The majority of the sample was White (71%) and were from the Korean and Vietnam War eras.
Results: *APOε4* and *BDNF*-met were present in 29% and 27% of the sample, respectively; both were present in six participants. Regression models were fitted separately for TMT-B raw time-to-complete and number of errors, both cross-sectionally at screening and then longitudinally. The presence of *BDNF*-met was a significant predictor of TMT-B time and number of errors in both models (Time: β = 0.09, p = 0.03 and β = 0.11, p < 0.01; Errors: IRR = 2.4, p = 0.01 and IRR = 1.9, p = 0.01), while *APOε4* only predicted errors longitudinally (IRR = 1.8, p = 0.03). There was no significant allelic interaction; however, the presence of both alleles additively multiplied TMT-B errors by approximately 3.7 times at screening (IRR = 3.7; p = 0.01) and 3.3 times longitudinally (IRR = 3.3; p < 0.01).
Conclusions: Altogether, these results are suggestive of an adverse, additive, effect of the *APOε4* and *BDNF*-met polymorphisms on executive functioning, in particular error-proneness, with their combined presence tripling the errors made on TMT-B cross-sectionally and longitudinally. Consistent with previous research, the TMT-B error analysis increases detection of cognitive impairment, similar to other clinical samples (Varjacic et al., 2018). While TMT-B errors are typically interpreted qualitatively, the strong effect of these established risk alleles on error rates further support this metric as a clinically useful indicator of executive dysfunction in a PTSD population. In keeping with the Boston Process approach, these findings support the importance of error analysis in clinical interpretation of neuropsychological performance.

Categories: Genetics/Genetic Disorders
Keyword 1: apolipoprotein E
Keyword 2: executive functions

2 The Role of Causality in Understanding How Prior Event Knowledge Impacts New Learning

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Objective: The influence of prior knowledge on new learning is well established. However, there has been less research dedicated to teasing apart the key components of prior knowledge's structure that contribute to memory enhancement. In the current study, we focused on event structures, which include various relations, such as associative, causal, and temporal. Given that events possess attributes relevant to numerous cognitive memory processes, we were most interested in exploring how event structures that possess causal relations enhance new memory formation. Specifically, we examined whether events that exhibit causal associative relations provide an additional boost to new learning compared to event structures with non-causal associative relations.
Participants and Methods: Forty-six undergraduate students took part in the study. Participants' learning of the content of image pairs that exhibit everyday, real-world events were measured using a cued recall paradigm. The stimuli consisted of 60 image pairs that illustrated two events that were related causally and associatively (i.e., causal pairs); related only associatively (i.e., non-causal pairs); or not related at all (i.e., unrelated pairs). During an encoding phase, image pairs were presented one at a time, and after the presentation of each image pair, participants answered an encoding question that focused on the relationship between the two images. After the encoding phase and a short filler task, participants were shown a cue image (always the first picture from the pair) and were asked to provide a brief written description of the content of the second presented image from each pair. Also, as a manipulation check, we asked subjects to rate each image pair on causal direction and association strength after completion of the cued recall memory task.
Results: We found that, relative to unrelated pairs, events that possess associative relations (i.e., both causal and non-causal items) benefit learning of new information. In addition, causal relations provided an additional boost to new learning. Specifically, cued recall performance is best for causal pairs, followed by non-causal pairs and unrelated pairs. Moreover, causal direction ratings significantly predict overall item-level accuracy above and beyond general associative relations that exist in events. We also examined recall accuracy for specific content information within each event (i.e., agent, action, object) and found that causal

https://doi.org/10.1017/S1355617723006732 Published online by Cambridge University Press

relations uniquely contribute to recall performance of objects and actions.
Conclusions: Overall, the present study's findings suggest that prior event knowledge structures possessing causal and non-causal associative relations support new learning, especially compared to image pairs with no relations. Of interest, causality provides an additional boost to new learning above and beyond general associative relations. By focusing on the role of causality in event structures, our findings informed our understanding of how prior knowledge supports new learning. Considering that the effect of prior knowledge on new episodic learning is especially evident in older adults, since they more readily rely on their schematic knowledge, a future direction would entail investigating how causal links influence new memory formation in older adults.

Categories: Memory Functions/Amnesia
Keyword 1: memory: normal
Keyword 2: learning
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3 The Effect of Face and Body Expressions on the Process of Learning and Memory of Images Among Healthy Participants and Individuals with Traumatic Brain Injury (TBI): Examination Using Eye Movements

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Objective: Context-Dependent Effect (CDE) is a process by which restoring the original learning context enhances recall ability of the material being studied. One type of context is body expressions. Memory is one of the most common areas affected by Traumatic Brain Injury (TBI). However, although the performance of people with TBI is lower than that of healthy people in most memory-related parameters, both groups show evidence for CDE. We examined the CDE via behavioral and eye movement measures.
Participants and Methods: Twenty-four healthy individuals and 27 patients with moderate-to-severe TBI participated in a memory task. Participants were exposed to pictures of people with neutral facial expression and neutral body expression and were asked to remember them for a subsequent memory test. In the testing session, they were asked to determine whether or not the person presented to them had appeared before, under two conditions: (1) where the context remains constant (facial expression and body expression remained neutral– the Repeat condition) (2) where the context changes (facial expression remained neutral and the body changed to angry or happy expression – the Re-pair condition).
Results: While memory of the individuals with TBI was poorer than that of the control group, both groups exhibited CDE, as this effect was stronger in the Repeat condition compared to the Re-pair angry condition. We found that participants spent most of their time looking at the head. In addition, in both groups, we found a CDE and a group effect with regard to the difference in Dwell Time, so DT toward faces in the Repeat condition was higher than toward faces in the Re-pair condition. Also, DT toward correctly recognized people was higher among the control group than the TBI group. This effect appeared in the study and test phases.
Conclusions: This study supports previous research showing evidence for CDE using body expression in the TBI group, like the control group, and extends our comprehension of the relationship between eye movements, memory, and context of facial and body expression.

Categories: Memory Functions/Amnesia
Keyword 1: brain injury
Keyword 2: memory: implicit
Keyword 3: traumatic brain injury
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4 Associations between prospective memory performance and cognitive domains

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Objective: Executive functions have been shown to predict prospective memory (PM) performance (Martin, Kliegel, & McDaniel,

https://doi.org/10.1017/S1355617723006732 Published online by Cambridge University Press