



Perceptual Evaluation of the Mosque Facades of Different Periods: Preference, Complexity, Impressiveness, and Stimulative

Farklı Dönem Cami Cephelerinin Algısal Değerlendirilmesi:
Karmaşıklık, Beğeni, Etkileyicilik ve Uyarıcılık

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ABSTRACT

It was aimed in this study to determine the effects on the perceptual evaluations of participants for the design differences of mosque facades that were shaped according to periods, countries and architectural trends within the geographical boundaries where the Islamic religion spread. With this purpose, 100 participants treated in 3 groups (Seljukid period, Ottoman period and Turkish Republic Period) were evaluated with the semantic differentiation scale, which covered the variables of preference, complexity, impressiveness and stimulative of the facade visuals of 16 different mosques. In conclusion, the data obtained on the mosque visuals, which were used in the survey study, showed that there was a statistically significant differences among the variables of complexity, impressiveness and stimulative and it was determined that there was a reverse U-shaped relationship between the variables of preference and complexity in the evaluation of mosque. Then, to examine the effect of age, gender and education level on participants evaluations of the mosque visuals, the one-way analysis of variance was applied. Accordingly, it was determined that the male participants displayed a more negative approach compared to female, middle-aged participants (36-50 years of age) compared to young participants (22-35 years of age), participants with higher education compared to participants with secondary education. According to results; the Ottoman period mosques were more complex compared to the others, they were preferred more and found to be even more effective and stimulating.

Keywords: Complexity; impressiveness; mosque facade; perception; preference; social factors.

ÖZ

Bu çalışmada, ülkelere, mimari akımlara ve dönemlere göre farklı olarak yapılmış cami cephelerinin insanlar tarafından nasıl algılandığının irdelenmesi amaçlanmıştır. Bu kapsamda, Osmanlı, Selçuklu ve Cumhuriyet Dönemi olmak üzere 3 farklı gruba ayrılan 16 adet cami cephe görseli, 100 kişi tarafından anket yolu ile analiz edilmiştir. Anketlerde karmaşıklık, beğeni, etkileyicilik ve uyarıcılık olarak seçilen dört farklı sıfat çifti beş basamaklı anlamsal farklılaşma ölçeği ile değerlendirilmiştir. Yapılan analizlerle seçilen değişkenler arasındaki farklılıkların istatistiksel açıdan anlamlı olduğu görülmüştür. Çalışmada cami görselleri üzerinden elde edilen verilerin karmaşıklık, beğeni, etkileyicilik ve uyarıcılık gibi kavramlar arasındaki ilişkisi tespit edilmiş ve beğeni ile karmaşıklık arasında ters U şekilli bir ilişkinin olduğu görülmüştür. Çalışmada yaş, cinsiyet ve eğitim düzeyi gibi sosyal faktörlerin cami algısında ne ölçüde etken olduğunu saptamak için tek yönlü varyans analizi yapılmıştır. Analizlere göre erkek katılımcıların kadınlara göre camilerin algısal değerlendirmesinde daha seçici ya da eleştirel oldukları tespit edilirken, orta yaş (36-50 arası) katılımcıların genç (22-35 arası) katılımcılara göre daha eleştirel olduğu görülmüştür. Benzer şekilde eğitim seviyesinin artması da cami değerlendirmesinde seçiciliği artırmıştır. Çalışmadan elde edilen bulgulara göre, Osmanlı dönemi camilerinin diğer dönemlere ait camilere göre daha kompleks olduğu görülmüş buna rağmen daha çok beğenilmiş ve etkileyici bulunmuştur.

Anahtar sözcükler: Etkileyicilik; karmaşıklık; cami cephesi; algı; tercih; sosyal faktörler.

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Introduction

The studies carried out in the architecture until the 1980's mainly focused on the structural features of the space. Especially after the 1980s, the effects of buildings and interior spaces on persons started to be treated much more psychologically in particular and many studies were made about how the physical attributes of spaces affected the perceptual-behavioral evaluations of persons. In studies (Evans, 2003;¹ Tsunetsugu et al., 2005;² Küller, 2002;³ Kobayash & Sato, 1992;⁴ Noguchi & Sakaguchi, 1999⁵ and Dunn & Hayes, 2000⁶) that were related to the socio-emotional reactions of persons related to buildings and interior spaces, it was observed that the physiological reactions of persons were related one-to-one with the visual environment and the space design.

Perception is an event that can change according to the characteristics of persons. Characteristics, such as the age, educational level, gender, profession, marital status, culture, income level and fields of interest can change the dimension and form of perception of persons who perceive. Furthermore, the different personality structures and psychology of persons can also be the cause of differences in the perception of a space. These personal independent characteristics are concepts that could set forth why and how persons perceive. When all of these factors that change and affect the perception of persons are considered, then it can be observed that it would not be easy to make analyses connected to perception (Akalin et al.(2009⁷, 2010⁸); Gifford (1980);⁹ Imamoğlu (2000);¹⁰ Dube & Morgan (1996)¹¹).

In many studies made for the evaluation of the process of use of architectural spaces, it has been stated that the form of the space, the method and strength of lighting the space, the color of the space, the placement order of furniture and equipment, the density of persons and items, have an important effect in the positive/negative perception of interior spaces (Yildirim et al., 2007a,¹² 2007b;¹³ Aydıntan, 2001;¹⁴ Yamaner, 2001;¹⁵ Küller et al., 2006¹⁶). Furthermore, a large number of scientific studies have been made that examine the differences among the user characteristics on the perception of space (Ayyıldız, 2000;¹⁷ Başkaya et al., 2003,¹⁸ 2005;¹⁹ Yıldırım, 2005²⁰). It has been set forth in these studies that the physical and psychosocial needs of persons could display differences

according to personal characteristics, such as age, gender and education.

With the findings of the perception studies made of the interrogations on the building facade images and on the interior space, it would be possible to design spaces that would increase user satisfaction. Architects should be aware that the space designed is important for the user and the essence of the design should be taken from the daily realities, from the needs, from the feelings and from the habits of persons. Since design is given meaning according to the user, it is necessary for the architect to be able to forecast in advance the emotional reactions formed in the individual, that is, how it would be perceived by the individual, who is the real subject of the design image that is, that are wanted to be formed and the message that the architect wants to give to the design and moreover, that it is also necessary to be able to design this image. On this point, the importance of perception studies increases every day for being able to design buildings and spaces in the direction of the requests and preferences of the users.

Theoretical Background and the Findings of Previous Studies

In the studies mentioned above that are also verified, in the formation of the emotional reaction to a building that would be perceived to a space or from outside in which the individual is found, the environmental and design factors of the space are also effective together with the social factors of the individual. Baytin (1994)²¹ and Füg (1981)²² stated that it is necessary for the architect to know previously what type of influence would be aroused by the image and what type of reaction would be met by the image from the aspect of being able to see what type of impressions would be obtained from geometric forms and that architects can only exist with persons who are able to perceive.

In many studies made on the perception of building facade and space, mostly variables, such as preference, complexity, preference and impressiveness have been used. In some of the studies on the building visuals, the relationships of the parameters, such as being interesting with facade complexity or preference were tested (Berlyne, 1974;²³ Herzog & Shier, 2000;²⁴ Imamoğlu, 2000;²⁵ Stamps, 2003²⁶). A linear relationship was obtained among the variables of complexity and preference in some of these studies (Devlin & Nasar, 1989;²⁷ Kaplan et al., 1972;²⁸ Nasar, 1983²⁹), whereas, in some other studies, a reverse U-shaped relationship was found (Akalin et al., 2009;³⁰ Imamoğlu, 2000;³¹ Berlyne, 1974,³² 1977;³³ Wohlwill, 1968,³⁴

¹ Evans, 2003.

² Tsunetsugu et al., 2005.

³ Küller, 2002.

⁴ Kobayash & Sato, 1992.

⁵ Noguchi & Sakaguchi, 1999.

⁶ Dunn & Hayes, 2000.

⁷ Akalin et al., 2009.

⁸ Akalin et al., 2010.

⁹ Gifford, 1980.

¹⁰ Imamoğlu, 2000.

¹¹ Dube & Morgan, 1996.

¹² Yıldırım et al., 2007a.

¹³ Yıldırım et al., 2007b.

¹⁴ Aydıntan, 2001.

¹⁵ Yamaner, 2001.

¹⁶ Küller et al., 2006.

¹⁷ Ayyıldız, 2000.

¹⁸ Başkaya et al., 2003.

¹⁹ Başkaya et al., 2005.

²⁰ Yıldırım, 2005.

²¹ Baytin, 1994.

²² Füg, 1981.

²³ Berlyne, 1974.

²⁴ Herzog & Shier, 2000.

²⁵ Imamoğlu, 2000.

²⁶ Stamps, 2003.

²⁷ Devlin & Nasar, 1989.

²⁸ Kaplan et al., 1972.

²⁹ Nasar, 1983.

³⁰ Akalin et al., 2009.

³¹ Imamoğlu, 2000.

³² Berlyne, 1974.

³³ Berlyne, 1977.

³⁴ Wohlwill, 1968.

1975;³⁵ Crozier, 1974³⁶). In the study by Berlyne (1977),³⁷ it was set forth that the esthetic pertaining to shape was an important variable of complexity, whereas, the explanation of the reverse U-shaped relationship between complexity and preference was made in the following manner, "As the complexity increases, the form that exists in the correct relationship is not the most complex and the situation that is the medium degree of complexity will be preferred". Berlyne (1974, 1977)³⁸ set forth that the complexity was dependent on the number of elements and with an increase in the number of elements, the level of complexity would increase.³⁹

In the study by İmamoğlu (2000)⁴⁰ that is similar to the approach of Berlyne (1974),⁴¹ it examined the relationship among the concepts of preference, familiarity and complexity in the two-storied 8 traditional and 8 modern housing facades which were each listed from simple appearance towards complexity. In conclusion, the level of complexity, which was listed in a controlled manner, could be perceived by the test participants and it was stated that there was a relationship in a reverse "U" form between complexity and preference. According to İmamoğlu (2000)⁴²'s study, the general pattern of these relationships seemed to be valid for different measures (rating and preference), respondents' background (architecture and non-architecture), and house types (traditional and modern), in spite of some minor differences.

Just as in the study by İmamoğlu (2000),⁴³ in a study by Akalin et al. (2010)⁴⁴ had found same results for modeling 7 mid-rise apartment buildings. The selected buildings as postmodern consumer examples were built by speculative developers after the year 2000. The building facades had been developed three different situations in the form of plain, medium complex and most complex in a computer environment. According to the results of the Akalin et al. (2010),⁴⁵ it was interesting to see that the most complex façades were also the most impressive among all complexity levels, but they were not actually preferred. However in another study by Akalin et al. (2009),⁴⁶ by undergoing an intervention by the user, the situation of "preference-complex" and "impressiveness" of the detached housing examples, there was a relationship in a reverse "U" shape between preference and complexity and that the buildings

having a facade with a medium degree of complexity were preferred even more.

Most of the time, insufficient attention was paid to the educational level in the perception studies made for evaluating the facade and interior space visuals. This situation could stem from the fact that education is such a difficult parameter that it could not be evaluated on its own. Whereas, it is possible to be able to establish a connection between the culture and socio economic level of the individual with educational level, it is clear that the perception of facade and space could change connected to these parameters. In the studies made by Zülkadiroğlu (2013);⁴⁷ Şenyiğit (2010);⁴⁸ İmamoğlu (2000);⁴⁹ Akalin et al. (2009, 2010);⁵⁰ Erdoğan et al. (2010a, 2010b);⁵¹ Yıldırım (2005);⁵² Yıldırım et al. (2015)⁵³ on the perception of building facades and interior spaces, they reached the conclusion that educational level was a significant factor on perception.

Age is another parameter effects the perceptual evaluations. The effect of age on the perception of space was examined in the studies (Holbrook and Schindler, 1994;⁵⁴ Joyce and Lambert, 1996⁵⁵) and it was reported that young persons were more positive in their evaluations compared to elderly persons. Similarly, Wethman (1968),⁵⁶ Royse (1969),⁵⁷ Michelson (1976),⁵⁸ Nasar (1989)⁵⁹ and Gifford (1980)⁶⁰ had found that persons of different ages could perceive buildings differently.

When the gender factor as a different parameter was considered in the literature, it was determined that it was effective on behavioral differences. In the studies İmamoğlu (2000)⁶¹ and Akalin et al. (2009)⁶² made on the building facade visuals, a conclusion was obtained in the perception by females of facades having different levels of complexity. Yıldırım et al. (2011,⁶³ 2014⁶⁴), Dube & Morgan (1996)⁶⁵ and Dinç (2009)⁶⁶ also stated that females are more critical compared to males.

Objective of the Study and Hypotheses

From the studies in the literature made on the subject of perception in architecture, no study at all was encountered other than the study made by Phillips and Russell (2011)⁶⁷ for the perception of the external facades of religious buildings. The study made by Phillips and Russell (2011)⁶⁸ made a perceptual evaluation of the buildings be-

³⁵ Wohlwill, 1975.

³⁶ Crozier, 1974.

³⁷ Berlyne (1977).

³⁸ Berlyne (1974, 1977).

³⁹ U-shaped or N-shaped developmental functions are used for demonstration the relationship between the selected variables. Especially psychologists have intrigued functions patterns for decades because these functions can be easily used for demonstration be-

tween the parameters which have not linear decreasing or increasing relations. These types of functions have been used in perceptual studies in buildings as well.

⁴⁰ İmamoğlu (2000).

⁴¹ Berlyne (1974).

⁴² İmamoğlu, 2000.

⁴³ İmamoğlu, 2000.

⁴⁴ Akalin et al., 2010.

⁴⁵ Akalin et al., 2010.

⁴⁶ Akalin et al., 2009.

⁴⁷ Zülkadiroğlu, 2013.

⁴⁸ Şenyiğit, 2010.

⁴⁹ İmamoğlu, 2000.

⁵⁰ Akalin et al., 2009.

⁵¹ Akalin et al., 2010.

⁵² Erdoğan et al., 2010a.

⁵³ Erdoğan et al., 2010a.

⁵⁴ Yıldırım, 2005.

⁵⁵ Yıldırım et al., 2015.

⁵⁶ Holbrook and Schindler, 1994.

⁵⁷ Joyce and Lambert, 1996.

⁵⁸ Wethman, 1968.

⁵⁹ Royse, 1969.

⁶⁰ Michelson, 1976.

⁶¹ Nasar, 1989.

⁶² Gifford, 1980.

⁶³ İmamoğlu, 2000.

⁶⁴ Akalin et al., 2009.

⁶⁵ Yıldırım et al., 2011.

⁶⁶ Yıldırım et al., 2014.

⁶⁷ Dube & Morgan, 1996.

⁶⁸ Dinç, 2009.

⁶⁹ Phillips and Russell, 2011.

⁷⁰ Phillips and Russell, 2011.

longing to five different religions by 19 different children between the ages of 11-14 living in Northern Ireland.

Whereas, in this study, it was deliberated how the mosques built differently according to the climatic conditions within the geographical boundaries where the Islamic religion has spread, according to periods, countries and architectural movements that have not been treated previously would be perceived by persons and the three basic aims were questioned below:

1) To determine the effect on the perceptual evaluations of participants for the facade attributes of mosques belonging to different periods,

2) To determine in which direction it would support the literature from the aspect of concepts, such as complexity, preference, impressiveness and stimulative by the data obtained on the mosque visuals,

3) To determine the effect of social factors, such as educational level, gender and age of participants in the perception of religious buildings, such as mosques.

It was observed in the literature that the effects on the perceptual evaluations of participants for the facade attributes of mosques belonging to different periods had not been questioned at all up until the present-day. Starting from this point, the research hypotheses constituted for this study have been given below:

Hypothesis 1 (H₁): Participants are expected to perceive and interpret differently the facade attributes of mosques from different periods. Especially, gender and age of participants will cause the differences in perception of façade.

Hypothesis 2 (H₂): There is a reverse U-shaped relationship between the variables of preference and complexity in the evaluation of mosque.

Hypothesis 3 (H₃): Participants with secondary education will perceive and interpret more positively the facade attributes of mosques belonging to different periods compared to participants with higher education.

Method

In this study, it has been aimed to determine the effects on perceptual performance of participants for the mosques used as a space of worship with different designs and which are the symbol of the Islamic religion that is the second largest religion, that has a widespread belief in the world, according to the climatic conditions within the geographical boundaries where the Islamic religion has spread, periods, countries and architectural movements and the shapes treated differently. The selection of the participants, the digital photographs used in the study, the design of the research survey and the statistical evaluation methods have been explained below:

Table 1. General information of participants

General information of participants		n	%
Gender	Male	35	35
	Female	65	65
Age	18-35	68	68
	36-60	32	32
Education level	Secondary education	18	18
	Higher education	82	82

n: Number of participants; %: Percentages.

Selection of the Participants

A total of 100 participants participated in this study that was selected with the random method from among the persons residing in the central settlement region of the city of Konya. Of these 100 participants on which the research survey was implemented, 65 were composed of females, 35 were males, 68 were young participants and 82 were composed of higher education graduates (Table 1). Although equal number of participants were tried to be surveyed considering the age, gender and educational level, there was no equality among the groups. The surveys were obtained in an about two month period during 2015 summer face-to-face interviews with the randomly selected participants. Participants were selected different official staff in Konya.

Selection of the Mosques

In this study, 16 different mosque examples were treated according to modern architectural perceptions, as well as the historical mosques that have lasted from the past to the present-day. The mosque examples taken from Turkey were examined in three sub-groups: The 1st Group was the mosques from the tenth to fourteenth centuries representing the Seljukid architecture, which was a movement constituted by the Seljukid Empire founded within the borders of Turkey (Anatolia) today. The 2nd Group was the mosque examples treated from the Ottoman architecture, which was a movement constituted by the Ottoman Empire that ruled on a rather vast area in the world including the lands of Turkey from the end of the fourteenth century up until the twentieth century. The 3rd Group was the mosques of the modern period from the fall of the Ottoman Empire to the new Republic of Turkey that were taken as the basis. The only parameter in the selection of the mosques was their construction periods. The facade views of a total of 16 different mosques used in the survey study were digital photographs with the dimensions of 130 x 180 mm² that were multiplied in color and with a high quality (600 dpi). The numerical distribution of the mosques separated into 4 different groups has been given in Table 2, whereas, the

Table 2. Numerical distribution of mosque

Group	Mosque group name	Historical period	Sample number
1. Group	Seljukid Architecture	10-14 centuries	5
2. Group	Ottoman Architecture	14-20 centuries	5
3. Group	The New Republic of Turkey Architecture	20 centuries -	6
Total mosque number			16

digital photographs classified according to the periods of the mosques have been given in Figure 1a and 1b.

Design of the Survey and Procedure

The three different hypotheses (H_1 - H_3) of this study were treated in two dimensions according to the four different dependent variables, such as preference, complexity, impressiveness and stimulative and were measured with the assistance of a detailed survey. The surveys found to be valid and reliable in the previous studies made (Berlyne, 1974;⁷¹ Biaggio and Supplee, 1983;⁷² Daroff and Rappoport, 1992;⁷³ İmamoğlu, 2000;⁷⁴ Akalin et al., 2009,⁷⁵ 2010;⁷⁶ Akalin- Baskaya & Yildirim, 2007;⁷⁷ Erdoğan et al., 2010;⁷⁸ Arslan & Ceylan, 2010⁷⁹) were utilized in the design of the evaluation survey of the mosque facade attributes. The survey form consisted of two parts: the first part asked for general information about the participants (age, gender, educational level, etc.); the second part consisted of five-point semantic differential scales about their perception of the facade attributes of the mosques. The participants had to evaluate each of the bipolar adjective pairs on a 1–5 semantic differential scale where 1 = beautiful and 5 = ugly. Related bipolar adjective pairs were designated for each category; for preference: beautiful – ugly; for complexity: simple – complex; for impressiveness: impressive – unimpressive; and for stimulative: stimulating – non-stimulating. The semantic differential scale is an important scale that is not only for measuring a single dimension of the surroundings perceived, it provides the opportunity to measure once many attributes and gives the opportunity to measure objectively the subjective evaluations. The survey data were obtained in an approximately two month period in face-to-face interviews at the homes and places of employment of the participants. The surveys were implemented on the test participants at different times of the day, including during the week and on the weekend. The test participants completed the survey in approximately 20 minutes (Sample of the survey is given in appendix).

⁷¹ Berlyne, 1974.

⁷² Biaggio and Supplee, 1983.

⁷³ Daroff and Rappoport, 1992.

⁷⁴ İmamoğlu, 2000.

⁷⁵ Akalin et al., 2009.

⁷⁶ Akalin et al., 2010.

⁷⁷ Akalin- Baskaya & Yildirim, 2007.

⁷⁸ Erdoğan et al., 2010.

⁷⁹ Arslan & Ceylan, 2010.

Statistical Analysis

In this study, the “perceptive evaluations of the facade attributes of mosques” by the participants were accepted to be “dependent variables”. There are many factors that affect the perceptions for the facade attributes of the mosques by the participants. Whereas, of these factors, “mosques belonging to different periods”, “age”, “gender” and “education” were accepted to be “independent variables”. These four independent variable that were defined were grouped in the following manner: X1: Facade features of the mosques (Seljukid period, Ottoman period and The Republic Period (Modern Turkish Period), X2: Age (18-35 / 36-60), X3: Gender (Female, Male) and X4: Education (Secondary Education, Higher Education). The percentage values, the arithmetic averages and standard deviations of the data obtained in the study were calculated. The Cronbach alpha reliability tests were made for the data and the one-way analysis of variance (ANOVA) was made for testing whether or not the differences among the dependent and independent variables were statistically significant at a levels of $p < 0.01$, $p < 0.05$ and $p < 0.10$. Tukey’s HSD test was used for being able to compare with each other the variables found to be significant in the analysis of variance.

Results

In this study, the facade attributes of some important mosques belonging to different periods (Seljukid period, Ottoman period and Turkish Republic Period) were evaluated according to the adjective pairs of preference, complexity, impressiveness and stimulative. Furthermore, it was also questioned whether or not the general appearances of the mosques represented the Islamic religion and the degrees of arousing curiosity. With this objective, a total of 16 each mosque photographs were used in the study with a minimum of 5 each mosque photographs from each group and the results obtained from the participants with the aid of a survey have been given below:

The Perceptual Evaluations of the Participants

The reliability of the semantic differentiation scale that included the perceptual evaluations of the participants for the facade attributes of the mosques was tested with the

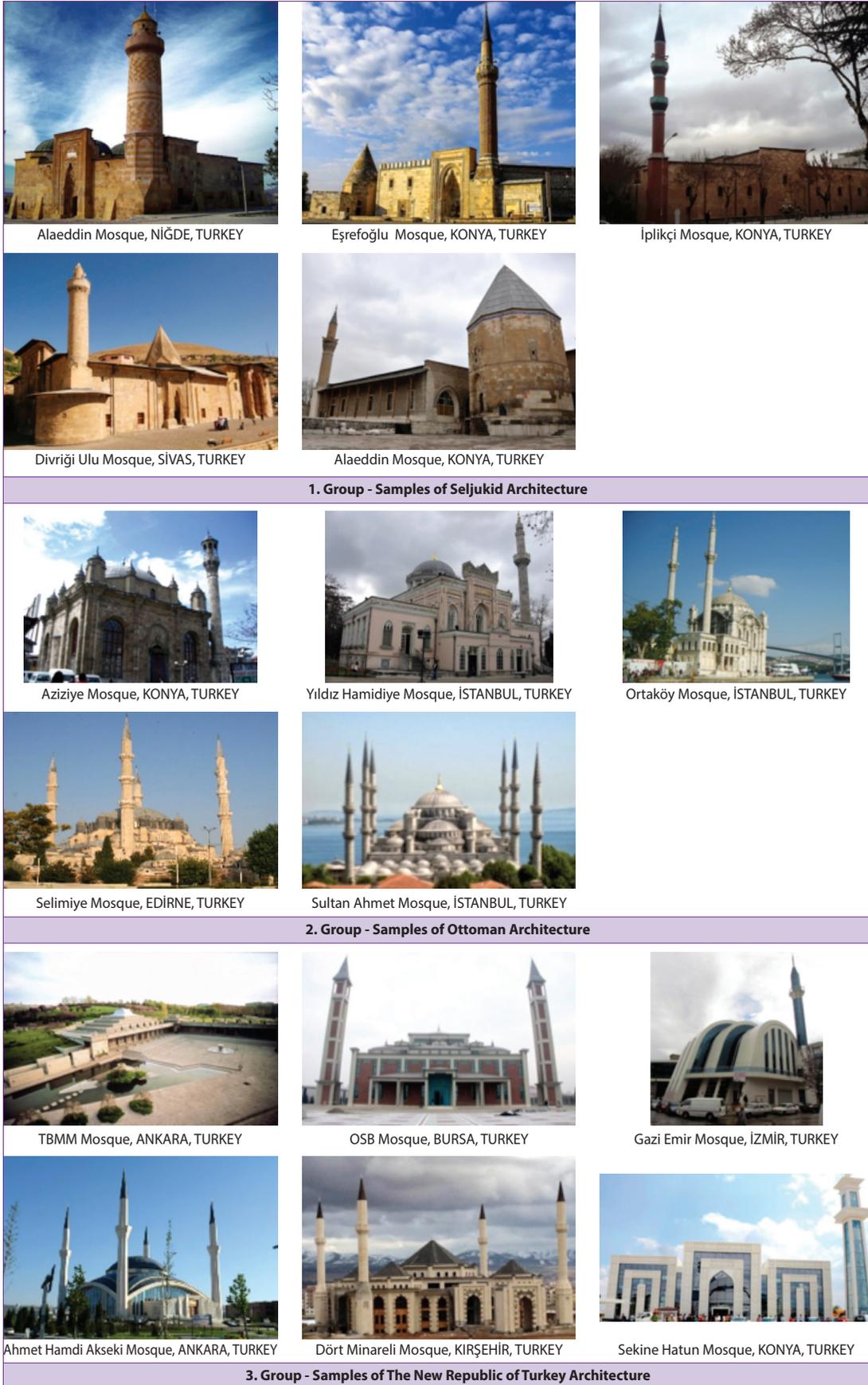


Figure 1. The digital photographs classified according to the periods of the mosques

Table 3. Results of reliability analysis of the dependent variables

Dependent variables	Scale items	Item reliability	Scale reliability
Preference	Beautiful - Ugly	0.86	0.88
Complexity	Simple - Complex	0.88	
Impressiveness	Impressive - Unimpressive	0.81	
Stimulative	Stimulating - Nonstimulating	0.83	

For each dependent variable, the scale reliability is provided.

Table 4. Means, standard deviation and homogeneous group values of the dependent variables regarding the mosque facades

Dependent variables	Mosque Groups								
	Seljukid Architecture			Ottoman Architecture			The New Republic of Turkey Arch.		
	M ^a	SD	HG	M	SD	HG	M	SD	HG
Preference	2.36	1.00	C	1.48	0.65	A	3.02	1.18	D
Complexity	1.70	1.10	C	2.95	1.00	A	1.63	1.06	C
Impressiveness	3.01	1.09	C	1.72	0.85	A	3.37	1.09	D
Stimulative	3.07	1.15	C	1.80	0.90	A	3.28	1.25	D

M: Mean; SD: Standard Deviation; HG: Homogeneous Group. a: Variable means ranged from 1 to 5, with higher numbers representing more negative responses.

Cronbach alpha and the results have been given in Table 3. The Cronbach alpha reliability coefficient for all of the adjective pairs used in the study was 0.88. In the studies made previously, scale coefficients above 0.70 were accepted to be reliable (Nunnally, 1978;⁸⁰ Kaplan & Saccuzzo, 2009;⁸¹ Bagozzi & Yi, 1988;⁸² Bosma et al., 1997;⁸³ Grewal et al., 1998⁸⁴). This scale was found to be reliable within this scope.

In this part, the differences among the perceptual evaluations for the facade attributes of the mosques (Seljukid period, Ottoman period and Turkish Republic Period) according to the dependent variables of the participants were tested statistically. Accordingly, the average and standard deviation (SD) values of the dependent variables collected in 4 groups (preference, complexity, impressiveness and stimulative) were determined and the results have been given in Table 4. Furthermore, the homogeneity groups (HG) were determined with Tukey’s HSD test for comparing the average values belonging to the differences among the facade attributes of the mosques.

When the average and homogeneity group values of all of the dependent variables were considered in Table 4, it was observed that the participants preferred the Ottoman period mosques better than the other mosques,

they found the Seljukid period and Turkish Republic Period mosques to be less complex and once again, they found the Ottoman period mosques to be much more effective and more stimulative compared to the other mosques. For the complexity variable, the preferences were listed as follows from slightly complex (plain) to very complex: Turkish Republic Period = Seljukid Period > Ottoman Period. The differences among the independent variables covering the facade attributes of the mosques were tested with the one-way analysis of variance (ANOVA) test (Table 5). Accordingly, the differences among the independent variables at the level of $p < 0.001$ were found to be significant for the dependent variables of “preference”, “complexity”, “impressiveness” and “stimulative”.

The graphical expression of the average values for the perceptual evaluations of the facade attributes of the mosques by the participants have been given in Figure 2. Accordingly, the preference, complexity, impressiveness and being stimulative values displayed differences according to the facade attributes of the mosques. This result supports the hypothesis previously proposed in H1.

The graph of the preference, impressiveness, and stimulative variables given in figure 2 showed the change in the same direction to each other of the average values for the perceptual evaluations of the facade attributes of mosques for each period and this showed that there was a parallel relationship among these three variables. The graph given in Figure 2 showed that there is a reverse

⁸⁰ Nunnally, 1978.

⁸³ Bosma et al., 1997.

⁸¹ Kaplan & Saccuzzo, 2009.

⁸⁴ Grewal et al., 1998.

⁸² Bagozzi & Yi, 1988.

Table 5. ANOVA results of the dependent variables in terms of the mosque facades

Dependent Variables		Sum of Squares	df	Mean Squares	F	Results
Preference	Between Groups	641.973	2	320.987	330.054	0.000*
	Within Groups	1553.124	1597	.973		
	Total	2195.098	1599			
Complexity	Between Groups	576.529	2	288.265	257.479	0.000*
	Within Groups	1787.948	1597	1.120		
	Total	2364.478	1599			
Impressiveness	Between Groups	798.915	2	399.457	377.689	0.000*
	Within Groups	1689.045	1597	1.058		
	Total	2487.960	1599			
Stimulative	Between Groups	669.718	2	334.859	265.294	0.000*
	Within Groups	2015.766	1597	1.262		
	Total	2685.484	1599			

* α : 0.001 is the level of significance.

U-shaped relationship between the “complexity” variable and other three variables (preference, impressiveness, and stimulative) that act in a parallel direction to each other. This result supports the hypothesis previous proposed in H2. When the perceptive degrees (slight, average and very complex) of “complexity” for the facade attributes of mosques for each period by the participants were taken into consideration, it was observed that the “complexity” values of the mosque facades of the Seljukid and Turkish Republic periods were the same. These results showed that the Ottoman period mosques, which were perceived to be very complex, were much more effective and preferred compared to the other mosques. Hence, the conclusion can be reached that the complex facade character did not negatively affect the preference of the mosque. Despite the fact that the Ottoman period mosques included a large number of domes, symmetrical plan and had a pyramid-shaped form, the fact that there were many minarets and the use of an upper cover with domes, they could have increased to a significant extent the levels of impressiveness and preference. On the other hand, it was observed that the participants evaluated the World mosque examples

as medium complex and the mosques of the Seljukid and Turkish Republic periods as slightly complex (plain).

The differences among the perceptual evaluations for the facade attributes of mosques according to the age, gender and educational of the participants were tested statistically and the average and standard deviations values of the results obtained have been given in Table 6, whereas, the graphical expressions have been given in Figures 3, 4 and 5, respectively.

Table 6 shows that it is determined that differences among the perceptual evaluations of the facade attributes of the mosques varies according to the various age (22-35, 36-50), gender (female, male) and education groups (secondary, higher). From the evaluation of the means it can be seen that younger participants, males, and secondary educated participants have a more positive perception of the facade attributes of the mosques than older participants, females and higher educated participants. Interestingly, younger participants, males and lower educated participants have similar minimum and maximum values on the perception of the facade attributes of the mosques (Figure 3, 4 and 5).

As can be observed in Figure 3, young participants (22-35 years of age) received the lowest values (positive) for each of the complexity, impressiveness and stimulative variables, while middle-aged participants (36-50 years of age) received the highest values (negative) for three dependent variables. Consequently, the mosques’ facade attributes complexity ($F=11.012$, $df=1$, $p<0.006$), which form the dependent variable, was found to be significant (at the $p<0.01$ level). However, a difference was not observed between the preference evaluations. This result supports the results obtained from similar studies (Joyce & Lambert, 1996; Holbrook & Schindler, 1994; Yıldırım, 2005; Yıldırım et al., 2007a; Yıldırım et al., 2015) made

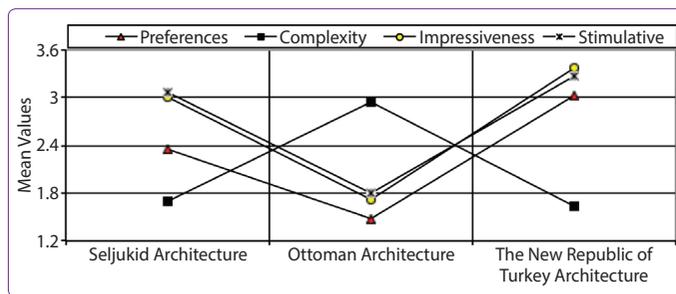


Figure 2. The graphical expression of the average values for the perceptual evaluations of the facade attributes of the mosques by the participants (Note: Variable means ranged from 1 to 5, with higher numbers representing more negative responses).

Table 6. Means and standard deviation values of the dependent variables according to age, gender and educational of participants

Dependent Variables	Age				Gender				Education Level			
	22-35		36-50		Female		Male		Secondary		Higher	
	M ^a	SD	M	SD	M	SD	M	SD	M ^a	SD	M	SD
Preference	2.33	1.18	2.33	1.14	2.36	1.16	2.32	1.17	2.31	1.16	2.36	1.17
Complexity	2.82	1.21	2.99	1.21	2.92	1.21	2.95	1.21	2.98	1.23	2.90	1.19
Impressiveness	2.73	1.25	2.77	1.24	2.79	1.22	2.71	1.25	2.64	1.25	2.85	1.23
Stimulative	2.74	1.31	2.77	1.26	2.77	1.28	2.74	1.30	2.60	1.30	2.89	1.27

M: Mean; SD: Standard Deviation; HG: Homogeneous Group. a: Variable means ranged from 1 to 5, with higher numbers representing more negative responses.

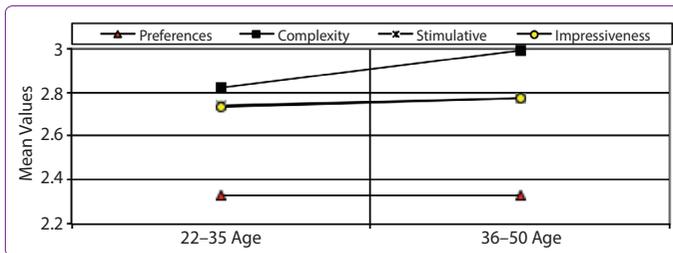


Figure 3. Effects of age level of the participants to the dependent variables (Variable means ranged from 1 to 5, with higher numbers representing more negative responses).

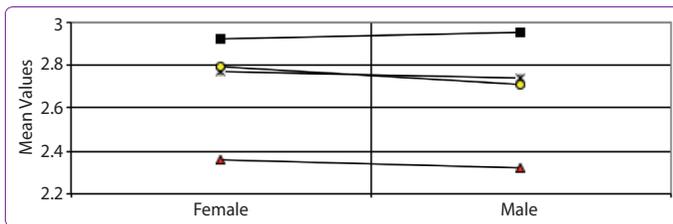


Figure 4. Effects of gender of the participants to the dependent variables (Variable means ranged from 1 to 5, with higher numbers representing more negative responses).

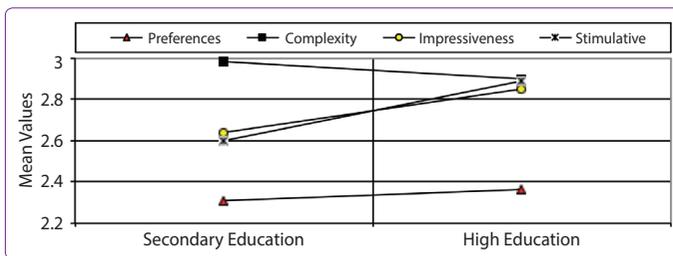


Figure 5. Effects of education level of the participants to the dependent variables (Variable means ranged from 1 to 5, with higher numbers representing more negative responses).

previously and the hypothesis proposed in H1.

According to the Figure 4, male participants received the lowest values (positive) for each of the preference, impressiveness and stimulative variables, while female participants received the highest values (negative) for two dependent variables. However, there was no statistically

significant difference between the variables at $p < 0.05$ level. This result for the impressiveness and stimulative variables supports the results obtained from similar studies (Stamps & Nassar, 1997; Imamaoglu, 2000; Akalin et al, 2009) made previously on building facades and the hypothesis proposed in H1.

As can be observed in Figure 5, the participants with secondary education received the lowest values (positive) for each of the dependent variables, while the participants with higher education received the highest values (negative) for three dependent variables. Consequently, the mosques' facade attributes impressiveness ($F=11.411$, $df=1$, $p<0.001$) and stimulative ($F=20.095$, $df=1$, $p<0.001$), which form the dependent variables, were found to be significant (at the $p<0.001$ level). However, a difference was not observed between the preference and complexity evaluations. This result supports the results obtained in similar studies (Yıldırım, 2005; Yıldırım et al., 2015; Zülkadiroğlu, 2013; Şenyiğit, 2010) made previously and the hypothesis proposed in H3.

Discussion and Conclusion

In this study, it was aimed: (1) to determine the effect on the perceptual evaluations of persons on the facade attributes of mosques belonging to different periods, (2) to compare with the literature the results obtained for the variables of preference, complexity, impressiveness and stimulative on the mosque visuals, (3) to determine whether or not social factors, such as age, gender and educational level, were a factor in the perception of mosques and the results obtained have been treated below.

- It was determined that the average values for impressiveness and stimulative in the perceptual evaluations for the facade attributes of mosques by the participants were very close to each other and that they displayed change in the same direction. This result also set forth that the variables of "impressiveness" and "stimulative" for the mosques that are the subject of the study could be thought of as a single concept.

• On the other hand, the graph of the “preference” variable followed a course in a parallel direction with the “impressiveness” and “stimulative” variables, but it was observed that the average values of the “preference” variable were realized in a more positive direction compared to the “impressiveness” and “stimulative” variables. In conclusion, the fact that the average values of the “impressiveness” and “stimulative” variables were higher (negative) than the “preference” variable for each period, showed that these variables could be one each sub-concept of the “preference” variable. Previously, the theory proposed by Akalin et al., (2010)⁸⁵ and Çapanoğlu (2014),⁸⁶ “the preference and the impressiveness variables have a parallel effect on the perception of environmental conditions” supports the results of this study.

• Another result of the study showed that there was a reverse U-shaped relationship between the “complexity” variable and other three variables (preference, impressiveness, and stimulative) that act in a parallel direction to each other. This conclusion does not support the theory previously expressed by Devlin and Nasar (1989),⁸⁷ “there is a positive linear relationship between perceived impressiveness and perceived complexity”.

• When the degrees (slight, medium or very complex) of perceiving “complexity” by the participants were considered for the facade attributes of mosques for every period, then it was observed that the “complexity” values for the facades of mosques for the Seljukid and Turkish Republic periods were low and close to each other. On the other hand, it was determined that the facade attributes of the Ottoman period mosques, which were found to be the most complex compared to the others, were found to be preferred a lot, to be more effective and stimulating. From these results, the conclusion can be reached that the complex facade character did not affect negatively the liking of the mosques. Despite the fact that the Ottoman period mosques included a great number of domes, had a symmetric plan, and had a pyramid shape, the fact that there were many minarets, and that they had an upper cover with domes were perceived to be complex, it could have increased to a significant extent their levels of impressiveness and preference.

• It was observed that another result was that the participants evaluated the Ottoman period mosques as very complex and the Seljukid and Turkish Republic period mosques as slightly complex (plain). This result does not support the theory expressed previously by Kaplan et al. (1972),⁸⁸ Devlin & Nasar (1989)⁸⁹ Çapanoğlu (2014),⁹⁰ Krupinski and Locher (1988),⁹¹ Nicki et al. (1981),⁹² Nasar,

1983⁹³ and Stamps (2002)⁹⁴ “there is a positive linear relationship between preference and complexity”.

• However, in contrast to these, in the studies made previously by Berlyne (1974),⁹⁵ Imamoglu (2000)⁹⁶ and Akalin et al. (2009),⁹⁷ which are the foundation of the H2 hypothesis, they expressed that a low and high degree of complexity decreases preference and a medium degree of complexity increases preference does not support the theory that there is a reverse U-shaped relationship. In this study, such a relationship was found and the results were obtained in the form of reverse U-shaped relationship.

• On the other hand, in the study by Frewald (1989)⁹⁸ it was expressed that historical buildings were preferred more compared to new / modern buildings. Similarly, in the studies by Herzog & Gale (1996),⁹⁹ in case maintenance was made on buildings, then it was set forth that old buildings were preferred even more compared to new buildings. Once again, Day (1992),¹⁰⁰ Nasar (1983),¹⁰¹ Stamps (1991¹⁰²; 1994¹⁰³) and Widmar (1984)¹⁰⁴ stated that in case buildings had excessively complex and visual richness, then it increased their preferability. According to the findings of this study, the fact that the Ottoman period mosques were the most complex and most preferred mosques, supported the studies made above on the perception of space and facade in the literature.

• Another result obtained from this study showed that social factors, such as age of the participants were one each significant parameter in the perception of the facade attributes of mosques. For example, it was observed that young persons (22-35 years of age) displayed a more positive approach in the perceptual evaluations for the facade attributes of mosques compared to middle-aged persons (36-50 years of age). This result supported the results obtained in similar studies (Joyce & Lambert, 1996;¹⁰⁵ Holbrook & Schindler, 1994;¹⁰⁶ Yıldırım, 2005;¹⁰⁷ Yıldırım et al., 2015¹⁰⁸) made previously.

• Furthermore, it was observed that females had a more positive approach in the evaluations of impressiveness and stimulative for the facade attributes of mosques compared to males. This result does not support the results obtained in similar studies (Imamoglu, 2000;¹⁰⁹ Akalin et al., 2009¹¹⁰) made previously on building facades for the impressiveness and stimulative variables. This situation could stem from the fact that the mosque users are gener-

⁸⁵ Akalin et al., 2010.

⁸⁶ Çapanoğlu, 2014.

⁸⁷ Devlin and Nasar, 1989.

⁸⁸ Kaplan et al. (1972).

⁸⁹ Devlin & Nasar (1989).

⁹⁰ Çapanoğlu (2014).

⁹¹ Krupinski and Locher (1988).

⁹² Nicki et al. (1981).

⁹³ Nasar, 1983.

⁹⁴ Stamps (2002).

⁹⁵ Berlyne (1974).

⁹⁶ Imamoglu (2000).

⁹⁷ Akalin et al. (2009).

⁹⁸ Frewald, 1989.

⁹⁹ Herzog & Gale, 1996.

¹⁰⁰ Day, 1992.

¹⁰¹ Nasar, 1983.

¹⁰² Stamps, 1991.

¹⁰³ Stamps, 1994.

¹⁰⁴ Widmar, 1984.

¹⁰⁵ Joyce & Lambert, 1996.

¹⁰⁶ Holbrook & Schindler, 1994.

¹⁰⁷ Yıldırım, 2005.

¹⁰⁸ Yıldırım et al., 2015.

¹⁰⁹ Imamoglu, 2000.

¹¹⁰ Akalin et al., 2009.

ally male, that the mosque is not a living space and from religious sensitivities.

• In addition to these, it was observed that persons with secondary education generally displayed a more positive approach in the perceptual evaluations for the facade attributes of mosques compared to persons with higher education. This result supports the results obtained in similar studies (Yıldırım, 2005;¹¹¹ Yıldırım et al., 2015;¹¹² Zülkadiroğlu, 2013;¹¹³ Şenyiğit, 2010¹¹⁴) made previously.

The summary of the results obtained in this study have been given below:

1) The data obtained on the mosque visuals, which were used in the survey study, showed that there was a statistically significant differences among the variables of complexity, preference, impressiveness and stimulative.

2) The subject concepts could be used in the evaluation of mosque visuals. From the mosque visuals, reverse U-shaped relationship was obtained between preference and complexity.

3) It was found that social factors, such as age, gender and educational level had a significant effect on the perception of mosques. In contrast to the literature, it was determined that male participants were more selective or critical in the perceptual evaluation of mosques compared to females.

4) Mosques constructed in different periods were perceived and evaluated differently by persons. The conclusion was reached that of the mosque groups questioned, despite the fact that the Ottoman period mosques were more complex compared to the others, they were preferred more and found to be even more effective and stimulating.

The effects on different cultural groups for the facade attributes of mosques could be researched in similar studies that would be made in the future.

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¹¹¹ Yıldırım, 2005.

¹¹³ Zülkadiroğlu, 2013.

¹¹² Yıldırım et al., 2015.

¹¹⁴ Şenyiğit, 2010.

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