

Intelligence-II¹³ and three subtests [Spelling (SP), Numerical Operations (NO), Word Reading (WR)] of the Wechsler Individual Achievement Test-III.¹⁴ Univariate analysis of variance assessed differences in emotional functioning and academic achievement among youth with and without ADHD. Correlation and regression analyses were conducted to examine the association between emotional factors and the three subtests of academic achievement.

Results: Youth with ADHD exhibited significantly higher ELN ($M=30.7$, $SD=8.7$) compared to their peers ($M=23.2$, $SD=5.8$), when controlling for child age, sex, and diagnoses of conduct disorder and/or oppositional defiant disorder [$F(1,41)=8.96$, $p<.01$, $\eta_p^2=.18$]. With respect to ER, youth with ($M=24.8$, $SD=4.2$) and without ADHD ($M=25.8$, $SD=4.3$) did not differ [$F(1,41)=.51$, $p=.48$]. Surprisingly, within this sample, ADHD diagnostic status was not significantly associated with performance on any of the academic achievement subtests [WR: $F(1,41)=.29$, $p=.59$; NO: $F(1,41)=.91$, $p=.35$; SP: $F(1,41)=2.14$, $p=.15$]. Among all youth, ER was significantly associated with WR ($r=.31$, $p=.04$) and SP ($r=.35$, $p=.02$), whereas ELN was associated with performance on NO ($r=-.30$, $p=.04$). When controlling for child age, sex, IQ, and ER within the full sample, higher ELN was associated with lower scores on the NO subtest ($b=-.56$, $SE=.26$, $p=.04$). The associations between higher ER and WR scores ($b=1.12$, $SE=.51$, $p=.03$), as well as higher ER and SP scores ($b=1.47$, $SE=.56$, $p=.01$), were significant when controlling for child age and sex, but not ELN and IQ ($p=.73$ and $p=.64$, respectively). **Conclusions:** As expected, youth with ADHD had higher ELN, although they did not differ from their peers in terms of ER. Results identified distinct associations between ER and higher reading/spelling performance, as well as ELN and lower math performance across all youth. Thus, findings suggest that appropriate emotional coping skills may be most important for reading and spelling, while emotional reactivity appears most salient to math performance outcomes. In particular, ELN may be a beneficial target for intervention, especially with respect to improvement in math problem-solving skills. Future work should account for executive functioning skills, expand the academic achievement domains to include fluency and more complex academic skills, and assess longitudinal pathways within a larger sample.

Categories: Emotion Regulation

Keyword 1: attention deficit hyperactivity disorder

Keyword 2: academic achievement

Keyword 3: emotional processes

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33 Depressive Symptoms Drive the Underutilization of Cognitive Reappraisal in Veterans with PTSD

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Objective: Adaptive emotional regulation strategies, such as cognitive reappraisal, are related to better neuropsychological functioning in the general population. Individuals with PTSD demonstrate difficulty with both emotional regulation and cognitive performance that contribute to clinical presentation (e.g., negative mood, irritability). However the extent to which neuropsychological functioning is associated with emotion regulation, alone and in concert with common comorbid symptoms like depression, remains understudied in this population. Better understanding how specific neuropsychological functions relate to cognitive reappraisal could point to novel treatment targets given preliminary evidence that certain cognitive training techniques can improve neuropsychological and affective outcomes. The present study aims to investigate the relationship between clinical symptoms of PTSD and depression, working memory capacity, and cognitive reappraisal in Veterans with PTSD. We hypothesized that clinical symptoms and working memory capacity would interact to predict cognitive reappraisal, such that elevated depression would relate to worse cognitive reappraisal, particularly for individuals with poor working memory capacity.

Participants and Methods: Measures of working memory (symmetry span task), mental health symptomatology (Clinician-Administered PTSD Scale for DSM-5 (CAPS-5) and Beck Depression Inventory-II (BDI-II)), and emotional regulation (Emotion Regulation Questionnaire (ERQ)) were collected in 38 Veterans. A regression analysis was conducted with total

CAPS score, total BDI score, total symmetry span score, and the interaction between BDI score and symmetry span score as the independent variables and total ERQ cognitive reappraisal score as the dependent variable.

Results: When examining each predictor independently, cognitive reappraisal was not associated with working memory ($t=1.42$, $p=.165$), but was significantly associated with PTSD ($t=-3.17$, $p<.003$) and depressive ($t=-4.15$, $p<.001$) symptom severity. The multiple regression model ($F(4, 35)=4.45$, $p<.005$, $R^2=.26$) did not support the hypothesized relationship between working memory and depressive symptoms ($t=0.56$, $p=.579$). Depression independently predicted utilization of cognitive reappraisal in veterans with PTSD ($t=2.43$, $p=.020$) but PTSD symptom severity and working memory scores did not. However, additional investigation revealed that independently, greater PTSD symptom severity did predict less utilization of cognitive reappraisal ($t=-3.17$, $p<.005$).

Conclusions: While depressive symptoms did not moderate the relationship between working memory and cognitive reappraisal, depressive symptoms did best predict utilization of cognitive reappraisal in a population with PTSD. Contrary to the hypothesized outcome, neither working memory nor PTSD symptoms were significant predictors of cognitive reappraisal when controlling for depressive symptoms. This suggests that the phenomenon of lower cognitive reappraisal rates in individuals with PTSD may be due to the presence of depressive symptoms rather than traumatic stress symptoms or neuropsychological ability. Due to the sample size and homogeneous diagnosis of the current study it is possible that the predicted relationship between working memory, PTSD severity, and cognitive reappraisal was not observed due to low power or a restricted range. Further investigation specifically in clinical populations on factors that predict utilization of cognitive reappraisal could expand on these findings in populations experiencing other stress-based disorders.

Categories: Emotion Regulation

Keyword 1: working memory

Keyword 2: post-traumatic stress disorder

Keyword 3: depression

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34 Neurocomputational Mechanisms of Social Reward Processing in Combat-Exposed Veterans

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Objective: Combat exposure is associated with higher rates of depressive symptoms, including anhedonia (i.e., a reduced ability to seek and experience rewards) and feelings of social disconnectedness. While these symptoms are commonly documented in combat-exposed Veterans following deployment, the cognitive mechanisms underlying this pathology is less well understood. Computational modeling can provide detailed mechanistic insights into complex cognition, which may be particularly useful to understand how social reward processing is altered following combat exposure. Here, we use a Bayesian learning model framework to address this question.

Participants and Methods: Thirty-three Operation Enduring Freedom (OEF)/ Operation Iraqi Freedom (OIF)/Operation New Dawn (OND) Veterans (25 Male, 8 Female) between the ages of 18-65 years old ($M = 41.61$, $SD = 10.49$) participated in this study. In both classic/monetary and social reward conditions, participants completed a 2-arm bandit task, in which they must choose on each trial between two options (i.e., slot machine vs social partner) with unknown reward rates. While they received monetary outcomes in the classic condition, participants received compliments from different fictitious partners in the social condition. We first compared a learning-independent Win-stay/Lose-shift (WSLS) heuristic and either a Rescorla-Wagner Q-learning or a Bayesian learning model (Dynamic Belief Model/DBM) paired with a Softmax reward maximization policy. DBM+Softmax provided the best fit of the data for most participants (31/33). Individual DBM parameters of prior reward expectation, reward learning (i.e., perceived stability of reward rates), and Softmax reward maximization were estimated and compared across conditions.