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# Attention and Memory in the Music Learning Process in Individuals with Visual Impairments

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**Abstract :** Introduction: The influence of visual impairments on several cognitive processes used in the music learning process is an increasingly important area in special education and cognitive musicology. Many children have several visual impairments due to the refractive errors and irreversible inhibitors. However, based on the compensatory neuroplasticity and functional reorganization, congenitally blind (CB) and early blind (EB) individuals use several areas of the occipital lobe to perceive and process auditory and tactile information. CB individuals have greater memory capacity, memory reliability, and less false memory mechanisms are used while executing several tasks, they have better working memory (WM) and short-term memory (STM). Blind individuals use several strategies while executing tactile and working memory n-back tasks: verbalization strategy (mental recall), tactile strategy (tactile recall) and combined strategies. Methods and design: The aim of the pilot study was to substantiate similar tendencies while executing attention, memory and combined auditory tasks in blind and sighted individuals constructed for this study, and to investigate attention, memory and combined mechanisms used in the music learning process. For this study eight (n=8) blind and eight (n=8) sighted individuals aged 13-20 were chosen. All respondents had more than five years music performance and music learning experience. In the attention task, all respondents had to identify pitch changes in tonal and randomized melodic pairs. The memory task was based on the mismatch negativity (MMN) proportion theory: 80 percent standard (not changed) and 20 percent deviant (changed) stimuli (sequences). Every sequence was named (na-na, ra-ra, za-za) and several items (pencil, spoon, tealight) were assigned for each sequence. Respondents had to recall the sequences, to associate them with the item and to detect possible changes. While executing the combined task, all respondents had to focus attention on the pitch changes and had to detect and describe these during the recall. Results and conclusion: The results support specific features in CB and EB, and similarities between late blind (LB) and sighted individuals. While executing attention and memory tasks, it was possible to observe the tendency in CB and EB by using more precise execution tactics and usage of more advanced periodic memory, while focusing on auditory and tactile stimuli. While executing memory and combined tasks, CB and EB individuals used passive working memory to recall standard sequences, active working memory to recall deviant sequences and combined strategies. Based on the observation results, assessment of blind respondents and recording specifics, following attention and memory correlations were identified: reflective attention and STM, reflective attention and periodic memory, auditory attention and WM, tactile attention and WM, auditory tactile attention and STM. The results and the summary of findings highlight the attention and memory features used in the music learning process in the context of blindness, and the tendency of the several attention and memory types correlated based on the task, strategy and individual features.

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