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Perceptual Evaluation of Traditional Turkish House Façade

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Abstract

Purpose

This study aimed to make a comparative evaluation of the differences between the original façade (original) and the modified façade of the traditional Turkish Houses (collected from Afyonkarahisar city) based on perception.

Design/Methodology/Approach

In line with this purpose, digital images of eight sets of original and modified street silhouettes with gray color scales have been produced on the computer. Two different groups consisting of 80 people (architect and non-architect group) have evaluated the prepared images by the semantic differentiation scale consisting of the adjective pairs. The main hypothesis of the study is "The original façade would be more preferred than the modified façade". Also, gender, architect and non-architect group comparisons were made in the evaluations, too.

Findings

The results have shown that the participants liked the original traditional Turkish House façade more. The tidy/untidy and proportional/non-proportional adjective pairs have had the biggest difference in this evaluation. In another result, male participants have evaluated the traditional Turkish House façade views liked more for all dependent variables except for familiar / unfamiliar and qualified / unqualified adjective pairs compared to female participants. In addition, non-architects have liked more than architects the façade views of traditional Turkish Houses for adjective pairs that are beautiful / ugly, not impressive / unimpressive and interesting / uninteresting. On the other hand the architects have liked more than non-architects the façade view of traditional Turkish Houses for the proportional / non-proportional adjective pair.

Research Limitations/Implications

This study has been conducted only for Turkish Houses collected from Afyonkarahisar city. In addition, only architects and non-architects group attended for evaluation of the surveys.

Social/Practical Implications

According to the most important finding obtained from the study, the fact that the original state is observed in the restoration of traditional Turkish Houses has caused people liked it more. Similarly, it has been observed that the organization of windows, solid-void relationship ratio, repetitions, horizontal and vertical structural elements (beams etc.) in the Turkish house façade characteristic will have a positive effect on perception.

Originality/Value

With this study, for the first time in the literature, the evaluation of holistic (comprehensive) street silhouettes was made based on a single façade layout.

Keywords: *Traditional Turkish House, Façade, Perception, Street silhouette, Modified, Profession.*

INTRODUCTION

In architecture, the façade means the main face of the entrance to the building and it varies in details according to the society and culture that live in. Another definition of façade; is the surface where the building has a dialogue with the urban space and its surroundings. Façade is also the interface between the building, space and the urban space. Bauer (1965), Le Corbusier (1965), Arnheim (1977), Venturi (1977), Klotz (1988), Frampton (1992), Krier (1992) and Şenyiğit and Altan (2011) reported that city users rather understand the façade by a formal composition and they mentioned that it constitutes the language of a city in terms of the meanings they carry. According to Krier (1992), façade is one of the important architectural elements that have a communication capacity with not only the interior space and the inhabitants of the building, but also its surrounding environment. Rasmussen (1962) states in her study that the buildings will be evaluated with their external appearance. The perception comes into play in expressing the façade of the city users. Human is a perception, cognition and behavior mechanism (Rapoport, 1977; Arslan, 2010). Perception, cognition and behavior are central to the human - environmental experience. Perception, in the simplest sense, is to have information from an environment through stimulation.

In scientific studies carried out in this field, it is reported that the levels of "likes" and "satisfaction" are increased if the physical environmental conditions in the architectural spaces are arranged according to the wishes and needs of the users. In these studies, it is stated that the architectural form of the space, the shape and color of the lighting, the layout of the furniture and fittings, and the density of human and furniture may have a positive / negative effect on the perception of the physical environmental conditions (Yamaner, 2001; Aydıntan, 2001; Küller et al., 2006; Yıldırım et al. 2007a; Yıldırım et al. 2007b). On the other hand, some studies have suggested that the physical and psycho-social needs of people may differ according to their demographic characteristics such as age, gender and education (Ayyıldız, 2000; Başkaya et al., 2003, 2005; Yıldırım, 2005; Yıldırım et al. 2007b). Besides the perception of the interior space, in many studies different researchers (Gifford et al., 2000, 2002; Akalın et al., 2009, 2010; Şenyiğit, 2010; Zülkadiroğlu, 2013) have evaluated the effects of the differences between the user characteristics on the perception of the façade, in recent years.

Dependent variables such as likes, complexity, preferences and impressiveness were used more in the studies on the perception of the building façade and interior space. In some of the studies (Berlyne, 1974; Imamoglu, 2000; Herzog and Shier, 2000 and Stamps, 2003), the façade complexity and other parameter relations such as impressiveness or liking (pleasantness) were tested over the building visuals, while in other studies (Wohlwill, 1968, 1975; Kaplan et al., 1972; Berlyne, 1974, 1977; Crozier, 1974; Nasar, 1983; Devlin and

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Nasar, 1989; Akalın et al., 2009), the relationship between the variables of complexity and preference was questioned. In addition, in the study of Şenyiğit (2010), she developed a different approach to the formal and semantic expression of street façades formed by buildings designed in an adjacent order.

Façade; a reflection of the building's function is an indication of the cultural situation of the building at the time when it was built. Façades are historical scenes where the cultural change of societies can be observed with a different interpretation. Therefore, it is especially important to preserve the facades of historical buildings and to restore them as true to their originals as possible. Thus, the social and cultural sustainability of the buildings is ensured.

Different countries have their own architectural buildings and trends that show periodic differences. For Turkey, the concept of a traditional Turkish House has an important place in terms of architecture. The façades applied in traditional Turkish houses have a very unique structure. There is a direct relationship between the plan schemes of the houses and their façade arrangements. The projection shapes on the façade are especially composed of large inner spaces on the second floor. However, although it changes depending on the climatic conditions, there is a direct proportion between the number of windows and the size of the space they belong to in generally hot climates. The land structure and geographical features of the region where Turkish Houses are located are extremely influential in the number of floors and locations. Generally, the houses facing the landscape are built southward as far as the residential area allows. In some terrestrial areas, courtyard and large garden applications are not encountered, while some examples are quite small, but side or backyard applications are encountered. Façade projections are generally smooth, parallel to the façade. The main façades of the buildings are facing the road and are formed in the width of the parcel border. Generally, two and three-story application is dominant in traditional Turkish houses (Eldem, 1954; Hacıbaloğlu, 1989 and Küçükerman, 1996). Due to the slope of the land, some buildings can be accessed from both the ground floor and the second floor level located at the upper level. The ground floor of the buildings is mostly reserved for service spaces. In addition, there are examples whose ground floor is entirely used for commercial purposes. The most characteristic element of the façade arrangement is the projections. It is quite common for Turkish Houses that are built adjacent to the road axle to have smooth façades and miter projections. In façade projections, wooden floor beams are extended from the ceiling of the ground floor towards the road axle. In façade arrangements, a plain and simple application usually draws attention. The horizontal and vertical wooden belts at the corners of the main mass and projections are the most important aesthetic element in plastered and whitewashed façades. On the lower edges of the projections, also in the same plane with the floor separations on straight façades, there are horizontal

wooden belts at the floor level and pillars emphasizing the corners. The most important visual effect in the façade layout is the window types and shutter or lattice (truss) applications. It is seen that the ½ aspect ratio is used in windows in traditional applications and the rectangular window type, where guillotine type window joinery is common and widely preferred. On the traditional Turkish House façades, the entrance, eaves overhang, window and door designs of the houses, the timber beams (ridge plates) that determine the floors, cihannüma (roof top floor), angle braces, the wrought iron and timber cages in the windows are the remarkable elements that activate the façade. The golden ratio rectangular windows and bay window arranged according to the principle of spaced repetition in the traditional Turkish House are the most characteristic features. In the façade layout, wide canopies draw attention according to the climate type of the region. Generally, part or all of the second floors of Turkish Houses form a cantilever. The simplest and most common form of projection is the closed overhangs that are extended over the main entrance located in the middle of the façade.

It was stated in the International Council of Monuments and Sites (ICOMOS) in (2013), that the architectural heritage of Turkish houses, is one of the most important components of cultural heritage. This International Council emphasizes the importance of revealing aesthetic and cultural values without damaging the qualities that make up the originality and identity of this architectural design. Therefore, Turkish houses are needed to be protected, covering a wide period both with their interior features and façade details. There are many scientific researches in the literature with functional and aesthetic values, suitable for the human size, with its interior fittings, which can be obtained with information about the lifestyle of the society with its plan schemes concerning traditional Turkish Houses (Eldem, 1954; Hacıbaloğlu, 1989; Küçükerman, 1996; Bektaş, 1996; Burkut, 1998; Göker, 2009; Dursun, 2012; Göğebakan, 2015 and Özel, 2019). In addition to the functional features of the traditional Turkish House, some studies have also carried out on the original façade details (Baran & Yıldırım, 2008; Divleli, 2008; Ürer, 2013 and Gümüş, 2019). However, according to authors' knowledge although there are some studies about perceptional evaluation of buildings façades, there are limited scientific studies in the literature regarding the façade arrangements of historical patterns in Turkish House.

1.1. Previous Empirical Findings

The value represented by the façades can be changed or be perceived differently by the user. Many factors are important in the perception of the building facade. In Arsheim's book "The Dynamics of Architectural Form" (1977), one of the main sources on this subject; he says that the viewer's perception and cultural background are important in reading the building façade as a visual text. Similarly Kevin Lynch's book "The

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Image of the City" gives alseo some clues on the perception of urban elements on an upper scale with emphasizing the human-environment interaction.

Façades have physical, sociological and / or psychological representations. Imamoğlu (2000) mentioned these effects of building façades and stated that the memorable part of the building is the façade. The building façade often reflects the real identity of the building. Huxtable (2004), Hayashi (2004), Kong and Yeoh (2004) Hui (2007) emphasized the importance of the building façade especially in urban perception. Similarly, studies on the effects of building façade appearance on perceptual evaluations were made (Robbins and Langton, 1999; Gifford et al., 2000; Brown and Gifford, 2001). Mehrabian and Russell (1974), Russell et al. (1981) and Gifford et al. (2000) determined in their studies that observer preferences were changed with building façades. It has been reported in the literature that the architectural style of the buildings (Nasar, 1989; Stamps III, 1991; Karaman, 1985 and Hui, 2007, Akalin et al., 2009, Atalan, 2016; Sochocka and Anter, 2017; Montero-Parajo et al., 2017; Ilbeigi et al., 2017 and 2019), the color of the buildings and the using materials on façades (Gifford et al., 2000, Karaman, 1985; Hui, 2007) are effective in the perceptional evaluations.

The researchers used different cognitive properties in the studies where the façade and the spaces were evaluated depending on perception. For example; Imamoglu (2000) (Beauty, Pleasantness, Likeability, Complexity, Ornamentation and Familiarity), Gifford et al. (2000) (Clarity, Complexity, Friendliness Meaningfulness, Ruggedness and Originality), Akalin et al. (2009) (Preference, Complexity and Impression), Ghomeishi et al. (2012) (Complexity, Friendliness and Sociability), Malekinezhad et al. (2013) (Pleasant and Arousal), Arslan and Yıldırım (2017) and Ozkan (2017) (Complexity, Preference and Impressiveness), Groat (2013); Kaplan et al. (1972); Herzog and Shier (2000); Stamps (2003) Bornstein and Berlyne (2006); (Complexity and Pleasure) and Vartanian et al. (2013) (Beauty and Pleasantness) have benefited from such concepts. According to the content of the study to be conducted, the researchers make comments on the statistically meaningful ones at the end of the study by choosing from the cognitive properties in the literature.

In the evaluations, comparisons are made with social factors such as gender and profession. One of the most important social factors affecting the results in perception-based façade evaluation studies was the professional experience of the participants. A great deal of research was conducted on this subject, especially comparing architects and non-architects. The first studies on this were conducted by Hershberger (1969) and Mehrabian and Russell (1974). In other studies conducted in the literature, evaluations of architects and non-architects were examined depending on different perceptual parameters. Looking at

these studies in general, it is seen that an architect's evaluation is more critical than non-architect groups.

In the researches, it is determined that the gender factor is effective at least as much as the professional factor in behavioral differences. Kim et al. (2013) stated that female's satisfaction levels are lower than male's according to environmental factors. In studies on building façade visuals, Imamoğlu (2000), Akalın et al. (2009) obtained a similar result in female's perception of façades with different levels of complexity. These researchers state that female are more critical than male. In the studies conducted by Dube and Morgan (1996), Yıldırım et al. (2011, 2014, 2015) and Ayalp et al. (2016, 2017), it was observed that the first negative emotions were determinative in the evaluations of female and the first positive emotions were more determinant in the evaluations of male.

Imamoglu (1979a and 1979b), Krampen et al. (1979) and Imamoglu (2000) studied the perceptual evaluations of traditional house façades. In his study, Imamoğlu (2000) determined the differences between the evaluations from the architects and non-architects participants, on selected in two sets of traditional and modern Turkish house façade. Many of the important works in the literature (Wohlwill, 1968, 1975; Kaplan et. al., 1972; Crozier, 1974; Berlyne, 1974, 1977; Berlyne, 1974; Nasar, 1983; Devlin and Nasar, 1989; Herzog and Shier, 2000; Stamps, 2003 and Akalın et al., 2009) are on contemporary building façades.

The historical and traditional buildings that form the identity of the cities are located in the memory of the city user, primarily with their façades. Therefore, the role of the façade in defining urban spaces is also important. Changing the purpose of use and requirements over time requires rearrangements of façades. Façade arrangements of traditional Turkish Houses are often a subject of criticism. Feilden (1982), Hersek (1989), Özsoy (2009) and David and Fort (2019) made evaluations of façade renovations having deficiencies on historical and traditional houses.

It is also an important parameter whether the users experience the space or the façade in advance, especially according to the research made on the perception of space and façade. Arnheim (2009) states that traces that are similar to each other in memory touch each other through strengthening, weakening, and exchanging. According to Arnheim, the visual knowledge acquired in the past does not only help to recognize the nature of an object or action emerging from the field of vision, but also assigns a place to the present object within the system of things that make up our worldview. As Arnheim stated, the visual knowledge gained in the past allows us to comment on the objects that we see and make sense of. Erdogan et al. (2013) in their studies, also made evaluations on a group of users who experienced the place too.

In many previous perceptional evaluation studies in the literature, digital image (Yildirim et al., 2014 and 2019), and Virtual Reality (VR) technology (Wallet et al., 2013) have been used. Yildirim et al. (2019)

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have mentioned that virtual reality (VR) applications give satisfactory results and also can be achieved cheaper than real environment (RE) scenarios. Similarly, several studies have demonstrated an effective transfer of skills and/or spatial knowledge from virtual to real environments (virtual/real transfer), indicating that the spatial knowledge acquired in virtual environments is very similar to that acquired in real environments (Wolbers and Hegarty, 2010, Kuliga, et al. 2015, Bozdag, 2018). Digital images have also been widely used on façade perception studies instead of real images. (Erdoğan ve ark. 2013, Akalın et al. 2009).

1.2. Research Considerations

The current study aims to contribute to the above-mentioned literature by exploring the effects of changes occurring in traditional Turkish House façades over time on the perceptual evaluations of the participants. It is expected that there would be differences between the initial (original) states of the façades and the evaluations of the modified states. An additional objective of the present study is to examine the role of gender and profession as important independent variables affecting participants' perception. In this context, the hypotheses constructed within the scope of the research are as follows;

H_1: *There are important differences between the perceptual evaluations of the participants regarding the original or modified façades of traditional Turkish Houses.*

H_2: *There are significant differences between the evaluations of male and female participants for each dependent variable.*

H_3: *There are significant differences between the evaluations of architect and non-architects participants for each dependent variable.*

This study aimed to determined statistically reliable information from perceptional evaluation of the street silhouettes of Turkish Houses. It is very important to determine how Turkish Houses having original façade designs are perceived by society with the façade change. Moving from this point, the street façades located in the historical city pattern of Afyonkarahisar Province, where traditional Turkish Houses are located, have been evaluated by groups of architects and non-architects. In the evaluations, a comparative analysis was performed on the altered (existing or modified) and original street façades which have been prepared by authors. The prepared images have evaluated by two different groups consisting of 80 people by the semantic differentiation scale consisting of the adjective pairs. The comparison sets of the bipolar adjective pairs were chosen among the most commonly used and having statistically significant results in the perception based evaluation studies in the literature. With the data obtained, it was given some recommendations regarding the arrangement of the façade in the historical pattern.

2. METHODS

2.1. Research Environment

In the study, comparative evaluations of original and the modified of traditional Turkish House façades conducted on the street silhouettes in the historical city pattern. The historical city center of Afyonkarahisar province, which has a very old historical heritage, was chosen for the evaluations. Traditional Turkish houses one of the examples of architectural design that reveals the Turkish identity in Anatolia, varies according to the geographical position. Afyonkarahisar is located in the inner western Anatolian part of Turkey. It has the characteristic features of continental climate due to its geography. Summers are very short and winters are quite long. For this reason, most of daily life is passed indoors. Open courtyard culture has not been formed in traditional houses in these regions. The façade arrangements of the Afyonkarahisar Houses examined include "Cihannüma". Although this section, which is away from daily use, gives the houses a monumental appearance even if it is independent from the ground floor. This monumentality is important in terms of adding aesthetic value to the façade of the building. The sofa and rooms' projections in Afyonkarahisar Houses add aesthetic value to the façade.

Most of the historical mansions, houses, and mosques built in Afyonkarahisar in the early 1900s and before were affected by the great Afyonkarahisar fortress fire that broke out in August 1902 and lasted for more than two days. After the fire, the neighborhoods had been re - constructed. 500 Afyonkarahisar Houses that survived from that day till today have determined and the restoration and façade arrangement of these buildings have started in 2017. In Figure 1, street pictures from Afyonkarahisar province were given after related restoration works.

Figure 1. Traditional Afyonkarahisar Houses (after restoration) (web page-2)

In this study, firstly, eight street silhouettes were determined from these restorated neighborhoods. The restorated (or modified) façade drawings of the determined street silhouettes have been reached from the Mostar Architecture office. From these modified drawings which are prepared in the AutoCAD (2018), some technical arrangements have done such as eaves, window and door designs, angle braces and other carrier elements etc. for creating original Afyonkarahisar House façades.

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For the participants to perceive the images better, prepared the original and modified drawings those were transferred to the Photoshop (2018) and was colored on the gray scale and the color and material were excluded from the research. The digital pictures of the eight sets of original and modified street silhouettes given in Figure 2 prepared were evaluated with the help of the semantic differentiation scale consisting of the adjective pairs given below.

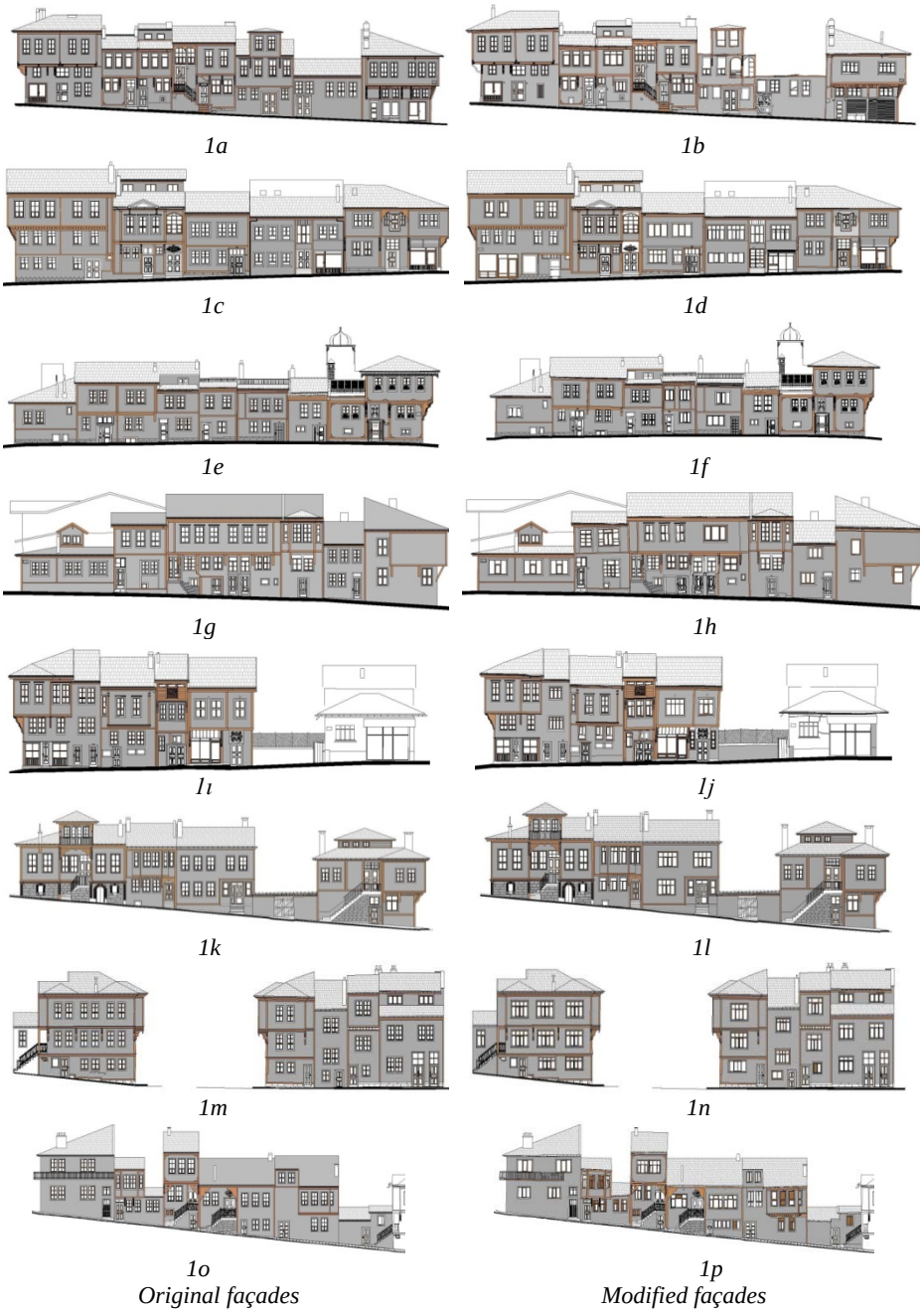

Figure 2. Original and modified digital façade views of the traditional Turkish Houses

2.2 Design of the Survey and Procedure

The first part of the research questionnaire used includes general information such as gender and profession of the participants. In the second part, there is a semantic differentiation scale that measures the

perceptual evaluations of the participants about the original and modified façade views of traditional Turkish Houses in Afyonkarahisar. These façade images were evaluated by the participants. In the evaluation, total of ten bi-polar adjective pairs with semantic differential scales from 1 to 5 have been used. In this scale 1 and 5 represents beautiful (positive) polar and ugly (negative) polar, respectively. The selected bi-polar adjective pairs are beautiful / ugly, simple / complex, impressive / unimpressive, tidy / untidy, interesting / uninteresting, typical / untypical, proportional / non-proportional, sincere / formal, qualified / unqualified, familiar / unfamiliar. The semantic differential scales have been used previously by different researchers (Berlyne (1974 and 1975), Imamoglu (1975), McAndrew (1993) and Yildirim *et al.* (2007a, 2007b; 2011a, 2011b; 2015).

In this study, the data of the original and modified façade views of traditional Turkish Houses were taken from survey results on façades views of eight streets. Drawings of eight street silhouettes where traditional Turkish Houses located are given in Figure 2. These street silhouettes façades were drawn in AUTOCAD (2018) on lateral A4 size (210-297 mm^2), good quality paper. While the right side of the paper represented the modified houses' façade, other set of drawings represented the original traditional Turkish Houses' façade. The data of this study were obtained from the perceptual evaluations of the participants regarding the digital images of the original and modified façade drawings of traditional Turkish Houses.

The participants were not familiar with Afyonkarahisar traditional Turkish houses façades. In other words, the participants were not acquainted with this place. Thus the effect of the independent variable of whether the participants recognize the façades and buildings was neglected in this study. Erdoğan *et al.*, (2013) evaluated the similar situation as a parameter in their studies on historical fronts.

2.3 Participants

80 participants (42 were architecture and 38 were civil engineering students in final semester in bachelor degree, respectively) were selected from undergraduate students from the Architecture and Civil Engineering Department of Necmettin Erbakan University in Konya. Each group had a similar diverse distribution by gender: 46,5% of the participants were male, 53,5% were female. The mean age of the participants was 22.

The detailed digital pictures of the traditional Turkish Houses were shown to participants on data projection. Before the application of survey, the general information about the survey has been given all participants, briefly. After that, survey questions were asked for answering by all participants looking at street façades in survey forms. Research data were obtained from two different groups by face-to-face meetings in 2020. The research was conducted at two different

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meetings during the weekdays. It took the participants approximately twenty minutes to complete each of the questionnaires.

2.4 Data Collection

The evaluations of the façade views of the traditional Turkish Houses by participants were accepted as "dependent variables" (depicted in Tables 1, 2, 3 and 4), whereas, the façade views of the traditional Turkish Houses on participants' gender and professions were accepted as "independent variables."

After conducting reliability tests of the data obtained with the Cronbach's alpha method (Table 1), the means and standard deviations values were determined. Afterward, to examine the effect of differences in the original and modified façade views, gender and professions variables on the perceptual evaluations of the traditional Turkish Houses, the appropriate techniques of the One-Way Analysis of Variance (ANOVA) were used. The significant means of the variance obtained from all participants data were depicted by using comparative graphs.

3. EVALUATION OF RESEARCH FINDINGS

This study aimed to determine the effects of original and modified façade views of the traditional Turkish Houses in Afyonkarahisar on the perceptual evaluations of the participants. The reliability of dependent variables, including participants' perceptual evaluations of the traditional Turkish Houses façade views, was tested using the Cronbach's alpha test and has been given in Table 1. Accordingly, the reliability coefficient for the semantic differential scale of ten bipolar adjectives was 0.86. Previously conducted studies (e.g., Cronbach, 1951; Panayides, 2013) have stated that the alpha reliability coefficients for all items can be accepted as "reliable" when it is above 0.70. Accordingly, the Cronbach's alpha coefficient obtained in the current study was above this specified value. As a result, the semantic differential scale was found to be reliable.

Table 1. Reliability test results of the dependent variables

Dependent Variables	Items Reliability	Scale Reliability
Beautiful / Ugly	0.835	0.86
Simple / Complex	0.849	
Impressive / Unimpressive	0.834	
Tidy / Untidy	0.838	
Interesting / Uninteresting	0.862	
Typical / Untypical	0.849	
Proportional / Non-proportional	0.844	
Sincere / Formal	0.842	
Qualified / Unqualified	0.837	
Familiar / Unfamiliar	0.872	

Note: Item reliability and scale reliability were provided for each dependent variable.

In this section, the differences between the perceptual evaluations of the participants about the original and modified façade views of the

traditional Turkish Houses in Afyonkarahisar were conducted by using statistical methods. The mean and standard deviation values and ANOVA results of the data were given in Table 2, respectively.

Table 2. Mean and standard deviation values and ANOVA results of the original and modified façade views of the traditional Turkish Houses

Dependent Variables	**Traditional Turkish House Façade Views**				**ANOVA Results**		
	Original Façade		Modified Façade				
	M	SD	M	SD	**F**	**df**	**Sig.**
Beautiful / Ugly	2.38[a]	1.03	3.11	1.13	144.065	1	0.000*
Simple / Complex	2.62	1.07	3.26	1.15	105.998	1	0.000*
Impressive / Unimpressive	2.61	1.04	3.24	1.15	103.981	1	0.000*
Tidy / Untidy	2.33	1.09	3.44	1.20	299.926	1	0.000*
Interesting / Uninteresting	2.92	1.02	3.21	1.14	22.363	1	0.000*
Typical / Untypical	2.43	0.95	2.75	1.07	32.099	1	0.000*
Proportional / Non-proportional	2.30	1.13	3.40	1.17	290.844	1	0.000*
Sincere / Formal	2.23	0.96	2.67	1.16	53.596	1	0.000*
Qualified / Unqualified	2.39	0.94	3.07	1.06	145.984	1	0.000*
Familiar / Unfamiliar	2.34	1.04	2.58	1.07	16.584	1	0.000*

***Notes**: * p<0.001 level is significant. M: Mean value, SD: Standard deviation, F: F value, df: Degree of freedom. a: Means of the variables listed between 1-5 (large numbers are negative responses)*

According to the values given in Table 2, statistically significant differences were found at the level of p<0.001 between the participants' perceptual evaluations of the original and modified façade views of the traditional Turkish Houses. It was determined that original façade views were perceived more positively than modified façade views by the participants. The differences between the participants' perceptual evaluations of the original and modified façade views of the traditional Turkish Houses were found to be statistically significant at the level of p<0.001 for beautiful / ugly (sig.=0.000), simple / complex (sig.=0.000), impressive / unimpressive (sig.=0.000), tidy / untidy (sig.=0.000), interesting / uninteresting (sig.=0.000), typical / untypical (sig.=0.000), proportional / non-proportional (sig.=0.000), sincere / formal (sig.=0.000), qualified / unqualified (sig.=0.000) and familiar / unfamiliar (sig.=0.000) dependent variables. The graphical descriptions of these analyses results were depicted in Figure 3.

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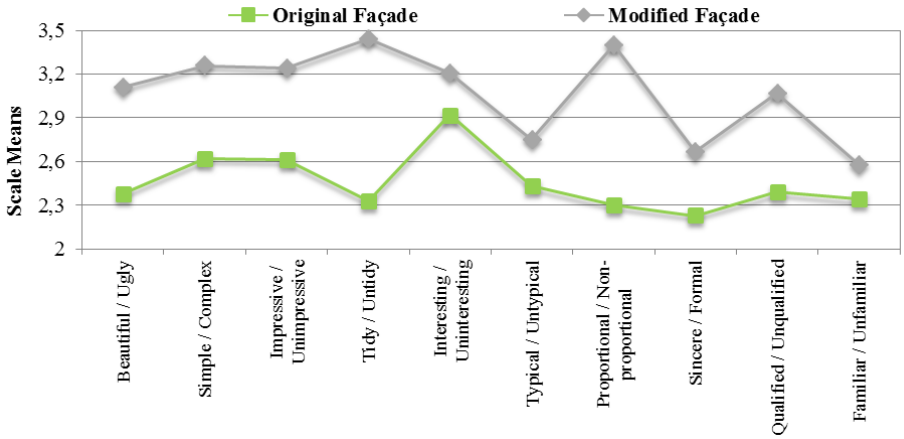

Figure 3. Effect of the original and modified façade views on the dependent variables

***Note**: Means of the variables listed between 1-5 (large numbers are negative responses).*

The effects of the original façade views on the participants' perceptual evaluations have been shown in Figure 3. It was observed that while the modified façade views had the highest values (negative value) for each of the dependent variables, the original façade views had the lowest values (positive value). When the average values of adjective pairs given in Figure 3 are analysed, it is seen that the differences between tidy / untidy and proportional / non-proportional adjective pairs are dominant. These results showed that the original façade views are perceived more positively than the modified façade views and also supported the hypothesis of H_1. However, no other study was found in the literature to compare this hypothesis.

The differences between evaluations of the façade views of the traditional Turkish Houses according to participants' gender (female and male) were determined by using the statistical parameters and ANOVA results which were given in Table 3.

Table 3. Mean and standard deviation values and ANOVA results of participants' evaluations according to gender

Dependent Variables	Participants' Gender				ANOVA Results		
	Female		Male				
	M	SD	M	SD	F	df	Sig.
Beautiful / Ugly	2.79[a]	1.16	2.71	1.13	1.445	1	0.230[is]
Simple / Complex	3.09	1.20	2.81	1.10	18.263	1	0.000*
Impressive / Unimpressive	3.04	1.17	2.83	1.11	10.779	1	0.001*
Tidy / Untidy	2.95	1.33	2.83	1.22	2.799	1	0.095**
Interesting / Uninteresting	3.09	1.16	3.05	1.03	0.373	1	0.541[is]
Typical / Untypical	2.61	1.06	2.57	0.99	0.331	1	0.565[is]
Proportional / Non-proportional	2.88	1.35	2.82	1.21	0.791	1	0.374[is]
Sincere / Formal	2.50	1.17	2.41	1.01	2.163	1	0.142[is]
Qualified / Unqualified	2.72	1.13	2.74	1.00	0.109	1	0.742[is]
Familiar / Unfamiliar	2.32	1.05	2.59	1.06	21.053	1	0.000*

***Notes**: * $p<0.05$ and ** $p<0.10$ levels are significant. is: $p<0.05$ is insignificant. M: Mean value, SD: Standard deviation, F: F value, df: Degree of freedom. a: Means of the variables listed between 1-5 (large numbers are negative responses).*

The results given in Table 3 showed important differences between the façade views evaluations of the traditional Turkish Houses according to participants' gender. Males have more positively than females of the evaluation of façade views of the traditional Turkish Houses. The ANOVA test was performed to determine whether there was a statistically significant difference between the participants' perceptual evaluations according to gender at the levels of $p<0.05$ and $p<0.10$. Consequently, among the perceptual evaluations of the participants according to their gender, for simple / complex (sig.=0.000), impressive / unimpressive (sig.=0.001), tidy / untidy (sig.=0.095) and familiar / unfamiliar (sig.=0.000) dependent variables, statistically significant differences were found at the levels of $p<0.05$ and $p<0.10$. No statistically significant difference was found at the level of $p<0.05$ for other dependent variables. From these mean values, it is seen that females are more familiar with the façade views of the traditional Turkish Houses than males. These results have been given by graphs in Figure 4.

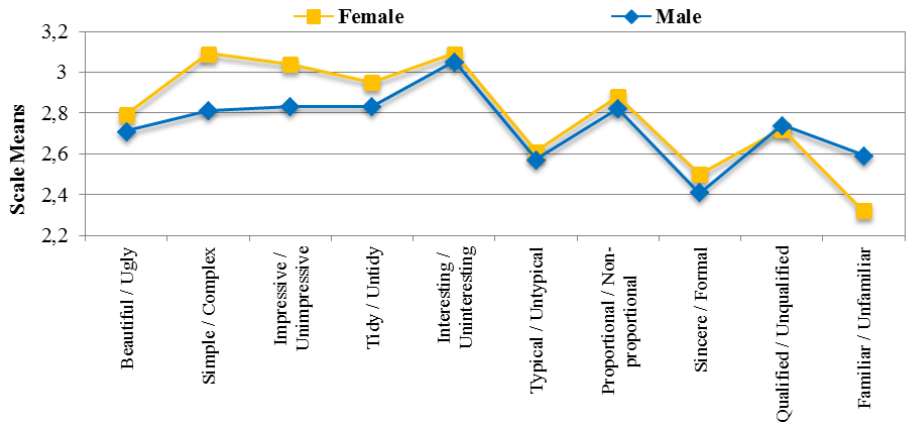

Figure 4. The effect of participants' gender on dependent variables

***Note**: Means of the variables listed between 1-5 (large numbers are negative responses).*

As seen in Figure 4, males have the lowest values (positive value) for all other dependent variables except familiar / unfamiliar and qualified / unqualified adjective pairs. These findings partially support the second hypothesis (H_2), similarly with Imamoğlu (2000), Akalın et al. (2009), Kim et al. (2013), Yildirim et al. (2014, 2015) and Ayalp et al. (2016, 2017).

In this study, the differences between evaluations of the façade views of the traditional Turkish Houses according to the participants' professions (architect and non-architects) were also determined with another analysis. The evaluation differences between participants' professions on the façade views of the traditional Turkish Houses were obtained by statistical parameters and ANOVA results. These results were also given in Table 4, respectively.

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Table 4. Mean and standard deviation values and ANOVA results of participants' evaluations according to professions

Dependent Variables	Participants' Professions				ANOVA Results		
	Architect		Non-Architects				
	M	SD	M	SD	F	df	Sig.
Beautiful / Ugly	2.90[a]	1.02	2.57	1.24	26.862	1	0.000*
Simple / Complex	2.92	1.15	2.95	1.17	0.173	1	0.678[is]
Impressive / Unimpressive	3.10	1.06	2.73	1.20	33.647	1	0.000*
Tidy / Untidy	2.91	1.28	2.85	1.27	0.683	1	0.409[is]
Interesting / Uninteresting	3.18	1.07	2.94	1.10	14.725	1	0.000*
Typical / Untypical	2.60	1.03	2.56	1.02	0.280	1	0.597[is]
Proportional / Non-proportional	2.78	1.27	2.92	1.28	3.920	1	0.048*
Sincere / Formal	2.47	1.01	2.42	1.17	0.525	1	0.469[is]
Qualified / Unqualified	2.76	1.05	2.70	1.07	1.240	1	0.266[is]
Familiar / Unfamiliar	2.45	1.04	2.48	1.09	0.171	1	0.680[is]

***Notes**: * p<0.05 level is significant. is: p<0.05 is insignificant. M: Mean value, SD: Standard deviation, F: F value, df: Degree of freedom. a: Means of the variables listed between 1-5 (large numbers are negative responses).*

The results given in Table 4 showed important differences between the perceptual evaluations of the façade views of the traditional Turkish Houses according to the participants' professions (architect and non-architects). It was found that non-architects perceive the façade views of the traditional Turkish Houses more positively than architects for beautiful / ugly, impressive / unimpressive and interesting / uninteresting adjective pairs. On the other hand, architects evaluate the proportional / non-proportional adjective couple more positively.

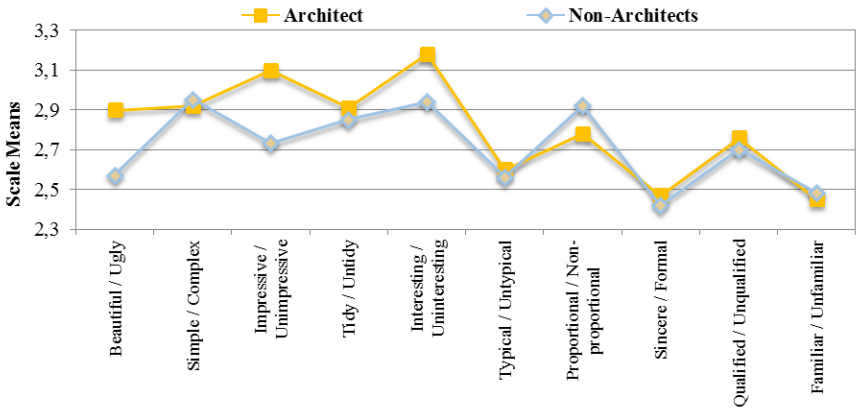

Figure 5. The effect of participants' professions on dependent variables

Note: Means of the variables listed between 1-5 (large numbers are negative responses)

The ANOVA test was performed to determine whether there was a statistically significant difference between the participants' perceptual evaluations according to professions at the level of p<0.05. Consequently, among the perceptual evaluations of the participants according to their professions, for beautiful / ugly (sig.=0.000), impressive / unimpressive (sig.=0.000), interesting / uninteresting (sig.=0.000) and proportional / non-proportional (sig.=0.048) dependent variables, statistically significant differences were found at the level of p<0.05. No statistically significant difference was found at

the level of $p<0.05$ for other dependent variables. These results have been depicted by graphs in Figure 5.

According to the Figure 5, non-architects have the lowest values (positive value) for seven dependent variables. However, there is a statistically significant difference between the four adjective pairs. Therefore, the third hypothesis of this research has been partially supported (H_3). The common conclusion in the studies conducted in the literature (Hershberger and Cass, 1974; Groat, 1982; Devlin and Nasar, 1989; Nasar, 1989; Devlin, 1990; Wilson and Canter, 1990; Stamps, 1991; Hubbard, 1994; Purcell, 1995; Wilson, 1996, Imamoğlu 2000, Akalın et al. 2009, Gifford et al. (2000, 2002)) is that the evaluation of architects is more critical than other groups.

4. DISCUSSION AND CONCLUSION

The aim of this study is to make a comparative evaluation of the differences between the original façade and the modified façade of the traditional Turkish Houses based on perception. In line with this purpose, digital images of eight sets of original and modified street silhouettes with gray color scales were produced on the computer. Two different groups consisting of 80 people (architect and non-architect group) have evaluated the prepared images by the semantic differentiation scale consisting of the adjective pairs. The results obtained from this study are given below, respectively.

According to the results obtained, the main hypothesis (H_1) that "*There are important differences between the perceptual evaluations of the participants regarding the original or modified façades of traditional Turkish Houses.*" has been confirmed. The biggest differences in these evaluations were in the tidy / untidy and proportional / non-proportional adjective pairs. While the other adjective pairs that were queried varied closely, they were in the familiar / unfamiliar adjective pair with the least difference value. Since there is no study on modified traditional house façades in the literature, discussion directly with the main hypothesis has not been conducted. On the other hand Imamoğlu (2000) and Akalin et al. (2009) in their researches took the opinions of architect and non-architect participants over the old and new façades. In the results of these studies, it has been determined that ratio of liking and impressiveness increases as the complexity decreases over the simple / complex, impressive / not impressive and beautiful / ugly adjective pairs. In this study, different from the existing literature, tidy / untidy and proportional / non-proportional adjective pairs came to the fore in evaluating stage. The reason for this can be explained by the design principles and criteria that strengthen the visual perception in the traditional Turkish House façade layout. For example;

1. Arrangement of many building elements such as windows, doors and timber beams to repeat at certain intervals on the façade,
2. Existing of the timber beams that allow easy reading of the number and heights of the floors and story height;

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3. More mass and balanced arrangement of traditional building façades in terms of solid-void relationships and façade articulation,
4. Repeating metal railing decorations which are arranged with the combination of basic geometries,
5. The continuity of similar form and style in all the houses on the streets.

With this study, for the first time in the literature, the evaluation of holistic (comprehensive) street silhouettes was based on a single façade layout. As a result of the evaluation, it was seen that tidy / untidy and proportional / non-proportional adjective pairs are more prominent than others.

As mentioned in H_2 hypothesis, there have been important differences between the perceptual evaluations of the façade views of the traditional Turkish Houses according to participants' gender (female and male). It was found that males perceive more positively the façade views of the traditional Turkish Houses than females. From these average values, it is seen that females are more familiar with the façade views of the traditional Turkish Houses than males. Males have the lowest values (positive value) for all other dependent variables except familiar / unfamiliar and qualified / unqualified adjective pairs. These all findings partially support the second hypothesis (H_2). According to environmental factors, female's satisfaction levels are lower than male's. This issue mentioned by Imamoğlu (2000), Akalın *et al.* (2009) and Kim *et al.* (2013) in the literature. These researchers also state that; females are more critical than males especially different level of complexity at the house façade. Similar results were obtained in different perception based studies conducted by Yildirim *et al*. (2014 and 2015), Ayalp *et al*. (2016 and 2017). Also results obtained by this study supported the statement as "Female's satisfaction judgments were largely influenced by their initial negative emotions, whereas male's satisfaction judgments depended on their first positive emotions, suggesting a primacy effect for both genders" in the literature.

It is seen that the evaluations of the façade views of the traditional Turkish Houses showed important differences according to the participants' professions (architect and non-architects). It was found that non-architects perceive the façade views of the traditional Turkish Houses more positively than architects for beautiful / ugly, impressive / unimpressive and interesting / uninteresting adjective pairs. On the other hand, it is seen that architects evaluate the proportional / non-proportional adjective couple more positively. This statement can be explained as architecture students have been taken Architectural History and Restoration Courses within the architectural education. According to Gifford (1997), a special education is also an essential personal difference in the environmental perception. Delvin and Naser (2010) and Yazdanfar et al. (2015) also achieved similar results. According to the results, visual literacy has a direct connection with the

individuals' perception. Non-architects have the lowest values (positive value) for selected seven dependent variables. However, there is a statistically significant difference between the four adjective pairs. Therefore, the third hypothesis of this research has been partially supported. According to the literature (Hershberger and Cass, 1974; Groat, 1982; Devlin and Nasar, 1989; Nasar, 1989; Devlin, 1990; Wilson and Canter, 1990; Stamps, 1991; Hubbard, 1994; Purcell, 1995; Wilson, 1996; Imamoğlu, 2000; Gifford *et al.,* 2000, 2002; Gifford *et al*., 2000; Akalın *et al*. 2009; Llinares *et al*., 2011; Malekinezhad *et al.,* 2013; Ghomeishi and Jusan, 2013; Boumová and Zdráhalová, 2016; Arslan *et al.,* 2018; Llinares and Iñarra, 2014; Ilbeigi *et al.,* 2019) there is a common consensus on architects have the lowest perceptional evaluation for dependent variables.

In this study, special attention was paid to the fact that the participants had not experienced to the streets where Afyonkarahisar houses were built on. Thus, the parameter (familiar) that Arnheim (2009) expressed has disabled. Vice versa, if it had not been neglected, this situation should have been taken into account in the analysis.

5. MANAGERIAL IMPLICATIONS AND FUTURE RESEARCH

A comparative analysis was carried out on the original and modified states of the street façades of traditional Turkish Houses, which draw attention with their unique designs. With the study; a comparative analysis was carried out on the originally and modified street façades of traditional Turkish Houses. The results obtained in this research showed that the original and modified façade have statistically significant effects on the participants' perceptual evaluations of the façade view. It has been determined that gender is an important social factor in the perception of the façade and that architectural education has an effect in the perception of the façade. The related studies can be enlarged/developed in future as;

1. In the evaluation of traditional Turkish House façades, the effect of material texture and different color usage on perception can be evaluated.
2. The effectiveness of projections, mass articulations and oriels, which are important parts of traditional dwelling, can be investigated.
3. The results obtained from Turkish house from different regions and having different properties collected can be generalized.
4. Evaluation can be made with different age groups.
5. In order to fully confirm the H_2 hypothesis, it is thought that architecture education can be compared with the first year and last year student groups.
6. The evaluation of those who familiar or not familiar to the place can be compared. Similarly, the fact that the participants have never seen the traditional Turkish house (outside of

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Turkey if possible) may be a parameter that may affect the result.

The paper is about the perceptual evaluation of some traditional historic Street silhouettes in Turkey based on a set of predefined dual comparisons by a group of participants consisting of architects and non-architects. According to the most important finding obtained from the study, the fact that the original state is observed in the restoration of traditional Turkish Houses has caused people to be liked more. Similarly, it has been observed that the organization of windows, solid-void relationship ratio, repetitions, horizontal and vertical structural elements (beams etc.) in the Turkish house façade characteristic will have a positive effect on perception. It can be predicted that the studies that associate the perception of people with the façades of the buildings will increase in the following years. In this context, the effect of the façade material, the amount of void and other factors on perception can be measured. In addition, multiple regression analysis can be performed by matching perceptual data with the data obtained from mathematical modeling on the façade.

CONFLICT OF INTEREST

We have no conflict of interest to declare.

FINANCIAL DISCLOSURE

The authors declared that this study has received no financial support.

ETHICS COMMITTEE APPROVAL

Ethics committee approval was not required for this article.

LEGAL PUBLIC/PRIVATE PERMISSIONS

In this research, the necessary permissions were obtained from the relevant participants (individuals, institutions and organizations) during the survey, in-depth interview, focus group interview, observation or experiment.

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Resume

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