Rhythm in speech and music

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Rhythm is fundamental to speech and music. What do these two domains share in terms of rhythmic organization? There is a long history of interest in this topic by both linguists and musicologists, but remarkably few empirical explorations have been conducted. This is particularly striking since there are rich bodies of empirical research on rhythm within each domain.

In this presentation I suggest that progress in empirical comparative research depends on a clear distinction between periodic and nonperiodic rhythms in human auditory cognition. I will argue that speech and music have fundamental differences in terms of periodic rhythms, and important connections in terms of nonperiodic rhythms. Evidence for this argument draws on diverse strands of evidence, including quantitative comparisons of rhythmic patterns in speech and music, research on rhythm perception, and data from cognitive neuroscience.

Underlying this argument is a basic point about the definition of rhythm. "Rhythm" is a widely-used term in many fields (e.g., speech science, music cognition, neuroscience), and can mean different things to different people. Hence it is important to be explicit about what one means by rhythm. For many researchers, rhythm denotes periodicity, in other words, a pattern repeating regularly in time. I believe this definition is too narrow, and that a broader definition is needed that encompasses both periodic and nonperiodic rhythms. Hence I offer the following definition: Rhythm is the systematic patterning of timing, accent, and grouping in sequences of events. I welcome critiques of this definition (and concrete suggestions for alternatives) during the workshop.

Relevant readings
[First three available at http://www.nsi.edu/users/patel/publications.html]

Patel, A.D., Iversen, J.R., & Rosenberg, J.C. (2006). Comparing the rhythm and melody of speech and music: The case of British English and French. *Journal of the Acoustical Society of America,* 119:3034-3047.

Iversen, J.R., Patel, A.D., & Ohgushi, K. (in press). Perception of rhythmic grouping depends on auditory experience. *Journal of the Acoustical Society of America*.

Patel, A.D. (2006). Musical rhythm, linguistic rhythm, and human evolution. *Music Perception,* 24:99-104.

Ch. 3 (Rhythm) of Patel, A.D. (2008). *Music, Language, and the Brain.* NY: Oxford Univ. Press