Rhythmic priming of syntactic processing in Jabberwocky

David Gyorgy[1] , J Douglas Saddy[2], Sonja Kotz[3], Julie Franck[1]

1. Universite de Geneve
2. University of Reading
3. Maastricht University

Abstract

Recent empirical evidence has shown several correlations between language and musical rhythm processing in typical and atypical populations. One important line of research has proposed that musical rhythm and language processing involve the internal construction of hierarchical sequences, i.e., ordered collections of unique elements that can be represented in a structure in which lower-level units are combined into higher-level constituents. The present study hypothesized that a domain-general cognitive system responsible for internal hierarchical structure building constitutes a key shared mechanism between musical rhythm and language processing. In two experiments, typical French-speaking adults listened to thirty-two-second structurally regular or irregular rhythmic primes before completing six-sentence blocks of a grammaticality judgment task on Jabberwocky sentences. In both experiments, rhythmic priming influenced syntactic processing only in the first three sentences after a prime. Interestingly, participants with better rhythm discrimination abilities seemed to show less of a priming effect, while those with better auditory attention benefited more from the presence of a regular prime. These findings provide further evidence for a domain-general cognitive network responsible for hierarchical structure building in musical rhythm and language. Furthermore, our data seem to showcase that, in typical adults processing Jabberwocky sentences, the rhythmic priming effect comprises at least two components: a short-term facilitatory effect of regular rhythmic stimulation and an inhibitory effect of irregular rhythmic priming.

Keywords: Syntax, Rhythm, Rhythmic priming, Entrainment, Hierarchical structure building

Email: Machkus66613@gmail.com

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