Rivista di estetica issn 0035-6212

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http://www.labont.it/estetica/index.asp

Corrispondenza, lavori proposti per la stampa, libri per recensioni e riviste in cambio indirizzare a:

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n.s., 66 (3/2017), anno LVII
The Auditory Object
edited by Elvira Di Bona, Vincenzo Santarcangelo

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Francesca Forlè

WHERE STRAUS MEETS ENACTIVISM. REFLECTIONS ON AN ENACTIVE THEORY OF MUSIC PERCEPTION

Abstract

In this paper, I will try to integrate Joel Krueger's enactive theory of music perception with some of Erwin Straus' reflections on different forms of experiencing spatiality and movement. Krueger (2009, 2011b) maintains that music perception is a form of *active* perception, in which our body and our ability to move with music act as vehicles to draw out certain features of the piece and to respond to the affordances it presents. However, the author does not specify what *kind* of movements are involved in the enactment of music perception. I will propose such a specification, using Straus' distinction between *goal-directed* and *expressive* movements (Straus 1930).

Introduction

In recent years, Joel Krueger (2009, 2011b) has tried to enlarge on Noë's perceptual enactivism (Noë 2004) by moving from the domain of visual perception to that of musical experience. The main idea is that, just as Noë showed the constitutive dependence of visual experience on our embodied nature and practical sensorimotor knowledge, similarly, musical experience can be said to be actively constituted in our embodied encounter with music itself (Krueger 2009: 99-100).

Krueger starts noticing that music *moves* us. We are often more or less physically drawn into a musical piece, for instance in tapping along with its rhythm or in dancing. Moreover, in moving with music, we can come to bodily 'feel' its dynamism and expressive features, having a more vivid perceptual experience than one we can have when just sitting on a chair. On this basis, Krueger maintains that music perception can be a form of *active* perception in which the character and content of our experience are shaped by the way we physically interact with music itself.

Rivista di estetica, n.s., n. 66 (3/2017), LVIII, pp. 106-117 © Rosenberg & Sellier

In this framework, our body and our ability to move in synchrony with the musical piece have obviously a fundamental role. However, Krueger does not elaborate on the specific *kind* of movements involved in the interaction with music. Even though he mentions the most common movements we perform while listening to music (tapping fingers and toes, bobbing one's head, swaying back and forth), he does not pay attention to the features these movements have in common and to what distinguishes them from other kinds of movement and action, such as walking, grasping a ball, opening a door, preparing a meal.

In this paper, I shall try to investigate such a distinction. I will start from Erwin Straus' characterization of *goal-directed movements* and *expressive movements* (Straus 1930), and I will argue that the latter are the ones involved in the enactment of music perception.

The enactive theory of music perception

Introducing his enactive account of musical content and experience, Krueger explicitly refers to Noë's model of visual perception (Kruger 2009: 100-104; Krueger 2011b: 63). According to Noë's enactive proposal, seeing is a way of exploring the world that is mediated by the perceiver's practical abilities. In this sense, "our ability to perceive not only depends on, but is constituted by, our possession of […] sensorimotor knowledge" (Noë 2004: 2). Noë notoriously defends this thesis by means of some phenomenologically compelling examples. He shows, for instance, that even though our visual experience usually seems to be fully detailed and high-resolution, we are actually able to focus on just a few details at a time. Looking at this written page, for example, we would say that it is fully written and it appears in our visual experience as uniformly detailed but, if we fix our gaze, we can actually read very few words on it. Noë's idea is that we can have the experience of seeing the world in all its details not because the latter are always perceptually focused on but because they are perceptually present in the visual field as *accessible* – that is, as reachable and explorable by looking around, moving our body or simply our eyes (Noë 2004: 55-65). In another example, Noë describes the experience of seeing an entire three-dimensional object even by just looking at some profiles at a time (Noë 2004: 75-79). The idea is that this is possible because we experience the presence of the hidden profiles as those sides that can become visible if we move in one way or another. Both examples are intended to show that perceiving rests on an implicit understanding of how visual images change according to our bodily movements and what would be accessible if we move in certain ways.

Even though Noë has mainly focused on vision, he recognizes that there are specific sensorimotor contingencies between perception and movement for other sensory modalities too (Noë and O'Regan 2001; Noë 2004). In the case of auditory perception, for example, rotations of the head generally change the

temporal asymmetry between left and right ear, whereas movements of the head in the direction of the sound source generally affect the amplitude of the sensory input (Noë and O'Regan 2001: 941). As perceivers, we develop a specific *know-how* of such sensorimotor dependencies, so that, for instance, if we are approaching the source of a heard sound we can ascribe a constant loudness to the sound itself because we have a practical understanding of the fact that loudness is changing because of our approaching. This seems to be the same mechanism that allows a sequence of gradually softer sounds to convey the effect of something moving away. In this sense, we have a practical and implicit understanding of the way auditory perception is affected by our movements.

However, far from being concerned just with the analysis of auditory experience in general, Krueger is interested in particular in developing an enactive account of *music* perception. As we said, he has come to maintain that music perception can be a form of *active* perception – that is, a form of exploration, manipulation and drawing out of specific musical properties via our sensorimotor engagement with music (Krueger 2009: 107).

This is what happens, according to the author, in episodes of 'deep listening'.

Deep listening is the experience of listening attentively and selectively to a piece of music. It is not an involuntary or passive mode of hearing, such as being aware of background music without attentively focusing on it. On the contrary, it is an experience in which the subject selectively orients herself to the musical piece and its various features – while still maintaining a state of receptivity towards what is happening in the music (Krueger 2011b: 71).[1]

Deep listening can be described as a way of *exploring* the sonic world, by means of processes such as selecting features of interest and focusing of attention. More specifically, Krueger maintains that in deep listening we engage in an active exploration of the musical piece's *inner space*. Such an inner space is the piece's internal compositional structure – that is, "the systematic way that the elements of a musical piece's syntax hang together (i.e., how components like individual tones and rhythmic progression are arranged in prefigured spatial relations with one another, lending the piece its sonic coherence)" (Krueger 2009: 118). The idea is that our perceptual experience is defined, at least partly, by the way we actively engage with such a musical space.

When we listen to music, we for the most part automatically perceive the piece's internal spatial configuration. This is what it means to listen to music understandingly, to hear it as music and not as random noise. But deep listening is enacted when the

[1] The concept and the practice of 'deep listening' have been introduced and investigated by the composer and musician Pauline Oliveros. She has described deep listening as a voluntary, selective (inclusive and exclusive) way of listening, which is based on bodywork, interactive performance, sonic meditations. See for instance Oliveros 2005. Pauline Oliveros' thought and the practice of deep listening in music are today promoted by the Deep Listening Institute.

listening self is experienced as coming to *inhabit* this structure. […] this experiential inhabitation is not simply a perception of form, then, but is additionally an *entering into* the form – a piece's internal space, once again – so that the listener might actively explore its sonic topography (Krueger 2009: 118).

In other terms, in experiences such as listening sensitively to music we can somehow (virtually or actually) *interact* with the musical piece, for instance by entraining with its rhythm or being affectively and bodily moved by its melodic or harmonic contour. By means of this active engagement with the piece, our perceptual experience can be somehow augmented, since we can come to bodily feel and perceptually focus on several different musical aspects.

In this framework, our body obviously has a fundamental role.

Bodily movements such as gently swaying back and forth, bobbing one's head, tapping fingers and toes, and of course dancing […] modulate our perception of the spatial content of musical experience by modulating our relation to different features of the music, such as metre and melody. Bodily gestures in response to musical events can act as a kind of attentional focusing: the animate body, by interactively engaging with the piece, becomes a vehicle for voluntarily drawing out certain features of the piece, such as rhythmic beats or the progression of a melodic contour, by foregrounding them in our attentional field. This 'drawing out' is an enactive and exploratory gesture in response to felt affordances within the music. The listener perceives the inner space of the piece as a space that can be entered into, experientially, and by doing just this shapes how the experiential content of the piece-as-given becomes phenomenally manifest. We thus hear what the body feels (Philips-Silver and Trainor 2007). And what the body feels are sensorimotor contingencies – possibilities for rhythmic interaction and perceptual exploration that determine the character and content of musical experience (Krueger 2011b: 73-74).

In other terms, our body and our ability to move with music become both a way of focusing on specific features of the musical piece, and a way of responding to musical *affordances*, that is to the possibilities of motor engagement that the musical profile offers to the listener.

It is worth noticing that, far from being just a high-level and skillful approach to music, active engagement is a very widespread phenomenon. Very young children seem to perceive music as presenting a well-structured exploratory profile that invites bodily entrainment (Krueger 2011a; 2013). They do not do so having some conceptual, propositional representations of music affordances, but rather actively engaging and interacting with the sonic world, exploring it and discovering what it allows or not in terms of entrainment and bodily synchronization. Active engagement with music, therefore, seems to be one of the primary ways we perceptually experience music and it turns out to help us extracting the various meanings that music can have for us. Our experience, therefore, can be said to be at least partially defined by the way we can bodily

interact with music itself.[2] Of course, this does not mean that this is the only way we can perceptually experience music. We can surely have a more detached approach to it – for instance, when we listen to music inattentively or when we are just theoretically interested in analyzing its compositional structure. But the crucial point here is just that our bodily entrainment with music is a kind of active engagement that *can* have a central role in shaping musical experience and musical content.

Now, Krueger maintains that the active engagement with music can occur in many different ways. As we saw, he takes into account simple movements such as bobbing one's head, tapping fingers, swaying back and forth, but also more complex practices, such as dance. The latter, in particular, is described as a robust embodied response to musical events, in which the temporal regularities of melodic and rhythmic patterns of music are physicalized in a rich array of different bodily movements (Krueger 2011b: 75).

However, as we already mentioned, Krueger does not give us a characterization of the specific features of the movements involved in the active engagement with music and in the enactment of music perception. In particular, the author does not specify what kind of movements they are and what distinguishes them from other movements, such as simply walking or grasping a ball.

Here, I will try to integrate Krueger's proposal with such a specification. I will do so referring to Erwin Straus' reflections on the meanings of spatiality and the distinction between *goal-directed* and *expressive movements* (Straus 1930).

Where Straus meets enactivism

In his paper *The forms of spatiality* (1930), Erwin Straus investigates the ways we can experience and live in the space around us. He starts from criticizing the idea that the lived space is the space described by mathematics and physics, then he tries to investigate the relationships between the way we can perceive the space around us, the different qualities the lived space can have for us, and the kinds of movement we can perform in it. According to Straus, these aspects are not linked together by empirical or casual relations, but by *essential* ones: the nature of the lived space binds the qualities it has and motivates the fact that we are more likely to perform a specific kind of movements (Straus 1930: 35).

The interesting point for my analysis is that, in the mentioned paper, Straus pays attention to a specific form of spatiality, which is the *acoustic* one. He does not only distinguish it from the *optic* one, but he also describes its qualities and

[2] There are many other theories today that try to appreciate the role of the acting body in music perception, both from an empirical, psychological point of view and from a philosophical one. See for example Iyer (2004); Molnar-Szakacs and Overy (2006, 2009); Pelinski (2005); Peñalba Acitores (2011).

its essential link to expressive movements. His reflections will be very useful to investigate further the specific kind of movements involved in the enactment of music perception.

The theoretical framework of Straus' reflections is that of phenomenology and phenomenological psychiatry. In this framework, the analysis is conducted from the first-person perspective, which focuses on the description of the experience as it is lived by the subject of experience itself.[3.]

From this perspective, Straus begins his analysis maintaining that we cannot make an adequate description of our experience of the space around us if we think that our lived space is just the one that mathematics and physics describe. The latter is the metrical space: it is the tridimensional, empty space that can be measured by us and the one in which we can evaluate the orientation of things and the direction of movements. In the metrical space, we can say whether an object is up or down, on our left or our right, whether it is stationary or in movement, and, in the latter case, in which direction it moves. Experiencing spatiality in this way is obviously crucial for our lives, since it allows us to orient ourselves, reach things around and detect objects in movement. According to Straus, metrical space is the form of spatiality best experienced by vision and touch. Indeed, by means of these two modalities, we can perceive distances, spatial orientations and directions.

However, this is not the only way we experience space. For instance, according to Straus, we need to consider *acoustic* space as a form of spatiality that is totally different from the metrical (or *optic*) space we have just described (Straus 1930: 36-37). In order to explain these differences Straus pays attention to the ways a sound and a colored object appear in perception.

The author underlines that, even though the exact location of a colored object can be indefinite for the perceiver, colors are always spatialized and the direction in which we see them is well-defined (Straus 1930: 38). Suppose you can see the mountains from your window. If they are very far from you and partially occluded by nearer buildings, you could not be able to perceive where exactly they are and how far exactly they are from you. However, you will be able to say in which direction you see them – i.e. if they are right in front you, on your left, or on your right. We always see colors "over there", at a certain distance, in a certain direction and in a certain position. Colors (and shapes) structure the space around us, they organize and divide it in smaller portions, which are in different relations of distance or contiguity to each other (Straus 1930: 39). The optic space, therefore, is the space of distances, orientations, and directions.

According to Straus, something different happens with sounds.

[3] For a contemporary introduction to phenomenology and its method, see Gallagher and Zahavi (2008).

A premise is necessary here. To understand properly the author's conception, we need to distinguish between sounds and sound sources (Straus 1930: 37-38). The sound source has a precise location in space. Phenomenologically speaking, we can hear a sound as *coming from* somewhere in the metrical space – e.g. from the garden, from the room next to mine, from the apartment of my neighbor. Even though it is often difficult to localize where a sound comes from, sound sources can be reasonably said to be oriented in relation to us – e.g. on our left, right in front of us, or on our back. In other terms, it is reasonable to speak of sound sources as localized.

Something different emerges if we consider the sound itself. Once produced by the sound source, the sound penetrates the space around us and fills it up. The sound *per se* is not on my left or on my right: on the contrary, it fills the whole space around me and makes it homogeneous. If I am listening to a concert in a theatre, I experience music as filling the whole theatre homogenously, even though I localize the sound source on the stage. This happens because sounds are experienced as something that is *produced* by a source, but not confined in the portion of space where the source is. The case of colors is totally different (Straus 1930: 36-42). Colors are properties of the colored objects and occupy the regions of space of the objects themselves. Phenomenologically speaking, sounds are experienced as detaching themselves from their sources, colors as pertaining to the colored objects and being exactly where the latter are. According to Straus, this does not mean that colors are in space, whereas sounds are not. Both colors and sounds occupy space, but in a radically different way. We are in a specific relation of distance and orientation with colors (and colored objects), whereas sounds reach us and fill the whole space around us without being in a specific portion of space. In this sense, *optic* space and *acoustic* space are very different from each other. Colors (and shapes) are not just oriented towards us: they are also confined in a portion of space while contemporarily contributing to the articulation of space in different portions, which are in various relations of contiguity or distance with each other. In this sense, as we said, the optic space is the metrical space, where we can measure distances and evaluate orientations or directions of movement. As Straus says, in the optic space, objects are distinguished and identified thanks to the boundaries that separate one object from the other: indeed, boundaries allow the structural articulation of the optic space (Straus 1930: 47). The acoustic space, on the contrary, is homogenous in the sense that it is not divided into portions that are at a certain distance and in a certain orientation towards us. We inhabit the acoustic space and the sounds in it fill the whole space, being all around us. In this sense, the acoustic space is not the space of measurable distances and directions.[4]

[4] For a contemporary analysis of the notion of acoustic space, the relation between sounds and space and the one between sounds and sound sources, see for instance Casati and Dokic (2009); Nudds (2001); O'Callaghan (2009, 2010); O'Shaughnessy (1984).

The most interesting point, at least for my purposes, is that, distinguishing these two ways in which space can be inhabited and experienced by us, Straus proposes that two different modalities of *movement* pertain to the optic and acoustic space. In particular, according to the author, the optic space is the one of the measured, practical and goal-directed movement, whereas the acoustic space is the one of dance, and more generally of expressive movements (Straus 1930: 50). It is introduced here the difference between *goal-directed* and *expressive* movements, which will be crucial for my hypothesis of theoretical integration of Krueger's enactive theory of music perception.

According to Straus, goal-directed and expressive movements have to be conceived as two different combinations of the same repertoire of motor elements (Straus 1930: 50). Both kinds of movement, in fact, involve extensions of arms and legs, bending of knees, rotations of the head or the trunk, and so on. This allows a goal-directed movement to become an expressive one. For instance, a goal-directed movement such as walking to reach a certain place can become an expressive movement if we start walking following the melodic and rhythmic course of a march. In this case, the same motor elements acquire a new quality: they become interesting in themselves, not just as a means to reach a goal. Walking with music, we entrain with its rhythm and we are able to express, through movements, the dynamic qualities we find in music and the affective responses it elicits in us.

However, even sharing the same motor repertoire, goal-directed and expressive movements are two different ways in which motor elements can be organized. They also pertain to different modes of living and experiencing the space around us. As we said, goal-directed movement is the movement of the optic space; expressive movement is the one of the acoustic space. Indeed, Straus notices that certain kinds of movement, such as dancing or marching, appear as meaningful and reasonable to us just if they are performed with music. Music itself allows spatiality to show those specific features that make us perform *expressive* movements, as different from goal-directed ones. In this sense, music does not induce *any* movements, but movements of a very specific kind (Straus 1930: 50).

It is now time to describe the mentioned kinds of movement, in order to highlight their differences and understand better how they relate to different ways of experiencing spatiality.

As the name itself makes clear, goal-directed movement is motivated by goals to achieve. In this kind of movement, distances and directions have a fundamental role. If I need to walk to meet some friends I have an appointment with, I need to evaluate the distance between the departure point and the arrival one, as well as the direction I need to take. In goal-directed movement, we move from a spatial point to another one, directing and orienting ourselves towards a destination. As Straus says, we move *through* space, from one place to another (Straus 1930: 53). It is clear why the optic space is the one in which this kind of movement takes place. The optic space is measurable and characterized by

distances and directions that are often defined starting from the zero-point of our embodied position in space.[5] It is the walkable space, which is constituted by places we leave and places we go to. In other terms, the optic space is the form of spatiality in which a great amount of practical *affordances* can emerge for us.[6]

In opposition to goal-directed movement, expressive movement does not aim at realizing practical goals. In this kind of movement, we do not move *through* space, but *in* space (Straus 1930: 53). Let us think of dancing, for example. When we dance, we do not move just in order to reach a different point in the surrounding space: in this sense, directions and distances lose the central role they have in goal-directed movements. Better, their role is completely re-defined and subordinated to the expressive features movements are planned to convey. In dancing, we are not interested in *measuring* the space we move in; our movement is not limited by points of departure and arrival and loses a strict orientation in space. As Straus says, this is shown by the fact that in most cases dance floors do not need to have a specific shape (Straus 1930: 53). Dancing is not influenced by the orientation or shape of the space in which it takes place because it is not a goal-directed kind of movement, with a place to leave and one to reach. In this sense, it is non-directed and non-limited.

Here too, it is easy to understand why Straus maintains that the acoustic space is the space of expressive movements. Indeed, the acoustic space is not characterized by directions and distances, but it is filled up completely and homogeneously with sounds. As we previously said, sounds themselves – or, better, music itself – create this kind of spatiality that, having no structure of orientations and directions, precisely allows a kind of non-directed and non-limited movement such as dancing.

However, even lacking the practical background of 'approaching' and 'moving away' – that is, the system of goals and directions, points of departure and points of arrival, distances and orientation – dancing is organized on the basis of a precise system of meanings, that is the one of *expressivity.* Movements in dancing are not oriented at achieving a practical goal but at expressing affective valences (Straus 1930: 54, 64).

This is also the reason why in dancing we perform movements that are generally inappropriate in a goal-directed framework. For instance, Straus notices that in dancing we move our trunks much more than in goal-directed movements. In walking, for example, we tend to shake arms together with legs, but we do not particularly flex the trunk. The latter is quite rigid and helps us keeping the upright posture. Movements such as twisting the trunk, bending down, or swinging are not useful to walk and they can even hinder such a movement (Straus 1930: 52-53). In several styles of dancing, on the contrary, movements

[5] On the idea of the body as the zero-point of orientation see Husserl (1952).

[6] For a standard definition of the notion of *affordance* see Gibson (1979).

of the trunk are central and are in a relation of deep mutual influence with movements of pelvis, arms, and legs.

Another kind of movement that we find in dancing but generally not in goal-directed movements is rotation of the whole body. This is a very widespread movement in dancing, whereas it is experienced even as unpleasant and inconvenient in a goal-directed movement such as walking. According to Straus, this is due to the loss of orientation that rotation provokes. This appears as non-problematic in dancing, where directions and orientations do not have a central role, whereas it appears as upsetting in goal-directed movements where we need to orient and direct ourselves to achieve our goals (Straus 1930: 59). As rotating, moving backwards is recurrent in dancing but it is avoided in goal-directed movements since it does not allow the subject to see the direction in which she moves and to orient herself in the most convenient way.

These examples suggest that dancing can exploit movements that are avoided in goal-directed movements exactly because the background of goals and directions, points of departure and points of arrival does not work in dancing. In expressive movements, in fact, movements are selected based on their expressive power, not on their usefulness to direct oneself from one point in space to another one.

Straus' analysis of the differences between optic and acoustic space, as well as his description of goal-directed and expressive movements, can be very useful to integrate Joel Krueger's theory of enactive music perception. As we know, Krueger maintains that in episodes of deep-listening we can *enact* music perception since we can bodily interact with the music profile. The movements of our bodies – and the animate body itself – act as vehicles of drawing out specific features of the piece and as ways of responding to felt affordances. In this way, the sonic space comes to be *inhabited* by the listener. The hypothesis of this paper is that something more can be said about the sonic space and the movements involved in the enactment of music perception. First, the idea is that the sonic space could be described as Straus' *acoustic* space – that is, a form of spatiality in which directions and orientations lose their central role since sounds fill up the whole space around the listener, being everywhere and not just localized where the sound source is. Secondly, the idea is to specify the nature of the movements of entrainment. Such movements are not of any kind: the hypothesis is that they can be described as different occurrences of what Straus called *expressive* movements. Obviously, tapping fingers is not as expressive as dancing is; however, both movements are characterized by the fact of being not oriented to achieve a practical goal and not defined by the need of moving in a specific direction or with a specific orientation.

Krueger's analysis of music enactive perception, therefore, appears to be highly compatible with Straus' reflections on the forms of spatiality. In addition, it can be appropriately integrated by means of Straus' distinctions, in order to specify better the nature of music perception and our modes of entraining with it.

Conclusion

Music *moves* us. We are often physically drawn into music and we can move with it, entraining with its rhythm and following its melodic and harmonic contour. Yet, music does not elicit any movements, but movements of a specific kind. Movements such as tapping fingers, swaying back and forth, bobbing one's head or dancing are different from actions such as grasping a ball, opening a door, cleaning an apartment. The latter are oriented by their practical goals, the former have no practical aims and are not limited by a strict system of directions and distances to follow. Even when a goal-directed movement becomes an expressive one – as in the case of one starting walking following the rhythm of a march – it acquires new qualities and does not remain just a goal-directed movement. Arms and legs start moving in synchrony with rhythm and their movements become somehow interesting in themselves.

The hypothesis of this paper is that an enactive account of music perception needs to consider these differences between kinds of movement. The ones involved in the enactment of music perception – becoming therefore a vehicle to pay attention to certain features of the piece and then shaping the listener's perceptual experience – are not movements of any sort, but differences occurrences of what Straus called *expressive* movements.

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