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Auditory Environment in the Museums: The Case of Erimtan Archaeology and Arts Museum

Yilmazer, Semiha[1]
Bilkent University
Department of Interior Architecture and Environmental Design, Bilkent University, Ankara Turkey

Orhan, Cemre[2]
Bilkent University
Department of Interior Architecture and Environmental Design, Bilkent University, Ankara Turkey

ABSTRACT

The aim of this paper is to conduct a qualitative research to clarify the auditory environment in the museums. Research has taken place in the Erimtan Archaeology and Arts Museum which exhibits more than 2000 objects from Yüksel Erimtan's collection of Anatolian archaeological artifacts. It is located near the main gate of Ankara Castle. While the scale and the façade of the building are connected contextually to its historic environment, the interior provides the contemporary experience to its visitors. Grounded Theory (GT) is used in this paper to create a conceptual framework, and clarify visitors' perception of the soundscape in the museums. Semi-structured interviews are held with participants who are chosen among the visitors after they tour the museum on their own, until the data reaches theoretical saturation. Constant comparison method is used for analyzing the data and creating a conceptual framework which is compared with previous studies and the ISO 12913-1: 2014. According to the findings, context is determined as one of the core categories similarly to other studies. And some categories differ because of the various function of indoor space.

Keywords: Soundscape, Indoor Soundscape, Museum
I-INCE Classification of Subject Number: 70

1. INTRODUCTION

Museum studies have been focused on visitors' environmental comfort in terms of the acoustical parameters of spaces mostly (1 - 3). Acoustical parameters are not enough to reveal the connection between the sound and the environment. Therefore, the soundscape approach should also be considered as a supplementary element of the context (4).

[1] semiha@bilkent.edu.tr
[2] cemre.orhan@bilkent.edu.tr

R.M. Schafer first introduced the term soundscape in the late ’60s. He aimed to show an ecological harmony between the human community and its sonic environment (5). Until 2014, soundscape was defined as “how the environment is perceived by the listener” by most of the researchers (4, 5). Then, ISO 12913-1 defined soundscape as “an acoustic environment as perceived and/or understood by a person or people within a specific context” and built a conceptual framework. The standard and conceptual framework work together to evaluate the relationship between the acoustic environment and interpretation of auditory sensation (5 - 14). In that sense, it is approved that the Grounded Theory is a proper method to create the conceptual framework (12, 13).

Therefore, the aim of this paper is to investigate the acoustic environment and responses towards it by considering visitors’ subjective perception of the museum’s auditory environment.

2. METHODOLOGY

2.1 Site

Erimtan Archaeology and Arts Museum is located opposite to the main gate of Ankara Castle which is the most historic and cultural part of Ankara (Figure 1). The museum was opened in 2015. It is comprised of the facades of three old houses around the castle. While the scale and the façade of the building are connected contextually to its historic environment, the interior provides the contemporary experience to its visitors (Figure 2).

Figure 1 – Yellow spot represents the location of the Erimtan Archaeology and Arts Museum and the blue spot represents the location of the Ankara Castle’s entrance.

It is a three-story building and exhibits more than 2000 objects from Yüksel Erimtan’s collection of Anatolian archaeological artifacts like glass artifacts, gems, and coins, etc. (15). Main entrance of the museum directs people to the mezzanine floor which includes the permanent exhibition of archaeological objects, gift shop, and information desk. The first floor contains the display of archaeological artifacts and there is also a small cafeteria and library. And the ground floor is segregated for the art exhibition and managers’ offices. There is always a temporary exhibition throughout the

year on the ground floor. The study only takes place in the permanent exhibition areas, which includes the first floor and mezzanine floor to make the study more reliable. The height of the studied area is 10,6 meters. The main floor covering material is wood. The local travertine is used on the walls. The material of the ceiling is concrete and there are glass and metal surfaces in interior space.

Figure 2 – Interior of the Erimtan Archaeology and Arts Museum.

2.2 Data Collection and Analysis

Semi-structured interviews are held with a total of six participants including four female and two male. Their age ranged between 22-54. Participants attended the interview voluntarily and were chosen randomly after they toured the museum. They did not have any idea about the content of the interview while they were visiting. They were asked 15 main questions related with their expectation and perception towards the museums' visual and sonic environment. Interviews lasted between 7 to 17 minutes and were recorded and transcribed verbally. During the interviews the LAeq level was measured with the sound level meter in 20 minutes time intervals.

Data were collected on a sunny weekend day when the conditions were very proper for measuring. There was no storm, rain or any other outstanding outdoor noise source. The process of data collection took two days until the data reached theoretical saturation.

To analyze the gathered data from the interviews the Grounded Theory (GT) was used. Glaser and Strauss (1967) described the analysis of data as "constant comparative" method (16). The coding is the primary tool for analyzing that has three stages: Open coding; Axial coding; and Selective coding. Firstly, the interviews are examined sentence by sentence for open coding. And the data were separated into pieces to feature the essential points by labeling. After that, separated pieces were congregated under their association by using axial coding. Then the categories were created. And based on the relation between the categories, the framework is established to see the theory behind it. During the part of selective coding, a category which reflects the core of the phenomenon is chosen. The relation between this category and others were explored and this inclined the theory to explain the phenomenon. The data analysing process was completed with the help of the ATLAS.ti software.

Acoustical parameters of the building are measured by using ODEON Room Acoustics Software. The 3D model of the building was prepared by using SketchUp 2019 software. The model was exported to the ODEON Room Acoustics Software version 12 basic editions to measure the Speech Intelligibility Index (STI) and Reverberation Time (T20) with 7 sound sources and 27 receivers (Figure 3, Figure 4).

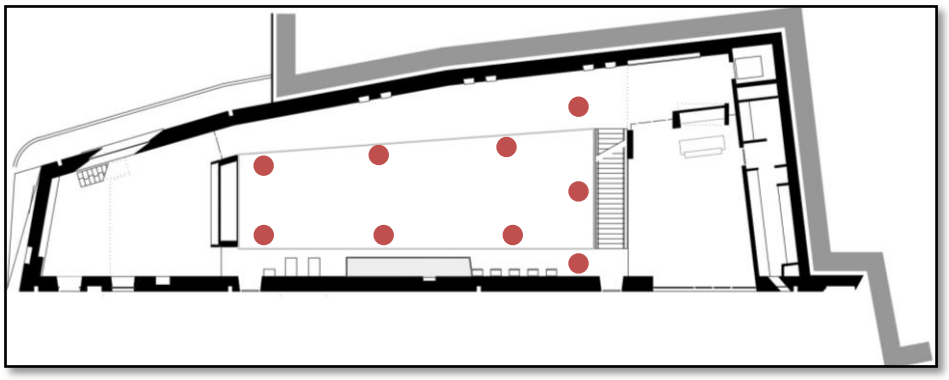

Figure 3 – Floor plan. Red spots show the location of the sound sources.

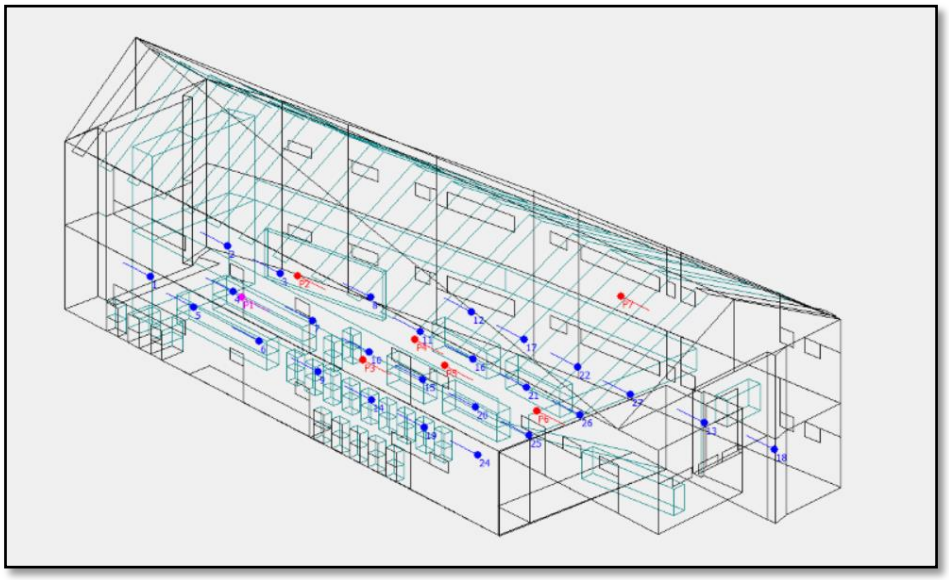

Figure 4 – Sound source and receiver locations of the ODEON model.

3. RESULTS AND DISCUSSION

ODEON simulation results showed that the speech transmission index (STI) ratings ranged from 0.35 to 0.72 with the average rating of 0.47. And average reverberation time (T20) ratings for the centre frequencies of speech are calculated as 2.62 for 500 Hz, 2.91 for 1000 Hz and 2.71 for 2000 Hz. The in-situ measurements were completed to find the LAeq level and it resulted with the average of 87,6 dB(A).

Data gathered out of the interview were analysed by using ATLAS.ti software. After the Grounded Theory analyses seven categories were generated as; expectation, perception, auditory environment, build environment, context, responses, and outcomes (Figure 5).

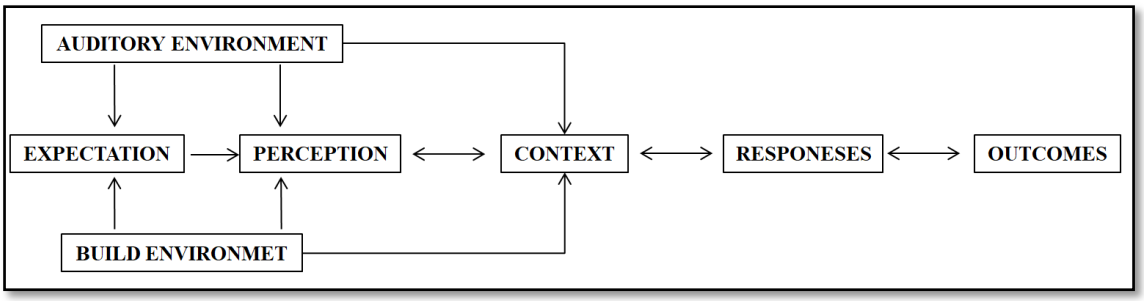

Figure 5 – Conceptual Framework for museums.

3.1 Expectation and Perception

According to Bruce and Davies (2014) when space has context then people's expectation of the context is the major factor in their perception of that space (17). Participants were asked to explain their expectation of both auditory environment and built environment for museums. They all had an expectation of how the build environment will be and how the auditory environment will sound.

Participants claimed that they expect museums to be quiet, spacious, and modern places. All of the participants perceived the Erimtan Archaeology and Arts Museum as a modern building but some of them could not relate the modern environment with the exhibition. Even if their expectation and perception were matching, they were not satisfied with this situation. It can be said that expectation and perception should be considered as essential elements for the design process of the spaces.

3.2 Build Environment and Auditory Environment

Build environment has two subcategories as "Physical Specialties" and "Intuitive Specialties" (Table 1). Physical specialties include the components like exhibition areas and content of the exhibited items, interior style like modern or old, space allocation of the museum, and materials. Intuitive specialties include subjects like spacious, habitat, ordinate, and joyous.

The auditory environment consists of subcategories such as sound sources, background sound, high level sound, and low level sound (Table 1).

Table 1 - Categories and the subcategories.

EXPECTATION	PERCEPTION	AUDITORY ENVIRONMENT	BUILD ENVIRONMENT	CONTEXT	RESPONSES	OUTCOMES
		-Sound Sources -Background Sound -High Level -Low Level	-Physical Specialities -Intuitive Specialities		-Positive -Neutral -Negative	

3.3 Context

The context was defined as "the interrelationships between person and activity and place, in space and time" (14, 18). As it was proved in the previous studies (6, 9, 13), this study also clarifies that context shapes participants' responses towards the soundscape and help to create the subcategories like positive, neutral, and negative responses. Therefore, context should be considered not only with the auditory environment but also with the built environment (6, 10 - 13).

There is sensor-fitted device hanging from the ceiling on the first floor. If someone passes by under, sound record automatically starts sounding. It might be

annoying if one cannot control the voiced device generally. But most of the participants did not find it annoying. When they were asked about the perceived sounds in museum one participant (P) answered:

P: *There is a sound recording with a sensor here. It's activated every time someone goes under. I think it's great because it gives information about the object it is related to. Sometimes it is very tiring to read the information about the objects in the museums and to examine the object at the same time. In fact, I'm not reading the full range of information generally. But here, while focusing on the object, the object-related sound coming from behind is very unique rather than irritating.*

When the context of sound is harmonizing with the environment and its process it affects the participants' responses towards the soundscape.

3.4 Responses

This category consists of three subcategories as positive, neutral and negative responses towards the soundscape (Table 1). Context has great influence on the creation of these subcategories because if the perceived environment is matching with visitors' expectation and context, the soundscape is explained as positive, if it is not then the soundscape is explained as negative.

Participants' expectations from the museums are generally quiet and calm environment. Nevertheless most of them explained that completely mute museum spaces might be annoying because they worry about distracting others by talking about the exhibition. That is why they explained that they need background music. One participant said:

P: *Museums should not be too quiet. In fact, there may be a background music that will reflect the old history, maybe. For instance, if the works of Anatolia are exhibited, a music piece composed in Anatolia can be heard. Thus we do not hear the others talking and do not hesitate to talk because of the fear of disturbing others.*

For this study, if the responses are positive, it means that the museum environment is attractive and precious. If the responses are negative, it means that the museum environment is annoying and boring. Participants' responses are mostly positive for this museum.

3.5 Outcomes

Museum environments show the dignity of the country and provide visitors with a unique learning experience. In the museum, visitors are always in communication with the history and the culture thanks to the exhibited objects, not by touching but observing them. The more it is addressed to the senses, the easier it is for learning process.

In the museums sound can be one of the best subsidiaries for museums' aim of providing unique experience. Erimtan Archaeology and Arts Museum is a very modern building with its choices of materials, interior, and display units and located in the most historic and cultural part of the city. Also because the objects are all related to Ancient times, participants explained that they did not feel being in that moment.

P: *The museum looks too modern for its surroundings.*

None of them said they heard a disturbing sound, but they did not say they were fully satisfied with the sound environment.

P: *I think the building and the exhibition are not matching. I expect to be in a building which has more historical texture if the exhibited objects are related to history. And traditional background music would help a lot to create this connection.*

The sensor-fitted sound record was found very useful in terms of its informative content by all of the participants. But some of them were complaining about the high level of sound it caused and not able to control it.

P: *When I was reading information about other object, people continuously were passing under it. And because it has a very high sound level, it was hard to focus another object at the same time.*

Participants explained that if the sound source is relevant to the content of an object, they perceived it as beneficial. But once they started to interest in another object in the exhibition, still hearing that sound source disturbed them and they wanted to move away from that section of the museum as an outcome.

4. CONCLUSION

This study clarified that visitors need to designed sound environment in the museums. Museum experience appeals directly to the human senses. In this regard, correct sound usage can be a very effective design tool to make museums fit the purpose of collection, education, and recreation.

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