

ERP Responses to Cross-cultural Melodic Expectancy Violations

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ABSTRACT

Background

Previous research has shown that enculturation influences music cognition under certain conditions but not others. Listeners are able to respond to the tonal hierarchies of culturally unfamiliar music, but aren't always sensitive to deeper structural qualities (Castellano et al., 1984; Krumhansl, et al., 2000). Other studies have found that memory performance is poorer and tension judgments higher for culturally unfamiliar music (Demorest et al., 2008; Wong et al., 2009). It appears that some aspects of music cognition may be culturally conditioned while others are driven by the purely statistical properties of a musical stimulus.

Aims

The purpose of this study was to use ERP to test cultural awareness of out-of-scale notes in Western and North Indian music. We measured late positive ERP responses to out of scale notes in both listening conditions as well as a rating of the congruousness of the melody.

Method

US-born participants (n=10) listened to synthesized presentations of 30 excerpts each of European folk songs and North Indian ragas. All melodies were heard in their original form and in deviation form (120 melodies total). Continuous EEG was recorded from 29 scalp electrodes referenced to the left mastoid. Subjects pressed a button to rate the congruousness of each melody heard.

Results

There was a significant main effect for culture and condition with deviation melodies rated as less congruous than the original versions, and Indian music less congruous than Western. A significant condition by culture interaction indicated that listeners were less sensitive to deviations in the culturally unfamiliar melody context. There was a significant and widely distributed P600 response to out-of-scale notes in the Western condition and a much smaller but still significant P600 effect in the Indian condition.

Conclusions

Congruousness ratings suggest that listeners are less sensitive to melodic expectancy violations in the music of unfamiliar cultures compared to their own culture. ERP data were more mixed with subjects exhibiting a late positive component in response to deviations in both cultural

conditions, but less robust in the unfamiliar culture. The results provide support for the idea that listeners can internalize tonal structures in culturally unfamiliar music, but there are possible confounds between the two musical systems that must be resolved. We discuss the implications of these findings for theories on cultural versus universal factors in music cognition.

Keywords

Culture; Melodic Expectancy; Event-related potential; Music Cognition

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