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MEMORIA DE TRABAJO AUDITIVA: UN META-ANÁLISIS ALE DE ESTÍMULOS RÍTMICOS Y TONALES

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RESUMEN

El objetivo de este trabajo fue estudiar los correlatos neurofuncionales de la memoria de trabajo auditiva (MTA) musical, en tareas que involucran procesamiento de patrones rítmicos y tonales. Existe vasta evidencia previa acerca de la memoria de trabajo verbal y visual, pero el procesamiento de la memoria de trabajo relacionada a estructuras musicales ha sido mucho menos explorado. Se realizó un metaanálisis de estudios de neuroimagen utilizando el método ALE (Estimación de Probabilidad de Activación), que incluyó diez investigaciones previas. Los resultados mostraron activaciones consistentes en regiones frontales vinculadas al control ejecutivo, como el giro frontal superior izquierdo (GFSi) y el giro frontal inferior derecho (GFId). En la condición tonal también se activaron el giro frontal medial derecho (GFMd) y la corteza cingulada anterior izquierda, asociados a la manipulación de información y la atención sostenida. La condición rítmica no presentó resultados significativos, probablemente por la escasez de estudios disponibles. Estos hallazgos aportan evidencia sobre el rol de redes frontales en la MTA, especialmente en tareas que requieren retención activa de información musical. Se expandirá esta revisión para estudiar áreas compartidas con otras modalidades (ej. verbal y visual).

Palabras clave

Memoria de trabajo - Procesamiento musical - Metaanálisis - Música

ABSTRACT

AUDITORY WORKING MEMORY FOR RHYTHMIC AND PITCH STIMULI: AN ALE META-ANALYSIS

The aim of this study was to examine the neurofunctional correlates of auditory working memory (AWM) for musical stimuli, specifically in tasks involving the processing of rhythmic and tonal patterns. While there is extensive prior research on verbal and visual working memory, the processing of working memory related to musical structures has been far less explored. A meta-analysis of neuroimaging studies was conducted using the Activation Likelihood Estimation (ALE) method, including ten previous investigations. The results showed consistent activations in frontal regions associated with executive control, such as the left superior frontal gyrus (SFG) and the right inferior frontal gyrus (IFG). In the tonal condition, additional activations were observed in the right middle frontal gyrus (MFG) and the left

anterior cingulate cortex (ACC), areas linked to information manipulation and sustained attention. The rhythmic condition did not yield significant results, likely due to the limited number of available studies. These findings provide evidence for the role of frontal networks in AWM, particularly in tasks that require the active retention of musical information. Future work will expand this review to examine shared neural areas with other modalities (e.g., verbal and visual).

Keywords

Working memory - Music processing - Metaanalysis - Music

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