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A Research on The Application of A Harmony Between Personal Space and Architectural Space into A Case Study Like Park**

***Banu BEKCİ[1], Ali ÖZBİLEN[2]**

[1]Department of Landscape Architecture, Faculty of Forestry, Bartın University, 74200 Bartın, Turkey
[2]Department of Landscape Architecture, Faculty of Forestry, Karadeniz Technical University, Trabzon, Turkey
[*]Corresponding author: bekcibanu@hotmail.com

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Abstract

The behaviour aspects of physical space which is considered as a part of interaction between human and environment has been getting more attention. Especially personal space which is an important aspect of physical space as a function of people's preferences has been studied in recent studies. It is fact that people prefer to leave certain distance from each other during social interaction depending on various variables such as people around them and type of the activity. The objective of this study is to investigate parameters influency personal space preferences within architectural desing. Open space park nearby a city was selected to valuate and measure personal space distance. A survey was conducted to determine expectatıon of the people in terms of personal space distance. Observation method was employed to evaluate crowdness, proximity, distance and number of person in this contex. Two equations were derived to calculate personal maximum space distance as function of comfortness for two levels. It was found that there is no significant difference between standard deviations of two equation. Occupation rate of the space shaped a certain amount of pressure on people and its perception changes as function of physical environment based on correlation analysis. A relationship between expectation of people about space distance and use of space distance from the point of landscape desingn was developed to provide a solution for ideal condition.

Keywords: Personal space, Proxemics, Privacy, Density, Personal space distance

Mimari Mekân ve Kişisel Mekân Arasındaki Uyumun Bir Park Üzerinde Denetlenmesi

Özet

İnsan ve çevre ilişkisinin bir bölümü olarak yorumlanan, fiziksel mekândaki davranış şekillerine karşı artan bir ilgi vardır. Özellikle fiziksel mekânın kullanıcı tercihlerinin önemli bir boyutu olan kişisel mekân son dönemlerdeki çalışmalarda sıklıkla araştırılmaktadır. İnsanlar yer aldıkları aktiviteler ve çevrelerindeki insanlara bağlı olan sosyal etkileşime göre farklı mesafeleri kullanmalarından kaynaklanan kişisel mekân kavramı, bireyin fiziksel mekânını kendisinin bir parçası olarak görmesi şeklinde tanımlanmaktadır. Bu çalışmada, seçilen mimari mekân içerisinde kullanıcının kişisel mekân mesafesini etkileyen unsurlar ortaya konulmuştur. Kişisel mekân mesafesini ölçmek amacıyla kent merkezine yakın bir açık alan parkının kullanıcıları seçilmiştir. Kullanıcıların kişisel mekân mesafesindeki beklentilerini belirlemek amacıyla anket, kalabalık, yakınlık, uzaklık ve kişi sayısı faktörlerini kolay denetleyebilmek için de gözlem teknikleri kullanılmıştır. Yüzölçümleri farklı olan iki terasta yapılan çalışmada mekânın konfor koşullarını belirleyen kişisel mekân mesafesini (maksimum mesafe) hesaplamak amacıyla, bağımsız değişkenler (doluluk oranı, en yakın kişi) kullanılarak, katsayıları birbirinden farklı fakat değişkenleri aynı iki denklem elde edilmiştir. Bulunan iki denklemin standart hatalarının yakın olması aralarında pek bir fark olmadığını göstermektedir. Mimari mekanın dolu olarak algılanması mekanın fiziksel özelliğine ve doluluk oranına göre değiştiği korelasyon analizi sonucuna göre saptanmış olup, doluluk oranının artmasının da insanlar üzerinde baskı hissini uyandırdığı görülmüştür. Kullanıcının mimari mekân içerisinde ilk olarak manzara alanını daha sonra ise sınır bölgelerini tercih ettiği görülmekle birlikte, mekânın belirli bir doluluk oranına ulaşması ile geçiş alanlarının da kullanıldığı da tespit edilmiştir. Bununla birlikte aynı zamanda mekân tasarımının özellikleri ve kullanıcının kişisel mekân mesafesindeki beklentileri arasında bağlantı kurularak, peyzaj planlamalarında kişisel mekân mesafesi kullanımı için uygun tasarım çözümleri de geliştirilmiştir.

Anahtar Kelimeler: Kişisel mekân, Yakınlık, Mahremiyet, Yoğunluk, Kişisel mekân uzaklığı

**This study, The Graduate School of Natural and Applied Sciences of Karadeniz Technical University in Master's Thesis is the original study was built in 2002.

Introduction

Proxemics, the study of personal space and interpersonal distance, began more than four decades ago. Hall (1959) and Sommer (1959) demonstrated that people maintain personal or buffer space around themselves and each other. People prefer to use various distances for social interaction depending on the people around and the activity in which they take place. People treat the physical space immediately around them as if it is a part of themselves: this zone is called their personal space (Sears, 1983).

Hall (1959) has suggested that people carry around a series of spatial spheres where in different types of interactions are allowed to occur. Hall hypothesized (1966) four spatial zones which reflect different relationship between the interactants and the types of activities and spaces corresponding to them. Hall (1966) observed that these distances often relate to the senses: whether we can smell the other person, feel body heat, reach out and touch, or see facial features. Each of these zones which contain a near and far phase, provides a different level of sensory information. These are the intimate, personal, social, and public distances; Intimate distance: 0-6inch or 0-15cm, Personal distance: 18-30inch or 45-75cm, Social distance: 4-7feet or 1,2-2m, Public distance: over 25feet or 7m.
Several studies support this hypothesis. In another work, Sommer (1959) and Sakıcı (2009) on personal space is based on the belief that we seek the appropriate distance to preserve our comfort. It seems obvious that people feel uncomfortable when they talk to others who either stand too close or too far away.

Proxemics

Personal space, the distance between two or more human beings, has primarily been studied experimentally in one of four ways: chair selection, in which participants choose seats that vary in distance from a target person, stop distance, in which participants indicate when areal person such as an experimenter or confederate should stop approaching them; projective studies, in which participants manipulate dolls and figures; and natural observational studies. (Hayduk, 1983). Researchers have identified several other factors that moderate personal space, including culture (Hall, 1966; Watson, 1970), race (Rosegrant & Mccroskey, 1975; Hall, 1966), physiology (Mcbride *et al*., 1965; Sakıcı, 2009), age (Willis, 1966), and interpersonal relationships (Evans & Howard, 1973; Little, 1965).

Proxemic patterns are the spatial patterns that constitute the norm for a culture in specific types of situations (Bechtel and Zeisel, 1990). Research over the past several years has demostrated that different ethnic groups and subcultures have different proxemic codes (Hall, 1966). That is, people use their sensory receptors to structure the various proxemic zones differently during interpersonal encounters.

Factor influencing personal space

There are three factors that have influences on personal space. Personal space is a function of an individual's characteristics that are carried from situation to situation, such as sex, age, personality, mental health, and past experiences. Each of these characteristics has an important role on personal space but they can not operate on their own. The personal characteristics of the other person and the situation will also have an effect (Altman and Chemers, 1989; Sakıcı, 2009).

Some authors reported that males use larger distances than females (Evans and Howard, 1973; Gifford, 1982; Wiggins, 1999). Females interacting with females have also been found to exhibit smaller personal space zones than males interacting with males (Sommer, 1959; Baxter, 1970). Some researchers have argued that proxemic behaviors differ for men and women. Specifically, they claim that personal space between men is the largest, whereas between women is the smallest, and between men and women is middle level.

However, Becker (1973) failed to find support for sex effect. One possible reason is that sex effect. Another reason is that sex differences occur from the socialization of males and females rather than their biological differences. According to Rüstemli (1992), another reason that may account for the inconsistent findings about sex effects on personal space may involve the cultural context in which these studies are conducted. Rüstemli (1992) stated as: for the female

Turk, proximity to a male other in public, especially a male stranger, is not approved by the majority and has social, sexual, and moral implications. The traditional Turkish woman maintains a large distance from a man and is reserved in public.

Hayduk (1978, 1983) found that personal space increases with age. Infant have personal space is difficult to measure because infants have little independent mobility. Gosling, et.al (1998) conceptualize personality that an individual engages in behaviors within certain categories, such as warmth-coldness and extroversion-introversion. Most studies of extroversion or interpersonal warmth have shown that individuals with these tendencies have smaller personal space zones (Wiggins, 1999; Gifford, 1982).

Another factor is that individual having emotional problems, often have variable or inappropriate personal space zones. Sommer (1959) and Sakıcı (2009) examined the interpersonal distances preferred by schizophrenics. It was found that compared to hospital employees and nonschizophrenic patients, schizophrenics sometimes choose comparetively much greater seating distances and sometimes choose much smaller ones.

Hypotheses

In an interaction architectural space, the individual's personal privacy protection were influenced from lots of factors. Our life's inavoidable reality of interaction between people, acquires with these components. In other words, person within community comminicates not only with the individuals who are with them but also, with any individual from an architectural space. Therefore, individuals obliged to determine one interaction distance according to persons which they comminicate with them. This study supports in the direction of T. Hall's personal space distance concept which developed the definition with the help of them. Within the context of this study;

Users indicate how an exchange within a personal space privacy which exists architectural space (the occupancy rate of area, maximum distance),

What expactations users have in an architectural space,

In the direction of user's inspected criterions, researched how the personal space distance made wider and made narrower.

Material and Method

In an interaction architectural space, individual's have a personal privacy protection request of study and that study provides to the user choosing a space in the architectural space and also with this choice it provides betraying a personal space distance. This study is about user's measuring of the distance in an architectural space. Regarding personal comfortable to evaluate the personal space distance there are many of measuring technics such as simulation method, laboratory method, and interpersonal observation method (Duke and Nowick, 1972; Peterson, 1973; Kuete, 1962).

In this study, the observation method with resting the study to the major groups which provides analyzing the different characteristic, user's socio-demographic at the same time easier was used. Because of the purpose of measuring the space distance an appliance-oriented observation forms prepared. Personal space distance was analysed and defined by E.T. Hall (1966), it changes by the structure of the society, individual culture, age, sexuality. Therefore while mechanism communication with individuals, it contains verbal and non-verbal attitudes (Mc Crathy and Saegerth, 1979). These are sound tone, smile, glance, facial expression and our body harmony. These messages encourage the interaction as well as they limit the interaction (Hamm and Richardson, 2001).

Whyte has put forward in a research he has conducted on inner city open spaces that these spaces are used most commonly under the sunny and partly sunny conditions (except the extremely hot summer days) (Whyte, 1980). Considering the results, the observation were carried out in a sunny or half-sunny days.

The applications were evaulated in a three stage namely first observation form, second observation form and third is the survey. First observation form prepared by the purpose of controlling the table position, user groups (sexuality) and individual's arrival-departure time to the field. The preparation first observation form controlled on 735 person for five times in the week and sixty times in the

three month duration. The inspected every component couch in the first observation chart below with the specific shortenings (Table 1). For each, one observation per day, a different observation form was used. When accessed a specific occupancy rate in the area with a condition of not accessing to dominate the field observation was ended. The second observation form developed from physical position indicative plans. The purpose of the second observation form is to control under the area user individual's and to control the distance among individuals. In this way, the evaluation of the area usage was implemented correctly within a short time. The observation starts when a first incoming individual or group selects somewhere by themselves. The first individual or group replaced on the second observation form plan as shown in Figure 1. If there is a seperation from the area the extant tables marked to another map and continiued with marking new incoming individuals one by one.

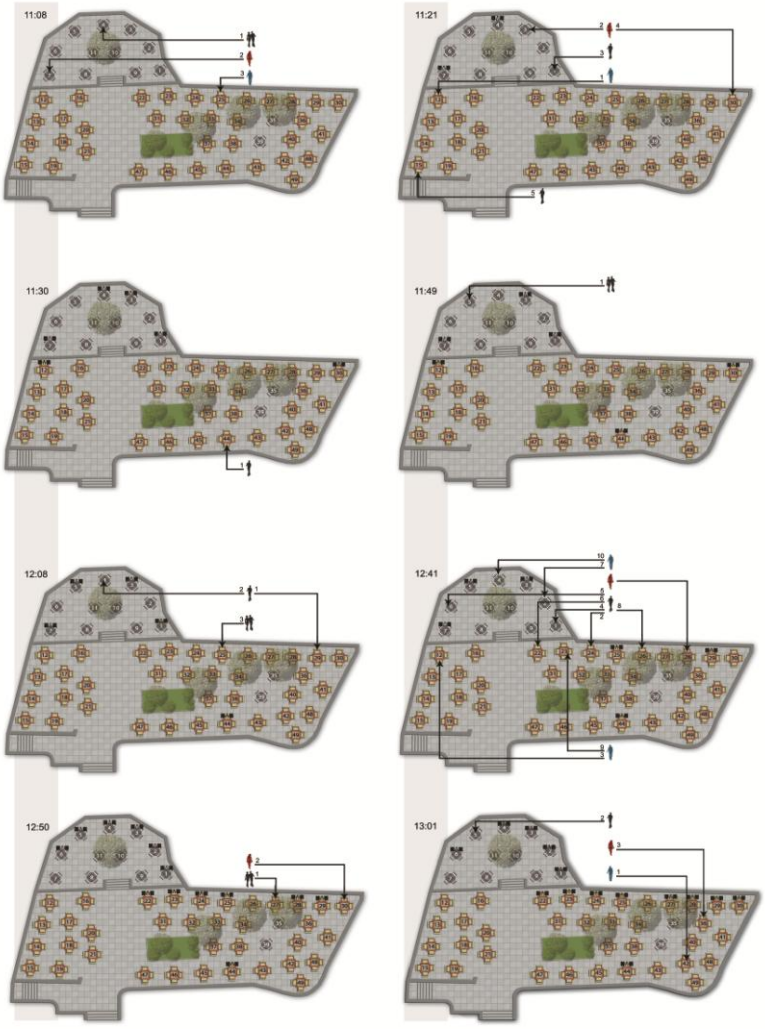
Table 1. Observation table (Kazancıoğlu, 2002)

	A	B	C	Single	Couple	Female	Male	Family	Arrival time	Turn time	Observation
1.					4				9: 30	11:30	
2.						7			10: 23	12: 46	
3.							25		10: 33	11: 08	
4.							12		11: 05	11: 51	
5.						3			11: 05	13: 55	
6.				1					11: 15	12: 08	
7.						30			11: 17	11: 49	
8.				15					11: 19	11: 21	
9.							37		11: 21	13: 10	
10.					5				11: 40	12: 50	
11.				29					11: 55	13: 01	
12.				4					11: 59	-	
13.					25				12: 02	-	
14.					28				12: 10	-	
15.							24		12: 13	-	
16.							12		12: 20	12: 41	
17.				1					12: 20	-	
18.				6					12: 21	-	
19.				22					12: 23	13: 01	
20.							2		12: 24	-	
21.				26					12: 26	12: 45	
22.							23		12: 28	13: 50	
23.							4		12: 30	13: 16	
24.					27				12: 47	-	
25.						30			12: 48	13: 01	
26.							42		12: 50	13: 24	
27.				5					12: 51	13: 50	
28.						36			12: 52	13: 02	
29.							14		12: 57	-	
30.						30			13: 02	-	
31.						22			13: 06	-	
32.							7		13; 06	13; 24	
33.				12					13;18	-	
34.							1		13; 24	-	
35.						7			13; 29	-	
36.					15				13; 30	-	
37.				8					13; 34	-	
38.							16		13; 37	-	
39.					29				13; 39	-	
40.						26			13; 43	-	
41.					43				13; 45	-	
42.						10			13; 45	-	
43.							35		13; 46	-	
44.						41			13; 47	-	
45.				23					13; 50	-	

The main purposes of this approach is understanding the average duration of individual's duration time in the park as well

as about the park's occupancy rate based on what park of park get filled about the individuals number in the table how they choosed a distance, and about the maximum space which distance the people go near.

Figure 1. Session of sample study (Kazancıoğlu, 2002)



In the first and second area of the table 1, the recorded original data replaced into the prepared plans below. The figures below replaced in parallel with table 1 to the continue of the same day. The purpose of having sampling at the same day is to understand the observation with better accuracy.

Study area

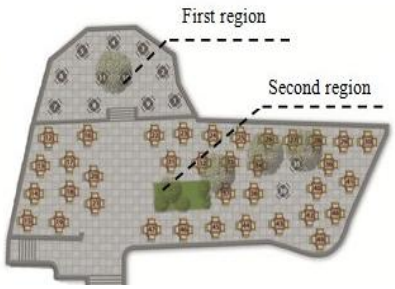
Within this scope, Ganita park has approximately 7500 m^2 area which is nearby to the Trabzon's shore area was selected (Gedikli, 1998). It's landscape and vegetation are good and the place is quit populated and secure. It is an important part in the city because individuals felt themselves safe compared to other open green spaces.

The distance between tables is 1.50cm and terraces are sheltered to wind. The communication is with foot road from the center. Park is in a 6–10 minutes distance from the center. The preference reason is being close to the center (Gedikli, 1998) as illustrated in figure 2.

Because of having a lot of terraces in the chosen park area and because of making the inspection difficult, two terraces which has 60cm difference between, took into consideration. These terraces takes place in the area which is to the side of the sea. In figure 3 workspaces I and II are presented.

Figure 2. The map of Ganita and near environment (Kazancıoğlu, 2002)

Figure 3. Study ares's region (Kazancıoğlu, 2002)



The workspace, landscape area, frontier area and transition were parceled. The reason of this classificitation determines the occupancy rate. In the progressive stages, the occupancy rate was determined on the most used 19 tables are in the landscape and it's region. Classified areas were given in the figure 4.

Figure 4. The image of the table in the boundery, scenery and transition zone (Kazancıoğlu, 2002)

Choosing of the Samples

Prepared first and second observation form with the specific method, was made from foreign observer and not letting the user know about anything. Totally 735 person's positional attitudes was followed during the duration of observation. The survey was addressed to 100 people. The studies in the area for an objective evaluation, received attention to individual's random selection for not being in an enterprise or not affliating to cultural level.

Results

The surveys made in the study area were analyzed by chi-square test and distribution of the users was looked upon. 32.4% of the surveyed were female and 67.6% of them were male. The survey group consisted 18% of 20 years or younger, 78% of 20-30 and 4% of more than 30 years old people. It can be seen that the study group mainly consists of young people. The education level of the people was classified as student and working people. The percentage of working people is 64% and the students' is 36% (Kazancıoğlu, 2002).

The questionnaire included not only personal questions but also questions related to distance. Primarily, questions were asked about whether the users feel comfortable or not for being in the area, or if they feel uncomfortable why did he/she choose this park. The answers to first question were

47% no and 53% yes. The various answers were come from the users being uncomfortable and still using the park. %5 of them said it was quiet and peaceful, 29% said there was no place to go, 9% said it was seafront, 10% said they had to come with their friends, 28% said they wanted to see the scenic view, 14% said it was open area, and 5% said it was close to downtown. A question was asked whether the distances among the tables were important for choosing the park and the answers were 64% no and 46% yes. The answers of a question related to whether the distance needs to be changed or not were 66% no, 32% leave them as they are, and %2 the distance needs to be decreased. It can be stated that the users choose the park consciously (Kazancıoğlu, 2002).

Comparing gender and comfortableness of the distance between tables, 32% of the women said yes (they feel comfortable), and 68% said no. However 70% of men said yes and 30% said no. Comparing gender and the appropriateness of the distance, %8 of the women said "needs to be decreased", 57% said "needs to be increased" and 35% said "leave them as they are". Moreover, 10% of the men said "needs to be decreased", 46% said "needs to be increased", and 44% said "leave them as they are". According to the answers gender is an important factor in personal space concept. The results obtained from first and second regions were evaluated with correlation and regression analyses. By using correlation analysis, which criterion was in the interaction with each other and which was not determined. The results of the correlation analysis were given in Table 2 and 3 (Kazancıoğlu, 2002).

Table 2. Correlation matrix of first region (to do at the 159 table) (Kazancıoğlu, 2002)

	St	**Or**	**Np**	**Md**	**Tp**
St (Spending time)	-				
Or (Occupancy rate)	-0.560**				
Np (The distance to the nearest person)	0.066	-0.200*			
Md (Maximum distance)	0.326**	-0.671**	-0.044		
Tp (The total number of the persons in the area)	0.034	-0.049	0.119	-0.037	-

** Correlation is significant at the 0.01 level (2-tailed); *Correlation is significant at the 0.05 level (2-tailed).

Table 3. Correlation matrix of second region (to do at the 211 table) (Kazancıoğlu, 2002)

	St	**Or**	**Np**	**Md**	**Tp**
St (Spending time)	-				
Or (Occupancy rate)	-0.596**				
Np (The distance to the nearest person)	0.028	0.223**			
Md (Maximum distance)	0.517**	-0.748**	0.182**		
Tp (The total number of the persons in the area)	-0.013	0.240**	-0.122	-0.089	-

** Correlation is significant at the 0.01 level (2-tailed); *Correlation is significant at the 0.05 level (2tailed).

According to the correlation analysis, all of the criteria are in a relationship with each other and it is described as follows;

- The results of the correlation analysis showed that, staying time and occupancy rate are statistically in a reverse relationship. Briefly, when the occupancy rate increases, staying time decreases.
- Among the occupancy rate and distance to the closest person and maximum distance, there is also reverse relationship found. That means, when the occupancy rate increases, closeness between the persons and maximum distance increases.
- The relationship between maximum distance and staying time is linear and positive and it is statistically significant. This means, when the maximum distance increases, the staying time is also increases.
- The relationship between fill-up ratio and in tables is linear and positive and it is statistically significant. This means, when the number of the people in tables

increases, the occupancy rate is also increases.

According to the results of the regression analysis of the data, a model is generated. The results of the regression analysis:

Table 4. First region regression analysis final table (Kazancıoğlu, 2002)

Dependent variable	Factor and dependent variable	R^2	SH
Md_1	5.626 – 0.187 . Or	0.45	1.00
Md_1	.103 – 0.198 . Or – 0.185 Np	0.48 3	0.99 7

Table 5. Second region regression analysis final table (Kazancıoğlu, 2002)

Dependent variable	Factor and dependent variable	R^2	SH
Md_2	15.728 – 0.723 . Or	0.56	3.04
Md_2	14.875 – 0.746 . Or + 0,59 . Tp	0.568	3.02

The results of the regression analysis for the region 1 are given in table 4, and for the second region they are given in table 9. According to Table 4, if Md and Or are added to the analysis as independent variables, 45% of the variation can be explained by the model. However, if Np was the second independent variable, the variation would be 48.3%. According to Table 5, if Md and Or are added to the analysis as independent variables, 56% of the variation can be explained by the model. But, if Tp was the second independent variable, the variation would be 0.568%. Because there was no significant difference among the coefficients and independent variables, and also the standard deviations of the two equations were quite similar, it can be stated that they are not different. The reason of different coefficients is that first region has 10.5 square meters area and the second one has 25 square meters (Kazancıoğlu, 2002).

For the first region; Md1 = 5,626 - 0,187.Or
For the second region; Md2 = 15,728 - 0,723. Or model is more appropriate.

Variance analysis was carried out; keeping the study areas fixed, and the longest staying period is calculated. The longest staying period was observed in scenic area with 50.5%, 34.8% at borders and 23.1% at passing zone. p= 0,0001<0,05 was found in variance analysis, that means, the average staying time between the regions is statistically significant. The longest staying time found 43% at scenic area, 29% at borders and 28% at passing zone (Kazancıoğlu, 2002).

Discussion

People manipulate the physical environment and prefer to use various distances for social interaction depending on the people around and the activity takes place. Personal space is an important aspect of physical space as a part of the human environment interface. It serves to describe and communicate the requirements for individual privacy and the need for freedom of the person from undesired intrusion by others. In case of the activity analyzed in this study, to prefer space, people would like to attain certain levels of privacy. It can be stated that people feel uncomfortable if they are approached at a distance that they judge as too close. This may increase possible disturbance, then generates a pattern of withdrawal behaviors (Kazancıoğlu, 2002) .

As mentioned earlier, environmental psychologists who consider personal space as a main mechanism, tend to refer to personal space distance. Interpersonal distance informs participant's relationship to others. However, there is a certain influence on the determination of the distance and orientation preferred by the individuals. Personal characteristics of the individual such as age, sex, and education play an important role on interpersonal distance. Characteristics of the other person have also an effect in a social interaction (Kazancıoğlu, 2002) .

Furthermore, the situational variables have an influence on interpersonal distance. Increasing the number of people may cause reductions in the amount of space available for each person. Consequently, the situation is associated with privacy reduction and spatial invasion. The results of this research support that in high density conditions which people are more overwhelmed by the

presence of others than less crowded surrounding. This could be due to invasions on theirs personal space such as they can not be able to attain desired levels of privacy in order to complete their activities. Social density increases as the feeling of being crowded increases and interpersonal distance between subjects decreases. Therefore, people get more annoyed with the presence of others (Kazancıoğlu, 2002) .

Thus, the findings of this research clearly support that when individuals subject to high density conditions, they often respond by increasing withdrawal behaviors as also determined in a previous study (Sommer, 1959). In case, to leave early architectural space or as a far seat behavioral to the full table.

According to Argyle and Cook (1967), the interaction between more than two individual and with the constriction of personal space distance, a proximity observed between individuals in sphere. Also in this study, in the event of constriction of user's personal space boundary, like an early dissociation or hauling from the surrounding would be seen.

Klinge (2001), in an university library which male and female students are found in this surrounding, was observed the attitudes for protecting the personal space (personal privacy). Consequently, due to the sexuality resemblance individual's making the same conducts was seen. Besides, the result of this study supported that female find the gender of the person standing behind more important than male do. This indicates that Turkish female adults are more sensitive to the gender of the person in a social interaction.

Conclusion

In this study, personal space privacy betrayed with an important corresponding human being- environment relation in the landscape design. The different personality characteristics and also different cultural groups all factors upon the personal space distance controled with undertaking.

Sex differences were considered as an important factor on the determination of interpersonal distance preferences. Also, situational variables such as density conditions had an effect on interpersonal distance. Another important factor is effect of the activity on the behavior of people and interpersonal distance between individuals. This study, to be choosen place in architectural space by users, requires certain privacy needs due to the nature of the activity itself (Kazancıoğlu, 2002).

When social density increased, the feeling of being crowded increased and interpersonal distance between subjects decreased. Therefore, people were more overwhelwed by to found in architectural space in high density conditions. This increase in arousal generated a pattern of withdrawal behaviors. This behaviors included to turn back other people, don't eye contact and to sit for place.

Thermore, it was found that the number of the persons in the architectural space has an important role on the perception of space dimensions. As the number of the persons increased, people perceived the space narrower. To be increase distance between the table preventing the personal space invasion, and decreasing the feelings of being crowded. Findings were obtained also about the importance of sex differences on the interpersonal distance preference. It has been found that same sex pairings had smaller interpersonal distance than different sex pairing in the architectural space. For the same sex pairings, male preferred larger distances than females. For different sex pairings, a female's approach to a male was more distant than a male's approach to a male. It can be concluded that, Turkish female adults are more sensitive to the gender of the person in the social interaction defined by this activity (Kazancıoğlu, 2002).

Additionally, research on personal space distance preferences and personal space may be conducted in different public spaces such as restaurants, offices, schools, libraries, and to examine cultural pattern in different social encounters (Kazancıoğlu, 2002).

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