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Running Head: Music-Evoked Nostalgia

Neural responses to nostalgia-evoking music modeled by elements of dynamic musical structure and individual differences in affective traits

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Abstract

Nostalgia is an emotion that is most commonly associated with personally and socially relevant memories. It is primarily positive in valence and is readily evoked by music. It is also an idiosyncratic experience that varies between individuals based on affective traits. We identified frontal, limbic, paralimbic, and midbrain brain regions in which the strength of the relationship between ratings of nostalgia evoked by music and blood-oxygen-level-dependent (BOLD) signal was predicted by affective personality measures (nostalgia proneness and the *sadness* scale of the Affective Neuroscience Personality Scales) that are known to modulate the strength of nostalgic experiences. We also identified brain areas including the inferior frontal gyrus, substantia nigra, cerebellum, and insula in which time-varying BOLD activity correlated more strongly with the time-varying tonal structure of nostalgia-evoking music than with music that evoked no or little nostalgia. These findings illustrate one way in which the reward and emotion regulation networks of the brain are recruited during the experiencing of complex emotional experiences triggered by music. These findings also highlight the

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