

Architecture and Music: General literature-based considerations with reference to particular cases of mutual influence between the two arts

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Abstract. The connections between architecture and music are a fascinating subject that has interested researchers since early times. Architectural thought seems to influence or in some way be implied in different musical activities. For example, architects have acoustic concerns when they create spaces for music performance. On the other hand, architectural notions and creativity are present in musical components like melody, harmony and rhythm. This essay is a reflexion on the mutual and close interaction between architecture and music. We present a brief perspective on notions related to this subject, which supports the first author's ongoing activity as an architect of spaces for music. We also refer to the particular historic case of Iannis Xenakis, in whose work the connections between the two fields are evident.

Keywords. Architecture, Music, Xenakis

1 Introduction

This essay was written as part of the first author's masters dissertation in Architecture, to be presented at University of Beira Interior (Portugal) in 2017. It focuses the connections between Architecture and Music. The two fields appear to be linked in different ways, a fact that has interested researchers since very early times. Such links are particularly evident in the architect's devising of spaces for music, when for example acoustic issues arise. When it comes to music performance, architectural space quality is vital. The architect must consider issues such as reverberation and eco, as well as the characteristics of the music for which the space is intended. The choice of materials must take into consideration their acoustic potentials and limitations. Wrong choices may result in spaces unsuitable for performing the music to which they are intended. Many expensive and visually attractive music spaces exist that present se-

vere limitations from the musical perspective.

The connections between architecture and music are obviously not limited to the creation of spaces for music performance. Perhaps in a more undefined way, architectural notions seem to be present in music. Many abstract issues arise when the relations between musical structures (like melodies, harmonies, and rhythms) and architectural elements are concerned. In the case of tonal music, for example, such apparent relations may be very inspiring for a musician's understanding of music.

The case of Iannis Xenakis (1922–2001), who was a composer and also an architect and engineer, helped us understand better some of the possible connections between architecture and music that may become relevant in the first author's work as architect. In our literature review, we took particular attention to the case of Xenakis' work at the Convent of Sainte Marie de La Tourette in France, in the façade of which it is possible to relate rhythm to the architectural features.

2 General conceptual issues on architecture and music

Different aspects of society, culture, and life in general may illuminate and influence architectural activity. Swiss architect Mário Botta (b. 1943) refers the case of Charles-Edouard Jeanneret-Gris (1887–1965), widely known as Le Corbusier, who is said to have known how to bring political, social, and economic facts into architecture. [1] Architecture involves many activities and knowledges, and it is therefore difficult to define it. History has taught researchers that it is of little use to reflect on the etymology of words referring to fields of knowledge, and architecture is no exception. [2] In this essay, the word architecture will refer to all the knowledges, skills, and inspirations that a creator of spaces may need.

For most people, defining music may seem intuitive. Some may be able to understand music, even without having received any musical instruction. The definition of music as “organized sound” has become obsolete but may be helpful in our work. Sounds may be temporally organized by composers, and organized sound structures may be recognized in nature. In any case, the recognition of “organized sounds” implies the existence of observers. Observers' emotions become relevant and one cannot separate them from aesthetic and intellectual judgment.

Architecture and music share organizational aspects of elements of different types. From the architectural perspective, it is very interesting how the score presents temporal order of sounds in the form of spatial organization of musical notation. [3] Staerken states that “The speculations about the relation between music and architecture are probably as old as both arts themselves.” [4] Indeed, when one reflects on the connections between architecture and music, many issues arise. Instrumentation, for example, may be paralleled to the choice of materials in architecture. Scores may be paralleled to layouts. Architects and musicians share one particularly strong characteristic: both convert thoughts, which are intrinsically linked to aesthetic judgement and to emotions, into notations intended to serve as instructions to performers. In one case, performers materialize buildings or spaces; in the other, performers play music. A white sheet arguably means the same for the architect as it does for the composer. It is a space waiting to receive the notation that stems from artistic thought, which will later be converted into something that may be appreciated by an audience. We argue

that many architects lack the awareness of such relationships, and with this essay we hope to help promote this awareness. Architecture and music undoubtedly share a mathematical element [4] that may be recognized (in both fields) in elements such as perspective, distance, height, balance, density, light, and color. Henrique refers that the notion of arithmetic proportion has long been taken as a fundamental rule both in architecture and in music. The most remarkable works of architectural and musical art arguably stem from the coincidence of emotionally-enriched artistic inspiration and very differentiated technical capacities. The idea that composers use sounds as their raw materials brings us to historically very relevant music theorists and critics such as Eduard Hanslick (1825–1904).[5] In technical terms, it is vital that the composer, when the conversion of thought into notation is concerned, knows how to use his/her materials as well as a good architect would.

There is record of architects who are or become musicians, and vice-versa. Many architects have found a refuge in music, as many musicians have been fascinated by the planning of spaces. Richard Wagner (1813–1883), who imagined the Bayreuther Festspielhaus for the performance of his own operas, is one such case. Some of the members of Pink Floyd (Roger Waters, Nick Mason and Richard Wright) studied architecture at the Regent Street Polytechnic in London. In 1969, the Pink Floyd launched «Music for architectural students», an album that recalls the time the musicians worked as architects.

3 Musical gesture vs architectural gesture

The notion of gesture, both architectural and musical, is very relevant to the first author's ongoing research. In both fields, gesture results in palpable works. The architect draws, whilst the composer writes musical notation. Furthermore, musical gesture is not limited to the composers' activity. Music performers convert composers' instructions into audible works of art, as if they were the engineers and builders of the artists' ideas. Gesture converts creators' intentions into artistic realities. In the case of music performance, gesture is arguably more automatic and quick than in the cases of musical composition and architecture. In live performances, unlike in the case of recordings, a player may not be able to correct a mistake. Composers and performers in non-live situations, as well as architects, may do it.

4 Scenography, architecture, and music

The art of scenography is that of projecting and building stage spaces. It is closely connected both to architecture and to music. [6] To the architects' eyes, the stage is a space like any other for which a client may commission a project. Portuguese architect Manuel Graça Dias (b. 1953) states that architecture may be seen as the organization of space for humans to develop their activities. [6] The connection between scenography and music is arguably less physical, i.e. less material, than that between architecture and scenography. Scenography is involved in any musical performance, even it does not take place on a traditional stage. Spaces for musical performance, no

matter their characteristics, may be considered as stages. Scenography will be present even when planning a performance of children in a birthday party. Telling the child to remove the chair that interferes with the audience's view of the player, or closing the room's blinds in order to achieve a particular light environment, may be examples of informal scenographic activities.

The study of *Propriedade Privada*, a contemporary ballet work by Companhia Olga Roriz with João Mendes Ribeiro (b. 1960) as a scenographer, has illuminated our understanding of the combination of three arts: architecture, scenography, and music.

We also analysed the scenographic work involved in the production of Jean-Michel Jarre (b. 1948), in which scenography is connected with music with a very strong visual impact. Jarre uses visual projections on buildings' façades, employs fireworks, light lasers, and tridimensional effects with electronic sound elements (as in *Oxygen Moscow*, premiered in 1997).

5 The case of Xenakis

Iannis Xenakis was, as mentioned above, both an architect and a composer. He was born in 1922, and graduated in civil engineering. As an engineer, he worked with the famous Le Corbusier, also mentioned above. Le Corbusier was particularly interested in the golden ratio and the Fibonacci sequence in respect to architecture. [7] Kanach refers that Xenakis was a composer, an architect, and a mathematician, and that this fact is reflected in his music [8]. According to Duarte, Xenakis tried to link architecture and music in conceptual terms, by creating visually and acoustic mutations and aiming at the technical optimization of the auditory experience. [3] Xenakis view of music in space is vital for the understanding of his production as a musician. He worked simultaneously as composer and architect. [4] The Cité de la Musique in Paris has been considered as the climax of his evolution as artist both in architecture and music. Sterken notes that "His [Xenakis'] elaborate proposal for a City of Music in Paris can be considered the climax of this evolution. Thus, a shift will be revealed from an abstract, conceptual relation between music and architecture, to a more sensual and practical approach to sound and space." [4]

Beside having worked and learned from Le Corbusier, Xenakis was a music student of Olivier Messiaen (1908–1992). Speaking of Xenakis, Messiaen remarked that "I understood straight away that he was not someone like the others. [...] He is of superior intelligence. [...] This was a man so much out of the ordinary that I said... No, you are almost thirty, you have the good fortune of being Greek, of being an architect and having studied special mathematics. Take advantage of these things. Do them in your music". [9] Xenakis strictly followed Messiaen's advice. His early musical work involves two elements from the world of architecture: the "modular", and graphic paper. In *Metastasis* (1953–54) Xenakis proposed to illustrate the relation, which he considered as obvious, between "sound volumes" and straight lines. "Metastasis is a literal sonic interpretation of this idea: here, 'sound volumes' are created on the basis of simple straight lines (glissandi)." [4] The Philips Pavilion (a world's fair construction created for the Expo'58 in Brussels by Corbusier and his architects, in-

cluding Xenakis), presents evident visual similarities with the score of *Metastasis*.

6 Concluding remark

This essay presents a personal architect's view on the subject of the connections between architecture and music. It refers to some of the abundant literature about this topic; and also to famous examples of such connections. The connection between the two arts seems mutual. Music may be viewed, metaphorically, as architecture. Music, in many cases, may be composed for architectural spaces, and should therefore be considered in relation to them. Sound architecture involves musical concepts.

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