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## SONIC EFFECTS ON THE APPRECIATION OF ARCHITECTURAL AESTHETICS OF ARCHITECTURAL DESIGN PROJECTS

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### Abstract

Appreciation of visual aesthetics is always connected with the visual experience of art objects. Yet, as the human senses are all connected and work in a comprehensive complex way, there is always a need to investigate the relationship between the visual appreciation of visual arts and other senses. Sonic effects are among the influential factors in the appreciation of visual art works. Traditionally, birds were used to convey sonic effects on impressionist painters. Claude Monet for example has been well known for loving to paint as a bird was singing. With the availability of modern technology, it has been possible to add different types of sonic effects in the spaces of visual art exhibitions. The basic question here is to what extent the sonic media can affect the appreciation of visual art? This question gets more importance in the field of architecture where the visual experience is more livable and complex than other visual art productions. This research represents an attempt to investigate the effect of sonic on the appreciation of architectural aesthetics. A group of architecture students were asked to evaluate the architectural aesthetics of an architectural design project with and without the presence of sonic effects. It was found that, the sonic effects have an impact on their appreciation of the architectural aesthetics of the project. This directs the attention to the importance of using sonic effects to aid the appreciation of aesthetics of architectural design projects by students, architects or the general public. It also highlights the need to consider sonic effects as a means to aid the education process in the architectural design studio.

**Keywords:** Environmental aesthetics; aesthetics appreciation; sonic, architecture; visual arts.

### 1. Introduction

Aesthetics is generally understood as pertaining to what is aesthetically valued (what is 'beautiful') or disvalued (what is 'ugly') in a given environment (Brady, 2011). Carlson (2003) suggested that nature "should" be appreciated through a rational understanding of the natural environment. The term environmental aesthetics has been used to make connection between the irrationality of the aesthetics and the rationality of the natural environment. Therefore, the appreciation of the natural environment should be viewed from different perspectives taking into account its comprehensiveness and diversity. It is also evident that there is a strong relationship between visual and auditory sensing (Duthie, 2013). Claude Monet (1840-1926) for example has been well known for loving to paint while a bird was singing (Chan, 2015). Alisa Rawls (1988-) used to be inspired by singing birds in her paintings (1st dibs, 2018). This strong relationship between sound and environmental aesthetics has been investigated through many approaches among which appeared the concept of the 'soundscape' (Wang, Keda, 2003). Soundscape was first defined by R. Murray Schafer as "... any acoustic field of study." Soundscape generally can refer to the sound composition in any acoustic environment (Schafer, 1994, 7).

Soundscape research involves the study of different disciplines like human and social sciences in addition to the physical environment. Soundscape looks at the sounds in the environment as a resource not as a waste (Kang, Jian and Schulte-Fortkamp, Brigitte ed. 2016). As soundscape can only have existence in space and not in vague, spatial settings are the essential context of its behavior (Prior, 2016). Composing the physical part of the spatial settings, the built environment represents a great sound box for an endless number of sounds forming a great complex urban symphony. "Sound Walk" is another interesting term that has been widely used in

soundscape research (Milo et. al. 2016). It refers to the movement in space with the purpose of listening to the environment and as such establishing a relationship between sound and the visual experience the environment. The study of sounds in the built environment has great importance for the creation of more comfortable spatial settings with less noise pollution and more beautiful relaxing sounds. In architecture, which is the main composer of the built environment, the soundscape is crucial for providing the most suitable acoustic settings for the architectural spaces. The psychological and physiological effects of sound on the architectural space have been increasingly under consideration in recent years (Kaduri, 2016; Milo et. al. 2016). Soundwalk research for example has been trying to understand the relationship between sound, the built space and its aesthetics (Milo et. al. 2016). Furthermore, establishing a relationship between soundscape and architecture helps to understand the production of architecture through the design process (Wang, 2003).

Yet little attention was directed to the effect of sound on the appreciation of the aesthetics of architectural compositions. If environmental aesthetics tries to bring the irrationality of aesthetics to the rationality of the environment, sonic effects on architectural aesthetics tries to study the irrationality of subjective reactions to sonic and the subjective appreciation of architecture aesthetics. The relationship between these two irrationalities is critical and needs careful considerations. There is a need to formulate more theoretical and philosophical frameworks on the relationship between the two of them. There is also a need to develop the suitable methodologies for exploring this relationship.

This research was part of a challenging adventure to explore the world of architecture aesthetics and the understanding of architecture students for this world. Students were divided into groups to study different topics of architectural aesthetics under the supervision and direction of the author. Three students chose to explore the effect of sonic on the appreciation of architectural aesthetics and helped in conducting the investigation presented in this research.

## **2. Methodology**

The methodology mainly depended on presenting a video for an architectural design project to a group of students of architecture in the University of Bahrain. The video was shown to the students four times in four separate sessions. The first one was without any sounds. The second session was with narrative. The third session was with music. And the last session was with narrative and music.

The video was presented to the participating students in the same spatial, visual and sonic environment simultaneously. This was planned carefully in order to avoid any change in the settings of the experiment or in the factors affecting the participants' appreciation of the aesthetics of the project.

A questionnaire was introduced to the students after each session of the experiment to examine their appreciation of the architectural aesthetics of the project through the evaluation of some of its visual design qualities. It was also considered that all the participating students had studied the courses Basic Design 1 and 2 to ensure that all of them are familiar with the visual design terminologies used in the questionnaire.

## **3. The project**

The architectural design project was an "Islamic Cultural Center" which was chosen randomly from the projects of the three students who helped in conducting the research experiment. Figures 1 to 3 show some features of the project. They were reproduced from the video used in the experiment.

Several points were taken into consideration in choosing the project:

- The participants had no previous experience with the architectural design of the project. This was important to guarantee that their appreciation of its architectural aesthetics will not be affected by previous experience. This also was important to ensure disinterestedness and spontaneousness of the participants' appreciation.
- The participants needed to easily understand the project in terms of scope and function. The participants should waste no time or effort in understanding the function and components of the project and should direct all their energy to the appreciation of its architectural aesthetics.

## **4. The participants**

The research targeted students of architecture from the levels 1, 2, 3, 4 and 5. Several reasons were behind this choice:

- Students of architecture usually use the term aesthetics many times a day but without real understanding of it despite its great importance for the better understanding of architecture. This experiment was a chance to highlight this fact and to raise the students' awareness of it.
- Students of other specializations have less understanding of esthetics as a term and philosophy.
- It was easier to conduct the experiment in the university campus and in the spaces of the Department of Architecture and Interior design in specific.



**Figure 1:** The presented project  
**Source:** Research team



**Figure 2:** The presented project  
**Source:** Research team



**Figure 2:** The presented project  
**Source:** Research team

The sample was obtained through cluster random sampling of the available students with consideration of gender. To ensuring the equality in the results, the selection of the students from each level was based on the average number of the total sum (total number of students in each level (Wiseman, 1999)

At the end of the experiment, 27 questionnaire sheets were returned out of 40 in total. This equates to a return rate of 67.5% which is less than the estimated return rate of 85% (34 responses), around which the sampling methodology was based. It is acknowledged here that representativeness of the data to the target is limited due to some practical factors in the research environment. It is hoped that it would be possible in the future to do the experiment with a larger sample of architecture students in particular and students from different specializations in general. This also would pave the way for conducting the experiment outside the university environment in an attempt to arrive at more generalized results and conclusions on the effect of sonic on the appreciation of architecture and visual art aesthetics.

## **5. The narrative**

Not only architecture provides the spaces for the events and their narratives, it can be by itself a narrative (Tseng, 2015). The relationship between words and visual media is strong enough to affect people's attitudes towards this media. This relationship has been well studied and different approaches have been developed not to mention the "Bouba/Kiki" approach of Wolfgang Kohler ((Duthie, 2013). This research is limited to study the relationship between the narrative as a description of the architectural design project and the appreciation of its architectural aesthetics. It was a neutral description of the project. The narrative was recorded by one student of the students who conducted the experiment. The narrative was made neutral as possible in order to eliminate any preference towards the words and meanings of the narrative that might divert concentration off the architectural design of the project. Simple vocabulary was deliberately used that can be understood easily by all the participants. Both the tone and method of reading the narrative or its vocabulary were not considered as factors that might affect the appreciation of the listeners in this experiment. This is for practical and temporal limitations of the experiment and also for delineating the scope of the research. This is without denying the need to study the relationship between different types and qualities of narrative and the appreciation of the aesthetics of architecture and visual art in future research.

## **6. The music**

The relationship between music and visual arts is a very deep and historical one. For centuries artists of visual arts have been using music as inspirations for their paintings and sculptures (Duthie, 2013). On the other hand, the effects of music on people's appreciation of visual art have also been studied. Ercegovac et. al. (2015) proves empirically that normal people usually associate different types of music with different types of visual arts. They found that landscape art motifs for example are preferred to be associated with classical, jazz and popular music. The music chosen for the research experiment was taken from The Classical FM Digital Radio (<https://www.classicfm.com/discover-music/mood/relaxing/music-relaxation/>). The piece was Air on a G string by J.S. Bach which came from Bach's Orchestral Suite No. 3. It is considered one of the finest Baroque melodies. The name and source of the piece were not declared to the participants to avoid any reactions towards the music. The aim was to provide background music while the students followed the presentation of the architectural design of the project.

## **7. The questionnaire**

The questionnaire is considered among the important tools for examining the attitudes, reactions and opinions of people. Using the questionnaire helps to sample an adequate number of respondents within a short time (Gall et al., 2006). The use of questionnaire in this research was limited both in time and scale. It was not possible to conduct the experiment with different types of music and narrative or different types of presentations for the architectural design project. It was also limited to a small number of architecture students.

The questionnaire measured the students' appreciation of architectural aesthetics in the design project during the digital presentation of the project's video. Architectural aesthetics have been considered early in history to be part of the most famous principles of architecture written by Vitruvius in the first century BC: *venustas* (beauty), *firmitas* (firmness), and *utilitas* (commodity) (Dahabreh, 2014). Beauty which is the main factor of aesthetics can only be perceived and appreciated by looking at the firmness and commodity of architecture. Many theories have been developing after Vitruvius in order to define what firmness and commodity are and their relationship with beauty. Among these are Wotton (1624, 1897), Gropius (1947), Norberg-Schulz (1965), and Steele (1973) (Dahabreh, 2014). Trying to arrive at a more comprehensive framework defining more accurately what is architecture; Dahabreh (2014) developed a new quadruple framework consisting of 4 types of form: perceptual, conceptual, spatial and structural. It is noticeable that the "beauty" of Vitruvius is missing here. This can be

understood as an attempt to consider beauty as an integral-internal component of each one of these four elements of architectural form. By defining the components and principles of design of each one of these four forms, the appreciation of their aesthetics will give them a degree of beauty or ugliness. For the limitations of this research, the questionnaire did not try to consider any direct measurement of the perceptual and conceptual aesthetics of the project. It concentrated on the spatial and structural forms that constitute the physical body-form of the building (Ching, 2007). It was assumed that perceptual and conceptual aesthetics can be indirectly assessed by the mere judgment of the participants. Ching (2007: p 34) defines form in architecture as the: *“Internal structure and external outline and the principle that gives unity to the whole. While form often includes a sense of three-dimensional mass or volume, shape refers more specifically to the essential aspect of form that governs its appearance—the configuration or relative disposition of the lines or contours that delimit a figure or form”*. He then determined several elements for this form: Shape, size, color, texture, position, orientation and visual inertia. Based on this configuration, The questionnaire of this research used some form aspects that can easily be perceived during the presentation of the project’s video. It also used simple vocabulary that can easily be understood by all levels of the students participated in the experiment. Architectural form elements used in the questionnaire included:

- Shape and masses
- Proportions of solid and void
- Details of the facades
- Building materials
- Colours
- Overall exterior
- Landscape design around the building
- Relationship between different landscape elements
- Overall experience of building and landscape

The questionnaire responses obtained were examined manually with the help of the students of the research team. To avoid human errors, the responses were double-checked before being transferred to the spreadsheet. The distribution of responses on each variable was further analyzed, and possible relationships between variables were also explored.

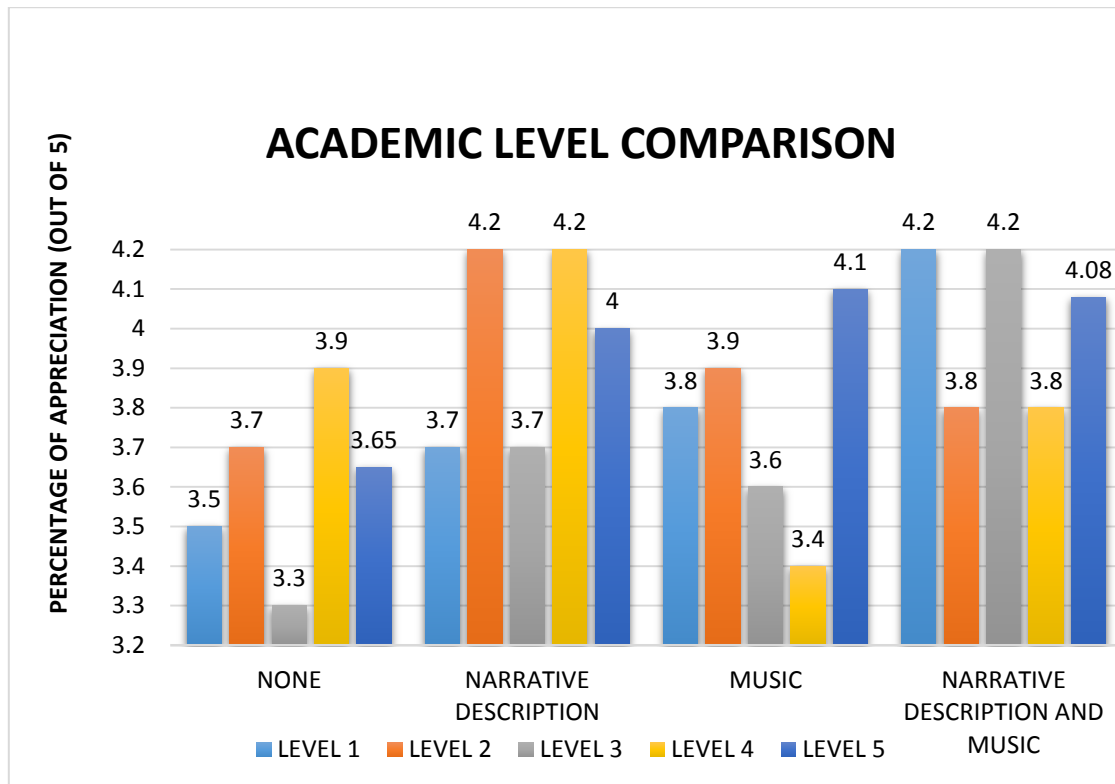
## 8. Data Analysis

The questionnaire used numerical scale from 1 to 5 for each question where 1 was the lowest and 5 was the highest.

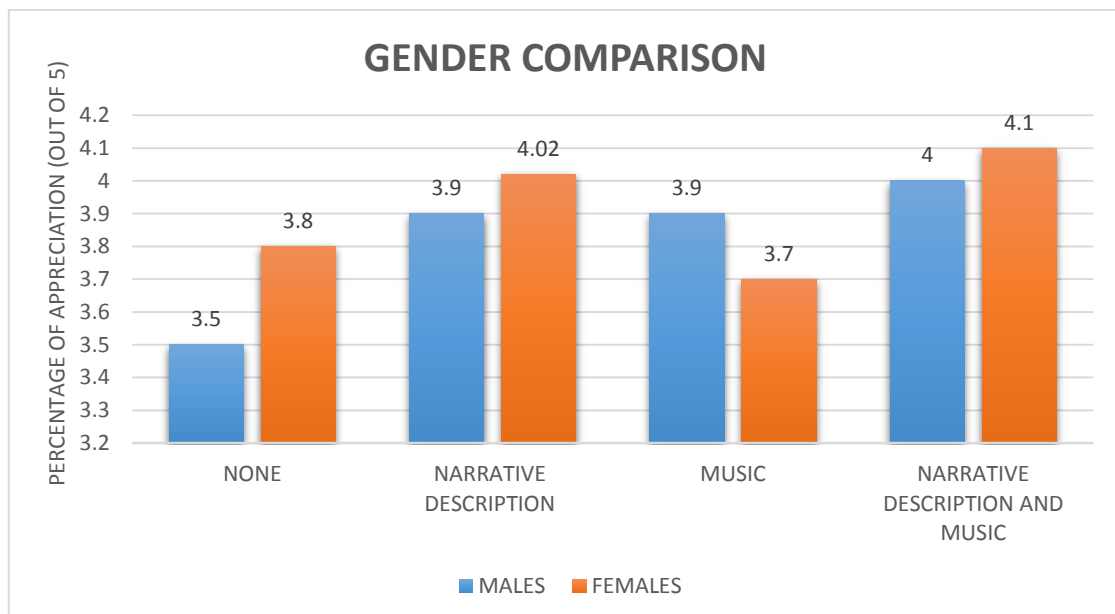
- The returned questionnaire papers were divided into subsections according to the academic levels and gender.
- The highest score that could be obtained from each questionnaire sheet in each session of the experiment= 75 (15 questions x 5). Presuming that participants from each academic level are 8 then the total highest score for each level = 600
- The total actual score of each level could then be divided by (600) to find the percentage of the actual total value of the collected responses in one students’ level. For example, if the collected sum is 500, then percentage of the evaluation= 83% for all
- To find the total response ratio on the 1-5 scale of any student level in any of the 4 experiment stages, then 83% is divided by 4x5. For example,  $83/20 = 4.1$  out of 5.
- This process is then repeated in each part for each academic level and gender.

## 9. Results

The general results of the experiment are shown in Figures 4 and 5. They show that the appreciation of level-1 students increased gradually through the experiment from no-sonic and the highest with music-narrative. On the contrary, level-2 students showed the best appreciation of the project’s aesthetics with narrative alone. Third, level 3 students gave the best appreciation while listening to music-narrative followed by narrative then music alone. Their appreciation positively responded to sonic effect and was lowest with no-sonic. Surprisingly, level-4 students showed the lowest score while listening to music while the highest was with narrative. Music-narrative and no-sonic got the same score which was much higher than music. Finally, level-5 students showed gradual increase in their appreciation from no-sonic to music-narrative with music is the highest. With regard to gender differences, it was interesting to notice that the female students’ appreciation of the architectural aesthetics of the project positively increased with narrative alone and with music-narrative while it decreased with music alone. On the contrary, male students positively appreciated the architectural aesthetics of the project with the presence of sonic effects.



**Figure 4:** Students' appreciation of architecture aesthetics of the project by level of study  
**Source:** Research team



**Figure 5:** Students' appreciation of architecture aesthetics of the project by gender  
**Source:** Research team



## Conclusions

These results show clearly that the students' appreciation of the architectural aesthetics of design projects can be enhanced with the existence of sonic effects. Yet at the same time they highlight the need for more research into the exact effects of the different types of sonic. Also there is a need to understand the reasons behind the differences in the student's appreciation in different curriculum levels. There is a need to understand the reasons behind the differences in the appreciation of the male and female students. All these insights will shed more light not only on the relationship between sonic effects and the student's appreciation of architectural design projects but also how to choose the type of the sonic to be used and how to use it in the learning environment of architecture schools. This will shed more light on an important part of the architectural education process other than the traditional concentration on course contents or teacher contribution. Finally, with the development of all these concepts more understanding will be available on the relationship between sonic effects and people's appreciation of aesthetics of visual art in general.

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