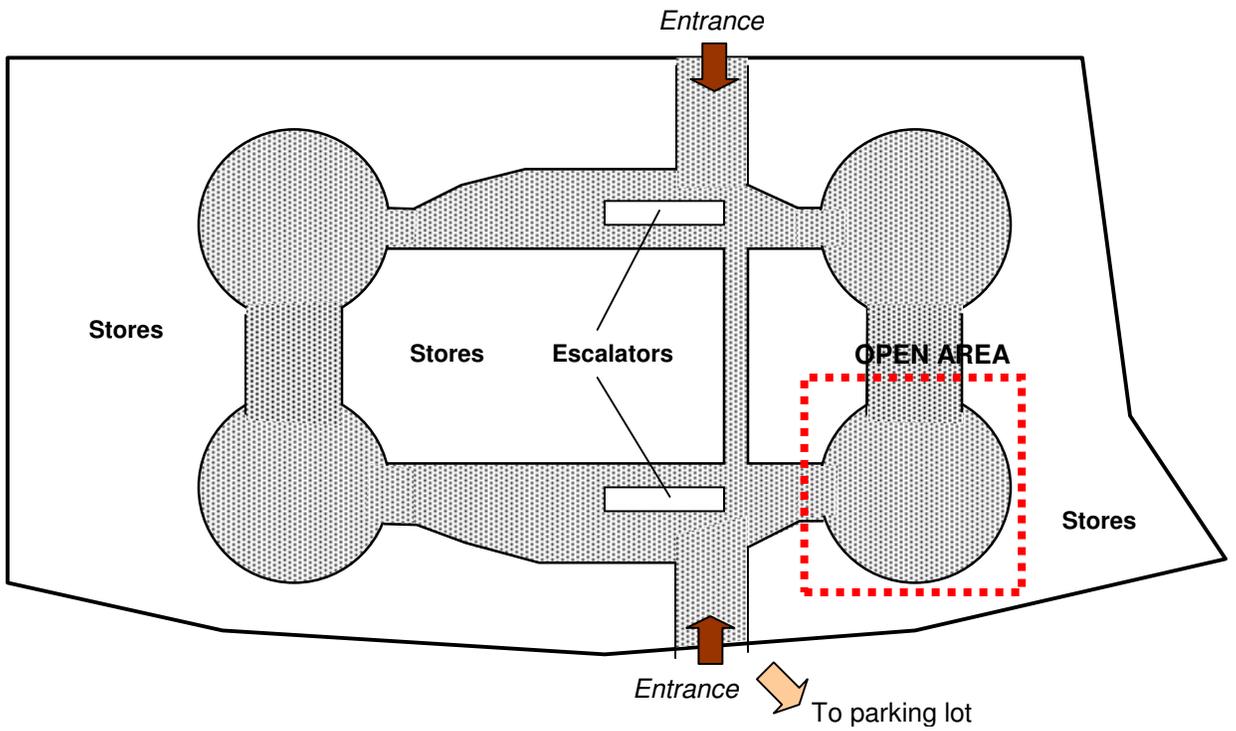


APPENDIX 2-D (continued). Floor plans of shopping malls

Armada Shopping Mall—second level floor plan

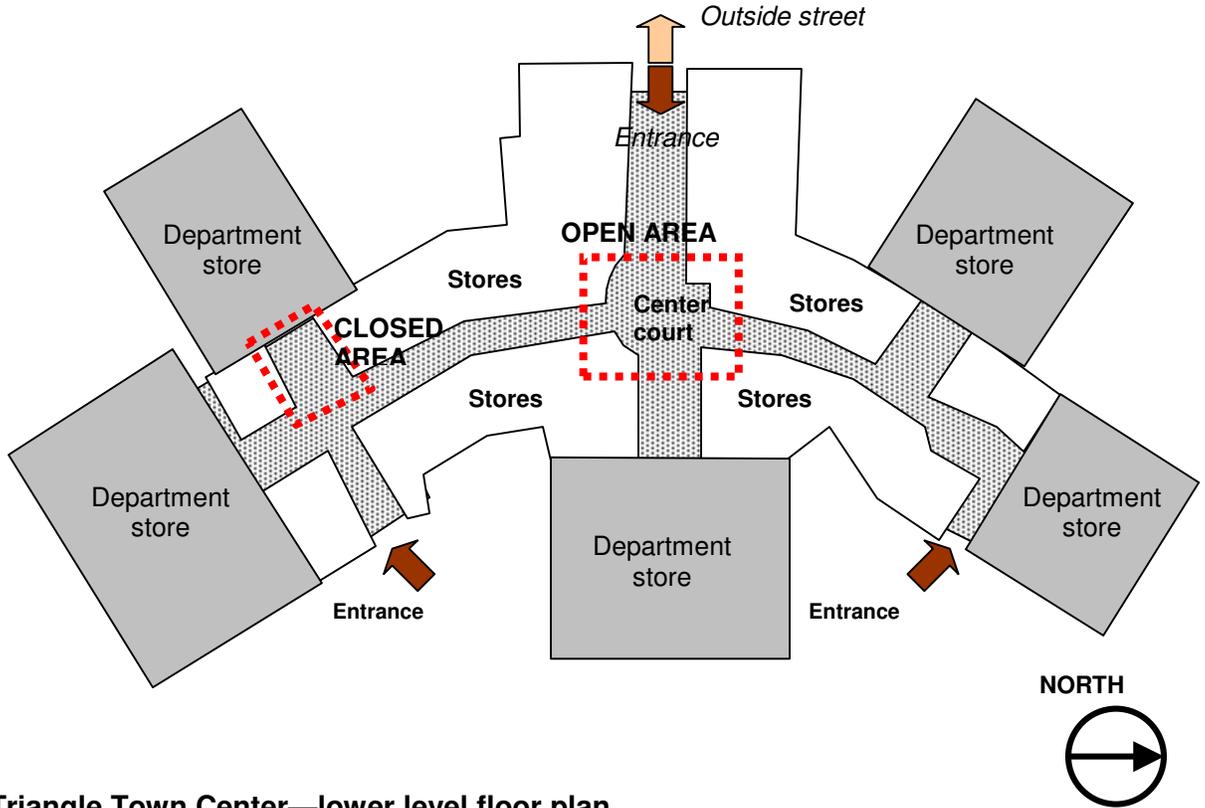


Armada Shopping Mall—lower level floor plan

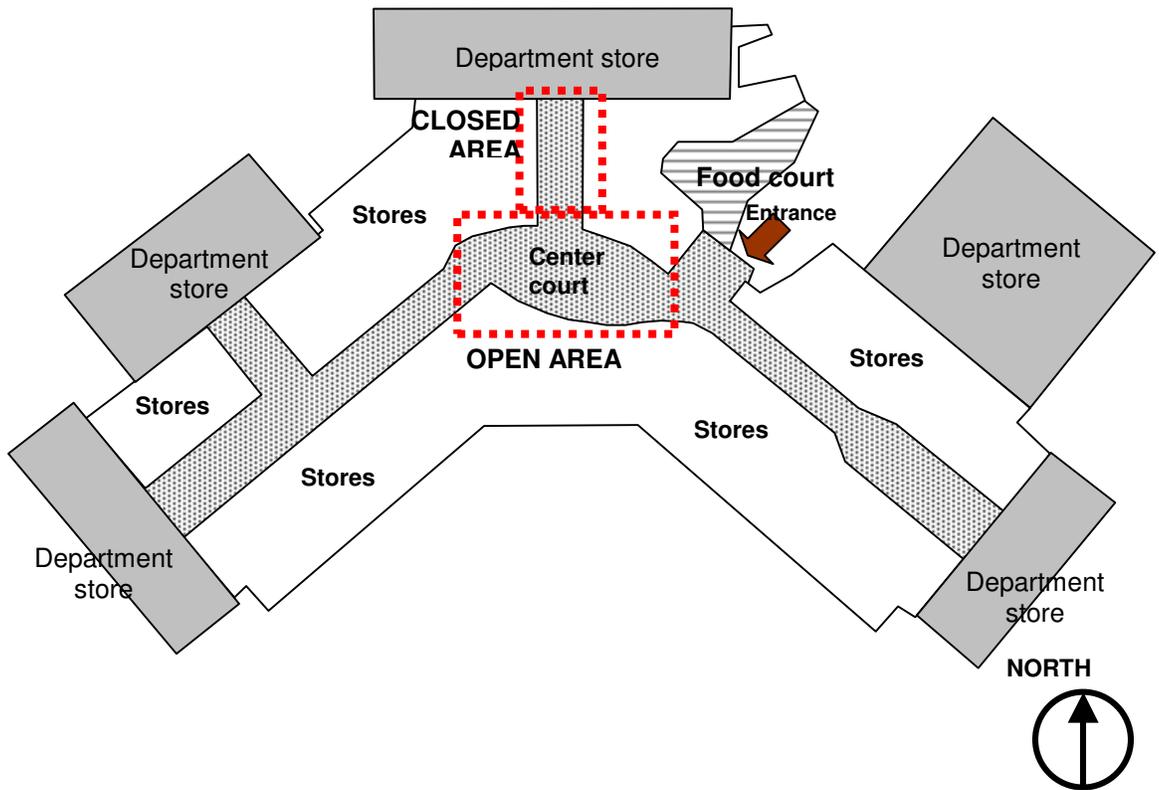


APPENDIX 2-D (continued). Mall floor plans

Streets at Southpoint—lower level floor plan



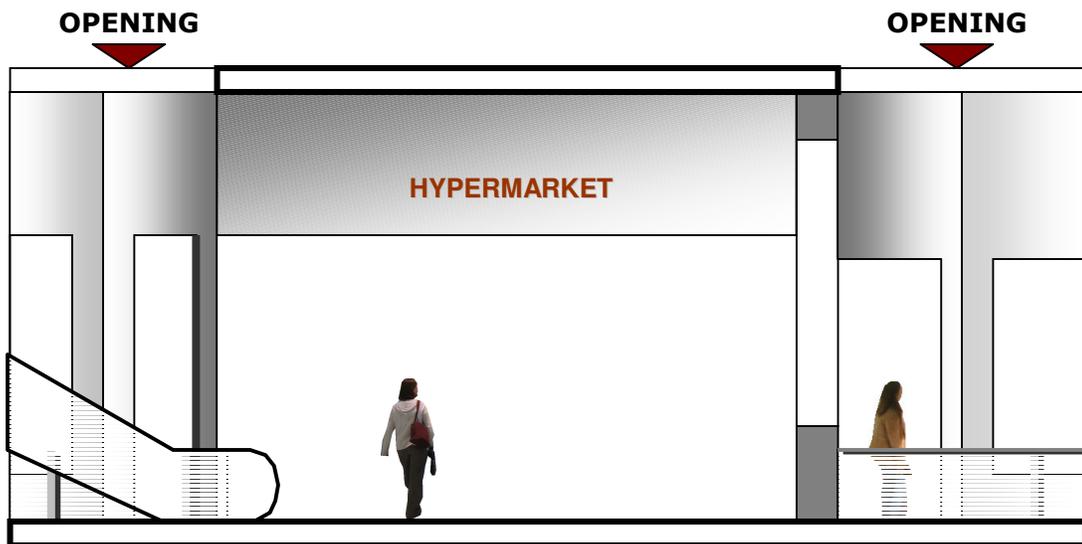
Triangle Town Center—lower level floor plan



APPENDIX 2-E. Sections of open and closed areas

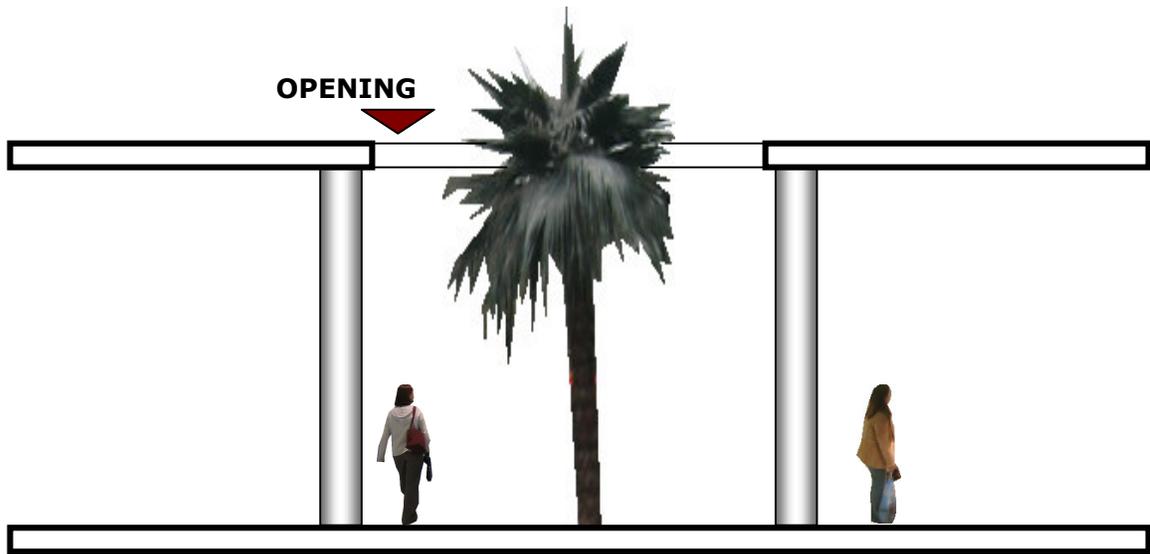


Migros Shopping Mall—open area section (Facing the food court)

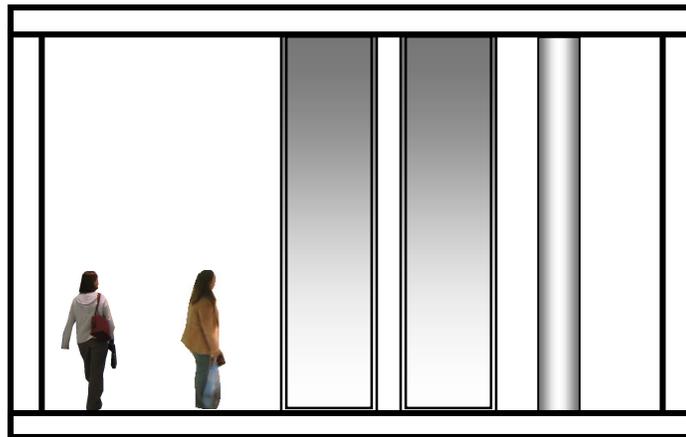


Migros Shopping Mall—closed area section (facing the hypermarket entrance)

APPENDIX 2-E (continued). Sections of open and closed areas

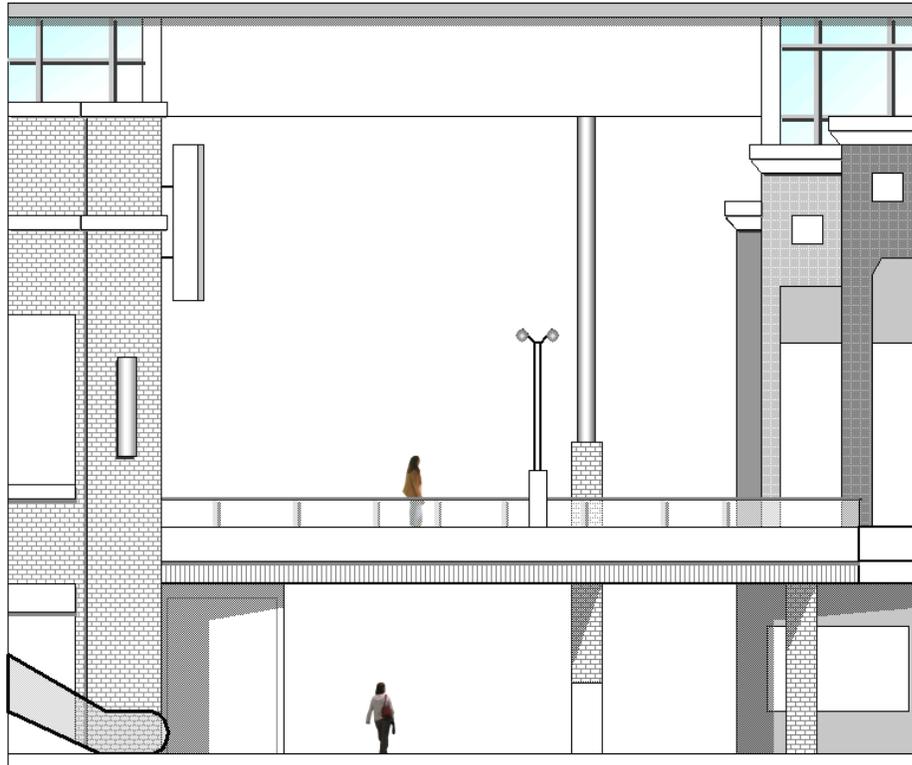


Armada Shopping Mall—open area section (facing the stores on the corner)

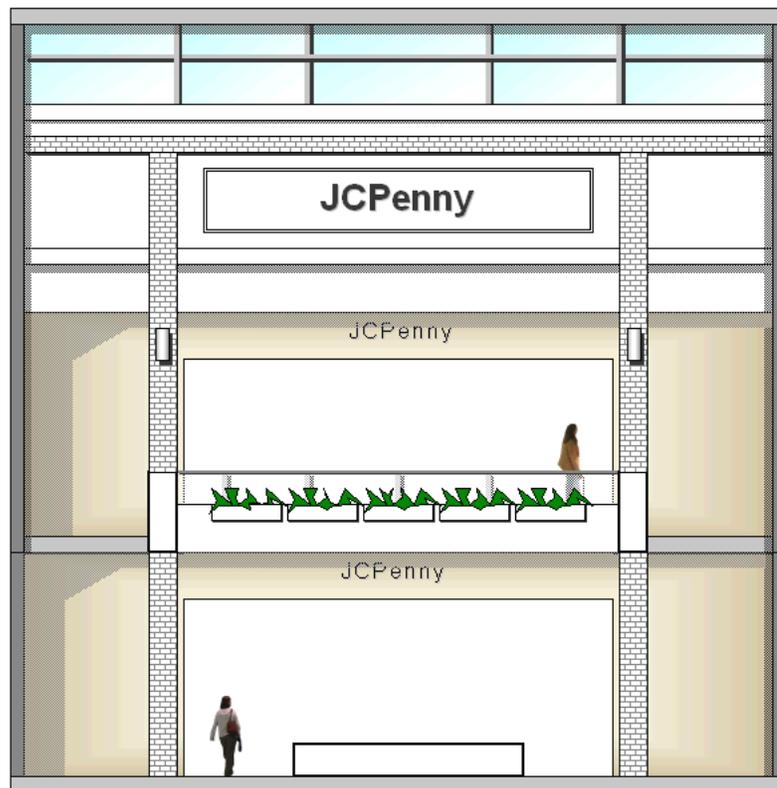


Armada Shopping Mall—closed area section (facing the escalators)

APPENDIX 2-E (continued). Sections of open and closed areas

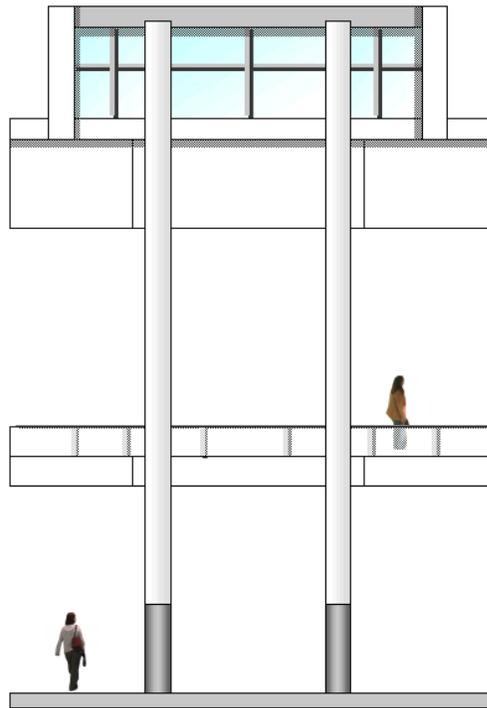


Streets at Southpoint—open area section (facing the corridor on the North section)

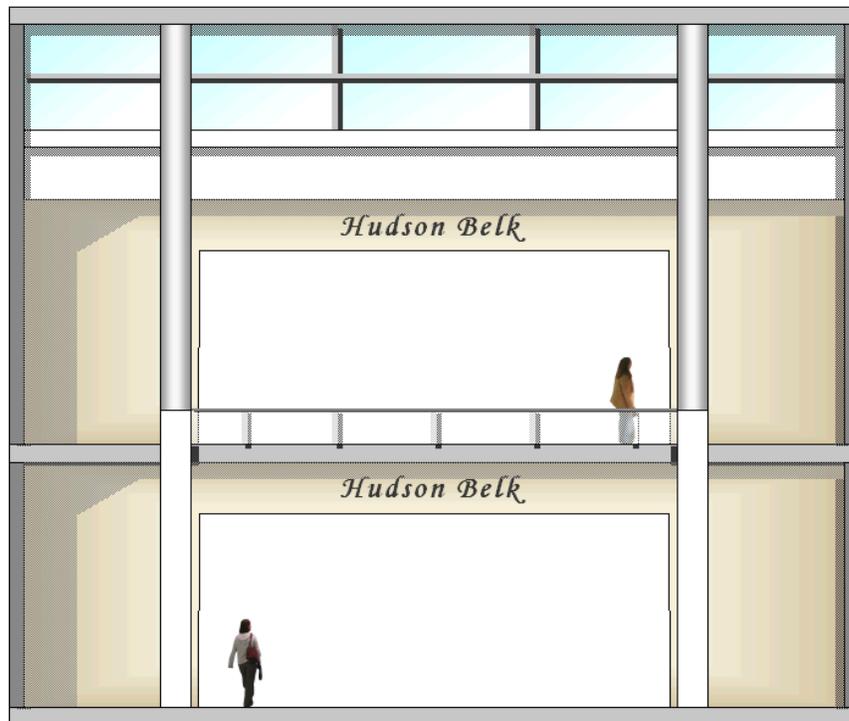


Streets at Southpoint—closed area section (facing the department store entrance)

APPENDIX 2-E (continued). Sections of open and closed areas



Triangle Town Center—open area section (facing the corridor on the West section)



Triangle Town Center—closed area section (facing the department store entrance)

APPENDIX 2-F. Pictures of open and closed areas

Upper level food court corridor (open) in Migros Shopping Mall



Entrance area (closed) in Migros Shopping Mall



APPENDIX 2-F (continued). Pictures of open and closed areas

Circular corridor (open) in Armada Shopping Mall



Linear corridor (closed) in Armada Shopping Mall



APPENDIX 2-F (continued). Pictures of open and closed areas

Center court (open) in Streets at Southpoint

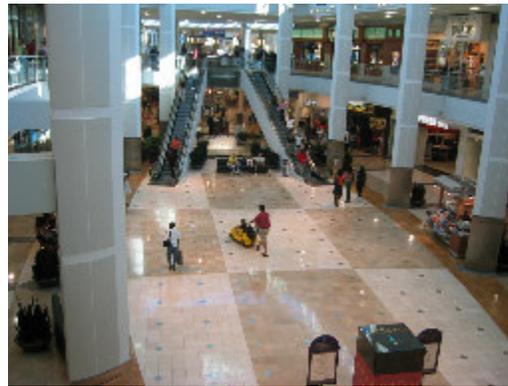


JC Penny entrance (closed) in Streets at Southpoint



APPENDIX 2-F (continued). Pictures of open and closed areas

Center court (open) in Triangle Town Center



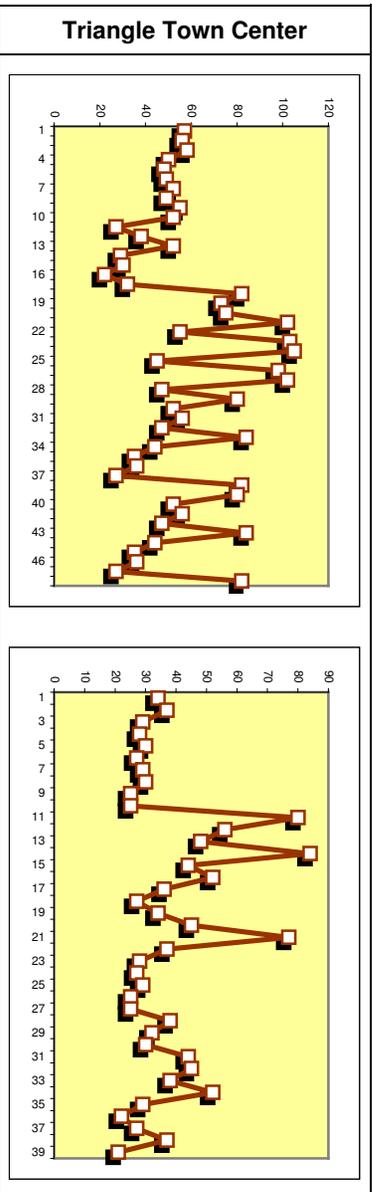
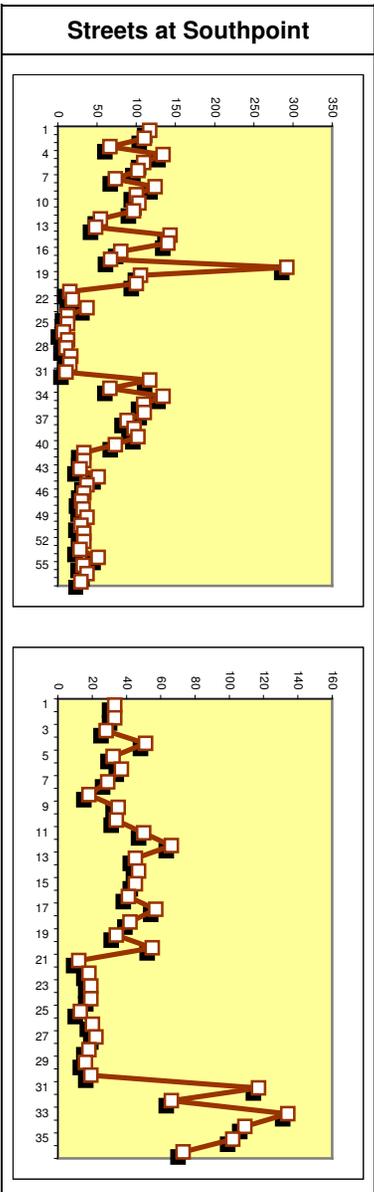
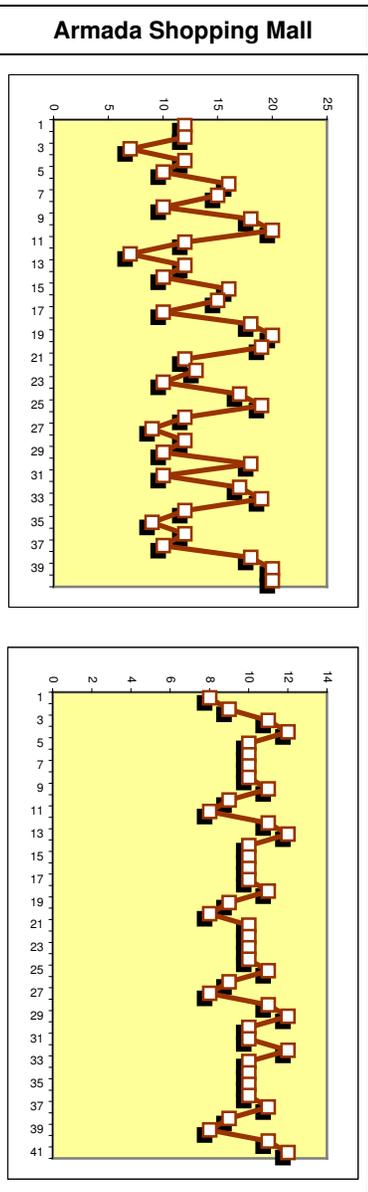
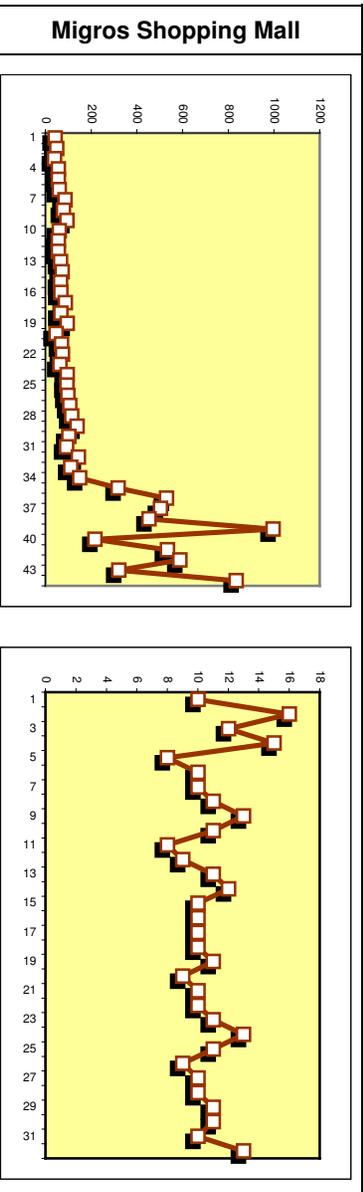
Hudson Belk entrance (closed) in Triangle Town Center



APPENDIX 2-G. Lighting levels measured in mall areas during interviews

Open areas

Closed areas



APPENDIX 2-H. Summary of spatial characteristics of open and closed areas

MALL	AREA	SIZE	SHAPE	LIGHTING	ESCALATOR	TILES	SEATING	MATERIAL	CEILING	FUNCTION	VISIBILITY	LOCATION
ARMADA	Circular corridor (open)	M	Circular	A	++	30x30cm light gray	-	Ceramic tiles, metal, glass	Low	Corridor	+	Lowest level
	Linear Corridor (closed)	S	Linear	A	++		Bench for two people				+	2 nd floor
MIGROS	Food court corridor (open)	L	T-shape/ rectangular	N	++	30x30cm beige	-		High	Entrance/ corridor	++	Upper floor
	Entrance area (closed)	S	Rectangular	A	++		-		Low		-	First floor
TRIANGLE	Center court (open)	L	Circular	N	++	30x30cm beige	Large non-fixed benches		High	Corridor/ intersection	+++	Lower level
	Hudson Belk entrance area (closed)	S	Rectangular	A+N	-		-				Entrance to the store	-
SOUTHPOINT	Center court (open)	L	Circular	A	++	30x30cm dark gray/ beige natural stone	Seating wall on the corner – bench for three people		High	Corridor/ intersection	+++	Lower level
	JC Penny entrance area (closed)	S	Rectangular	A+N	-						+	Lower level

Size: L-Large/M-Medium/L-Large Lighting: A-Artificial/N-Natural

Visibility: + Only end of the corridor/++ Corridors and adjacent areas/+++ Corridors, areas, and upstairs floor

APPENDIX 3. Results of exploratory survey

ARMADA N=13	ENTRANCE (Rear)	4	3	3	3	2	1	1	1	1	1	1	1	
	CORRIDOR (Circular)	2	2	2	2	2	2	2	1	1				
	CORRIDOR (Linear)	4	4	4	4	4	4	4	4	4	3	3		
	FOOD COURT	4	4	4	3	3	3	1	1	1	1			
MIGROS N=13	ENTRANCE AREA	4	4	4	4	4	4	3	2	2	1	1	1	
	CORRIDOR (Palms)	3	3	3	3	3	2	2	2	2	2	1	1	
	CORRIDOR (Back)	4	4	4	4	4	3	3	3	2	2	2	2	1
	CORRIDOR (FoodCourt)	4	4	3	3	3	3	2	1	1	1	1	1	1
TRIANGLE N=13	CENTER COURT	4	2	2	1	1	1	1	1	1	1	1	1	
	MAIN ENTRANCE (Next to Starbucks)	4	4	4	2	2	2	1	1	1	1			
	CORRIDOR (to Hechts)	4	4	4	3	3	3	3	3	2	2			
	CORRIDOR (to Belk entrance)	4	4	4	4	4	4	3	3	3	2	1		
SOUTHPOINT N=13	CENTER COURT	4	4	4	3	3	2	2	2	2	1	1	1	1
	MAIN ENTRANCE	4	4	3	3	3	3	3	2	2	2	1	1	1
	CORRIDORS	3	3	3	3	3	3	2	2	2	2	1	1	1
	SEARS ENTRANCE	4	4	4	4	4	4	4	2	2	1	1	1	

1 MOST OPEN / 4 MOST ENCLOSED

The frequency tests were conducted to select the most open and closed area preferred by the mall users. Researcher first evaluated the third question to sum up the responses.

The results showed that 54% of respondents selected the rear entrance area of Armada Shopping Mall as the most open, and 69% of respondents selected the linear corridor on the second floor as the most enclosed area; 48% of respondents selected the food court area of Migros Shopping Mall as the most open, and 39% of respondents selected the main entrance as the most enclosed area; 61% of respondents selected the center court area of the Triangle Town Center as the most open, and 46% of respondents selected the corridor to Belk entrance as the most enclosed area; 46% of respondents ranked the center court of the Streets at Southpoint as the most open, and 69% of respondents ranked the Sears entrance as the most closed area.

APPENDIX 4-A. User and shopping characteristics (interview session)

User characteristics (Demographic profile)

	MIGROS		ARMADA		SOUTHPOINT		TRIANGLE	
Demographic characteristics	Open	Closed	Open	Closed	Open	Closed	Open	Closed
Gender								
Male	32.4	53.1	35	38.8	45.5	42	46.6	64
Female	67.6	46.9	65	62.2	54.5	58	53.4	36
Age Groups								
1 (< 18)	2.2	3.1	7.5	4.8	3.5	8.3	10.4	10.2
2 (18-29)	50	56.3	42.5	36.6	35.1	33.3	27	25.6
3 (30-54)	41	37.5	47.5	46.4	50.9	44.4	48	46.2
4 (55 >=)	6.8	3.1	2.5	12.2	10.5	14	14.6	18
Total (N)	44	32	40	41	57	36	48	39

* Other than the total, all values are in percentages

Shopping characteristics (First time visit, frequency and time of visit and time spent)

	MIGROS	ARMADA	SOUTHPOINT	TRIANGLE
First time visit				
Yes	6.5	8.7	10.2	8.1
No	93.5	91.3	89.8	91.9
Frequency of visit				
Once a month	32.5	28.6	57.7	47.1
2-3 times a month	25.9	21.4	17.3	14.7
Once a week	18.2	34.5	17.3	23.5
2-3 times a week	10.4	10.7	7.7	11.8
Almost everyday	5.2	3.6	0	2.9
Everyday	7.8	1.2	0	0
Time of day to visit				
Morning	2.6	2.1	3.9	5.9
Noon	6.5	5.3	1.9	0
Afternoon	53.2	63.2	61.5	76.5
Night	37.7	29.5	32.7	17.6
Time of week to visit				
Weekday	11.7	4.8	5.8	8.8
Weekend	41.6	57.8	50	41.2
Both	46.8	37.3	44.2	50
Time spent				
< 1 hour	3.7	4.3	13.6	21.6
1-2 hours	37.8	39.1	56	54.1
2-3 hours	36.6	40.2	27.1	16.2
> 3 hours	22	16.3	1.7	8.1

* All values are in percentages

APPENDIX 4-A (continued). User and shopping characteristics (interview session)

Shopping characteristics (coming alone and number of people next to the respondents)

	MIGROS	ARMADA	SOUTHPOINT	TRIANGLE
Come alone?				
Yes	22.4	22.2	23.7	19.5
No	77.6	77.8	76.3	80.5
Number of people				
0	22.4	22.2	29	26.4
1	39.5	13.6	44.1	43.7
2	15.8	18.5	15.1	28.7
More than 2	22.4	45.7	11.8	1.2

*All values are in percentages

Shopping characteristics (activities)

	MIGROS	ARMADA	SOUTHPOINT	TRIANGLE
Activities				
Window shopping [†]	16.6	17.6	19	15.9
Visit stores [†]	17.4	15.8	17.4	18.9
Purchase an item [†]	9	15.8	17.4	15.9
Watch people	4.2	3.1	4.4	6.8
Meet friends	5.5	4.7	3.5	6
Eat / drink	17	16.7	14.9	15.9
Walk around	14.2	14.5	16.4	14.4
Exercise	0.7	1.9	4	3
Watch movie	14.9	8.5	0	0
Others	0.3	1.2	3	3

*All values are in percentages

[†]Purchase driven activities

Users' responses to the statements

Statement	Level of agreement	MIGROS	ARMADA	SOUTHPOINT	TRIANGLE
I visit this mall only for shopping	Strongly agree	15.8	37	31.2	43.7
	Agree somewhat	10.5	22.2	17.2	26.4
	Disagree	73.7	40.7	51.6	29.9
Crowded areas of the mall disturb me	Strongly agree	44.7	37	18.3	23
	Agree somewhat	14.4	19.8	10.7	12.6
	Disagree	40.9	43.2	71	64.4
I am attracted to open places	Strongly agree	69.7	69.1	86	95.4
	Agree somewhat	9.2	17.3	8.6	3.5
	Disagree	21.1	13.6	5.4	1.1

*All values are in percentages

APPENDIX 4-B. User characteristics (observation session)

	MIGROS	ARMADA	SOUTHPOINT	TRIANGLE
Age composition				
1-1	1.9	0.5	0.6	4
1-2	1.4	0.8	1.7	2.1
1-3	2.3	4.1	2.3	4
1-4	-	0.2	-	0.2
2-2	66.3	54.5	67.1	52.3
2-3	6	14.5	6.5	6.3
2-4	0.2	1.1	-	0.5
3-3	19.2	22.3	20.4	25.3
3-4	1.7	1.4	0.8	1.6
4-4	1.1	0.8	0.8	3.7
Gender				
Male-Male	26.4	21.2	14.4	17.5
Female-Female	26.9	29.6	45.6	37.5
Male-Female	46.8	49.2	40	44.9
TOTAL (N)	1198	642	662	570

Age groups: 1 (<18), 2 (18-29), 3 (30-54), 4 (55>=)

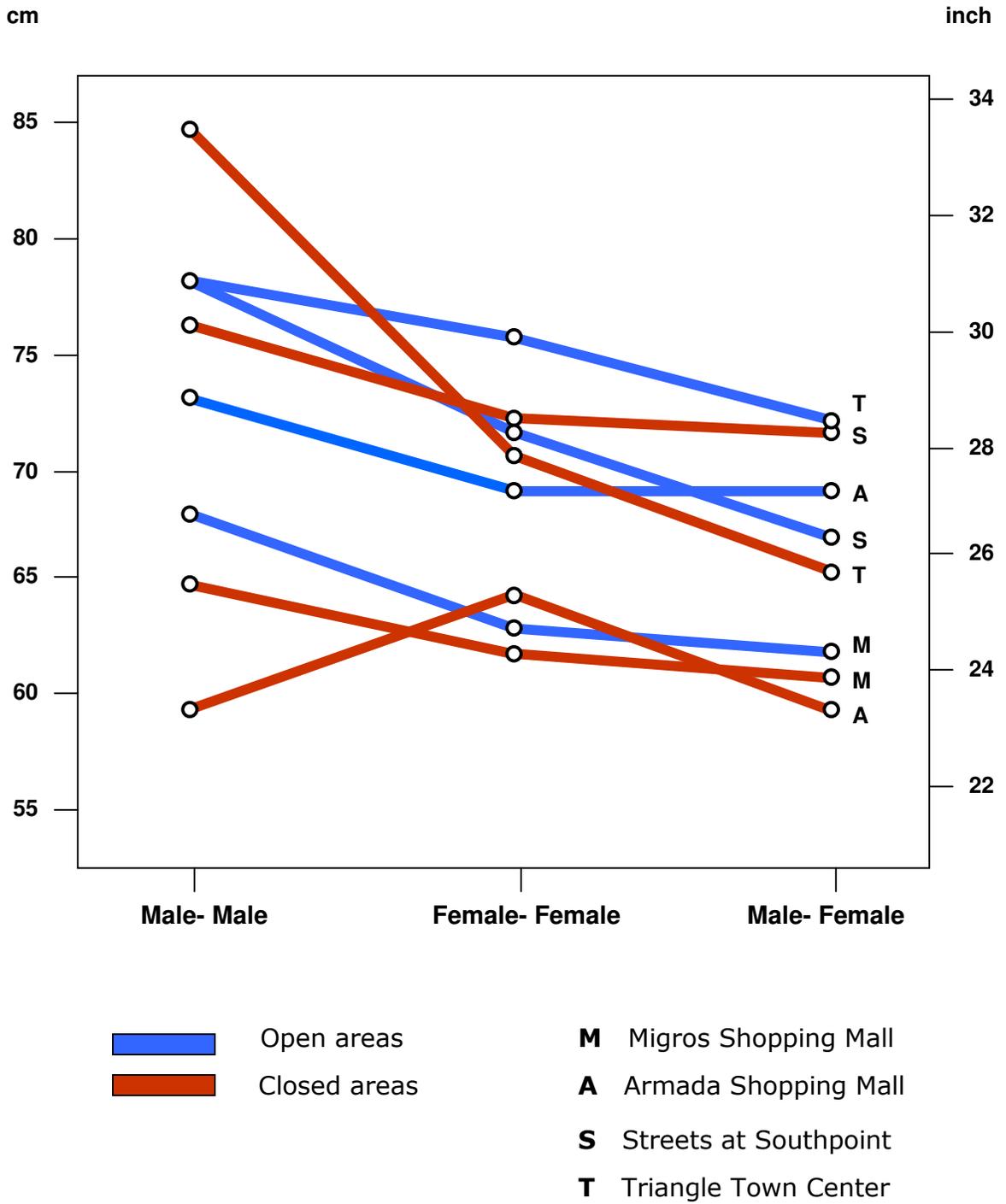
* Other than the total, all values are in percentages

APPENDIX 5-A. Distribution of mean interpersonal distances in open and closed areas

Distance cm (inches)	MIGROS SHOPPING MALL		ARMADA SHOPPING MALL		STREETS AT SOUTHPOINT		TRIANGLE TOWN CENTER	
	OPEN*	CLOSED*	OPEN*	CLOSED*	OPEN*	CLOSED*	OPEN*	CLOSED*
24 (9.5)	0.3							
30 (11.8)	0.7							
36 (14.2)	2.5	0.9		2.5				
42 (16.5)	6.8	5.2	1.8	11.3	2.6		2.4	6.1
48 (18.9)	12.1	16.4	5.5	16.7	10.3	6.7	8.3	6.1
54 (21.3)	15.4	18.3	11.6	15.9	12.2	7.8	10.5	14.7
60 (23.6)	15.5	17.5	21.3	18	15	13.3	15.6	20.8
66 (26)	12.5	14	11.6	8.2	10.7	17.8	9.2	10.4
72 (28.3)	10.7	11.9	18.9	10.5	11.7	14.4	11.4	10.4
78 (30.7)	8.5	6.8	10.4	7.7	9.6	10	7.9	6.1
84 (33)	5.7	2.9	5.5	5.9	9.3	12.2	9.6	12.1
90 (35.4)	3.5	1.9	3.1	1.7	5.9	5.6	5.1	3.4
96 (37.8)	2.2	1.9	3.1	1.1	4.4	4.4	6.1	1.7
102 (40.2)	0.7	0.6	1.8		2.6	4.4	2.8	2.6
108 (42.5)	0.9		2.4		1.4		3.5	1.7
114 (44.9)	0.3		0.6		1.1		0.8	
120 (47.2)	0.6		1.2		1.6		1.9	
126 (49.6)					0.4		0.4	
132 (52)					0.4		1.5	
138 (54.3)					0.5		0.4	
144 (56.7)							1.1	
150 (59.1)							0.4	

* All values are in percentages

APPENDIX 5-B. Mean interpersonal distances across gender compositions



APPENDIX 6. Questions asked during informal interviews with the mall management

What were the basic design and planning guidelines that were used in building this mall?
What kind of design elements make this mall different from other malls that aim to attract more users?
Other than shopping related activities, what type of other activities and events are organized in this mall?
How are these activities and events accommodated and what type of spatial changes do you make for these activities and events?
Do you conduct user surveys regularly? IF YES , do you include “design” issues in those surveys?
What are the future plans to renovate and/or extend the mall space?
What do you think about the mall’s connection with neighborhood and other parts of the city? Do you have any proposals to improve these connections?
What do you think about the accessibility to this mall?
Which other malls in the city (region) can you compare this mall with?
Are there any other malls that you manage other than this one?
FOR TURKISH MALLS: As you know, the first modern shopping malls were built in the US. Do you observe those malls and apply their strategies to the mall(s) that you manage?
Can you define the general user profile of this mall? What type of users, at what time of the day visit this mall?
Do you receive any comments about the design characteristics of this mall from users? IF YES , how do you process these comments?
FOR AMERICAN MALLS: Can you define briefly the function of the outside street? What is the importance of building an outside street to attract users to this mall?
Are there any design professionals such as architects, landscape architects, and interior designers who work as a part of this management?

APPENDIX 7-A. Exploratory survey (English version)

EXPLORATORY SURVEY

MALL: A1 A2 B1 B2

DATE: _____

TIME: _____

Hi. I am conducting a research about shopping malls like this one. Would you mind answering a few questions. It will take only few minutes.

GOOD. The purpose of these questions is to learn about enclosure characteristics of places inside this mall. This interview is completely voluntary. If you want to skip a question, just let me know.

Q1. Is this your first visit to this mall?

- Yes
- No

Q2. Can you please name two areas inside this mall, other than restaurants and stores,

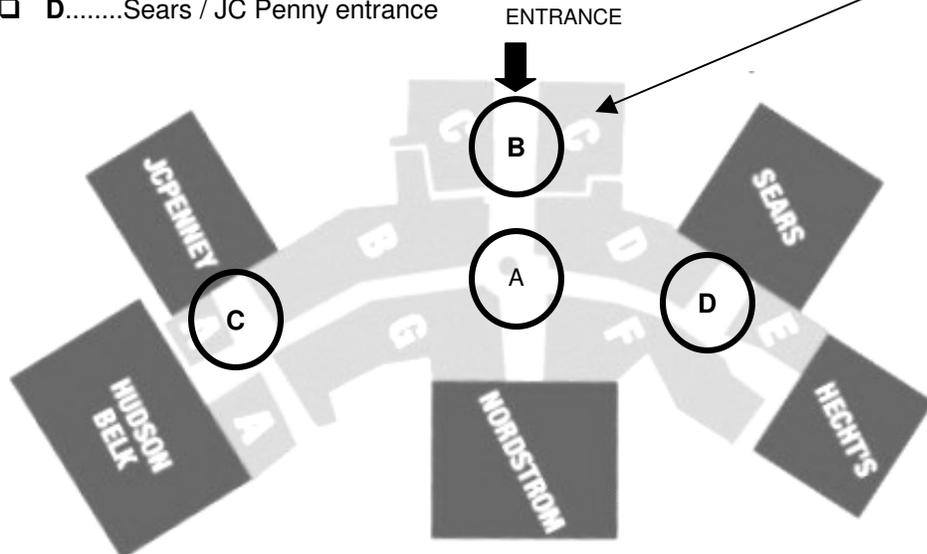
which are MORE SPACIOUS (open) than other areas in the mall?

- AREA 1:.....
- AREA 2:.....

Q3. Can you please rank these listed areas from **1** to **4** in which **1** -- MOST OPEN (spacious) and **4** -- MOST ENCLOSED (confined)

- A**.....Center court
- B**.....Main entrance
- C**.....Corridors
- D**.....Sears / JC Penny entrance

PLACE THAT WE ARE STANDING



APPENDIX 7-B. Exploratory survey (Turkish version)

MEKAN TANIMLAMA ANKETİ

ALAN: A1 A2 B1 B2

TARİH: _____

SAAT: _____

Merhaba. Bu alışveriş merkezi ile ilgili bir araştırma yapıyorum. Anketimize katılmak ister misiniz?
Sadece birkaç dakikanızı alacağım.

TEŞEKKÜRLER. Sorularla ilgili bir probleminiz olursa lütfen bildiriniz. Cevaplamak istemediğiniz soruları geçebilirsiniz.

S1. Bu Alışveriş Merkezi'ne ilk defa mı geliyorsunuz?

- Evet
 Hayır

Q2. Bu alışveriş merkezi içinde, *restoran ve dükkanlar haricinde*, diğer alanlara göre daha **GENİŞ** İKİ (2) alanı tanımlayabilir misiniz?

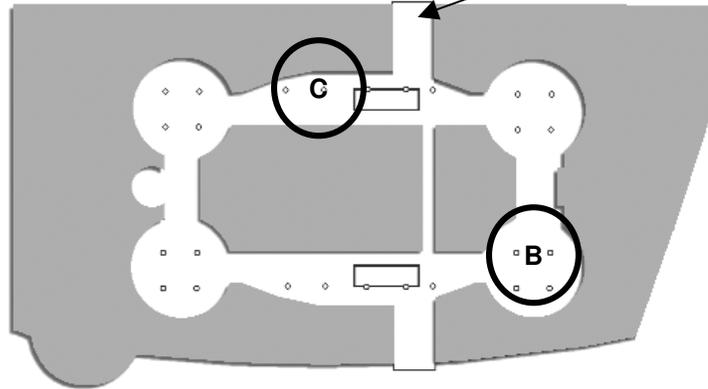
- ALAN 1:.....
 ALAN 2:.....

Q3. Aşağıda listelenen alanları **1** 'den **4** 'e kadar sıralayabilir misiniz?

1 – En açık (Ferah) ve **4** – En kapalı (Dar)

- A**..... Zemin kat giriş kapısı alanı (Giriş katı)
 B..... Dairesel koridor (Alt kat)
 C..... Yürüyen merdiven koridor alanı (2. kat)
 D..... En üst kat yemek yeme alanı

SU ANDA BULUNDUĞUMUZ NOKTA



APPENDIX 8-A. Questionnaire instrument (English version-page 1)

INTERVIEW QUESTIONNAIRE									
MALL <input type="checkbox"/> B1 <input type="checkbox"/> B2 AREA <input type="checkbox"/> 1 <input type="checkbox"/> 2	DATE: _____ TIME: _____								
<p>Hi. I am conducting a research about shopping malls like this one. Would you mind answering a few questions. It will take only few minutes.</p> <p>GOOD. This interview is completely voluntary. If you want to skip a question, just let me know.</p>									
1. Is this your first visit to this mall? <input type="checkbox"/> Yes (go Q 5) <input type="checkbox"/> No (go Q 2)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; padding: 5px;"> 2. How often do you visit this mall? <input type="checkbox"/> Once a month <input type="checkbox"/> 2-3 times a month <input type="checkbox"/> Once a week <input type="checkbox"/> 2-3 times a week <input type="checkbox"/> Almost everyday <input type="checkbox"/> Everyday </td> <td style="width: 33%; padding: 5px;"> 3. What time of the day do you generally visit this mall? <input type="checkbox"/> Morning <input type="checkbox"/> Noon <input type="checkbox"/> Afternoon <input type="checkbox"/> Night </td> <td style="width: 33%; padding: 5px;"> 4. What time of week do you generally visit this mall? <input type="checkbox"/> Weekday <input type="checkbox"/> Weekened <input type="checkbox"/> Both </td> </tr> </table>			2. How often do you visit this mall? <input type="checkbox"/> Once a month <input type="checkbox"/> 2-3 times a month <input type="checkbox"/> Once a week <input type="checkbox"/> 2-3 times a week <input type="checkbox"/> Almost everyday <input type="checkbox"/> Everyday	3. What time of the day do you generally visit this mall? <input type="checkbox"/> Morning <input type="checkbox"/> Noon <input type="checkbox"/> Afternoon <input type="checkbox"/> Night	4. What time of week do you generally visit this mall? <input type="checkbox"/> Weekday <input type="checkbox"/> Weekened <input type="checkbox"/> Both			
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5. How much time do you intend to spend in this mall? <input type="checkbox"/> Less than 1 hr <input type="checkbox"/> Between 1-2 hrs <input type="checkbox"/> Between 2-3 hrs <input type="checkbox"/> More than 3 hrs	6. Did you come to this mall alone TODAY? <input type="checkbox"/> Yes (go Q 8) <input type="checkbox"/> No (go Q 7)	7. How many people are there with you NOW? <input type="checkbox"/> None <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> More than 2							
8. Please name the ways that you spend your time in this mall <input type="checkbox"/> Window shopping <input type="checkbox"/> Visit stores <input type="checkbox"/> Watch people <input type="checkbox"/> Meet friends/family <input type="checkbox"/> Eat/drink <input type="checkbox"/> Purchase an item <input type="checkbox"/> Walk around <input type="checkbox"/> Exercise <input type="checkbox"/> Go to a movie <input type="checkbox"/> Other _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> 9. From the list below, can you select TWO areas in this mall that you like MOST? </td> <td style="width: 50%; padding: 5px;"> 10. From the list below, can you select TWO areas in this mall that you like LEAST? </td> </tr> <tr> <td colspan="2" style="padding: 5px;"> <input type="checkbox"/> Center court area in middle of the mall <input type="checkbox"/> Main entrance area <input type="checkbox"/> Corridors to Hecht's and Belk <input type="checkbox"/> Corridor to Nordstrom <input type="checkbox"/> Seating area in center court <input type="checkbox"/> Seating area in corridors <input type="checkbox"/> Food court <input type="checkbox"/> Stores (Specify names) <input type="checkbox"/> Restaurants (Specify names) <input type="checkbox"/> Anchor stores (Specify names) <input type="checkbox"/> Street outside from main entrance to restaurants <input type="checkbox"/> Parking lot (Specify location) <input type="checkbox"/> Other <input type="checkbox"/> None </td> </tr> <tr> <td style="padding: 5px;"> WHY? <input type="checkbox"/> <input type="checkbox"/> </td> <td style="padding: 5px;"> WHY? <input type="checkbox"/> <input type="checkbox"/> </td> </tr> </table>			9. From the list below, can you select TWO areas in this mall that you like MOST?	10. From the list below, can you select TWO areas in this mall that you like LEAST?	<input type="checkbox"/> Center court area in middle of the mall <input type="checkbox"/> Main entrance area <input type="checkbox"/> Corridors to Hecht's and Belk <input type="checkbox"/> Corridor to Nordstrom <input type="checkbox"/> Seating area in center court <input type="checkbox"/> Seating area in corridors <input type="checkbox"/> Food court <input type="checkbox"/> Stores (Specify names) <input type="checkbox"/> Restaurants (Specify names) <input type="checkbox"/> Anchor stores (Specify names) <input type="checkbox"/> Street outside from main entrance to restaurants <input type="checkbox"/> Parking lot (Specify location) <input type="checkbox"/> Other <input type="checkbox"/> None		WHY? <input type="checkbox"/> <input type="checkbox"/>	WHY? <input type="checkbox"/> <input type="checkbox"/>
9. From the list below, can you select TWO areas in this mall that you like MOST?	10. From the list below, can you select TWO areas in this mall that you like LEAST?								
<input type="checkbox"/> Center court area in middle of the mall <input type="checkbox"/> Main entrance area <input type="checkbox"/> Corridors to Hecht's and Belk <input type="checkbox"/> Corridor to Nordstrom <input type="checkbox"/> Seating area in center court <input type="checkbox"/> Seating area in corridors <input type="checkbox"/> Food court <input type="checkbox"/> Stores (Specify names) <input type="checkbox"/> Restaurants (Specify names) <input type="checkbox"/> Anchor stores (Specify names) <input type="checkbox"/> Street outside from main entrance to restaurants <input type="checkbox"/> Parking lot (Specify location) <input type="checkbox"/> Other <input type="checkbox"/> None									
WHY? <input type="checkbox"/> <input type="checkbox"/>	WHY? <input type="checkbox"/> <input type="checkbox"/>								

APPENDIX 8-A (continued). Questionnaire instrument (English version-page 2)

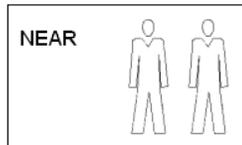
11. We are now standing in Can you define this area with THREE words?

.....

12. Now, I'm going to read a list of words, which might describe this area that we are standing. Tell me if you strongly agree, agree somewhat or disagree that the word describes this area.

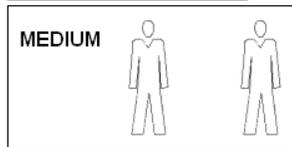
	STRONGLY AGREE	AGREE SOMEWHAT	DISAGREE
Spacious	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Crowded	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. Figures below show DISTANCE ZONES between people. Can you select ONE which you prefer while you walk or stand in this area of the mall



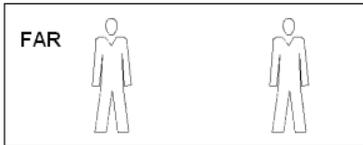
A. NEXT TO FRIENDS/FAMILY MEMBERS

- Near
- Medium
- Far



B. NEXT TO STRANGERS

- Near
- Medium
- Far



14. Below is a list of statements. Please indicate whether you strongly agree, agree somewhat or disagree with each statement.

	STRONGLY AGREE	AGREE SOMEWHAT	DISAGREE
This mall is a fine place to spend time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I visit this mall only for shopping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
This mall is often crowded	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Crowded areas of this mall disturb me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The mall seems more enclosed when it is crowded	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
When it is bright and well lit, the mall seems more spacious	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am attracted to places that are spacious	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The height of this place creates a spacious feeling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. Age group <18 18-29 30-39 40-54 55=>

16. Gender Male Female

This is the end of the questionnaire. Thanks for your cooperation.

APPENDIX 8-B. Questionnaire instrument (Turkish version-page1)

ANKET SORULARI					
AVM: <input type="checkbox"/> E1 <input type="checkbox"/> E2 ALAN: <input type="checkbox"/> 1 <input type="checkbox"/> 2	TARİH: _____ ZAMAN: _____				
<p>Merhaba. Bu alışveriş merkezi ile ilgili bir araştırma yapıyorum. Anketimize katılmak ister misiniz? Sadece birkaç dakikanızı alacağım.</p> <p>TEŞEKKÜRLER. Sorularla ilgili bir probleminiz olursa lütfen bildiriniz. Cevaplamak istemediğiniz soruları geçebilirsiniz.</p>					
<p>1. Bu Alışveriş Merkezi'ne ilk defa mı geliyorsunuz?</p> <p><input type="checkbox"/> Evet (git S 5) <input type="checkbox"/> Hayır (git S 2)</p>					
<table border="1" style="width: 100%; border-collapse: collapse;"><tr><td style="width: 25%; padding: 5px;">2. Bu AVM'ni ne kadar sıklıkta ziyaret ediyorsunuz? <input type="checkbox"/> Ayda bir <input type="checkbox"/> Ayda 2-3 defa <input type="checkbox"/> Haftada bir <input type="checkbox"/> Haftada 2-3 defa <input type="checkbox"/> Neredeyse hergün <input type="checkbox"/> Hergün</td><td style="width: 25%; padding: 5px;">3. Bu AVM'ni günün hangi saatlerinde ziyaret ediyorsunuz? <input type="checkbox"/> Sabah <input type="checkbox"/> Öğle <input type="checkbox"/> Öğleden sonra <input type="checkbox"/> Akşam</td><td style="width: 25%; padding: 5px;">4. Bu AVM'ni haftanın hangi zamanında ziyaret ediyorsunuz? <input type="checkbox"/> Hafta içi <input type="checkbox"/> Hafta sonu <input type="checkbox"/> Her ikisinde</td><td style="width: 25%;"></td></tr></table>		2. Bu AVM'ni ne kadar sıklıkta ziyaret ediyorsunuz? <input type="checkbox"/> Ayda bir <input type="checkbox"/> Ayda 2-3 defa <input type="checkbox"/> Haftada bir <input type="checkbox"/> Haftada 2-3 defa <input type="checkbox"/> Neredeyse hergün <input type="checkbox"/> Hergün	3. Bu AVM'ni günün hangi saatlerinde ziyaret ediyorsunuz? <input type="checkbox"/> Sabah <input type="checkbox"/> Öğle <input type="checkbox"/> Öğleden sonra <input type="checkbox"/> Akşam	4. Bu AVM'ni haftanın hangi zamanında ziyaret ediyorsunuz? <input type="checkbox"/> Hafta içi <input type="checkbox"/> Hafta sonu <input type="checkbox"/> Her ikisinde	
2. Bu AVM'ni ne kadar sıklıkta ziyaret ediyorsunuz? <input type="checkbox"/> Ayda bir <input type="checkbox"/> Ayda 2-3 defa <input type="checkbox"/> Haftada bir <input type="checkbox"/> Haftada 2-3 defa <input type="checkbox"/> Neredeyse hergün <input type="checkbox"/> Hergün	3. Bu AVM'ni günün hangi saatlerinde ziyaret ediyorsunuz? <input type="checkbox"/> Sabah <input type="checkbox"/> Öğle <input type="checkbox"/> Öğleden sonra <input type="checkbox"/> Akşam	4. Bu AVM'ni haftanın hangi zamanında ziyaret ediyorsunuz? <input type="checkbox"/> Hafta içi <input type="checkbox"/> Hafta sonu <input type="checkbox"/> Her ikisinde			
<p>5. Bu AVM'nde ne kadar zaman geçiriyorsunuz?</p> <p><input type="checkbox"/> 1 saatten az <input type="checkbox"/> 1-2 saat arası <input type="checkbox"/> 2-3 saat arası <input type="checkbox"/> 3 saatten fazla</p>					
<p>6. BUGÜN bu AVM'ne tek başınıza mı geldiniz?</p> <p><input type="checkbox"/> Evet (git S 8) <input type="checkbox"/> Hayır (git S 7)</p>					
<p>7. Şu an sizin yanınızda kaç kişi bulunmaktadır?</p> <p><input type="checkbox"/> Hiç kimse <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 2'den fazla</p>					
<p>8. Bu AVM'nde zamanınızı nasıl geçiriyorsunuz? (Birden fazla işaretlenebilir)</p> <p><input type="checkbox"/> Vitrinlere bakmak <input type="checkbox"/> Mağazaları ziyaret <input type="checkbox"/> İnsanları seyretmek <input type="checkbox"/> Yakınlarımla buluşmak <input type="checkbox"/> Yemek / içmek <input type="checkbox"/> Mal satın almak <input type="checkbox"/> Dolaşmak <input type="checkbox"/> Egzersiz yapmak <input type="checkbox"/> Sinemaya gitmek <input type="checkbox"/> Diğer _____</p>					
<p>9. Aşağıdaki isteden, bu AVM'de en çok BEGENDİĞİNİZ İKİ (2) alanı seçer misiniz?</p> <table border="1" style="width: 100%; border-collapse: collapse;"><tr><td style="padding: 5px;"><input type="checkbox"/> Zemin kat giriş alanları <input type="checkbox"/> Asansörler arası koridorlar <input type="checkbox"/> Kıyafet ve ayakkabı dükkanlarının bulunduğu koridorlar <input type="checkbox"/> Palmiyeli koridor <input type="checkbox"/> Koridorlarda ki oturma alanları <input type="checkbox"/> En alt katta ki havuz alanı <input type="checkbox"/> En üst kat yemek yeme alanı <input type="checkbox"/> Saçakaltı-Dışardaki sütunlu alan <input type="checkbox"/> Sinema - Tiyatro <input type="checkbox"/> Büyük Mağazalar (Çarşı, Mudo gibi) <input type="checkbox"/> Restoran-Kafe (İSİM BELİRTİN) <input type="checkbox"/> Dükkanlar (İSİM BELİRTİN) <input type="checkbox"/> Otopark (KONUM BELİRTİN) <input type="checkbox"/> Diğer..... <input type="checkbox"/> Hiçbiri</td></tr></table>		<input type="checkbox"/> Zemin kat giriş alanları <input type="checkbox"/> Asansörler arası koridorlar <input type="checkbox"/> Kıyafet ve ayakkabı dükkanlarının bulunduğu koridorlar <input type="checkbox"/> Palmiyeli koridor <input type="checkbox"/> Koridorlarda ki oturma alanları <input type="checkbox"/> En alt katta ki havuz alanı <input type="checkbox"/> En üst kat yemek yeme alanı <input type="checkbox"/> Saçakaltı-Dışardaki sütunlu alan <input type="checkbox"/> Sinema - Tiyatro <input type="checkbox"/> Büyük Mağazalar (Çarşı, Mudo gibi) <input type="checkbox"/> Restoran-Kafe (İSİM BELİRTİN) <input type="checkbox"/> Dükkanlar (İSİM BELİRTİN) <input type="checkbox"/> Otopark (KONUM BELİRTİN) <input type="checkbox"/> Diğer..... <input type="checkbox"/> Hiçbiri			
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<p>10. Aşağıdaki listeden, bu AVM'de en BEGENMEDİĞİNİZ İKİ (2) alanı seçer misiniz?</p>					
<table border="1" style="width: 100%; border-collapse: collapse;"><tr><td style="width: 50%; padding: 5px;">NEDEN beğeniyorsunuz?</td><td style="width: 50%; padding: 5px;">NEDEN beğenmiyorsunuz?</td></tr><tr><td style="padding: 5px;"><input type="checkbox"/> _____ <input type="checkbox"/> _____</td><td style="padding: 5px;"><input type="checkbox"/> _____ <input type="checkbox"/> _____</td></tr></table>		NEDEN beğeniyorsunuz?	NEDEN beğenmiyorsunuz?	<input type="checkbox"/> _____ <input type="checkbox"/> _____	<input type="checkbox"/> _____ <input type="checkbox"/> _____
NEDEN beğeniyorsunuz?	NEDEN beğenmiyorsunuz?				
<input type="checkbox"/> _____ <input type="checkbox"/> _____	<input type="checkbox"/> _____ <input type="checkbox"/> _____				

APPENDIX 8-B (continued). Questionnaire instrument (Turkish version-page 2)

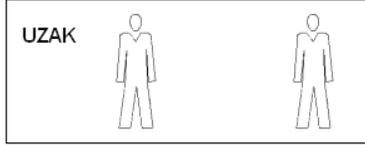
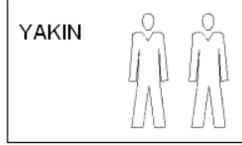
11. Şu anda içinde duruyoruz. Bu alanı **ÜÇ (3)** kelime ile tanımlar mısınız?

.....

12. Şimdi size bu içinde durduğumuz alanla ilgili çeşitli tanımlar okuyacağım. Bu tanımlamalara katılıyor, kısmen katılıyor ya da katılmıyor musunuz?

	KATILYORUM	KISMEN KATILYORUM	KATILMIYORUM
Geniş	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aydınlık	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kalabalık	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. Aşağıdaki şekiller iki kişi arasındaki duruş mesafesini göstermektedir. İçinde durduğumuz bu alanda tanıdıklarınız ya da tanımadıklarınız yanında dururken hangi mesafeyi tercih edersiniz?



A. YAKINLARINIZIN YANINDA (Aile / Arkadaş)

- Yakın
 Orta yakınlık
 Uzak

B. YABANCILARIN YANINDA

- Yakın
 Orta yakınlık
 Uzak

14. Aşağıda çeşitli ifadeler listelenmiştir. Listelenen bu ifadelere katılıyor, kısmen katılıyor ya da katılmıyor musunuz?

	KATILYORUM	KISMEN KATILYORUM	KATILMIYORUM
Bu AVM vakit geçirmek için iyi bir mekan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bu AVM'ni sadece alışveriş yapmak için ziyaret ederim	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bu AVM genellikle kalabalık	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bu AVM'deki kalabalık alanlar beni rahatsız ediyor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bu AVM kalabalık günlerde daha dar görünüyor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aydınlık günlerde bu AVM daha geniş görünüyor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bu içinde durduğumuz alanın yüksekliği mekanı geniş gösteriyor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Daha çok geniş mekanlar hoşuma gidiyor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. Yaş grubunuz <18 18-29 30-39 40-54 55=>

16. Cinsiyet Erkek Kadın

Katılımınız için teşekkür ederim.