
CampusReader: Reading Comprehension Factors Study

Status Report as of June 14, 2011

Abstract

This study investigates the relationship between cognitive factors, mental health factors associated with post-traumatic stress disorder, and reading comprehension performance by comparing assessment findings of three groups: (1) veterans with a dual diagnosis of mild concussion and post-traumatic stress disorder, (2) veterans with only a diagnosis of post-traumatic stress disorder but no concussion diagnosis, and (3) age, gender and education matched non-veterans with no diagnosis of mild concussion and no diagnosis of PTSD. Results will be used to inform the development of the CampusReader project.

Introduction and Background

An increasing number of veterans being discharged from the armed services with both mild concussion and mental health disorders, such as post traumatic stress disorder, are seeking services within the Veteran's Administration health care system and other community healthcare providers. Evaluation and rehabilitation has traditionally focused primarily on the effects of concussion. Although mental health factors are acknowledged as possible contributing factors, there is little empirical evidence to support this conjecture (Adler, et al, 2011; Tanielian & Jaycox, 2008; Vasterling, Verfaellie, & Sullivan, 2009).

The present study will help to fill this gap, and contribute to the understanding of the degree to which cognitive and mental health factors independently contribute to the reading comprehension deficits of the many veterans seeking post-secondary education. This project, a collaborative effort between researcher clinicians at the Portland Veteran's Administration Medical Center and the University of Oregon HEDCO Speech, Language and Hearing Clinic, is an investigation of the relationship between cognitive factors, mental health factors associated with post-traumatic stress disorder, and reading comprehension performance. The study will address the following questions:

Research Questions

1. Do individuals with post-combat related mental health issues AND a history of concussion perform lower on reading comprehension measures when compared to non-injured age, gender and education matched controls?
2. Do individuals with post-combat related mental health factors BUT NO history of concussion perform lower on reading comprehension measures on reading comprehension measures when compared to non-injured age, gender and education matched controls?
3. Overall, does cognitive performance as measured by a battery of cognitive assessments predict reading comprehension performance for these three groups?
 - a. If so, do particular cognitive skills predict particular reading comprehension skills?
 - b. If so, are the cognitive profiles and predictions different for the groups with both post-combat related mental health issues and concussion, versus post-combat related mental health issues only, versus the control group.

Research Design

The research questions are being investigated using a between-subjects group design comparing the three groups. Participants for the first two groups are being recruited, screened, and assessed at the Portland Veteran's

Administration Medical Center. Participants for the control group, are being recruited, screened and assessed at the University of Oregon's HEDCO Speech, Language and Hearing clinic.

Dependent Variables

All participants complete a battery of cognitive measures, mental health questionnaires and reading comprehension tests over the course of two, two-hour sessions.

Cognitive Measures

Cognitive measures include the Connor's Continuous Performance Test II (CPT-II; Connors & MHS Staff, 2000), a measure of sustained attention; the California Verbal Learning Test (CVLT-II; Delis, Kramer, Kaplan & Ober, 2000), a measure of verbal learning and recall; the Wechsler Memory Scale Logical Memory subtest (WMS; Wechsler, 2001), a measure of immediate and delayed story recall; the Delis-Kaplan Executive Function Test Picture-Word Interference Test (D-KEFS; Delis, Kaplan, & Kramer, 2001), a measure of suppression and alternating attention; and a well-validated experimental working memory span test (Waters & Caplan, 2003).

Mental Health Measures

Mental health measures include the Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989), a self-report questionnaire that assesses the quantity and quality of sleep; for the veteran groups the Patient Health Questionnaire (PHQ-9; Kroenke, Spitzer, & Williams, 2001), a self-report measure that targets depressive symptoms; the British Columbia Post-Concussive Symptom Inventory (BC-PSI; Iverson & Lang 2003); and the PTSD Checklist –Military Version (PCL - M; Weathers & Ford, 1991).

Reading Measures

Reading measures include the Wechsler Test of Adult Reading (WTAR; Wechsler, 2001), an oral reading measure minimally sensitive to the effects of brain dysfunction and used to estimate pre-morbid baseline intelligence; the Nelson-Denny Paragraph Reading Assessment (Brown, Fishco, & Hanna, 1993), a widely used academic and clinical measure of text level reading comprehension; and a four component paragraph experimental reading measure (Hannon & Daneman, 2001; Potts & Peterson, 1985).

The experimental task has been demonstrated to be highly reliable at differentiating between different levels of text comprehension (Hannon & Daneman, 2001). Readers who may be competent at surface level reading (i.e. can decode words and comprehend vocabulary) or propositional level reading (i.e. can comprehend meaning locally within the text) may still struggle with comprehending at the situation level of reading. The situation level, a concept originally denoted with respect to narrative text, requires the ability to integrate meaning across the text, and with background knowledge. It is at the situation level that a reader develops a mental representation of meaning of the text that goes beyond the text.

For the task, participants are presented with paragraphs comprised of three individually presented sentences on a computer screen. Each sentence of the paragraph compares the features of two objects. Some of the objects are non-sense words and some of the objects are real. For example, "A blem is heavier than a nart; a nart is heavier than an apple; a flib is heavier than a melon." Following the last sentence, a series of true-false test statements related to the paragraph. For example, "An apple is heavier than a nart," (false) or "A flib is heavier than an apple" (true). The number of object features for each paragraph trial varies to create a range of complexity within the task. The true-false sentences are designed to tap into the different levels of text processing. Dependent variables for the task include true-false accuracy, time spent on each sentence of each paragraph, and time spent responding to true-false question types. At the conclusion of the task participants are also interviewed regarding any strategy use during the task.

Timeline

Recruitment began April 27, 2011. Participant testing began April 29, 2011 and is anticipated to be complete by October, 2011.

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Project Information

Project Title: Delivery of Personalized Reading Strategies for People with Cognitive Impairments in Post-Secondary Settings

Project Description: An NSF-funded five-year project initiated in August, 2010 that focuses on integrating reading comprehension strategies with online textbooks to support struggling readers enrolled in post-secondary courses (trade or college, on-campus or on-line).

Project, Principle Investigators: McKay Moore Sohlberg, PhD; Stephen Fickas, PhD

Study Title: Reading Comprehension Factors Study

Study Investigators: Michael Sullivan, PhD, Gina Griffiths

Funding Source: National Science Foundation

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