COMPARING THE PERCEPTION OF MEANINGFUL DISCOURSE STRUCTURE IN MUSIC AND LANGUAGE

Abstract

Recent evidence of similar neural processing of music and language suggests that they share much in common (Steinbeis and Koelsch 2007). Studying the compositionality, i.e. the building blocks and their manner of combination, may reveal the likely similarity in the perceived discourse structure. Music studies have proposed that listeners attend to local but not global structure (Tillman and Bigand 2004, Deliège et. al. 1997); however, linguistic data have yet to distinguish the level of meaningful structure perception. Thus, this study aims to make parallel findings for both domains, additionally comparing musicians to nonmusicians.

Two comparable syntactic theories for music and text are the Generative Theory of Tonal Music (Lerdahl and Jackendoff 1983) and the Rhetorical Structure Theory (Carlson et. al. 2001), respectively. Both rely heavily on the shared recursive property and stem from a hierarchical approach. Using these rules, two original music and corresponding text stimuli were paired by segment number and tree depths. The branches at each tree depth were cut and randomized as audio-visual music clips and visual text slides in iMovie projects. Collegiate native English speakers – 50 music-majors ("musicians") and 50 non-music-majors ("nonmusicians") – were asked to recreate what they considered the original work in a puzzle task.

The resulting ordered strings were analyzed using edit distance, revealing that successful recreation was overall independent of subject and stimulus type. Musicians performed better than nonmusicians for music only at intermediate tree depths ($p=0.03$), suggesting that musicians attend to structural (global) cues in their recreation process while nonmusicians rely on surface (local) cues. Cluster analyses confirm this projection. This was not the case for text, where all subjects used segment adjacency (local cues) to recreate the stimuli. These novel findings provide empirical support for a differing compositionalistic tendency in music and language as perceived by musicians versus nonmusicians.

References

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