A Temporal Basis for Acousmatic Rhythm

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Over the last 20 years or so, acousmatic music has experienced what we might call the "rhythmic turn": Meter and pulse have become a great deal more prevalent in recent acousmatic repertoire than in the decades prior. Of course metered pulse has never particularly been a taboo in acousmatic music, but, like melodic or harmonic materials, rhythm was, at least initially, a territory that musique concrète and acousmatic music could reference or access but that was not central to the art form. This does not, however, mean that rhythm has been absent from non-metered acousmatic music; instead, we find rhythm naturally, though sometimes unconsciously, embedded within the objet sonore [1].

Surprisingly little attention has been paid to acousmatic rhythm in research literature; considering the recent upsurge in more openly rhythmic approaches within the genre, it is perhaps time to examine acousmatic rhythm more closely. This article is intended as a brief look at the acousmatic perspective on rhythm. The article begins with a quick overview of discussion around rhythm in electroacoustic music in general, then contrasts this with some of Pierre Schaeffer’s views on rhythm and finally compares the perceptual temporal levels identified by Schaeffer with similar levels drawn from electroacoustic music, contemporary music and cognitive psychology.

ELECTROACOUSTIC RHYTHM

We might begin by first taking a moment to consider views on rhythm within electroacoustic music more generally. A certain amount of electroacoustic theory has proposed rhythm to be an, or even the, essential element of music. Xenakis proposed rhythm as an ultimate sine qua non [2], while Stockhausen proposed rhythm to be the fundamental parameter of all sound, which he famously demonstrates in Kontakte [3]. More recently, Curtis Roads has similarly declared rhythm in electroacoustic music to be "the dominant element in a flux of ever-changing parameter interactions," or even "the sum total of all parameter interactions" [4].

Taking inspiration from Stockhausen and Xenakis, a primary thread in electroacoustic theory with regard to rhythm is an approach that extends rhythmic concerns across all temporal layers, from the smallest to the most extended conceivable time scales. Roads usefully identified a range of these time scales, from infinite all the way down to infinitesimal:

- Infinite
- Supra
- Macro
- Meso
- Sound object
- Micro
- Sample
- Subsample
- Infinitesimal [5]

Roads describes this as a sliding continuum: "Time scales interlink. A given level encapsulates events on lower levels and is itself subsumed within higher time scales. Hence to operate on one level is to affect other levels" [6].

In other words, rhythm in electroacoustic music is nested across the entire range of time levels—from the vastest to the tiniest imaginable divisions, well beyond the limits of perceptibility.

ACOUSMATIC RHYTHM

Some of this, however, has relatively little application to acousmatic music, in that, while theoretically fascinating, it is perhaps perceptually dubious. The connections between rhythm and pitch or timbre, as described by Stockhausen and Xenakis, are essentially mathematical. Despite these theoretical relationships and continua, we nevertheless perceive...

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rhythm, pitch, and timbre as cognitively distinct—albeit related and mutually dependent—qualities. The extension of rhythm to the infinite and infinitesimal extremes proposed by Roads, while once again fascinating, very clearly extends not only far beyond the limits of our concept of rhythm but far beyond the very limits of human perception and understanding. Acousmatic music, on the other hand, is predicated on perception and reception [7], and as a result these more hypothetical theories of rhythm are arguably less useful to the acousmatic composer.

Much of what is commonly referred to as rhythm, in fact, takes place only at Roads’s sound object level, and possibly also at the meso level; discussion of acousmatic rhythm would likely focus primarily on these two levels, possibly extending in as far as the micro level, and out as far as the macro level. We find this reflected somewhat in the literature—for example, Pierre Schaeffer (as summarized by Michel Chion) talks about duration: “We can distinguish short, medium, and extended durations”; “human perception functions best within an optimal temporal space, which is a medium duration. . . . Hence the choice of the three values of duration: (too) short—(ideally) medium—(too) long” [8].

KAIROS VS. CHRONOS

Schaeffer importantly, and typically, specifies duration as a question of “psychologically experienced” time, as opposed to “chronometric” time [9]. This is a fairly significant distinction. The Greek language, for example, has two distinct words for time: kairos and chronos, where chronos refers to “chronological time, the concept of time as a clock mode,” and kairos refers to time as “a temporal dimension of meaning, informing the correct understanding and interpretation of events, perceptions, actions, and cognitions” [10]. This clearly aligns with Schaeffer’s distinction, and we could thereby argue that acousmatic music generally, and acousmatic rhythm more specifically, is deliberately and explicitly concerned almost entirely with kairos rather than chronos.

TEMPORAL LEVELS

A relationship can be proposed between Roads and Schaeffer, in which micro = short, meso and sound object = medium, and macro = long, with everything further out on Roads’s spectrum clearly falling into Schaeffer’s “too long” or “too short” categories (see Table 1). Godøy makes a similar claim, proposing micro, meso and macro as correlates of Schaeffer’s short, medium and long [11], which once again fits well with Road’s categories, if we continue to lump Road’s meso and sound object together, and include infinite, supra and macro under the macro umbrella and sample, subsample and infinitesimal under the micro umbrella. Lerdahl and Jackendoff make a similar tripartite distinction into three zones: metrical structure, transitional zone and grouping structure [12], which line up once again with what we’ve seen so far, as well as proposing “the tactus” [13], which they would likely put under metrical structure, whereas in acousmatic music we might tend to correlate this with the transitional zone.

The fact that, again and again, we find theorists marking out such similar areas is no coincidence and is clearly linked to our perception and our cognitive processing. Cognitive psychology has offered us the idea of cognitive “chunking” in terms of memory and our experience of time, and again we find an identification of three time scales in our experience of music: the subchunk—the short, microtemporal, related to microstructure, with durations from 30 to 300 ms; the chunk—the mesotemporal, related to gesture, with durations from 300 ms to 3 sec; and the superchunk—the macrotemporal, related to form, with durations from 3 to roughly 30 or 40 sec [14,15]. These can also be linked to working memory, short-term memory, and long-term memory [16] and are fairly directly responsible for other elements of acousmatic theory, for example Schaeffer’s “stress-articulation” [17].

CONCLUSION

In other words, we find that theorists and research across a range of fields—from the acousmatic literature, to electroacoustic theorists, to broader areas of musicology, and onwards to cognitive research—all come to very similar conclusions regarding the primary temporal levels in our musical perception. As per Schaeffer, these levels, at least in a shared central area of Road’s broader range, relate directly to the levels at which we perceive and identify musical rhythm. This alignment of concepts with research results, developed independently and in different fields over a span of decades, is very informative, and supports acousmatic music’s claims to a thorough grounding in human perception and experience.

<table>
<thead>
<tr>
<th>Roads</th>
<th>Infinitesimal/Subsample</th>
<th>Micro</th>
<th>Sound object</th>
<th>Meso</th>
<th>Macro</th>
<th>Supra/Infinite</th>
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<tbody>
<tr>
<td>Schaeffer</td>
<td>Too short</td>
<td>Short</td>
<td>Medium</td>
<td>Long</td>
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<td>Godøy</td>
<td>Micro</td>
<td>Meso</td>
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<td>Lerdahl and Jackendoff</td>
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<td>Metrical structure</td>
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<td>Cognitive Psychology</td>
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<td>Subchunk</td>
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<td>Memory</td>
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<td>Working memory</td>
<td>Short-term memory</td>
<td>Long-term memory</td>
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The objet sonore, or “sound object,” is, broadly speaking, a concise, shaped sonic gesture that serves as the primary theoretical or compositional “unit” of musique concrète and acousmatic music. See M. Chion, La musique électroacoustique (Paris: Presses universitaires de France, 1982) p. 29–32.


14 O. Kühl, Musical Semantics (Bern: Peter Lang, 2007).


16 O. Kühl, Musical Semantics (Bern: Peter Lang, 2007).


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