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RESEARCH ARTICLE

Plant-Space Relationship: An Example of Mosque Courtyard

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ABSTRACT

The most important spatial element which helps understanding and defining a place are the type of plants which give a certain character or symbol. Although it is difficult to reveal the perception of space and plant interactions by humans, it can be achieved through experimental studies. In this study, visual impressions of the users in evaluating the perception of plants with spaces were determined by experimental study and the survey technique was used. The study was conducted in Istanbul, and over 500 people including 100 primary school students, 100 secondary school students, 100 high school students, 100 university students and 100 university graduates participated in the survey. In this study, 28 plants, which are frequently seen and familiar with outdoor areas, were used. In this study, it was aimed to reveal the opinions about which of these plants were associated with the mosque courtyard and which characteristic of the plants were emphasized. Gender and educational level differences were investigated and results revealed that gender and educational levels effected participants' preferences. According to the results, flower bushes were preferred primarily for the mosque courtyard, and rose, pine, tulip, violet and buxus plants were preferred as the first choices respectively.

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Introduction

Cities are places with identities and soul (Tekeli, 1991). Places also have identities and soul. The first image presented by the places is a combination of both natural and structural elements; This space is the projection and connotations of us (Kalın, 1997; Williamson, 2001). This is the spatial elements and components that make up the places (Yalım, 2017). The most important of these elements and components are plants (Özbilen and Kalın, 2001). Plants are an important spatial component in terms of understanding our physical environment. Plants form the living structure of open-green areas (Tyson, 1998). It is a well known fact that plants have many contributions to open-green spaces and to the community in aesthetic and functional terms. However, eventhough plants have many contributions to the society from a psychological point of view (Sakıcı, 2014; Söderback et al., 2004), the symbolic meanings of plants are neglected by everyone (Kalın, 1997; Guiraud, 1990). With the help of this study, when plants are used in open green areas, it will be emphasized that plant preference should be made specifically depending on the property of the place. In addition, it will be determined evoke meanings of plants, mental stimulation through these meanings, history revival property of plants and preservation of urban identity with the help of appropriate plant preferences. The relationship between the place and the plant will be revealed, an example of the courtyard of the mosque.

It is important and meaningful to symbolize a place, to recall, to announce, to promote, to embrace the entire scope of that place, such as its history, its special position in the society and its activities (Emin, 2012). That symbol is identical to that place. When it is said the space, it should be

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understood as an icon, when the icon will be seen it should be recognised (Sakıcı, 2017). The symbolic value of the place is also important for the cultural continuity of the place (Tanyeli, 1988). It is argued that plant and spaces can be matched or identified with the help of this study.

Materials and Methods

While it is difficult to determine the perception of space-plant interactions by humans, it is possible to obtain targeted data with the help of experimental studies. In this study, the visual impressions of the users in the evaluation of the perception of plants with the spaces was revealed with an experimental study. For this purpose, the survey technique was used (Özbilen and Kalın, 2001). In order to determine the plants identified with the mosque courtyard, they were asked to write the first three plants in the courtyard of the mosque. In the survey, a table which consist of the visuals and names of the 28 plants which is considered to be the most widely recognized by the public and commonly used in Istanbul was created and the first three plants were determined with the help of this table (Table 1). As a result of the study, the prominent plant species in the courtyard of the mosque, the characteristic features of the prominent plants and the prominent plant dimensions were determined and the plants were identified with the courtyard of the mosque. In addition, chi-square analysis was used to determine whether educational levels and gender differences have an impact on plant space identification. For this research, Suleymaniye Mosque Courtyard in Istanbul was chosen and plant species used in this area were determined and studied.

Table 1. Plants used in the study

Picea (Spruce tree)	*Acacia* (Acacia tree)
Pinus (Pine tree)	*Nerium* (Oleander)
Cupressus (Cypress Tree)	*Olea* (Olive-tree)
Platanus (Plane tree)	*Elaeagnus* (Oleaster Tree)
Salix (Willow tree)	*Robinia* (Round Acacia)
Tilia (Linden)	*Thuja* (Thuja)
Magnolia (Magnolia)	*Buxus* (Boxwood)
Populus (Poplar)	*Euonymus* (Spindle Tree)
Cercis (Redbud Tree)	*Rosa* (Rose)
Lagerstroemia (Needle Tree)	*Tamarix* (Tamarix)
Viburnum (Guelder Rose)	*Bougainvillea* (Bougainvillea)
Jasminum (Jasmine)	*Tulipa* (Tulip)
Lonicera (Honeysuckle)	*Papaver* (Poppy)
Vitis (Grapevine)	*Viola* (Violet)

In the determination of the plants to be used for this study, it was paid attention that the plants consisted of five different measure groups (trees, small trees, bushes, climbers and ground covers) and to be preferred from the plants we often see in our environment. According to their characteristic properties, these plants are divided into nine groups. Table 2 shows these both groupings according to characteristic properties and size of the plants.

Table 2. Grouping of the plants used in the study according to the characteristics properties and size

SIZE OF PLANTS	GROUP NAMES	CHARACTERISTICS PROPERTIES OF PLANTS	PLANTS
TREES	1.Group	Coniferous Trees	Picea, Pinus, Cupressus
	2.Group	Wide Leaf Trees	Platanus, Salix, Tilia, Magnolia, Populus
SMALL TREES	3.Group	Flowering Small Trees	Cercis, Lagerstroemia, Acacia, Nerium
	4.Group	Gray Colored Fruity Small Trees	Olea, Elaeagnus,
	5.Group	Widely Used Tijli Small Trees	Round Robinia
BUSHES	6.Group	Bushes Used for Live Fence	Thuja, Buxus, Euonymus
	7.Group	Flowering Bushes	Rosa, Tamarix, Viburnum, Jasminum
CLIMBER	8.Group	Clinging, Climber Plants	Lonicera, Vitis, Bougainvillea
GRANDCOVER	9.Group	Flowers	Tulipa, Papaver, Viola

Results and Discussion

Demographic Characteristics of Participants

The surveys were conducted on 100 participants from each education level in Istanbul. A total of 500 people were surveyed from primary, secondary, high school, university and university graduates. In total, 299 of the participants were female and 201 were male. Gender distribution by educational level is shown in Table 3.

Recommended Plants for Mosque Courtyard

The distribution of preferences of the all participants according to the different education level of participants is shown in Table 4, in order to determine the plants identified with the mosque courtyard. According to the results, the first 5 most preferred plants for the Mosque Courtyard were rosa (52% preference), pinus (25% preference), tulipa (25% preference), viola (20% preference) and buxus (18% preference). When we look at the distribution of preferences according to education levels, elementary school students rosa (62%), tulipa (38%) and viola (32%), secondary school students rosa (57%), viola (24%) and pinus (23%), high school students rosa (46%), salix (25%) and tulipa (25%), university students rosa (50%), pinus (24%) and platanus (23%), university graduates rosa (45%), pinus (36%) and cupressus (34%) were preferred and the first choice in each education level group was rose. Kalin (1997) was revealed that the most preferred plants for the Mosque Courtyard were Cupressus and Platanus in his study, but in this study, Cupressus and Platanus was preferred in tenth and seventh, respectively.

We divided the plants into 9 groups according to the characteristic properties of the plants. The distribution of preferences according to these groups is given in Table 5. According to the results, the most preferred group were flowering bushes (Group 7) with 342 preference, 274 preferred flowers (Group 9) and coniferous trees (Group 1) with 218

preferences. According to the results of statistical analysis, there was a difference between the preferences of the groups depending on the level of education (p = 0.000) and the primary school students preferred the most flowers for the mosque courtyard (81 Preference), while the secondary school (81 preference), high school (65 Preference) and university students (68 Preference) preferred flowering bushes and university graduates (78 Preference) preferred coniferous trees. There was also a difference between the preferences of the groups depending on the gender (p = 0.004) and the first choice for the mosque courtyard was flowering bushes for both women (198 Preference) and men (144 Preference). Table 6 shows the distribution of preferences depending on gender.

Table 3. Gender distribution according to the educational level of the participants

Educational Level		Primary School	Secondary School	High School	University	University Graduate	Total
Gender	Female	46	44	88	59	62	299
	Male	54	56	12	41	38	201
Total		100	100	100	100	100	500

Table 4. Distribution of plant preferences for mosque courtyard according to educational level

		MOSQUE COURTYARD (p=0,000)					
Number	**Plant**	**Primary School**	**Secondary School**	**High School**	**University**	**University Graduates**	**Total**
1	Rosa	**62**	**57**	**46**	**50**	**45**	260
2	Pinus	21	**23**	21	**24**	**36**	125
3	Tulipa	**38**	22	**25**	21	18	124
4	Viola	**32**	**24**	14	13	15	98
5	Buxus	16	21	14	15	24	90
6	Thuja	16	16	12	20	19	83
7	Platanus	13	17	13	**23**	13	79
8	Vitis	11	21	24	15	8	79
9	Salix	8	11	**25**	17	12	73
10	Cupressus	9	4	10	11	**34**	68
11	Lonicera	7	5	24	11	9	56
12	Papaver	11	16	9	8	8	52
13	Jasminum	11	15	12	10	1	49
14	Cercis	10	2	2	8	9	31
15	Populus	5	4	4	11	4	28
16	Lagerstroemia	7	4	4	6	7	28
17	Bougainvillea	4	6	4	7	4	25
18	Picea	5	1	8	3	8	25
19	Nerium	1	4	4	9	4	22
20	Tamarix	1	5	6	5	4	21
21	Euonymus	5	4	3	2	1	15
22	Magnolia	1	1	2	3	7	14
23	Viburnum	2	4	1	3	2	12
24	Tilia	1	3	2	3	3	12
25	Elaeagnus	2	1	5	1	1	10
26	Acacia	1	3	3	0	1	8
27	Olea	0	2	3	0	2	7
28	RoundRobinia	0	4	0	1	1	6

Table 5. Preference distribution according to the education level of plant groups according to the characteristic properties of the plants for the mosque courtyard

Plant Groups Depending on characteristic property	All		Group										
			Primary School		**Secondary School**		**High School**		**University**		**University Graduates**		
	n	%	n	%	n	%	n	%	n	%	n	%	*p*
7.Group	342	22,8	76	*25,3*	***81***	***27,0***	***65***	***21,7***	***68***	***22,7***	52	*17,3*	
9.Group	274	18,3	***81***	***27,0***	62	*20,7*	48	*16,0*	42	*14,0*	41	*13,7*	
1.Group	218	14,5	35	*11,7*	28	*9,3*	39	*13,0*	38	*12,7*	***78***	***26,0***	
2.Group	206	13,7	28	*9,3*	36	*12,0*	46	*15,3*	57	*19,0*	39	*13,0*	
6.Group	188	12,5	37	*12,3*	41	*13,7*	29	*9,7*	37	*12,3*	44	*14,7*	**0,000**
8.Group	160	10,7	22	*7,3*	32	*10,7*	52	*17,3*	33	*11,0*	21	*7,0*	
3.Group	89	5,9	19	*6,3*	13	*4,3*	13	*4,3*	23	*7,7*	21	*7,0*	
4.Group	17	1,1	2	*0,7*	3	*1,0*	8	*2,7*	1	*0,3*	3	*1,0*	
5.Group	6	0,4	0	*0,0*	4	*1,3*	0	*0,0*	1	*0,3*	1	*0,3*	

Table 6. Preference distribution according to the gender distribution of plant groups according to the characteristic properties of the plants for the mosque courtyard

Plant Groups Depending on Characteristic Properties	Gender				
	Female		Male		
	n	%	n	%	p
Coniferous Trees (1.Group)	143	*15,9*	75	*12,4*	
Wide Leaf Trees (2.Group)	136	*15,2*	70	*11,6*	
Flowering Small Trees (3.Group)	53	*5,9*	36	*6,0*	
Gray Colored Fruity Small Trees (4.Group)	13	*1,4*	4	*0,7*	
Widely Used Tijli Small Trees (5.Group)	3	*0,3*	3	*0,5*	**0,004**
Bushes Used for Live Fence (6.Group)	94	*10,5*	94	*15,6*	
Flowering Bushes (7. Group)	***198***	***22,1***	***144***	***23,9***	
Clinging, Climber Plants (8.Group)	107	*11,9*	53	*8,8*	
Flowers (9.Group)	150	*16,7*	124	*20,6*	

Table 7. Preference distribution according to the education level of plant groups according to the size of the plants for the mosque courtyard

Plant Groups (In terms of size)	All		Group										
			Primary School		Secondary School		High School		University		University Graduates		
	n	%	n	%	n	%	n	%	n	%	n	%	p
Trees	424	28,3	63	*21,0*	64	*21,3*	85	*28,3*	95	*31,7*	***117***	***39,0***	
Small Trees	112	7,5	21	*7,0*	20	*6,7*	21	*7,0*	25	*8,3*	25	*8,3*	
Bushes	***530***	***35,3***	***113***	***37,7***	***122***	***40,7***	***94***	***31,3***	***105***	***35,0***	96	*32,0*	**0,000**
Climber	160	10,7	22	*7,3*	32	*10,7*	52	*17,3*	33	*11,0*	21	*7,0*	
Grandcover	274	18,3	81	*27,0*	62	*20,7*	48	*16,0*	42	*14,0*	41	*13,7*	

The distribution of preferences according to the grouping based on the size of the plants is shown in Table 7. According to the results, bushes (530 Preference) and trees (424 Preference) were more preferred for the mosque courtyard. Preference distributions according to the level of education were shown diversity (p = 0.000), primary, secondary, high school and University prefered bushes, but university graduates preferred trees. Depending on the gender, there was a difference between the preferences of the groups (p = 0.001) and females (292 Preference) and males (238 Preference) were the first group of bushes for the mosque courtyard. Table 8 shows the distribution of preferences depending on gender.

Table 8. Preference distribution according to the gender of plant groups according to the size of the plants for the mosque courtyard

Plant Groups (In terms of size)	Gender				
	Female		Male		
	n	%	n	%	p
Trees	279	*31,1*	145	*24,0*	
Small Trees	69	*7,7*	43	*7,1*	
Bushes	**292**	***32,6***	**238**	***39,5***	**0,001**
Climbers	107	*11,9*	53	*8,8*	
Grandcovers	150	*16,7*	124	*20,6*	

Conclusion

With the help of this work, It was revealed that certain plants were preferred more amongst others for the mosque courtyard. This situation reveals that places can be identified with plants. The best five plants rosa, pinus, tulipa, viola and buxus were preferred for the mosque courtyard and there were differences in preferences according to the education level. However, people with different levels of education first preferred the rosa plant for the mosque courtyard. When we look at the distribution of preference according to the characteristic properties of the preferred plants for the mosque courtyard, firstly 'Flowering Bushes', second 'Flowers' and third 'Coniferous Trees' are preferred.'Widely Used Tijli Small Trees' and 'Gray Colored Fruity Small Trees' are not preferred.

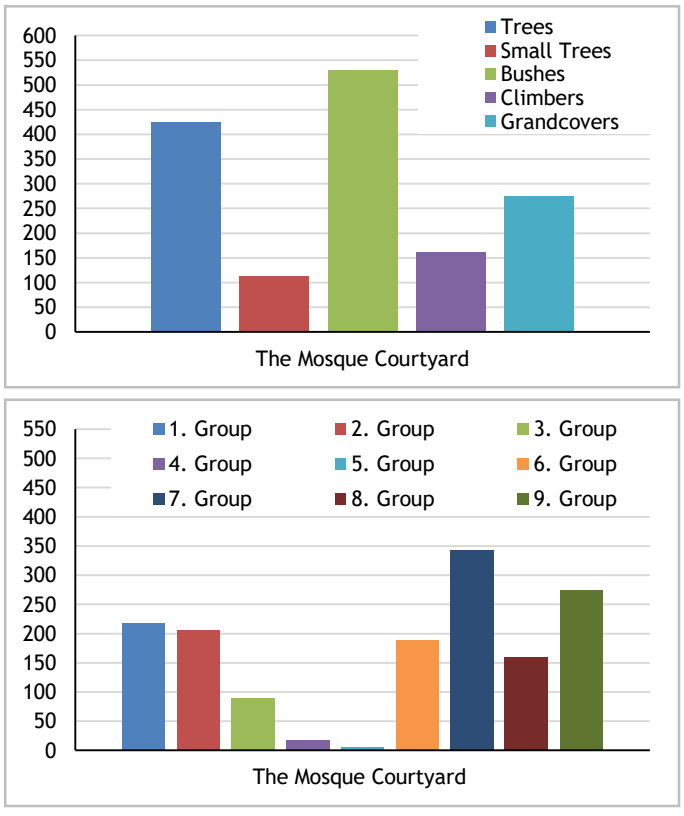

Figure 1. Preferred plants according to its size and characteristic properties for the mosque courtyard

When we look at the plants according to size grouping, respectively bushes and the trees were preferred for the courtyard of the mosque as a result of the study. The distribution of preferences of participants according to groups is shown in Figure 1. In addition, it was determined that the level of education and gender differences create differences in terms of preference distribution in both groups.

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