USING MEG TO INVESTIGATE HABITUATION IN MUSICAL CONTEXTS

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Long-term exposure to music allows us to develop an implicit knowledge of musical syntax and this knowledge serves as the foundation of musical expectation. Expectation violations are an important part of musical experience and give music an “ebb and flow” that keeps listeners interested. Regardless of how many times we listen to a song, when we are confronted with a syntax violation in the song we can still pinpoint that irregularity. The early-right anterior negativity (ERAN) is related to a listeners response to harmonic-syntax violations and peaks between 150ms and 250ms after stimulus onset. While numerous studies have investigated the ERAN, very few have addressed how it is affected by habituation. These studies rely on complex harmonic stimuli and focus on implicit response. The present study investigates the MEG-equivalent of the ERAN (mERAN) and how habituation modulates the strength of this response to simple melodies that are either syntactically well-formed, conforming to common-practice tonality (M1), or end with an out-of-key pitch (M2). Both musicians and non-musicians explicitly listened to M1/M2 numerous times and neural responses were recorded using MEG. Even with simplified stimuli, our results reliably replicate earlier findings based on more complex stimuli. Whereas previous studies on short-term habituation of the mERAN only look at changes in the violation condition, we comparatively analyze how responses to both M1 and M2 change over time by employing averages of the response over sequential sets of trials for the duration of the experiment. Such method also allows us to study how the relative relationship between M1 and M2 fluctuates, which effectively controls for fatigue and allows us to clearly show how the mERAN changes both independent of and in conjunction with normal responses. Preliminary results show that the difference between M1/M2 conditions sustains, contrasting with previous claims that ERAN response depreciates over time.

Keywords: ERAN, music, syntax, habituation, MEG, expectation.

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