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THE EFFECT OF OBSTRUCTIVE SLEEP APNEA ON EMOTIONAL MEMORY CONSOLIDATION

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Introduction: A growing body of evidence suggests that sleep is critical for the processing and consolidation of emotional information into long-term memory. Previous research has indicated that emotional components of scenes particularly benefit from sleep in healthy groups, yet sleep dependent emotional memory processes remain unexplored in many clinical cohorts, including those with obstructive sleep apnea (OSA).

Methods: In this study, a group of newly diagnosed OSA patients (n=26) and a matched group of healthy controls (n=24) encoded scenes with negative or neutral foreground objects placed on neutral backgrounds prior to a night of polysomnographically recorded sleep. In the morning, they completed a recognition test in which objects and backgrounds were presented separately and one at a time.

Results: OSA patients have a deficit in both overall gist memory and the specific recognition memory for the scenes. Impairment of gist recognition was across all elements of the scenes, both negative and neutral objects and backgrounds [main effect of group: $F(1,48) = 13.5, p=0.001$], while specific recognition impairment was exclusively found for negative objects [$t(48)=2.0, p=0.05$]. Across all participants, successful gist recognition correlated positively with sleep efficiency ($p=0.001$) and REM sleep ($p=0.009$), while successful specific memory recognition correlated only with REM sleep ($p=0.004$).

Conclusion: Our findings indicate that fragmented sleep and reduced REM sleep, both hallmarks of OSA, significantly disrupt distinct memory processes for emotional content. Gist memory is universally impacted, while memory for specific details appears to have a greater deterioration for negative aspects of memories. These memory affects may have impacts on complex emotional processes, such as emotion regulation, and could contribute to the high comorbid depressive symptoms in OSA.

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EVENING ALCOHOL CONSUMPTION AND SLOW WAVE SLEEP: IMPACT ON MORNING HIPPOCAMPUS-DEPENDENT LEARNING ACROSS THREE NIGHTS

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Introduction: Numerous studies interrogated the relationship between alcohol and a single night of sleep. Yet, many adults engage in cumulative days of drinking. Previous studies show alcohol on a single night increases slow wave sleep in the first third of night. Similarly,

sleep has been associated with the success of daytime learning. Our goal was to investigate across three consecutive nights how evening alcohol use and nighttime sleep are associated with morning learning.

Methods: 23 adults (11F, mean age 33.5 ± 12 years) completed six nights of PSG monitored sleep. Participants consumed alcohol with a target 0.08 breath alcohol concentration (BrAC) and no alcohol on three consecutive nights in counterbalanced order. Percent of slow wave sleep (SWS%) in the first third of the night was derived. Learning was assessed each morning with distinct stimuli on the Mnemonic Similarity Task (MST). The MST score derived was the Lure Discrimination Index (LDI), defined as the proportion of similar images correctly identified minus the proportion of old images incorrectly identified.

Results: SWS% during the first third of the night was greater for alcohol nights compared to non-alcohol nights ($F(1, 110)=10.891, p=0.01$). However, there was no evidence that either night number or the interaction of drink content and night number affected %SWS in the first third of night (all p 's > 0.05). There was a modest decrease in LDI on mornings following alcohol consumption; however, this effect was not significant. In a separate linear mixed-effect model we found no evidence for an effect of night number, drink content, or their interaction on MST LDI scores (all p 's > 0.05).

Conclusion: Our results indicate that slow wave sleep in the first third of the night is sensitive to evening alcohol consumption. Despite prior literature associating slow wave sleep with next-day learning, we observed no effect of alcohol or night number on morning learning. It is possible that the small sample size contributed to our results. There is little prior research on the cumulative effects of alcohol on sleep and learning; our study adds to this area of research despite the negative findings.

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IS WORKING MEMORY ASSOCIATED WITH AG-RELATED EMOTIONAL MEMORY BIAS?

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Introduction: Aging is accompanied by deterioration in both working memory (WM) and long-term memory (LTM), though the reason is not well understood. Sleep may play a role in young adults, but the findings in older adults are not as clear. In addition, older adults show better memory for positive memories, whereas younger tend to hold on to negative memories. The prefrontal cortex has been implicated in this emotional memory bias. The current study investigated the role of working memory (a prefrontal task) on emotional memory consolidation across sleep and wake in young and older adults.

Methods: In the morning, 93 younger (18–39) and 121 older (60–85) adults took a WM task and encoded neutral or negative word pairs, and gave valence and arousal ratings for each pair. After a wake or polysomnography-recorded sleep condition, memory for the word pairs was tested plus valence and arousal ratings.

Results: Youngers had better overall memory ($p<.001$), with older adults showing better memory for neutral compared to negative word pairs ($p=.04$), as well as increased positivity ($p=.02$), which was correlated with LTM performance ($p=.009$). In contrast, younger performed better on the negative word pairs ($p=.01$), but no change in ratings and no association between emotional reactivity and LTM. Further, WM was positively related to memory in younger ($r=.38, p=.02$), but not in older adults. Lastly, no role for sleep likely due to the lack of an immediate test.