

Review of “Perception of rhythmic grouping depends on auditory experience”

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Rhythm is innate to both speech and music. How we perceive rhythm greatly affects how constructs in language and music are grouped together, a high-level function essential to proper comprehension. The tendency to group auditory events together is so irresistible in humans that even a sequence of identical sounds such as a ticking clock is perceived as two separate, grouped sounds, “tick, tock.” The principles behind auditory grouping extend beyond such contrived test tones, however. They apply strongly to general language perception and learning. Rhythmic grouping particularly affects how language segmentation is learned.

Researchers have long theorized that rhythmic grouping relied upon universal perceptual rules. Language segmentation was thought to fall under the category of abilities equally endemic to all humans. Current work, however, postulates that grouping is heavily influenced by culture.

In Iversen and Patel’s work, the authors tested native speakers of English and Japanese with short rhythmic tones to see if there was a cultural bias towards one type of rhythmic grouping versus another. The inspiration came from an empirical study by Kusumoto and Moreton, in which sequences of test tones alternated in amplitude or duration. The investigators did not find a significant difference in the two groups when the amplitude sequence was presented, with both exhibiting a bias towards the “loud-soft” grouping. When varied in duration, however, American English speakers reported hearing a repetition of “short-long” groups, while Japanese speakers preferred the “long-short” order. Iversen and Patel repeated this experiment with a few modifications to test their hypothesis that speech, the most common auditory stimulus, causes this disparity in rhythmic perception.

The researchers tested two groups of native English and Japanese speakers with test tones varying either in amplitude or duration. The changing amplitude sequences revealed little new information, showing that both English and Japanese speakers tended towards the “loud-soft” grouping. However, the duration-varying test demonstrated that Japanese speakers prominently preferred the “long-short” order, with practically no English speakers doing so. One possible source for this phenomenon is how functors in each language are placed. In English, we see groupings such as “to eat,” “to sleep,” etc. In Japanese, these functional prepositions are placed after verbs. As an essential part of almost every spoken sentence, the order of the subject and verb could exert a significant influence upon rhythmic grouping of even nonspeech auditory samples.