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Sound as Epistemic Construct and Music as Experience: New Perspectives on Musical Sense-Making

ABSTRACT

This paper explores the possibility of bringing together the concepts of analysis and experience in studying music. Rather than opposing both of them, it tries to show the dynamic tension between the step-by-step processing which is so typical for the experiential approach and the synoptic overview of the more encompassing analytical approach. Crucial in this distinction is the role of sensory impressions and the distance the listener takes with respect to the actual sonorous unfolding. It is argued that both approaches should complement each other in an attempt to provide a richer kind of musical understanding and a more lived experience of sounding music.

Introduction

Music is a temporal and sounding art. It is characterised most typically by its sonorous articulation over time, with the possibility of actual sensation and real-time processing by the listener. This is an epistemological position which calls forth a process-like approach to musical sense-making, as advocated already by the early pioneers of cognitive musicology who claimed that music is above all a human experience, rather than a petrified structure (Laske 1977). Music analysis, on the other hand, has a tradition of sense-making by abstracting from mere sensory experience to verbal and abstract categories. This is the logocentric approach (see Tagg 2013, for a critical discussion) that relies on signs or verbal-symbolic labels rather than sensory realia and deals with music at a virtual level of abstraction outside of the time of actual unfolding. It is a semiotic approach to musical sense-making, with signs as tools to mediate between the sounds and our reactions to the sounds. There is, however, a tension between the actual sensory experience, proceeding in real time, and the representation at a symbolic level that proceeds outside of the time of actual unfolding (Reybrouck 2010 and 2015b). Sensory objects, in fact, come into being only if they are perceived. This echoes, to some extent, the old *nominalist* claim of Berkeley who stated that 'esse est aut percipi aut percipere', which has made it possible to formalize sensory objects as ideas, reducing perception to verbal and abstract categories. The nominalist claim of Berkeley's approach, however, is somewhat confusing, given the role of perception and perceiving in his definition. Perceptual judgments, in fact, rely on sensory qualities as well. As such, there has been a kind of paradigm shift in some subfields of recent musicological research, which stresses the role of the musical experience and the way we make sense of it (Määttänen 1993; Westerlund 2002). They imply a kind of perceptual bonding and presentational immediacy, which affords them the statute of *first-hand experience*, which as a rule proceeds in real time (Reybrouck 2015b and 2017b). Rather than conceiving of music as an artefact, as something 'out there', to be analysed in a rather static way outside of the time of actual unfolding, it is possible to conceive of music as a temporal art that is instantiated only when it sounds. Dealing with music, then, entails an ongoing process of sense-making that relies on continuous epistemic interactions with the sounds. Music, in this view, is not merely an ontological category, but a sounding articulation over time that calls forth an epistemic process of knowledge construction, both in bottom-up and top-down way. The sensory impressions, in fact, provide the raw material that acts as the substratum for higher-level sense-making, that can function also in a more propositional and logocentric way. As such, there is no real opposition between these two modalities.

Music, Analysis, Experience

Conceiving of music in terms of a processual and experiential approach is not new. It is possible, in fact, to conceive of a structure also in a dynamic way, and even dealing with a static structure, such as score, can call forth a process-like approach. 'Reading' a score, in fact, is also a process, which needs some consumption of time. There is, however, one major distinction with real-time listening. The latter proceeds in the direction of the actual unfolding. It is perceptually bound and constrained by the inexorable character of time. This is not the case for score reading, which has the possibility of navigating through the structure by moving both in a forward or backward direction. In order to be able to do this, however, there must be the possibility of having access to the structure of the music as a whole. This is not the case with real-time listing, which is an ongoing process with epistemic interactions with the sounds that are accumulated as the music unfolds. It is only possible to recollect all of them in memory once all the sounding events have sounded, so that the idea of the structure as a whole has always a post hoc character.

Both positions may seem to be opposed to each other. Yet, they mostly complement each other, allowing to cope with the sounds both through the temporal window of perceptual experience as in actual sensation, and at the level of the more encompassing global overview in memory and imagination (Reybrouck 2017a). As such, it must be possible to bring together analysis and experience (Maeder and Reybrouck 2015 and 2016) and to broaden the analytical approach to the study of music to encompass also analysis-by-ear and music-as-heard. Music analysis, in this view, should not only rely on a static and symbolic description of the music (the score), but should embrace also a *dynamic-vectorial approach* that keeps step with the sonorous unfolding over time. This latter calls forth an approach that implies the physical presence of things or events (in this case the sounding events) that are selected as the focus of attention and are pointed at mentally in a dynamic way. Hence the term dynamic-vectorial.

The Concept of Analysis

It is arguable to bring together the concepts of analysis and experience when dealing with the study of music. The concept

of *analysis* can be conceived from a musical or a more general point of view, but both approaches deal with the act of examining in detail the constitution or the structure of something. As such, analysis is aimed at dissolving, dissecting, and distilling in order to put apart the ingredients of a larger whole. To analyse, however, is only one of the many cognitive operations we can perform on the sounding music. The concept has been elaborated already by Leibniz who argued for the dissection of a larger whole in smaller parts on which arithmetic and algebraic operations could be performed. By introducing an *algebra of thoughts*, he aimed at finding through analysis the prime factors of human thinking in order to conclude synthetically on new possibilities relying essentially on the basic operations of analysing and combining, somewhat analogous to Aristotle's distinction between *lytic* and *thetic* operations.

The concepts have been taken up again in the context of psychological studies on *grouping* and *segmenting*, both in general and in the domain of music, with a lot of overlapping theoretical and empirical grounding from the domain of Gestalt psychology. There are, in fact, psychological constraints, which function at the level of conscious and deliberate control but which can occur also at lower levels of psychophysical processing, as evidenced in the principles of perceptual organization (Deutsch 1999; Bregman 1990), with a major distinction between 'first-order grouping' of perceptual elements at a local scale and 'higher-order grouping' as in musical phrasing and segmenting (Deliège 1987; Clarke and Krumhansl 1990). From a semiotic point of view, it is possible to generalise still further and to conceive of basic *thetic* (grouping) and *lytic* (segmenting) operations, by relying not only on the acoustic features of the sounds, but also on structural features that remain invariant under transformation. This is the case, for instance, with musical figures (like geometrical ones) on which elementary *logico-mathematical operations* can be applied (addition, subtraction, multiplication, division, and looking for equality or difference) as described already by Piaget (1967). Taken as a whole, they challenges the traditional concept of analysis — which stresses only the lytic part of the operations — by arguing for a broader set of *mental computations* that may be used to make sense of the music as structure.

The application of the logico-mathematical way of thinking, further, has influenced also to some extent the field of computational musicology (see Reybrouck 2016a for an overview). The concept of computation has its philosophical roots in the writing of Hobbes who conceive of reasoning in terms of reckoning or calculation. Similar conceptions can be found in Leibniz's attempt to create a 'logical calculus' of all human ideas — a real algebra of thought or *calculus ratiocinator* (see Baker and Hacker 1984) — and in Kant who analysed all experience as controlled by formal rules. A more recent version is even associated with philosophers as Hilary Putnam and Jerry Fodor. But it was Hobbes, who can be considered the founding father of the computational approach. He took the calculating activity itself as his model of the mechanisms of the mental operations by conceiving of thought as symbolic computation, as a kind of rule-governed manipulation of symbols inside the head.

The Concept of Experience

The major distinction between the experiential and computational approach lies in the focus of attention which can be directed either to discrete particulars or to a more synoptic overview and in the distance the listener takes with respect to the sounding music. Much depends here on the temporal representation which may provide a different kind of perspective on the music with a distinction between synoptic types of representations as against moment-to-moment overviews. The concepts of *perspective* and *resolution* have been proposed in this context (Godøy 1997), with resolution referring to the resolving power of our perceptual processing and perspective to the distance we take with respect to the sounding music. With respect to *resolution*, there is a difference between high-resolution processing of the sound (about 10 milliseconds) and the processing in terms of perceptual units (2–3 seconds) which allow event identification over time (Wittmann and Pöppel 1999–2000). At a still more overarching level, it is even possible to grasp simultaneously a succession of representations in memory or imagination in one single act of consciousness (Reybrouck 2001 and 2004). This summing up is not articulated over time, as a series of successive representations, but entails a relational consciousness which embraces at a glance a whole field of imagery and representation. As such, it is possible to direct our attention, in a kind of mental pointing, to discrete slices of time as well as to larger temporal spans. The concept of *perspective*, on the other hand, is related to the concept of resolution: we can stay very close to the music and process the sounding articulation in a moment-to-moment history that reflects the idiosyncrasies of the sensory particulars, but we can resume these particulars also in a more distant way by summing up the sounding impressions in memory and imagery. We then move from an analytic to a more synthetic way of processing of the sound.

The concept of *experience*, on the other hand, can be considered as a dynamic-vectorial approach to musical sense-making by stressing the importance of the moment-to-moment history of the epistemic interactions with the music as it sounds. Starting from some older philosophical writings by Dewey and James who stressed the importance of having an experience (Dewey 1958) and the role of knowledge-by-acquaintance (James 1976) as the kind of knowledge we have of a thing by its presentation to the senses, their claims can be translated to the realm of music. Experiencing music, in this view, provides the richness and fullness of perception which is both an experiential and a conceptual matter. These older insights are well-known but they have received new impetus from more recent contributions in the domain of enactive and embodied cognition in cognitive linguistics (Johnson 1987; Lakoff 1987; Varela, Thompson and Rosch 1991) and from empirical findings from neurobiology and psychobiology (see Reybrouck 2001, 2005 and 2008) with as major new development the continuous registering of reactions to sounding music as exemplified in the *neurobiology* and *psychobiology of perception* (Uttal 2001; Reybrouck 2013).

There are, as such, different levels of processing of the sounding music with at the lowest level mere *sensation* or detection of the musical signal. At a higher level comes *perception*, which involves a relatively immediate, personal and mental reaction but without the perceiver intervening consciously in this reaction. At the highest level there is *cognition*, which makes it possible to acquire, to record, to evoke and use the knowledge that was acquired through sensory and perceptual processes. It is here that predications and conceptualizations come into play with a major distinction between continuous and discrete processing of the sound (Reybrouck 2016b). Sensory perception, in fact, is continuous as the sound signal is mostly characterised by a continuous articulation over time. Sense-making, on the contrary, can be reduced to acts of mental pointing to the music, as a kind of episodic acts of focal

attention. It can be conceived, however, also as a kind of continuous gesture that tracks the sonorous articulation over time. As such, musical sense-making is a combined approach of *processual predications* and *episodic nominalisations*: the former follow the temporal evolution of a situation and involve a continuous series of states that represent different phases of the process as occupying a continuous series of points in conceived time; the latter refer to just a single instance of the process (Langacker 1987).

This distinction is related to the in-time/outside-of-time dichotomy (Xenakis 1963). Listening in real time is characterised by a kind of perceptual bonding (in time); conceptualising about music can take distance from the sensory unfolding over time (outside of time). It allows the listener to recapitulate previous and future impressions in imagery by relying both on memory and representation, and this brings us back to the distinction between analysis and experience. Experience is continuous and proceeding 'in time'. It celibrates the richness and fullness of the sounding signal; analysis, on the contrary is characterised by distance and polarisation between the listener and the music.

Conclusion and Perspectives

The aim of this contribution was to elaborate on the experiential approach to music in an attempt to bring together analysis and experience. Rather than conceiving of them as opposed to each other, they are brought in relation to the dynamics of representation that spans a continuum between step-by-step processing and synoptic overview in an attempt to go beyond traditional dichotomies which revolve around the discrete/continuous and the in time/outside of time approach to music knowledge construction.

Keywords

Musical Cognition, Musical Epistemology, Musical Perception, Musical Signification, Music Psychology.

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