

Grammaticality judgments in linguistic and musical structures

Abstract

A connection between language and music has been a matter of debate both in theory and empirical research. In theory, generativist approaches have posited common syntactic rules for music and language. In empirical research, efforts have been made to localize musical and linguistic syntactic processing in the brain, while others have suggested a common processing system. An online, graded grammaticality judgment task was administered to typical adults with and without music education. The stimuli contained structural deviances both in language and music: for linguistic syntax, deviant stimuli with adjective-noun mismatch were read, whereas for musical syntax, deviant stimuli with cadence violation were heard. These regular and irregular stimuli were judged alongside semantically regular and irregular sentences. For semantics, deviant sentences contained reversed thematic roles of non-reversible verbs, that is verbs that demand a [+animate] agent and a [-animate] theme. The participants read or heard the sequences and had to decide on a scale of 1-5 how acceptable the presented stimulus was. Reaction times were also recorded. It was hypothesized that stimuli with structural deviations would yield stricter judgments, whereas semantically deviant stimuli would yield milder judgments. No specific hypothesis was made on reaction times, although it was hypothesized that the group that had reported some years of music education would be quicker to decide on deviant music stimuli. Judgments were successful altogether; regular stimuli were generally given high scoring and irregular stimuli were given low scoring. However, it was observed that linguistic stimuli as a whole caused a binary judgment, whereas deviant music stimuli were more evenly distributed. No effect of music education was observed on the participants' performance. Optimality Theory suggests that constraint rules are hierarchically organized for each language, resulting in hard and soft constraints. A similar approach is observed in Generative Theory of Tonal Music and there have been some efforts to align these theories in a common framework for some levels of linguistic and music analysis. It is suggested that the constraints used for linguistic stimuli are hard, whereas the constraint used for music stimuli is soft. However, these two theoretical approaches have not been aligned in terms of syntactic analysis; thus, further theoretical and empirical research is needed.