Results: Recognition memory was significantly impaired following inhibition of TRN PV neurons during the memory retention interval (NOR: N=10, p<0.01, OPR: N=10, p<0.01). Procedural memory, computed as percent improvement from Day-1 to Day-2 of the rotarod task, was also impaired in the TRN inhibition group (N=7) compared to control (N=5, p<0.05). However, correlations between spindle density and behavioral performance were inconsistent among tasks.
Conclusion: These findings demonstrate that optical inhibition of TRN PV neurons following learning affects memory performance. Further investigation of the precise physiological mechanisms that cause behavioral impairments is necessary.
Support (If Any): VA Merit 1I01BX001356, VA Merit 1I01BX002774, VA CDA 1IK2BX002130, T32HL007901, MH039683, HL095491. JTM received partial salary compensation and funding from Merck MISP, but has no conflict of interest with this work.

0219

ACOUSTIC STIMULATION INCREASES SLOPE, AMPLITUDE AND TIME IN BETWEEN SLOW WAVES IN OLDER ADULLTS

Santostasi G
Northwestern University, Chicago, IL

Introduction: Acoustic stimulation during sleep has been shown to increase slow-wave activity (SWA) in young adults but has not been examined in older adults. The aim of this study was to examine the ability of acoustic stimulation to increase SWA parameters in adults ≥50 years old.
Methods: Seven adults (age 66.85 ± 10 years, 1 male) completed one night of acoustic stimulation and one night of sham stimulation. During sleep, an adaptive phase-locked loop (PLL) algorithm was used to lock on to endogenous slow waves measured in midline frontopolar electroencephalographic recordings in real time. Acoustic stimuli were delivered when the PLL system predicted the positive upstate of the slow wave. Stimuli consisted of pulses of pink noise lasting 50 ms with an inter-tone interval of approximately 1 s, depending on the individual's slow oscillations. Tones occurred in blocks of 5 pulses ("ON blocks") followed by a refractory period of equal length ("OFF blocks"). Frequency-amplitude methods were used to calculate amplitude, slopes and time in between slow waves negative peaks.
Results: The amplitude, slope and time in between slow waves had lognormal distributions. The mean of the distribution of the logs of the amplitudes, slopes, and time in between slow waves was 8.1, 5 and 6 percent higher during the stimulation night (p<0.001) compared to the sham night.Spindles were also distributed lognormaly and the mean of the logs during the stimulation night was higher by 5 % relative to sham (p<0.001).
Conclusion: Acoustic stimulation during sleep can enhance SWA and spindle amplitude and has the potential to improve sleep quality in middle-age and older adults.
Support (If Any): Funding: Dixon Translational Research Grant, NIH T32 NS047987, National Science Foundation GFRP DGE-1324585, NIA P01AG11412.

0220

SLEEP OR WAKE BENEFIT WORKING MEMORY IN OLDER ADULTS?

Sattari N, Mednick SC
University of California Riverside, Riverside, CA

Introduction: Aging is associated with decreases in cognitive ability (e.g, working memory (WM)), supporting neural structures (Sowell et al., 2004), and sleep (Wolkove st al., 2007); however, the relationship between these factors is not clear. Insufficient sleep prior to testing may impair WM in young adults (Gradisar et al., 2008), but it is not clear whether sleep after testing may benefit WM. Here, we investigate the role of a nap, quiet wake (QW) and active wake (AW) on changes in WM performance in older adults.
Methods: 38 healthy older adults (15 females, 70.8 ± 6 years old) were asked to solve simple math problems while holding a variable-length list of letters in their working memory before (Session 1) and after (Session 2) a nap intervention: 50-minute polysomnographically-recorded nap (n=23), 60-min QW (n=7) or 60-min AW (n=8). Proportional correct performance measure was calculated, and one-way ANOVA and independent-samples t-tests compared group performance, as well as paired t-tests to evaluate within-group changes in performance. Bivariate correlations examined association between sleep variables and performance.
Results: We found a significant main effect of nap condition (p=.05). Post-hoc comparisons revealed no differences in Session 1 (all p>.09). However, at Session 2, QW performed significantly better compared to both nap (p=.04) and AW (p=.02). Additionally, compared to the other groups, QW and AW WM performance did not deteriorate during the day (QW: p=.4; nap: p=.02 and AW: p=.8). Stage 1 sleep percentage negatively predicted Session 2 performance in the nap group (r=-.4, p=.04).
Conclusion: We show that older adults benefit from a period of quiet wake or active wake in maintenance of WM across the day. Moreover, napping and active wake showed worse WM performance compared with QW. Given the prior literature demonstrating scant benefits of sleep for memory consolidation in older adults (Scullin, 2013), our data suggest that older adults do not use sleep to maintain executive functioning across the day either.
Support (If Any): None.

0221

EXAMINING THE COMPETITION OF SALIENCE CUES FOR DOMINANCE IN MEMORY OVER A NAP VERSUS WAKE

Alger SE, Payne JD
University of Notre Dame, Notre Dame, IN

Introduction: Selectively remembering emotional information is biologically adaptive, but how this type of salience ranks in importance to other salience cues, such as a task direction to remember or forget specific items, remains unclear. Furthermore, sleep selectively consolidates that which is the most important to remember, but it is unknown how sleep, and what particular aspects of sleep physiology, will prioritize multiple cues of future relevance.
Methods: Participants viewed both negative and neutral scenes, with presentation of each scene followed by a direction to either REMEMBER or FORGET that item. Half of the emotional and neutral items were to-be-remembered, the other half to-be-forgotten. Following baseline testing on half the encoded material, subjects either obtained a 90-min nap or remained awake. Memory for the remaining images was tested 7 hours later, holding constant the time of training and testing between groups.
Results: Across groups, we found a greater preservation of memory for negative compared to neutral scenes and for the to-be-remembered items compared to the to-be-forgotten items (both p<0.001). Interestingly, the task cue to remember was valued more than emotional salience, forming a hierarchy of memory with negative-remember items best remembered, followed by neutral-remember, negative-forget, and neutral-forget. Comparing the groups, we found a trending 3-way interaction at retest (p=0.09). For neutral