The Effect of Auditory Distraction on Verbal Memory in Military Veterans with and without mTBI

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Introduction

An increasing number of military veterans are enrolling in college and/or transitioning into the civilian workforce. Because of the nature of their military service, veterans are at a higher risk for service-related conditions, including mild traumatic brain injury (mTBI), post-traumatic stress disorder (PTSD), and social anxiety disorder. Mild TBI is of particular concern because the condition can go undiagnosed, yet the cognitive consequences can be significant. Common cognitive problems associated with mTBI are deficits in attention, working memory, and episodic memory. One challenge in evaluating veterans with mTBI is that their cognitive deficits may be relatively subtle, only arising under more demanding circumstances. Although clinical cognitive assessment is performed in controlled settings, situations in classrooms and work settings usually involve the processing of complex information under distracting situations. This study examined how verbal memory is affected by auditory distraction in veterans with and without mTBI.

Research Questions

• What is the effect of auditory distraction on verbal memory performance in military veterans?
• Does auditory distraction affect verbal memory in veterans with mTBI more than typical veterans?

Method

Participants

Thirteen military veterans currently enrolled at Arizona State University, community college, or college preparatory programs, participated in this study. All participants completed a questionnaire which included questions about their academic, medical, and military service history. Eight typical veterans reported no history of mTBI or concussion (Mean age = 29.6 yrs, SD=3.6) and five veterans reported a history of mTBI or concussion (Mean age = 31.2 yrs, SD=4.0). All participants spoke English fluently and provided informed consent prior to participating in the study. The participants were administered the Rey’s Auditory Verbal Learning Task (Schmidt, 1996) as part of a larger test battery.

Procedure

Rey’s Auditory Verbal Learning Task

The examiner reads a list of 15 words. The participant recalls the words in any order. Trials 1 through 4

The examiner reads a different list of 15 words. The participant recalls the words in any order. Intervening List

The participant recalls the original list of 15 words. Delayed Recall

Results

The data analyses focused on the proportion of words correctly recalled across the trials and distraction conditions. Given the small sample sizes (and low degrees of freedom), effect sizes were evaluated using partial eta-squared ($\eta^2$) following Cohen’s (1988) interpretation.

Discussion

Although auditory distraction affected verbal memory in both typical veterans and veterans with mTBI, the groups showed different performance patterns. For typical veterans, the effect of distraction on memory interacted with Trial type, which reflected the fact that distraction affected performance only in the delayed recall condition. For veterans with mTBI, the effect size of auditory distraction on verbal memory was large, with distraction detrimentally affecting performance across all trial types. Overall, the results indicate that auditory distraction disrupts verbal memory retrieval more in veterans with mTBI relative to veteran peers with no mTBI. Data collection for this study is ongoing and larger sample sizes will allow for stronger hypothesis testing.

References


Distraction Conditions

No Distraction

Auditory Distraction

Words recalled with multi-talker babble played over headphones.