

# Jonathon Harvey, *Mortuos Plango, Vivos Voco*: An Analytical Method for Timbre Analysis and Notation

J. Anthony Allen, University of Minnesota (alle0434@umn.edu)

**Abstract:** When examining an electronic tape work, pitch is often an irrelevant analytical measure. In some instances with pitched material, the harmonic context can hardly be considered the primary thematic content of the work. In many tape works it is timbre and gesture that characterize the piece. In this paper synopsis I will present a method for analysis and notation of the timbral content of a piece. I will draw initially from the work of Chou Wen-Chung, using Jonathon Harvey's *Mortuos Plango, Vivos Voco* as an exemplar of this method.

## 1 A Method of Timbre Notation

The approach I will use to look at Jonathon Harvey's *Mortuos Plango, Vivos Voco* is a derivation from Chou Wen-Chung's paper on Varese's *Ionization*, in which the various percussion instruments are grouped into seven timbre families: 1) Metal, 2) Membrane, 3) Snare, 4) Wood, 5) Rattle/Scratcher, 6) Air Friction, and 7) Keyboard (Van Solkema, 27). Looking at a piece's timbral framework can lead to insight into the work when pitch material is not the primary concern. Jonathan Harvey's *Mortuos Plango, Vivos Voco* does contain pitch elements, but the focus of the listener is primarily on the evolution of timbres throughout the piece.

### 1.2 Parameters

To analyze *Mortuos Plango, Vivos Voco* using timbral structures, we must begin by defining the parameters that will be associated with a system of numerical notation. *Mortuos Plango* is a unique example of this method in that a vast majority of the piece resides in the upper register, with particularly bright sounds. Therefore, many of the timbres employed share similar qualities. For my analysis, I have placed them in seven primary categories with additional timbres included in subcategories.

1. Deep Bell
2. Chime (high bell)
- 3a. Child voice (low)
- 3b. Child voice (high)
- 3c. Child voice (choppy)
- 4a. Synthesized bell
- 4b. Synthesized bell, Sporadic—quick attacks, non-sustaining
- 5a. Synthesized “wind”: pitch shifting
- 5b. Synthesized “wind”: higher pitched, more sine-wave quality
6. FM Synthesizer
7. Pedal tone: similar to 4, but sharper, with stationary pitch.

It is important to note that not all categories are determined solely by timbre. For example, 5a and 5b are both similar synthetic sounds, however, 5b is notably higher in pitch, which gives it distinction from 5a. In this instance, the difference could be related to the similarities and differences between a violin and a cello. Both retain many of the same physical properties, and research suggests that even orchestral performers of these instruments have had difficulty distinguishing them in experiments.<sup>1</sup> However, the Berg *Violin Concerto* performed on a cello would be a notable difference from its intended instrumentation. Similarly, 3a and 3b are both children singing, but, due to register, qualify as unique timbres. This is not to say, however, that they bear no resemblance to each other whatsoever; they remain grouped by the same family.

Situations such as 3c pose a new problem. The same voice as 3a and 3b is presented as fast, rhythmically complex, and for short bursts of time. Because the primary sonic material represented in 3a and 3b is not present, these sounds are distinctive, but related, to their 3a and 3b predecessors.

One could assume, based on the programmatic content of *Mortuos Plango*, that it deals with dualistic combinations of timbres (the polar life-death combinations implied in the title). On analysis, this appears to be the case. We can see in the categories that sonority [7] is a pedal tone that is derived from [4]. This derivation is distinct from [4] due to its insistence in pitch, register, and unique placement in the piece. Other timbres throughout the piece become transitory: particularly [2] and [4]. They often “convolve” into each other, as well as conglomerately “convolve” into other timbres (notably 5a). It is imperative that we incorporate these sounds into our analysis to fully understand the nature of the timbral unions. The combined timbres can be broken into three groups: Paired Sonorities, Sonority Evolution, and Sonority Convolution.

## 2.1 Paired Sonorities

To define *paired sonority*, we will begin by tracing the [1] and [2] timbre groups. The piece opens with both [1] and [2] as its primary material. At 0:25, [2] disappears, while [1] continues. The next entrance of [2] is by itself (at 1:41), and the next entrance of [1] is accompanied by [5]. These two entrances are not formally significant because each of them is very brief as compared to their opening gesture. Additionally, both groups at this point quickly become another group due to *convolution* or *evolution* (see below).<sup>2</sup> The next entrance of either timbre occurs at 2:37, when they both enter together. This sonority recalls the opening gesture, although it is shorter in duration. Again, at 3:05 both [1] and [2] enter together (offset slightly).

## 2.2 Evolved Sonorities

The second principal type of combined timbre incorporated into *Mortuos Plango* is *sonority evolution*. In these cases, one group is transformed into another, already existing, timbre group. Significant use is made of groups [2] and [4] in this particular piece. For example, when [2] evolves into [4], it is notated [2@4], while in transit but upon reaching its destination group it simply becomes [4].

Harvey makes use of family similarities when incorporating sonority evolution. One finds several occurrences of family evolution, such as the passage at 3:38: [3a@3b@3a@3b@3a].

## 2.3 Convolved Sonorities

Convolution, in this sense, is not referring specifically to the process of audio cross-synthesis although it was certainly a factor in the production of the sounds. For the purposes of this paper convolution refers to the *concept* of cross-synthesis: the sounds need not have been manufactured using such a process in order to fit this definition.<sup>3</sup> Convolution is an essential step in an analysis of this type in order to relate timbres to one another, as well as trace the paths of sonorities. This is distinctive from sonority evolution in that the result is a *new* timbre, related somewhat to characteristics of both initial timbres.

Our first occurrence of convolution (notated as \*),

occurs at 2:03. Sonorities [4a] and [3b] are convolved into a new sonority. For timbre classifications, these sonorities become complex structures that occasionally warrant their own category. However in this instance, the [4a\*3b] sonority retains the primary timbre of [4a]. The result is [4a] with rhythmic and, to a lesser extent, pitch attributes of [3b].

## 3. Conclusion

It is not this author's intention that these concepts were a primary factor in realizing this piece. Rather, timbral analysis gives an insight into the unconscious tendencies of the composer, particularly how they orchestrate in this medium. By using families of timbres, one can listen to tape music for orchestrational detail and exactitude.

## References

- Harvey, Jonathan. *In Quest of Spirit, Thoughts on Music*. Berkeley: University of California Press, 1999.
- Harvey, Jonathan. *Tombeau de Messiaen* [CD Liner notes]. London: Sargasso Recordings, 1999.
- Roads, Curtis. *Computer Music Tutorial*. Cambridge: MIT Press, 2000.
- Srinivasan, A., D. Sullivan, and I. Fujinaga. 2002. "Recognition of isolated instrument tones by conservatory students." *Proceedings of the 7th International Conference on Music Perception and Cognition*. (In press)
- Van Solkema, Sherman. *The New Worlds Of Edgard Varèse: A Symposium*. New York: Institute for Studies in American Music Department of Music, School of Performing Arts, Brooklyn College of the City University of New York Brooklyn, New York, 1979.

## Footnotes

<sup>1</sup> Research by Srinivasan, A., et al. Published in the *Proceedings of the 7th International Conference on Music Perception and Cognition detailed timbre recognition studies in which subjects confused instruments in similar families (violin, cello; clarinet, bass clarinet, etc.), but rarely had problems identifying timbres of instrumental families individually.*

<sup>2</sup> At 1:45, [2@4]; at 2:19, [1] and [5a] become [1\*5a].

<sup>3</sup> Convolution in terms of cross-synthesis is most likely the means by which some, if not all of these materials were generated. Convolution, strictly speaking, is defined as:

$$\text{output}[n] = a[n] * \text{unit}[n] = a[n]$$

For example, at time  $n = 0$ ,  $\text{unit}[n] = 1$ , but for all other values of  $n$ ,  $\text{unit}[n] = 0$ . (Roads, 420)

## Examples

