

**Carmel Raz:
Putting the Cart(er) Before the Horse: Performing and Perceiving Metric
Modulations**

The technique of metric modulation, the reinterpretation of a pulse layer as a component of a proportionally related pulse layer, has long been associated with the music of Elliott Carter.¹ Performers typically spend hours internalizing changing tempo relationships, a notoriously challenging skill to master. Creative solutions abound: the Chiara Quartet practice Carter's Third String Quartet with a specialized metric modulation computer program, while the Arditti Quartet tackle the same piece with a click track.² However, the question as to whether listeners are able to perceive metric modulations has not yet been empirically addressed. Cognitively, can we tell when a metric modulation goes substantially wrong?

As cognitive experiments have shown that listeners are sensitive to harmonic modulations, I conducted an analogous experiment in the domain of meter, asking listeners to identify the introduction of a tempo related by a complex proportion, i.e. an *incorrectly* executed metric modulation, altered from the target tempo by $\pm 15\%$.

My experimental results showed that while musically trained listeners can successfully identify metric modulations in a tonal context with a constant pulse saliency, they are unable to recognize metric modulations in Carter's music. This implies that the labors of the Chiara and Arditti Quartet might remain to a large extent unperceived. More research needs to be done on the cognitive processes involved in performing and hearing metric modulations, but preliminary results from this experiment suggest that performers can take a freer approach to Carter's works without endangering the music's essential expression.

¹ See Goldman, "The Music Of Elliott Carter," 151-170, Schiff, *The Music of Elliott Carter*, 72, and Tingley, "Metric Modulation and Elliott Carter's First String Quartet," 31-11.

² Chiara: Visit Greg Beaver's blog to download his metric modulation computer program at: <http://greg.chiaraquartet.net/categories/9-Mac-Development>.
Arditti: In an interview with Jonathan Bernard, Carter mentions that the Arditti use a click track. "An Interview with Elliott Carter," *Perspectives of New Music* 28, no. 2 (1990): 184.