

WHY DO STRING PLAYERS PERFORM EASIER PER MEMORY THAN WIND MUSIC PLAYERS? TESTING INSTRUMENTALIST STUDENTS' ATTENTION LEVELS DURING MUSIC READING

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Developing music reading skills is considered a central part of music education. The knowledge of musical notation is essential to participate in orchestras or in choral ensembles. In musical practice, pianists who play as soloists with an orchestra do not need written support as opposed to brass instrument soloists. Until now, no research has been conducted to discover the reasons why pianists and string players play easier by heart than brass instrument players.

Music related activities involve numerous psychological processes, including perception and rapid processing of audio stimuli, attention and auditory, sensory and visual memory activation. Students with working memory impairments have difficulties with concentration as well as with organizing and monitoring the quality of their own work (Alloway et al., 2009).

If the attention level is normal or high, the student is in an appropriate state for learning. It has been shown that participants with high working memory capacity perform significantly better on a variety of attention tasks (Fougnie, 2008).

Attention supports the development of emerging reading skills by helping students regulate the cognitive demands inherently part of learning (Sáez et al., 2011).

This study aims to test instrumentalist students' attention and mediation levels during music reading by means of NeuroSky's MindWave EEG device that translates brainwaves into digital information and beams it wirelessly to a computer. We investigated 22 right-handed wind instrumentalists, 12-14 years of age, and compared them with 21 violin players, matched for age and grade level. Students were asked to play an eight-bar composition by Szilvay. We analyzed attention and mediation levels, as well as alpha, beta and gamma band oscillatory responses to the musical piece during reading. The results of the data analysis were evaluated using e-Sense Metric. According to this metric, attention and meditation data are scaled between 1 and 100. The findings of the study revealed that the average attention level of the violin players was slightly high at 61.53; while that of the wind players was 39.98, that is, slightly low. A significant difference was found between the averages of attention levels between the string and the wind players ($t=2.656, p=.026$).

With the use of EEG, the appearance of fatigue can be detected and the concentration levels can be differentiated for the same exercise for different pupils. The results help us to improve instructional methods, and can also help us to reveal the processes of attention and mediation during the students' music reading. Further research can involve the replication of the study with pianists, comparing them with string players and wind music players. In an even more refined desing, a replication study could be carried out to compare pianists and brass instrument players. These further studies can serve as a basis for developing training programs of music reading comprehension for different instrumentalists.

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