



## Using architecture to understand music: an interdisciplinary active learning pilot project

Andrea Malvano

**To cite this article:** Andrea Malvano (2023) Using architecture to understand music: an interdisciplinary active learning pilot project, Music Education Research, 25:2, 216-230, DOI: [10.1080/14613808.2023.2183495](https://doi.org/10.1080/14613808.2023.2183495)

**To link to this article:** <https://doi.org/10.1080/14613808.2023.2183495>



Published online: 01 Mar 2023.



Submit your article to this journal [↗](#)



Article views: 28



View related articles [↗](#)



View Crossmark data [↗](#)



# Using architecture to understand music: an interdisciplinary active learning pilot project

Andrea Malvano

Dipartimento di Studi Umanistici, Università degli Studi di Torino, Torino, Italy

## ABSTRACT

Few university students in Italy today possess the necessary skills to read a musical score. Consequently, alternative strategies are needed in order to visualize – and hence to memorise – music. This is the main reason underpinning the pilot laboratory of musical architecture, which was launched in 2019 as university workshop thanks to the collaboration of Matteo Pericoli. The educational project's objective did not consist in the investigation of the stylistic analogies between architecture and music, but rather in the utilization of a plastic discipline in order to stimulate students to reflect upon musical writing, and to arrive to the point of creating three-dimensional models of the analysed compositions. The instruction of this teaching unit was based on the principles of brainstorming, peer learning, processing and the drawing up of a report of the acquired knowledge. The models created during the didactic module made it possible for the students to give an architectural form to musical solutions and concepts of a varying complexity, which facilitated their related visualization. The project demonstrated what advantages might be derived from tools which are alternatives to the musical score in order to photograph specific aspects of musical writing.

## ARTICLE HISTORY

Received 21 March 2022  
Accepted 15 February 2023

## KEYWORDS

Architecture; music; listening education; visualisation; models

## Visualising music in education

There is a sizeable portion of studies dedicated to the theme of visualisation in music education. One needs to hark back to Gestalt research to uncover the roots of processes based on psychology even before pedagogy (Rainer 1925; Fraisse 1974; Meyer 1956; Lerdhal and Jackendoff 1983). Rudolf Arnheim argued that vision was the first medium of thought, which should be deemed a sort of urgency of the human mind, to which the plastic representation of ideas is to be entrusted (Arnheim 1974). This principle has found its application in the definition of many educational methodologies, both in the development of drawing in school and pre-school age (Southcott and Cosaitis 2015; Oh 2006; Sintoni 2017), as well in the creation of self-invented notations (Carroll 2018; Elkoshi 2019). However, a great deal of research on audio-graphic interpretations of student musicians and non-musicians have underscored the exasperation of subjective and individualistic principles that are inappropriate for reconstructing shared models of music listening.

This study shows, however, that audio-graphic art is also governed by individuality, subjectivity and variable principles. In line with anthropological studies, this study proves the relevance of cultural practices in pitch-height mapping. Findings confirm that ‘cross-modal correspondences do not seem to present a single phenomenon. They are not all based on a single type of mental processing’ (Elkoshi 2019, 454).

Architecture has mostly been employed with the aim of producing stylistic comparisons with contemporary musical repertoires (Junod 2017; Till 2016; Andreolli 2017), but the formal and structural similarities between the two disciplines might undoubtedly favour the creation of educational paths focused on listening education. Already at the turn of the Twentieth Century, the most complex musical compositions (in particular fugues) were often analysed as *cathédrales sonores* at the Schola Cantorum in Paris, (D'Indy 1909, 37–38), made up of spaces, symmetries and vanishing points. Perhaps it was this very conception that inspired some recent educational projects, such as those described by Barbara Russano Hanning in *Vitalising Music History Teaching*, talking about rhythm, melody and metre about the church of St. Pierre in Moissac in southern France (Russano Hanning 2010). But there is also the possibility of exploiting architecture in order to form comparisons that go beyond the works that were the offspring of the same cultural thought, working on common constructive mechanisms.

This choice can be particularly effective in contact with students not able to read a score but enrolled in university music history courses. The situation is quite frequent in Italy. The teaching of music, owing to a reform in 1923 (Gentile 2003), stops at lower secondary school, while music education only remains present in the higher orders at musical high schools and pre-academic conservatory courses. It is therefore quite common for university courses in artistic, musical and performing arts disciplines to admit students who are unable to orient themselves in a musical score. Our challenge, as teachers at this level, lies in building up from the ground, and simultaneously, those knowledge bases and skill sets that may have been overlooked or neglected in the earlier stages of our students 'formal education'. Networking is required (Archetto 2022), working systematically on interdisciplinary categories, which allow students to understand music by analogies, mitigating their insecurities with references to more familiar disciplines. Architecture can work, becoming an effective means of visualising an art which is by its nature invisible.

## Laboratory and sample

The pilot listening education laboratory, which we intend to present in this article, took place at the Department of Humanities of an Italian University, as part of the supplementary educational activities to the Course of Studies in Artistic and Musical and Performing Arts (DAMS). The reference teaching was History of Music, which is compulsory in the first year of the three-year study plan and focused on repertoires ranging from the Eighteenth to the Twentieth Century. The scarcity of the technical skills of the students enrolled in the DAMS oblige teachers to exclusively work on listening to music, selecting some examples of works to be entrusted with the reconstruction of broad stylistic features. The workshop was designed to encourage a more conscious reflection on some of the aforementioned examples of works, favouring the visualisation of formal, syntactic and lexical concepts that students who are not musicians often struggle to fix in their minds. There were 6 meetings, all closely spaced, in May 2019 lasting between 2 and 5 h.

The project was set up by the author in collaboration with the architect, designer and teacher Matteo Pericoli, the creator of a literary architecture laboratory ([lablitarch.com](http://lablitarch.com)), already experimented with – starting from 2013 – in many schools and cultural institutions around the world (Columbia University School of the Arts, Hebrew University of Jerusalem, National Taiwan University, Scuola Holden and Fondazione 'Sandretto Re Rebaudengo' of Turin, Department of Architecture of the University of Ferrara, Department of Southwestern University, Hunter College and Graduate Center of New York, High Schools in Maryland, California, Oklahoma and Turin). The didactic cycle therefore produced, for the first time and in an experimental way, the transposition into the musical field of a project that was conceived to investigate literature by exploiting the interdisciplinary medium of architecture.

The sample of students enrolled in the laboratory consisted of DAMS students, most of whom were enrolled in the first year of the master programme and who had already attended the institutional lessons of History of Music. The need to work in small groups with a seminar methodology made it essential to select a limited number of participants, 15 in all, among the many who had expressed interest in the specific teaching activity.

## Methodology

The fundamental principles on which the Music Architecture Laboratory was based are active learning and cooperative learning. There is a great deal of specific literature on active learning in listening education activities (Starr 2012; Natvig 2012), which demonstrates the advantages of a class that learns, favouring an in-depth and collective reflection on the musical repertoire and an exploration of potential criticism, often submerged, levelled by the students. The benefits of this methodology include: an increase in the desire to learn, a generally positive and relaxed atmosphere of the class, the feeling of reaching knowledge independently, the maturation of greater sensitivity in synthesising the works analysed. The cooperative learning activities then make it possible to overcome the old model of the face-to-face lectures, still favoured by university teaching, facilitating the participation of everyone and challenging the ‘prompt question’ methodology (Baumer 2019, 181–182), which only allows to verify the level of attention shown by students during previous lessons and at the same time to comfort the teacher on the destination reached by the information transmitted. However, in modern listening didactics, opportunities are needed to reflect in a collective and problematised manner on the questions that the musical scores offer the listener. The dialogue between the teacher and the students is therefore crucial for identifying the aspects of musical writing on which it is necessary to question oneself, stimulating critical and hermeneutic thinking.

The workshop began with some key questions, advertised in the Department together with the promotional poster:

- What is music made of?
- How do themes follow one another, alternate and transform in the formal articulation of a composition?
- How does the space develop from a formal point of view?
- How do we perceive a melody or harmony?
- Is it possible to build a model of a musical composition?

Based on the model of the previous literary architecture laboratory, the goal was to explain (and therefore understand) music by utilising architecture. The final result had to consist in the creation of cardboard models of the analysed compositions. Pericoli, starting from the literary project, speaks of a game of roles, with only one strong rule:

"Whenever I hold a *Laboratory of Literary Architecture* workshop, we treat it like a game; a game with only one, straightforward rule: in our attempt to translate an intangible text into a tangible architectural model, we must be *literary* and not *literal*. Therefore, we mustn't replicate any location, object, setting, building, and so on, described in the text. We must instead dig deeper and work reductively. Delving into a literary text in order to discover how it is structured, how and why it stands, how its characters or themes are connected, and how its chronology is organised, is also a way to approach a purer kind of visceral architecture without the weight of intellectualism. One that relies instead on literary narrative to explore space and emotions" (Pericoli 2019, 287)

The need to avoid a literal transposition of literary contents could be adapted quite well to instrumental production, in its abstract manifestations without any explicit links with phenomenal reality. For this reason, the experiment seemed destined to achieve appreciable results, stimulating a thought of music that was articulated on a plastic-architectural basis, which replaced the notated visualisation of the scores – which remained inaccessible to most of the participants – with a physical and palpable perception of spaces, forms and compositional solutions.

There were two risks however. On the one hand, projective listening (La Face 2008; Della Casa 1985) to be understood as an egocentric perception of a piece of music, with the attention focused on the experiential subject (the listener) much more than on the object to be experienced (music). This is the danger that is incurred when the piece is transformed into the screen on which to project

a personal experience, transforming the artistic work not into an object which should be known but into an extension of individual subjectivity. The sensation is inevitable in conditions of superficial utilisation, but an obstacle to the production of educational activities aimed at forming a conscious listening to the analysed repertoire (Somigli 2013).

Then there was also the risk of running into an excessively idealistic vision of the selected musical pages, responding too abstractly to the basic question posed by Pericoli at the opening of the laboratory. If we take a score and shake it vigorously imagining that we are ‘stripping’ it of all the notes, just as we could do with the leaves of a tree, what will remain (Figure 1)? It was necessary to avoid that the question, which was undoubtedly useful for activating a reflection in cooperative learning without giving in to the consolidated mechanism of the ‘prompt question’, was a vehicle of personal reactions, completely disconnected from the awareness of the musical choices adopted by the composers examined.

Therefore, some methodological strategies were immediately defined, in order to delimit the risk area of these potential exasperations of the subjectivity of use. It was first of all deemed appropriate to provide the laboratory with a solid guide to preliminary listening to the pieces, in the absence of the architect, with the aim of forming a conscious, and not projective, knowledge of the selected music in the participants. We then thought with great attention upon the identification of the compositions, avoiding pages with explicit extra-musical references that could guide the students’ imaginations in an excessively literal way, and therefore through categories unrelated to listening. Finally, we stimulated reporting from the very first meetings, favouring the use of appropriate vocabulary – not necessarily technical – to describe the main characteristics of the works identified, highlighting the most original compositional procedures and questioning the group on the possible reasons for the choices made by the authors.

Finally, it was necessary to give an additional rule to the laboratory, discouraging the students from the plausible temptation to create models that were stylistically inspired by contemporary architecture: explicit allusions to buildings built in the same historical period did not seem useful to us, in order to give a plastic visualisation of the compositions. (churches, monuments etc.). This might have compromised the maximum possible connection with the music examined, creating annoying interferences with well-known architectural models, and was also capable of exercising decisive influences on the participants’ imagination: connecting Bach to a Baroque church, for example, could lead to building models in a manner of the everything independent of the conscious knowledge of the composition studied.

### How the workshop was conducted

The six meetings of the workshop took place in a short span of time (one lesson every 2/3 days) in accordance with a structure based on the previous Literary Architecture Laboratory’s model. The idea was to encourage participants to experience a full immersion within the repertoire being examined, facilitating close contact between the students.



**Figure 1.** Screenshots of the animation created by Pericoli to visualise the laboratory’s core question.

### **Phase 1: listening guide (3 h)**

This initial phase was preceded, as we said, by a careful selection of musical pieces. In agreement with the architect, it was preferred to choose short works, which did not engage the group's concentration in an overly cerebral way, and which did not present formal structures that were so complex as to guide the visual imagination in the structural construction of the cardboard models. The refusal of explicit extra-musical references, if not very generic, favoured the identification of compositions taken from the production of so-called absolute music (Dahlhaus 1978), undoubtedly less binding as concerns the visual definition of architectural projects. The experimental nature of the didactic cycle then suggested a comparison with disparate historical periods, covering three centuries: from the eighteenth century to the second century. Based on these criteria, the selection fell on the following musical works:

- Johann Sebastian Bach, *Brandenburg Concerto* no. 3 (first movement) for string orchestra
- Robert Schumann, *Duett* from *Fantasiestücke* op. 72 for violin, cello and piano
- Arnold Schönberg, *Vorgefühle* from *Orchesterstücke* op. 16
- Philip Glass, *Etude* n. 2 for piano

The listening guide was held in the manner of a seminar, with the entire group of participants gathered in a circle class, and the support of the piano to highlight the main compositional elements. The methodology was set up on the basis of three fundamental principles: segmentation, repetition and stratification. Despite the brevity of the pieces, Italian university students, not used enough to attend classical works, struggle to actively listen to music which has been conceived according to mechanisms that are quite different from the pop repertoire. The segmentation into small structures is therefore necessary in order to facilitate reflection on the solutions effectuated by the composer in the evolution of writing music (La Face 2008). The success of this approach was facilitated by repeated presentations of the same episodes, designed to help the class memorise the distinctive material of the individual sections and identify what Irène Deliège defines «cues», or salient elements by virtue of their relevance or frequency (Deliège 2001). The repeated listening was also focused on some fundamental parameters (rhythm, melody, harmony, semantic and emotional implications) with the aim of leading students to analyse music by layers. After the segmented and repeated analysis, all the pieces (with the exception of the *Brandenburg Concerto* n.3, which had already been studied during the lessons of the institutional History of Music course) were recomposed by an integral listening, supported by formal schemes containing all the cues and the compositional choices highlighted in the brainstorming phase. At the end of the lesson, the class received the link to a Spotify playlist via email, containing only the 4 pieces analysed, with the instruction to listen to the tracks repeatedly in order to assimilate the characteristics commented upon in the classroom.

### **Phase 2: history of architecture lesson (3 h)**

After the listening guide was completed, the architect Pericoli intervened in the second meeting, introducing himself to the students, telling them first of all about his creative and professional career. He presented some of his works to the class, especially focusing on three projects: the windows of great writers of the twentieth century (Pericoli 2015), the urban landscape of Manhattan (Pericoli 2001) and the long visual research on the skyline of 70 urban centres, today exhibited at the JFK airport in New York (the work, titled *Skyline of the World*, was presented in 2007). Then he made a quick overview of the history of architecture, from its origins to the twentieth century, selecting some exemplary works that could stimulate parallels with the language of music. With the collaboration of the writer, a brainstorming session was initiated, aimed at activating interdisciplinary reflection, both in the formal reading of the buildings observed, and in the expressive interpretation of some recurring solutions over time.



This phase of the laboratory was necessary in order to boost the confidence of students enrolled in a degree course in artistic, musical and performing arts disciplines in their ability to reflect upon architectural themes. No technical information was used by Pericoli, making it easier to observe the selected works in a broad perspective, which could capture one of the many possible manifestations of artistic thought in a building's or monument's features. The goal remained that of thinking about the architectural object in purely aesthetic terms, reading the possible reflections of a musical idea: be this at the entrance, detecting plausible influences of a research born in the field of composition, as well as at the exit, reading possible musical consequences of concepts expressed by architectural projects. Precisely in this phase, the teaching staff emphasised the search for timeless correspondences, without necessarily limiting the stylistic and formal connections to works that emerged during the same historical period.

At the end of this meeting, the class was divided according to the interest shown by individual students for one of the 4 compositions analysed in phase 1. Five groups were born:

- Group 1: three students working on Bach's *Brandenburg Concerto*
- Group 2: three students working on Schumann's *Duett*
- Group 3: three students working on Schönberg's *Vorgefühle*
- Group 4: three students working on Schönberg's *Vorgefühle*
- Group 5: three students working on Glass's *Etude n. 2*

The need to set up small groups, not exceeding 3 units, made it necessary to duplicate the project on *Vorgefühle* by Schönberg, favouring a further experimentation within the workshop: the comparison between the results obtained by two different teams starting from the same musical work.

### **Phase 3: brainstorming (4 h)**

Once the groups were defined and in the introductions to each other facilitated (many of the students did not know each other except in an extremely superficial way), the first brainstorming phase among the members phase took place. The students, united by the common interest in the indicated composition, had to begin to reflect among themselves on the reasons that had prompted them to make that choice, they had to identify which characteristics, on the basis of the listening guide carried out in phase 1, they wanted to highlight within the project. This activity required careful meditation on the many specificities commented on during the first meeting, inevitably leading to shared choices. For this reason, the brainstorming, during the first hour of phase 3, was completely free, with the intention of verifying actual convergence or divergence between the ideas of each individual group. Then the teachers began to follow the work, trying to mediate any communication difficulties between the various components, and directing the conversation towards results that were concretely achievable, as well as adequately representative of a conscious assimilation of the works studied.

Having collected the ideas about music, it was necessary to move on to the first plastic visions of the compositional solutions identified. The students were asked to answer questions about the visual forms that those compositions, on the basis of the analysis addressed collectively, could transmit on an individual level. Quite instinctively, concrete images emerged quickly, which soon had to adopt the approach of graphic design. In this moment of phase 3, the words began to naturally turn out to be inappropriate to express the thoughts of the students, who found themselves forced to sketch their plastic ideas more or less precisely, in keeping with their individual artistic inclinations. This moment of great expressive freedom was guided with extreme attention by both teachers, because it as a matter of fact defined the foundations of the interdisciplinary project: the convergence on some graphic ideas had in fact to be functional in order to verify the conscious reading of musical works and together to activate the class's creativity.

### **Phase 4: design (4 h)**

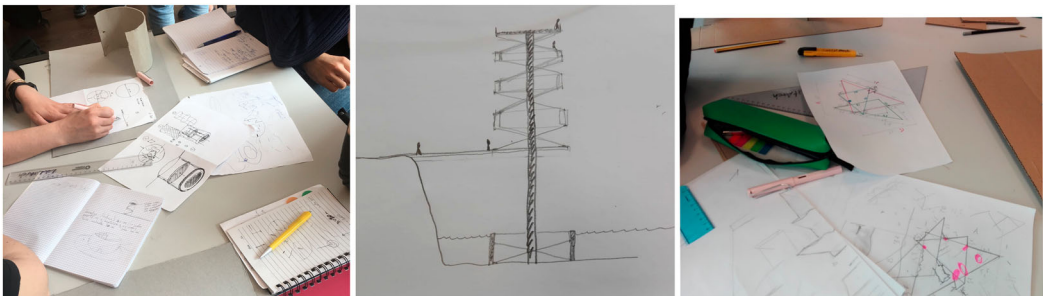
The actual design of the models only began during the fourth meeting (Figure 2). On the basis of the sketches commented on during the brainstorming phase, the students began to work on a definitive drawing of the building, taking into consideration those materials made available by the laboratory: paper of various colours, cardboard, nails, vinyl glue, transparent sheets, sticks of wood, crepe paper. This activity was supported by the collaboration of two young architects, who led the groups in planning buildings that could be technically feasible in the few hours still available, without however influencing the students' creative choices. In some cases, it proved necessary to adapt the ideas to the actual feasibility of the project, while maintaining the original thinking of the individual groups intact. Furthermore, given the humanistic imprinting of the class, some practical indications were indispensable in order to assemble the various elements of the project in a three-dimensional manner. The greatest difficulties occurred in group 2, which was engaged in the representation of Schumann's *Duett*, which envisaged a double concentric spiral inside the building, which required rather refined dexterity. Generally speaking, the teachers in this phase tried to maintain a maximum amount of independence between the various processes, avoiding any influences between the groups as much as possible.

### **Phase 5: construction (5 h)**

In this phase of the workshop the groups, once they arrived at a definitive, unique and shared graphic project, the activities of real construction of the models started. Always with the collaboration of the young architects and Pericoli, they selected the most appropriate materials, among those available, to give solidity and height to the artefacts. Each group proceeded to a very precise division of tasks, enhancing the manual inclinations of the individual components. In general, the students privileged the expressiveness of the buildings to the practicability of the same, which therefore took the form of imaginary architecture, completely free from any functional thought. The use of a foldable and extremely versatile material such as cardboard, the main constructive element of the models, has made it possible to faithfully respect the ideas condensed in graphic projects, at the same time obtaining very light and easy to handle results (Figure 3).

### **Phase 6: report of the proceedings (3 h)**

The drawing up of a report of the proceeding's activity was greatly stimulated during the workshop. Starting from the design phase, the students were invited to prepare a draft of a text, to which they could entrust the presentation of their models. This written description had to contain an appropriate synthesis of the main musical characteristics elaborated in the artefact, without necessarily resorting to technical terminology; it also had the function of explaining the meaning of each choice



**Figure 2.** Graphic elaborations that emerged in phase 4 of the workshop.



made by the group during the design stage. For this reason, both teachers spent a great deal of time, during the pauses of phases 4 and 5, to refine the writings of the individual groups, highlighting any weaknesses and sharing specific observations regarding clarity, appropriateness and interpretative depth.

The work on the texts, parallel to the assembly of the constructions, favoured the maturation of further awareness in the students on the reworked compositions. These writings were not delivered exclusively to the teachers, but were also the subject of oral reporting, at the end of the work, when – simulating the situation of the face-to-face lectures and seminar – a presentation of the models and the related design work was held, among the students themselves. In the specific case, the opportunity to participate in a day to enhance the course of study made it possible to carry out a further test of the drawing up of the reports, with the illustration of the projects to a public, not only to a university public, in a more formal situation, including live performances.

### Discussion of the results

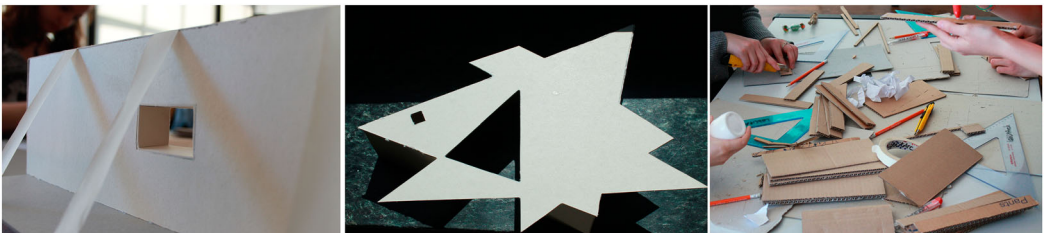
The workshop produced 5 models of the analysed compositions, mainly in wood and cardboard, mounted on square platforms. The measurements, very similar for all the works, on average were the following: 30 cm wide, 30 cm deep and 20 cm high.

#### Group 1: *Brandenburg Concerto n. 3*

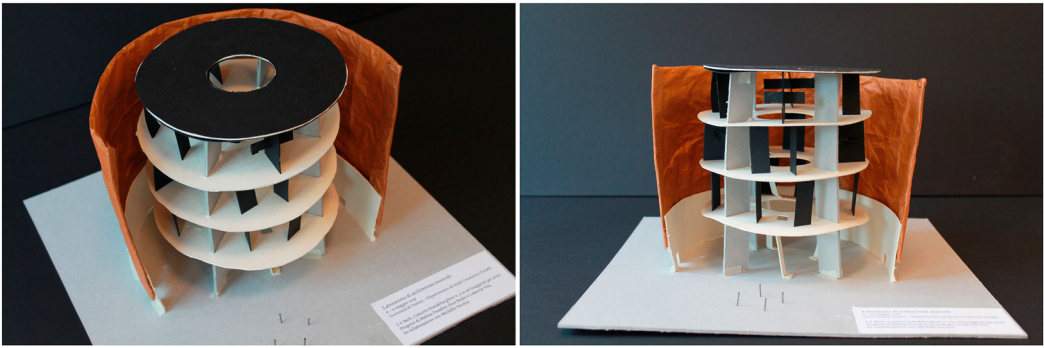
The model created by this project ([Figure 4](#)) wanted to reflect above all the strongly cerebral and illusionistic experience derived from listening to Bach's music. These are the words contained in the group's writing:

"Bach is the genius who enjoys his compositional playing and invites – perhaps challenges! – the listener to walk through his architecture, without hiding or even downgrading any element of this perfect unity in variety. The listener is directly catapulted into another dimension, and it is he himself who decides which way to go to get to the end of this long journey. For this reason, our architectural project has the shape of a cylindrical block, internally divided into four levels, in turn divided into four sections delimited by the four supporting walls. We wanted to maintain a dialogue with the structure as a whole at every level of the internal articulation, avoiding total boundaries and closures. In fact, you will notice how each floor has a circular hole in the centre that receives light from the ceiling opening and allows the visitor to maintain visual contact with the structure as a whole. Also, within each floor we have maintained the dialogue between the overall idea and a suggestion of delimitation, preferring structural partitions placed halfway between the circumference of the light well and the floor's perimeter".

The work essentially sought to express a recurring feature of Bach's production in plastic and visual terms, namely polyphonic writing, which by virtue of a perfect balance among the parts made it possible for the user to follow autonomous pathways within the intertwining of the melodic composition. The circular structure, just like the conception of time in the first movement of the



**Figure 3.** Some shots taken from the construction phase.



**Figure 4.** Group 1's model (double perspective).

*Brandenburg Concerto No. 3*, makes it possible to rethink a musical movement that systematically rotates around an anapaestic rhythmic pivot. But at the same time this open space architecture allows the visitor to always observe the building in its complexity without ever losing sight of the starting point, just as in Bach's composition the deductive principle that regulates the proliferation of the material favours the maintenance of a continuous contact with the thematic elements from which the musical process springs up.

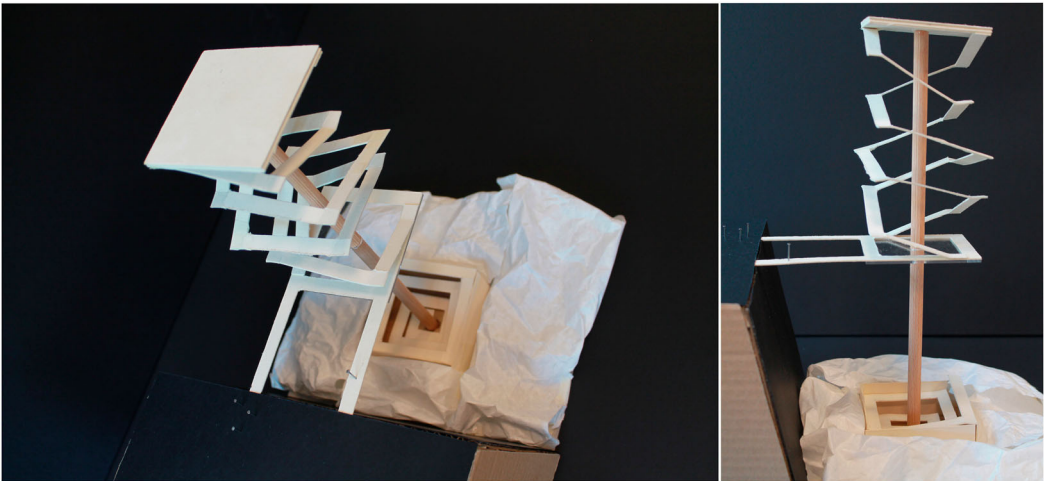
The presence of numerous stairs, which however always lead to the same destination, represents with an effective visual metaphor the multiplicity of paths that the listener can afford to follow within a polyphonic work. Overall, the model offers an invitation to the infinite voyaging possibilities that can be made within a structure based on the aesthetic foundation of unity in variety, thanks also to the multiplication of shadows and reflections, generated by the central opening. The illusionism of Bach's musical writing, which blends the tonal uniformity of the ensemble for strings only in a multifaceted palette of instrumental colours, thus finds a perfect manifestation in the illusionism of an architecture that tends to disorient the observer.

### **Group 2: *Duett* from *Fantasiestücke* op. 88 by Schumann**

The attention of the students, in this work (Figure 5), was attracted by the transformation of the relationships between the parts over the course of the piece. The title *Duett* in fact alludes to a dialogue between two interlocutors, although the composition is written for a trio; and actually in the first part to attract the attention of the listener are exclusively violin and cello, with the piano playing a simple role of accompaniment. But in the course of the movement, these hierarchies are overturned, bringing the keyboard instrument to assume a drawing in function towards the strings, progressively dragging them towards a dark unison sunk into the low register. Here is an excerpt from the group's final report:

"To convey the idea of the duet of the string instruments, the building has a spiral structure which, also given the half-height entrance, develops both upwards and downwards. The piano, on the other hand, is represented by the central column which, at first glance, only acts as a simple support while then, once you reach the top of the spiral, it conveys the idea of driving and command. Since Schumann's *Duett* is a rather light and fluctuating piece, the structure also wants to express this sense of suspension; hence the motif of the underlying void which, at first glance, suggests that the architecture is floating in mid-air, initially hiding the supporting column as well. The vague allusion to the physiognomy of the lighthouse is intended to express the guiding function of the piano during the course of the piece".

In this case as well, the students imagined a de-functionalized building, which in the lightness of the two concentric spirals alludes quite explicitly to the amorous intertwining between the voices of the strings. The solidity of the pole recalls the fundamental support played by the piano. But it is



**Figure 5.** Group 2's model (double perspective).

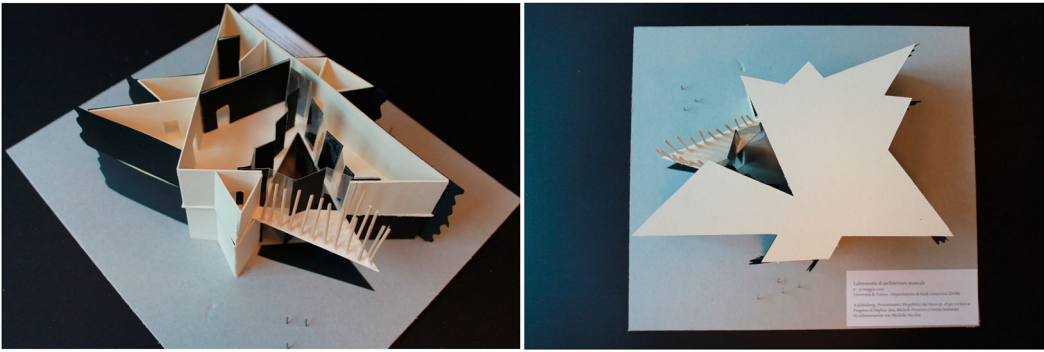
precisely the path that manages to tell the gradual evolution of internal relationships in Schuman's writing: arriving from the cliff, the visitor cannot help but grasp the enchanting beauty of the spirals, yet at the end of its ascent, thanks to a totally transparent viewing platform (just like London's Tower Bridge), he is forced to notice the striking and unpredictable depth of the pillar, which sinks its foundations directly into the sea.

### **Group 3: *Vorgefühle* from *Orchesterstücke* op. 16 by Schönberg**

The first of the two projects based on the atonal and expressionist piece by Arnold Schönberg was inspired above all by the sensation of neurosis and psychic disorder explicitly transmitted to the 1909 listener (Figure 6). The unresolved tension, represented musically by a continuous desire to sing that nevertheless never manages to take shape, suggested to the students the image of a maze with no way out:

"We imagined a visitor entering a two-story maze-like building. The irregular construction immediately upsets it due to its asymmetry that makes it lose its orientation. Dissonance pervades all musical writing in a systematic way. This situation produces a transformation of the usual function of dissonance: no longer an incidental but a systematic condition. In our building, every meeting between two walls generates an edge that is not straight, but wavy: the angle is therefore fluid. As in Schönberg's music, the fluidisation of the edge becomes 'normality'. In the central section of the piece all the instruments come to scream, seeking satisfaction from the accumulated sense of frustration; the scream is strangled in a pianissimo. In the same way, a 'garden' opens up in our building, where the visitor thinks he will find peace and order. Instead, he finds a hole illuminated by a blinding light: we were looking for peace, while we find anxiety and chaos, the walls are not orthogonal, the angles are sharp, an inhospitable space. Schoenberg's anxiety pervades everything, setting off reverberations on the walls of the garden and of the entire building".

In this case, beyond a predictable search for claustrophobic and disorienting spaces, the group's desire to represent in space a complex concept such as that of the emancipation of dissonance was surprising. The architecturally imaginative conception of the fluidised corner was the result of an in-depth brainstorming on the theme of atonal harmony, which, in experimenting with the visualisation of an extremely technical principle, testifies to the assimilation and at the same time the reworking of a cornerstone of Schönberg's aesthetics. Equally interesting is the image of the glimpse of blinding light, which deceives the visitor by offering the only apparent sensation of emotional



**Figure 6.** Group 3's Model (uncovered and covered building).

release, just like *Vorgefühle*'s continuous instrumental screams, systematically attenuated by sudden limitations of dynamics, exponentially charge the unsustainable tension of the composition.

#### **Group 4: *Vorgefühle* from *Orchesterstücke* op. 16 by Schönberg**

It is interesting to note that, despite a very different external structure (rectangular and irregular), the interiors and construction principles of the models made by Group 3 and Group 4 are very similar. Again in this case (Figure 7) frustrated tension, emancipation of dissonance and claustrophobia emerge clearly from the words of the students:

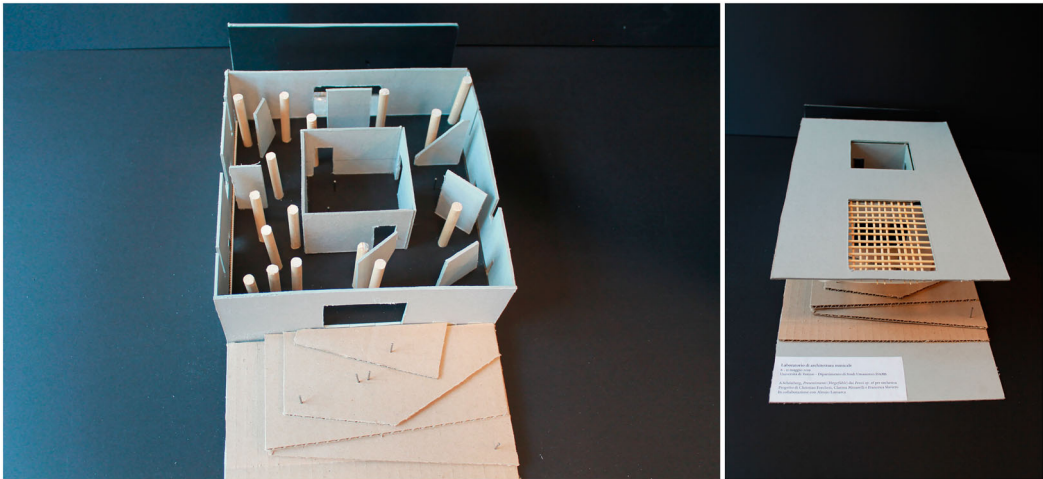
"The stairs at the entrance, with irregular treads and risers, trace the sense of instability and unpredictability of the piece and are surmounted by a reticulated roof which, maintaining the same height for the entire flight of stairs, gives those who walk them a feeling of increasing oppression. In the first part of the building, as in the composition, the dissonance begins to emerge little by little until it finally imposes itself once you enter, as the title of Schoenberg's piece suggests, in fact, a 'foreshadowing'. The slits on the side walls, placed at different heights, allow the light to enter, creating a disorienting effect within a labyrinthine pathway that prevents a regular journey, owing to the presence of a dense forest of columns and walls. This may remind us of the lack of predictability in the musical processing present in the piece".

The reference image is again that of the maze with no way out, with a series of columns with no structural function, but simply disorienting for the visitor and at the same time representative of the unresolved tensions in the composition. But the most interesting alignment with Group 3 concerns precisely the common choice of associating the sound of the muffled scream with the room with no exit and flooded with blinding light. The violence of the frustrated dynamic peaks in Schönberg finds in both projects a dazzling luminous manifestation, which suggests a salvation that is in reality only apparent. In this case, the students also tried to give a plastic form to *Vorgefühle*'s finale, which ends abruptly with an ostinato in accelerando: Schönberg leaves the listener with the sensation of a new beginning traumatically interrupted. Similarly, the Group 4 building ends with a window overlooking a stream, flanked by a tall, sinister black wall. The visitor, just like the listener, in catching his breath through the final opening feels both relief and terror: the desire for a new beginning is violently castrated by the vision of an insurmountable obstacle.

#### **Group 5: *Etude n. 2* by Glass**

Philip Glass's elementary and hypnotic minimalism suggested to Group 5 a basic structure: not a building but a very simple isolated staircase (Figure 8). In this case, the project underwent a decisive transformation during the various phases of the laboratory. The shared idea in fact consisted in the

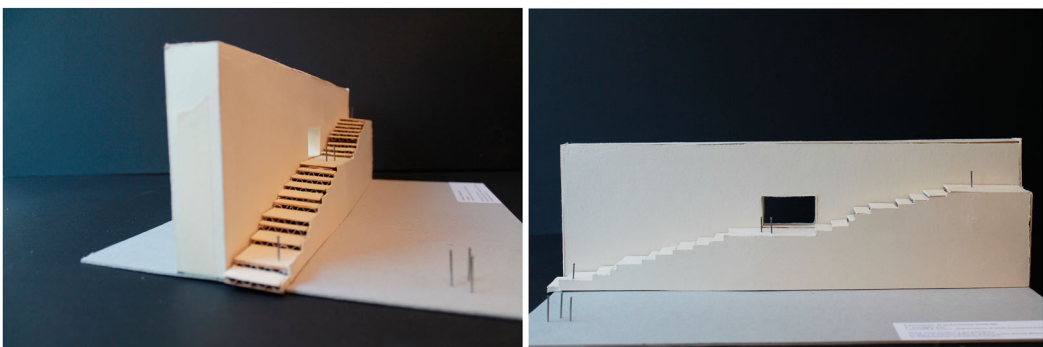




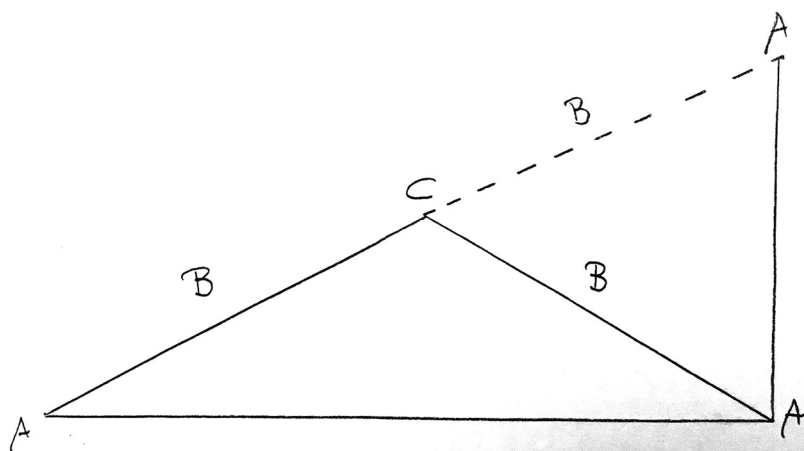
**Figure 7.** Group 4's Model (uncovered and covered building).

representation of a palindrome structure, exactly like the articulation of the musical piece: A-B-C-B'-A'. Initially, the members of the group had imagined a triangular architecture, which reached its peak (C) and returned in a perfectly retrograde manner to the same level as A, plastically visualising the path of accumulation-reduction of musical material. But then the collective reflection of the students favoured the maturation of a deeper and less literal thought, which extended the path of the staircase upwards, without returning to the same starting level (Figure 9):

"The listener / visitor is led by the melodic current to travel a road that leads him to a new element: the window, corresponding to section C of the musical piece, is offered to the viewer, allowing him to wander beyond the wall, without however be determined as an exhaustion of the action, but rather as a continuation of the journey and therefore of the experience. The staircase is not defined by markedly straight lines and proportioned according to very precise numerical ratios, which would have expressed the rigidity and fixity of the piece, but by curvilinear features and an irregularity which rather express the internal dynamism and fluidity of the music. Indeed, the whole composition flows according to a trend of kinestatic construction, in the middle of which is the window is situated which, if on the one hand creates a sense of relaxation of waiting in the listener (i.e. reaching a climax which, however, is not the landing place but only the appearance of the landing place) on the other hand avoids the possibility that the path is identical to itself, suggesting rather to the listener the memory of a journey, never repetitive and exactly specular:



**Figure 8.** Group 5's Model (double perspective).



**Figure 9.** In the Group 5's graph, the solid line identifies the first version of the formal scheme, while the dotted line corresponds to the definitive evolution of the project, then realised in the model.

therefore, despite the passage is in some way specular ( $ABC-B'-A'$ ) for this reason the possibility that something else breaks in and upsets expectations is no longer possible".

The result, in its essentiality, visually effectively expresses the peculiarity of musical symmetries, where the return of what has already been said cannot generate the same sensations in the listener, but only the memory of a past ( $AB$ ) now transformed by the superimposition with the new ( $C$ ). The continuation of the staircase towards a further peak ( $A'$ ) thus becomes the perfect representation of a pathway similar in form, but different in substance: it is true that we listen to the same material, but the passage of time forces us to perceive it in a different way. In the same way, in the staircase, we face identical risers and treads, but those same elements, already trodden in the first phase of the path, are no longer at the same height: they are taking us even higher towards the achievement of a completely different view.

## Conclusions

The Music Architecture Laboratory's didactic experimentation has made it possible to work on an urgent theme in contemporary society such as listening education. The methodological principles of active and cooperative learning have been adapted to a pilot project that may prove to be of particular use in those schools and academies where no specific skills are provided for reading the score. In Italy, applications can also be extended to secondary schools, where the teaching of music is not currently included in the curricula; but their expansions at an international level, as already demonstrated by the circulation of the literary format conceived by Matteo Pericoli, are also possible in cultural areas that are more musically skilled, where there is more solid technical knowledge, including in Conservatories, working on alternative forms to notation to visualise music could yield surprising results. But the ideal recipient of this workshop is undoubtedly the student who struggles to orient himself within a musical score. The models that were born from the didactic module allowed the participants to provide a plastic form, working on mechanisms of use and analogical interpretation of music, to musical solutions and concepts of various complexity: emancipation of dissonance, rotary tempo, polyphonic dialogue, palindrome form, and deductive principle. In a purely verbal dimension these ideas would have remained elusive, risking disappearing together with the memory of the works heard. But the concrete and physical visualisation of the aspects highlighted in the brainstorming phase allows the assimilated knowledge to be fixed in a much more solid way, facilitating its transformation into skills to be spent in contact with other musical compositions based on similar procedures.



Together with institutional courses in the history of music, the laboratory can become an effective tool for both verification and re-elaboration. On the one hand, a thoughtful and understandable representation of the works studied allows us to probe the actual maturation of conscious listening on the part of the students. On the other hand, the creation of original restorations allows to activate forms of autonomous reflection on the compositions examined, stimulating critical and hermeneutic thinking in the artistic field. The interdisciplinary nature of the project also facilitates the reading of the unfamiliar (music) through the familiar (architecture), facilitating the transmission of otherwise difficult to decipher messages.

The comparison between the two versions of *Vorgefühle* suggests a possible alternative to the project, focusing the reflection of all the groups on a single work. This solution certainly favours dialogue between students, setting different representations of the same musical concepts in parallel: observing alternative solutions to the problems faced forces us to question our own beliefs, feeding apparently exhausted discussions with new material. And the interest exercised by the convergence on similar shapes, in evaluating the functioning of perceptive and user mechanisms, is undeniable. But the subdivision of a broad repertoire among the groups involved proved to be equally useful, favouring shared reflections on disparate stylistic solutions: the preliminary listening guide was in fact addressed to the entire class, who therefore had the tools – at the end of the works – to understand and comment on all the projects presented together.

Among the possible forms of expansion, one could contemplate the application of new technologies to the laboratory. The construction and assembly activities could in fact be integrated (or replaced) by the use of specific and innovative software, which offer students the opportunity to build in absolute freedom within the space. Such tools could allow the construction of buildings that can be explored in every part, to be combined with musical tracks synchronised with the visitor's movements. There would therefore be a sort of gamification of the project, useful for combining sound and architecture in a refined way, in a precise synthesis between the constructive solutions adopted by the students and the single formal articulations of the composition.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Notes on contributor

**Andrea Malvano** is associate professor in the University of Turin (Department STUDIUM), where he is also Coordinator of the master degree in Cinema, Performing Arts, Music and Media. His courses are Didactics of the History of Music, Musical Dramaturgy, and History of Music. He was national coordinator of research projects about Rai Music Archive and about the audience education in XXth Century. His monograph about reception and analysis in Debussy's music was recently translated in Franch (*Debussy, un nouvel art de l'écoute*, Paris, Van Dieren 2022).

## References

- Andreolli, G. 2017. *Musica e architettura al tempo di Luigi Vanvitelli: spunti per un confronto*. Lucca: LIM.
- Archetto, M. 2022. "Interdisciplinary Approaches to the Introduction to Music Course." In *Teaching Music History*, edited by M. Natvig, 69–76. Aldershot: Ashgate.
- Arnheim, R. 1974. *Art and Visual Perception: A Psychology of the Creative Eye*. Berkeley: University of California Press.
- Baumer, M. 2019. "Quizmasters, Lecturers, and Facilitators: A Qualitative Study of Methodologies in Music History Survey Courses." In *Norton Guide to Teaching Music History*, edited by M. Balansuela, 172–183. New York, NY: Norton & Company.
- Carroll, D. 2018. "Children's Invented Notations: Extending Knowledge of Their Intuitive Musical Understandings Using a Vygotskian Social Constructivist View." *Psychology of Music* 46 (4): 521–539. doi:10.1177/0305735617716532
- Dahlhaus, C. 1978. *Die Idee der absoluten Musik*. Kassel: Bärenreiter.

- Deliège, I. 2001. "Prototype Effects in Music Listening: An Empirical Approach to the Notion of Imprint." *Music Perception* 8: 371–407. doi:10.1525/mp.2001.18.3.371
- Della Casa, M. 1985. *Educazione musicale e curricolo*. Bologna: Zanichelli.
- D'Indy, V. 1909. *Cours de composition musicale*. Paris: Durand: Deuxième Livre – Première Partie.
- Elkoshi, R. 2019. "Visualize Music and 'Sonify' Pictures: Studying Children's and Adults' Pitch-Height Invented Notations." *Music Education Research* 21 (4): 441–458. <https://doi.org/10.1080/14613808.2019.1626361>
- Fraisse, P. 1974. *Psychologie du rythme*. Paris: Presses Universitaires de France.
- Gentile, G. 2003. *La riforma della scuola in Italia*. Firenze: Le Lettere.
- Hanning, Russano. 2010. "Teaching Music History through Art." In *Vitalizing Music History Teaching*, edited by J. R. Briscoe, 139–160. Hillsdale: Pendragon Press.
- Junod, P. 2017. "A Survey of Architecture and Music." In *Dialogues between Music and the Visual Arts*, 140–161. London: Reaktion Books.
- La Face, G. 2008. "Il cammino dell'Educazione musicale: vicoli chiusi e strade maestre." In *Educazione musicale e Formazione*, edited by G. Laface, and F. Frabboni, 13–25. Milano: FrancoAngeli.
- Lerdhal, F., and R. Jackendoff. 1983. *A Generative Theory of Tonal Music*. Cambridge: MIT Press.
- Meyer, L. B. 1956. *Emotion and Meaning in Music*. Chicago, IL: The University of Chicago Press.
- Natvig, M. 2012. "Classroom Activities." In *The Music History Classroom*, edited by J. A. Davis, 15–30. Farnham: Ashgate.
- Oh, J. 2006. "An Exploratory Study of Children's Musical Experience: Visual Representations of Emotional Responses to Music." (PhD diss). EdD from Columbia University.
- Pericoli, M. 2001. *Manhattan unfurled: The East Side: The West Side*. New York, NY: Random House.
- Pericoli, M. 2015. *Finestre sul mondo*. Torino: Edt.
- Pericoli, M. 2019. "The Laboratory of Literary Architecture. The Joy of Cardboard, Glue, and Storytelling: A Cross-disciplinary Exploration of Literature as Architecture." In *The Routledge Companion on Architecture, Literature and The City*, edited by J. Charley, 283–305. London: Routledge.
- Rainer, O. 1925. *Musikalische Graphik: Studien und Versuche über die Wechselbeziehungen zwischen Ton und Farbharmonien*. Vienna: Deutscher Verlag für Jugend und Volk.
- Sintoni, C. 2017. "Linguaggio grafico-pittorico e comprensione musicale nella scuola primaria: Bydlo di Modest Musorgskij." *Musica Docta* 7: 141–160. <https://doi.org/10.6092/issn.2039-9715/7624>
- Somigli, P. 2013. *Didattica della musica. Un'introduzione*. Roma: Aracne.
- Southcott, Jane E., and W. Cosaitis. 2015. "Drawing Music and me: Children's images of musical engagement." *Australian Journal of Music Education* 2: 78–90. <https://search.informit.org/doi/10.3316/aeipt.215086>
- Starr, P. 2012. "Teaching in the Centrifugal Classroom." In *Teaching Music History*, edited by M. Natvig, 169–180. Aldershot: Ashgate.
- Till, N. 2016. "'Sound houses': Music, Architecture, and the Postmodern Sonic." In *The Oxford Handbook of Sound and Image in Western Art*, edited by Yael Kaduri, 163–191. New York, NY: Oxford University Press.