

# Thinking boundaries in the production of architecture and music

***Citation for published version (APA):***

Voorthuis, J. C. T. (2012). Thinking boundaries in the production of architecture and music. In K. Jong, de, A. Oxenaar, & M. Spaan (Eds.), *Music space and architecture* Architectura & Natura.

***Document status and date:***

Published: 01/01/2012

***Document Version:***

Accepted manuscript including changes made at the peer-review stage

***Please check the document version of this publication:***

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

[Link to publication](#)

***General rights***

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license above, please follow below link for the End User Agreement:

[www.tue.nl/taverne](http://www.tue.nl/taverne)

***Take down policy***

If you believe that this document breaches copyright please contact us at:

[openaccess@tue.nl](mailto:openaccess@tue.nl)

providing details and we will investigate your claim.

# Thinking boundaries in the production of architecture and music

Jacob Voorthuis

## Where lies the boundary between music and architecture?

Put in that way, the question makes us assume the existence of a boundary. That might seem self-evident – a boundary between two concepts is after all commonly demarcated by a definition: *definio* in Latin means to bound, set bounds to, limit, terminate, define. Boundaries are drawn to mark out property for the purposes of management and husbandry. Does it make sense to see architecture and music as owners of their own territory? Would such an approach not inevitably lead to *border conflicts*? Ludwig Wittgenstein advised us not to look at the formal definition of a word but rather to consider its actual use in our language.<sup>1</sup> This essay is an attempt to answer that call. The position it takes is that the words architecture and music refer to specific relationships between the human body and its environment, and *manage* these relationships in the economy of our understanding. They do this by providing the discussion about certain processes and their products with a network of significance, a framework of concepts articulated against a conceptual field that constitutes our being-human.<sup>2</sup> Every instance of use has its origin in the same source: the person making use of something. But how are we to represent that framework of concepts? This essay explores the issue at the hand of the concepts tectonics, movement and rhythm.

Nowadays we tend to think about meaning using different metaphors from those common during the Roman Empire: no longer as a partitioned landscape divided into lots and requiring border guards motivated by imperial ambitions, but as an intimately braided virtual network of coordinates plotting a complex surface of concepts with which people try to simulate reality so as to be able to use their body well in their environment.<sup>3</sup> This model does not pretend to have reached any ultimate truth, it is a simulation of reality that appears to work. The pattern formed by the connections in this virtual network shows a certain cohesion from the point of view of a person who is directing his gaze outwards towards the world in which he lives: the perspective, for example, of *my current view of* architecture as a discipline, or the perspective of *your earlier view of* music, in which the various things crowding in on that view are related to one another and measured against one another in the play of a discussion. Seen on the basis of such a model, there does not need to be any boundary drawn between architecture and music: they constitute colourful strands within the braided continuity of human experience. Nevertheless they can, just like a territory, be *mapped*. But how?

Architecture and music are produced in stages by the ordering of our environment in a design (the *virtual* space of the drawing or a composition), the performance (the *real or actualised* space of the design made into a building or the actual performance of a piece of music) and the experience of these, whereby the virtual and the real are attuned to each other in the representation of them.<sup>4</sup> The point of view of the *I* leads the way in this process, by drawing things together. In discussions with others, *I* discipline the words used in order to bring out my meaning. Music, before it is anything else, is a word able to shape a discussion by relating a special set of relationships between body and environment and thereby determining them in their significance. The sentence *this is architecture* or

---

<sup>1</sup> Wittgenstein, Ludwig (1976) *Filosofische onderzoekingen* (Philosophical Investigations), transl. Hans W. Bakx, Boom. Originally published in 1953.

<sup>2</sup> For holism in meaning, see Quine, W.V.O. (1951), 'Two Dogmas of Empiricism'. *The Philosophical Review* 60: 20-43. Reprinted in his 1953 *From a Logical Point of View*. Harvard University Press, and the later book *Word and Object*, published in 1960.

<sup>3</sup> This is a pragmatist standpoint, first elaborated by the American philosopher Charles Sanders Peirce. For an accessible explanation of this point of view, see, among others, Dewey, John (2005) *Art and Experience*. Penguin (first published in 1934). See also Shusterman, Richard, (2000) *Pragmatist Aesthetics, Living Beauty, Rethinking Art* (first edition published in 1992).

<sup>4</sup> For the difference between real and virtual space, see Summers, David (2003) *Real Spaces, World Art History and the Rise of Western modernism*. Phaidon.

*this is music* form judgements with reference to a special spatial experience. In the use of such a sentence we order the *tableau* of the environment we are undergoing through our senses and measure it against our experience, making it cohere into a an experience of, in this case, an instance of architecture or music. The sentence, *THIS is music!* involves a selection and ordering of our environment in experience; it is the judgement of a person in a *special* environment *where something special is taking place*, which is clearly the focus of his attention and which therefore guides the selection and stitching together of the elements of the *tableau* presented to his senses. However, just because the word music denotes and judges a special experience as being a musical one, does not of course mean that architecture is not simultaneously present as something that is also being undergone. In fact the two are able to complement each other well and invariably do so ; the spatial experience of beautiful music contributes to the experience of a sublime architecture and vice versa. They both denote and thereby manage their own processes of production and exploration, and do this with the single voice of our humanity, using whatever seems useful or is known to work effectively. Both develop within our human capacity for exploration and the practise of our bodies in using our environment. Man is confined by the possibilities and limitations of his body in organizing his experiences and placing them within the production process of being, such that, for example, I can say: I am someone who likes most of Beethoven and all of Bach and for this to mean something.<sup>5</sup> The senses are collectively instrumental in the production of space. Architecture and music are thus conceptual aspects of an I that help us direct the special relationships between body and environment. They are different in that they are responsible for managing different processes. How do we then distinguish between the two? The distinction between the two disciplines is made using this alternative model in at least three ways:

1. Through the pattern that emerges when each discipline orders the network of concepts within the field of human usage and the hierarchies each institutes thereby portraying themselves from the point of view of the user.
2. Through the way each of them makes use of the instrumental concepts they appeal to from their own user-perspective.
3. Through the way the disciplines come together, assembling around a particular event and then, so to speak, do their own thing, as for example with the theme death or marriage, themes that have a musical as well as an architectural dimension in the continuity of space.

I'd like to elaborate on the first two, leaving the last to your own imagination.

### First distinction: the portraying of a discipline

The philosopher Roman Ingarden asked himself the question: *where is music situated?*<sup>6</sup> Can we localize music? That turns out to be rather difficult; it is much easier, on reflection, to show where it is not. With regard to the place of music in the environment, it is clear that music cannot be situated on the page where it appears encoded in the form of musical notation which, with the right interpretation and the help of a musical instrument as well as a practiced musician, might *lead to* music. In this way we can point out the various stages of a musical experience where the music manifests itself in the form of something it cannot be said to be: a vibration, an echo, a memory of a movement, an analogy or a coded aid to memory within the environment to be called up. Nowhere here is it localized as a momentary feeling or the celebration of movement in being moved. And if the production of music requires a pattern of air vibrations to penetrate the body through its ears, its

---

<sup>5</sup> Johnson, Mark (2007) *The Meaning of the Body: Aesthetics of Human Understanding*. University of Chicago Press.

<sup>6</sup> Ingarden, Roman (1989), *Ontology of the Work of Art*, transl. Raymond Meyer & John T. Goldthwait. Ohio State University Press. First versions of this work were written in the 1930s.

stretched skin and its muscles, what then? Can we localize music in the body? Not, in any case, as vibrations in the air – those are and remain mere vibrations. Even with a pattern, they do not yet constitute music. Those patterns must be translated by the ear and the brain into *sound*, a purely psychosomatic phenomenon, and this is then distilled into music through skilful and well-practised feeling, a knowing enjoyment or even a resolute distaste.

Neurological studies increasingly show that the construction of music lies in the coordinated effort of the different parts of the brain. The cerebellum, the amygdala, the prefrontal cortex and various other parts work together, one measuring rhythm and beat, another producing a primal emotional judgement that is later reassessed and nuanced in the cerebral cortex in the light of an individual's experience.<sup>7</sup> The enjoyment of music takes shape in conducted feeling and motor movement, a dextrous and elegant movement that carries a proprioceptive component that in turn transfers meaning back into the environment. As such music itself is not *the feeling* or *the movement* that music inspires. Music cannot be localized in the body; as it concerns a concerted play of the body in its environment, it concerns a reciprocal game in which the *I* coordinates and determines the relationship between the two. Music might be better conceived as a word with which a set of correlative relations between the body and its environment is denoted and given character and cohesion. Music is an aspect of the *I* that can make statements such as *I think this is music*. In this statement, the word never transcends its status as an abstraction, a virtual pattern articulated upon a field of concepts; the feeling, the enjoyment, the movement, the sound, the memory, the experience have to be brought together and conducted in the production of music as if they together constituted a symphony orchestra of connected elements playing together. And if the experience of undergoing music is practised well and succeeds, then we arrive at the judgement: *Ah! What beautiful music*. The fact that many people use this judgment to refer to very different experiences in fact reinforces the view proposed here. Music isn't a thing, it is a judgment upon an event in the environment in which the body finds itself.

Is that any different for architecture? No it isn't. Architecture also refers to a word with which the process, that is the design-process, the process of making and the process of spatial experience together lead to the product that is architecture, such as a well- or badly judged design, a somatic memory of a space, perhaps expressed in appreciation, perhaps even articulated as a refined critical judgement, but usually cherished in silence in the form of a happy familiarity or intimacy, a well-practised space, a space I know and can do.<sup>8</sup>

The body's answer to music is a feeling; it is laughter, tears, deep joy and the smouldering simulation of wintery melancholy; it is dance, expression, movement, the rocking and the gestures of the body. The body's answer to architecture is the movement *through, alongside, over, under, in and out*, a place-related and place-determining act, the orientation of the body to light, sound and sight. Music manifests itself as a somatic answer to sound, and that is no different for architecture. Architecture manifests itself in the bodily answer to a spatial package of boundaries that architecture coordinates or manages in perception and discussion. Music as a term manages the bodily production of musical rhythm in movement and emotion while architecture concerns the bodily production of social space (let us not forget here that space in the work of Immanuel Kant refers first and foremost to the organizing and portraying capacity of the human mind, a space that, without this filtering and therefore determining aspect of our perceptive capabilities, we would never be able to know).<sup>9</sup>

The body *learns* to recognise rhythm, timbre, meter, harmony and melody so as to bring them into coordinated play, and it practises them to an apex of refinement, thus producing the experience of

---

<sup>7</sup> Levitin, Daniel J. (2006), *This is Your Brain on Music: The Science of a Human Obsession*. Dutton.

<sup>8</sup> Hillier, Bill (1999), *Space is the Machine: A Configurational Theory of Architecture*. Cambridge University Press.

<sup>9</sup> Lefebvre, Henri (1991), *The Production of Space*, transl. Donald Nicholas-Smith. Blackwell.

music.<sup>10</sup> The body thus explores its possibilities. In this way the construction of music may be said to be a compositional and explorative capacity situated in the responsive movements and judgements of the body that answers sound as music.

### Second distinction: the use of concepts, phonotectonics, movement, rhythm

The musical instrument is responsible for the sound and especially for the timbre and behaviour of the sound it produces when played. Architecture is also an instrument: the sound produced by a violin is always further shaped by the material and space of the environment it is played in. Phonotectonics is concerned with the way that materials come into relationship with one another so that they *help determine* the sound we hear.<sup>11</sup> The sound produced by our bodies allows us to initiate the production of meaning with phrases such as: *Who is this bathroom tenor I keep hearing?* Sound is the product of our body in the translation of air vibrations that are formed when materials come together. When two materials are conjoined in a construction or its cladding they make meaning possible. This aspect of architecture is called *tectonics*, from the Greek word *tekton*, carpenter. Tectonics constitutes a sub-discipline within architectural design that concerns itself specifically with the making, that is, the choice and articulation of materials when related to questions about the environment, the situation and the desired programme of a projected design: in short it concerns the selection, placement and configuration of materials to create *a good space*.<sup>12</sup> Through tectonics music and architecture meet in the concept of space. Paul Valéry remarked that a person experiencing music is necessarily immersed in both. A good example of this is the work *Forty Part Motet* (2001) by the Canadian artist Janet Cardiff. She took each voice from Thomas Tallis' *Spem in Alium nunquam habui*, and recorded it individually so that each voice could be given its own speaker within a space. Visitors to the installation could walk through the space and experience the music either as a whole or they could privilege an individual singer, depending on where they stood in the room and how they moved through it. Architecture and music are immersive, spatial arts. Music is not the product of one resonance box, the instrument, but a Russian nesting doll of sound boxes, of which the ear and the stretched skin of the body are only the last before the vibrations of air and membrane are translated into electrical impulses and transformed into experience. This nested series of sound boxes is subject to *architectonics* and to *phonotectonics*. A special example of architecture and music as tectonics in tune with one another is the Vithala Temple in Hampi. It is a musical temple in the most literal sense of the word. The story (of which there are a number) is that the temple was built in honour of a dancer whose movements were so spell-binding that the local lord decided to build a space *as a musical instrument* to accompany her dance. The pillars of the peristylum are designed as stone chimes. This story *produces* both the architecture and the music.

In this confluence of music, dance and architecture, is revealed, by way of movement, what may be the most beautiful relationship between music and architecture, namely that they are not just immersive spatial arts but that they are special because of the way they each answer movement in their own way. Dance is the somatic and spatial answer to music; it is the production of space in movement, the answer to sound, rhythm, metre, harmony and melody. The body lets itself move and be moved by music and thus makes music spatial not only by making it visible, but also tangible, in the rocking, stretching, bending, proprioceptive body and giving order to the place where the dance occurs. Experience is the answer of motion to emotion. Architecture is evident here in a number of ways. Architecture is, as we have seen, itself an instrument of sound. A Stradivarius is the instrument that gives a form to the vibration of strings. The architecture in which the Stradivarius is played does no different and compounds the result. It determines the manner in which these vibrations work in

---

<sup>10</sup> Wittgenstein, Ludwig, *Culture and Value*, edited by G.H. von Wright, transl. by Peter Wynch. 1980, pp. 51 and 70.

<sup>11</sup> This word comes from Schott, Gaspar (1677), *Magia universalis naturæ et artis*.

<sup>12</sup> Voorthuis, J.C.T. (2007) 'Tektoniek, een essay over het maken van een relatie' (Tectonics, an essay about the making of a relationship). *De Architect*, Volume 38, December, 2007, pp. 116-19.

space, and thus determines the way the body picks them up.<sup>13</sup> But that is only the beginning. Architecture as a built structure is a composed package of borders such as walls, openings, divisions and filters through which the body moves according to the rhythm of its own workings. The composition of surfaces and frames through which the body moves knows two aspects, namely the composition of those areas and frames, designed by the architect, and the perception of that composition in the moving body that thereafter reconstructs the composition of the architect into its own experiential *architectural composition*. To arrive at the production of space, that is to say, the production of architecture, a moving body must answer the building's call through his experience of it. The motion of the body through the space of the building causes the static structure to move in our experience of it through the dynamics of sound, the spatial location of those sounds, the succession and meeting of colours and textures, light and shade and objects. The organization and continual composition of views and mutually shifting frames make the walk through the architecture, the *route architecturale*, a musical experience in that the experience becomes a composition. Architecture is an experience in which the body moves and is therefore moved. Music is the bodily emotion that moves the body.

We can make this argument more specific. Music has rhythmic qualities. So does architecture. Rhythm is immediately perceivable in music; it is perhaps its most elementary aspect, or in any case its most convincing call to movement. How does architecture use rhythm? In two ways. When architects design a façade, they can do so by considering the building linearly. The façade of Palladio's Basilica thus becomes a rhythmic composition when one *reads* its sequence of columns, entablatures, openings and projections from left to right or the other way around. We can teach ourselves that kind of *reading*; it takes practice and refinement. However architecture's rhythmic aspect goes much further than that. After all, a person has to move *through* space; the movement creates a second more profound rhythmic experience: the rhythmic stride past shifting surfaces, the rhythm of openings, and the sequence of volumes etc. But it is yet more complex. I compose my experience by turning my gaze during my motion through the building. That creates architecture as a temporal experience of superimposed fragmented images braided into continuity. However, even that is only half of the story, the experience becomes richer when my eyes and ears, taste and smell work together, and when the experience can be practised a second or third time each measured against the earlier, thus making it grow in wealth and refinement. Every building is a unique sensual composition that is determined situationally by a concrete person: composed by them into an experiential event in the form of a portrait.

### Conclusion: the new map

In their use, the words architecture and music coordinate discussions about the production of space. That production consists of the design, the performance, the perception and, above all, their reciprocal dependence. Thus they coordinate or manage not so much *a territory* as a *process of production*, each making use of the entire human capacity to take in our environment and compose it according to the focus of our attention, whether that be the experience of architectonic space and/or that of musical space. Both words form an aspect of human enterprise as a whole, the exploratory capacity of people to put their own bodies and environment to use for the purposes of growth, self-maintenance, reflection, exercise or practise and development.

If we want to map architecture and music, we end up with a diagrammatic scheme in which the experience of a person takes up a central position, allowing itself to be differentiated only in order to answer that experience in some action, thought and/or movement. In the most literal sense we arrive at a *pragmatism*, from the Greek work πράγμα, or *act*. The words architecture and music form a finely-woven, delicate and changeable network of virtual relationships in which concept and

---

<sup>13</sup>

See Louis Kahn's 1960 poem, 'Order is'.

interpretation become possible in discourse such that they offer direction to the act of design, composition, performance and experience.

The model offered here as an alternative does not prohibit us to see music and architecture in the old way. That would reinstall the famous *paragone*, a conversation game based on a playful rivalry between disciplines demanding skilful and opportunistic border controls and military prowess that, however, inevitably partitions the continuity of human experience in order to control and rule. From the point of view offered here, that becomes unnecessary. The difference is now constituted in the way that, for example, different kinds of tools and their particular uses develop to work together at something that is the product in which they all play a part. Tools, material, knowledge and expertise assemble around a challenge – the making of a cupboard, for example – and are then all used by a person according to their specific abilities or suggested possibilities, each requiring their own movements and each judged according to their own criteria of finish and excellence, but all working towards a single product: the cupboard. Words and their use are, according to this analogy, the tools and at the same time the material as well as the skill to employ them in relation to the challenge to be captured in words: an experience. They come together around a discussion or a description and take their proper place; in this way they form a complete and carefully braided event with meaning, an experience of meaning carefully positioned in the light of the experience of being human and *making* a well-reasoned attitude possible.

The pattern that the abstraction *architecture* creates in servicing the coherence it attempts to maintain and develop between various concepts that call it to use, shares coordinates with the field of concepts that is called up by the abstraction *music*, though not all of them; most importantly, they both look at the concepts from their own desired purpose and their own experience. That difference creates the possibility that they each make use of the same concepts in their own way. Both disciplines, for example, use the verb *to compose*, but they each compose using a different set of conceptual instruments, their own repertoire of means and materials in the service of their own desired goals and on the basis of the specialised competency of the user. There is however, something strange about the singularity of these concepts, means and goals: they do not belong to the discipline, there is no *ownership* here that would grant exclusive privilege to a particular use. It points rather to a singularity in the use of *shared means*. To illustrate with a simple example, it is not the sound or a material that belongs either to architecture or music, it is the use that is made of it in experience that determines the distinction. Using the word architecture, we search for the space of architecture and bring it up for discussion, and with the word music, we, in fact, do much the same but then in search for the space of music.