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Ear worms and working memory: how do the inner ear, inner voice and attention keep ear worms looping in memory

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Abstract

The report evaluates the application of established working memory (WM) theory to the emerging field of involuntary musical imagery (INMI) using an experimental, repeated-measures factorial design. First, INMI is defined and characterised by briefly overviewing the literature. Then, the WM model is applied to INMI, and the literature evaluated in light of this application. Most importantly, three mechanisms for sustaining earworms are identified: the inner ear, inner voice and attentional refreshing. The study then aims to see how induced INMI is effected by the suppression of these three mechanisms, on a sample of 29 university students. To do this, the study uses a repeated-measures 2 × 2 × 2 factorial design where participants complete the attention network test (ANT) under eight conditions, based on the combination of these manipulations: chewing gum, hearing foreign speech, easy or difficult ANT. The results found a main effect of the foreign speech, and interactions between chewing gum and attention, and hearing the foreign speech and chewing gum. This suggests that attention plays a definite role in sustaining INMI, or conversely that when distracted and under high attentional load, INMI is supressed. Hearing foreign speech also supresses INMI, which supports the role of the phonological loop (PL), and likely the inner ear, while chewing gum was surprisingly found to facilitate INMI. More descriptively, the study supports the literature in finding that in a South African university sample INMI is a common, positive to neutral experience, but that can be induced experimentally and can be distracting. Ultimately, in proposing and evaluating an application of WM to INMI, the study adds depth to field of INMI by highlighting mechanisms involved in facilitating and supressing INMI.

Keywords: *attention network test (ANT), chewing gum, earworms, involuntary musical imagery (INMI), involuntary musical imagery scale (IMIS), working memory (WM).*