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The Effect of Sleep and Emotion on Pattern Separation

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INTRODUCTION

I. Slow wave sleep has been considered an important aspect of memory consolidation, most commonly through a model known as **active systems consolidation**[1]

   I. Newly encoded memories are repeatedly activated, driven by slow oscillations that occur in the neocortex.

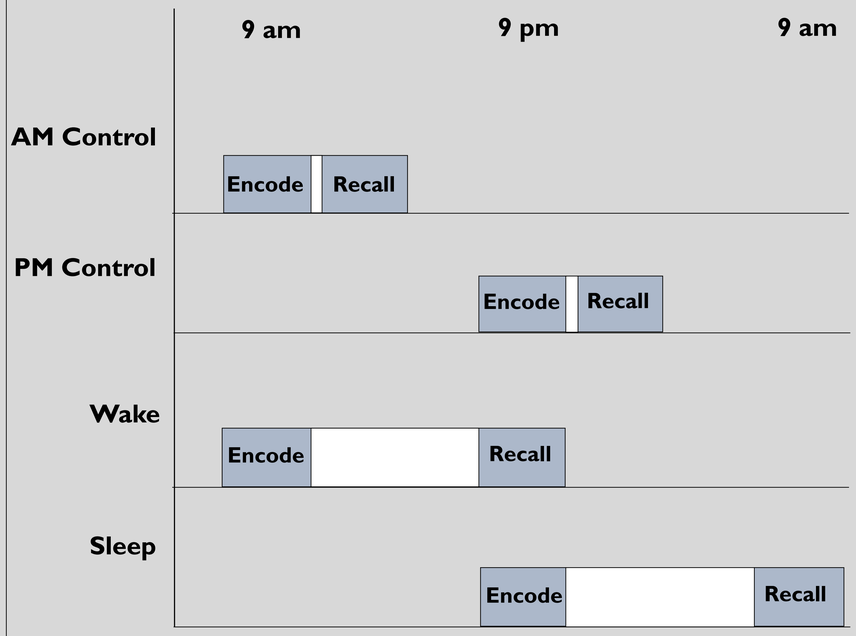
II. A widely accepted view is that emotional memories are preferentially consolidated during sleep making them easily obtainable for retrieval.

   I. However, recent meta-analyses of sleep, emotion, and memory have suggested that this effect may not be as robust as we once thought[2,3].

III. A relatively new way to investigate sleep and emotional effects on memory is with a pattern separation task called the Mnemonic Similarity Task (MST)[4].

IV. The current study examined pattern separation and item recognition using an emotional variation of the MST consisting of negative and neutral images.

METHOD



METHOD

I. Participants (N=92) viewed a series of 120 negative and 120 neutral images and made valence judgements by rating each image.

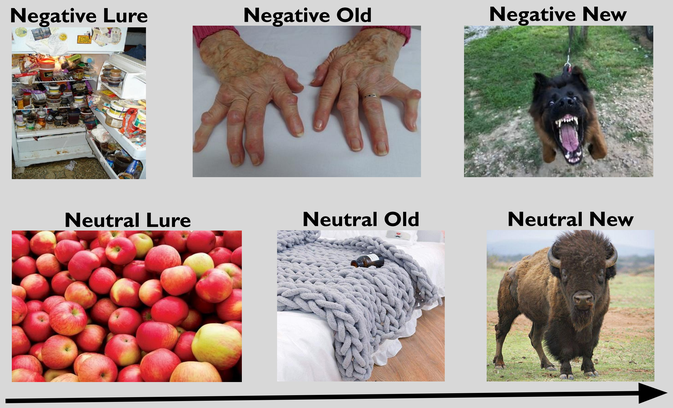
II. The recognition task took place 12-hours after the incidental encoding phase for the sleep and wake groups, and 1-hour after the incidental encoding phase for the AM and PM control groups.

   I. Participants viewed a series of 120 old images (targets), and an additional 240 new images (new and lures).

   II. For each image, participants identified the image as being "old" or "new" on a 6-point confidence scale.

Study

Test

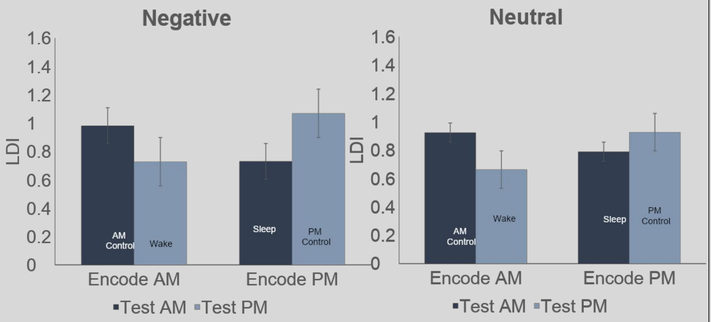


RESULTS

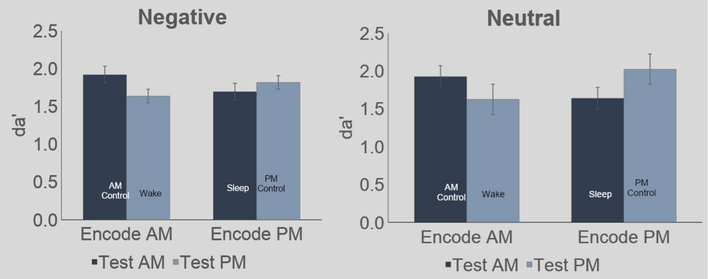
I. We ran Bayesian ANOVAs to examine interactions between encoding time, test time, emotion, and test type item recognition and pattern separation.

II. All indicated a Bayes Factor below 1.00, providing no support for effects of sleep or emotion on memory.

Pattern Separation



Item Recognition



DISCUSSION

I. Preliminary results suggested no difference in pattern separation and item recognition as a function of sleep and emotion.

II. Though this contradicts our hypotheses, the findings support a more current claim in the literature that sleep does not enhance emotional memories more than neutral memories.

REFERENCES

[1]**Rasch, B., Born, J. (2013).** About sleep's role in memory. *Psychological Reviews, 93*(2), 681-766; [2]**Lipinska, G., Stuart, B.,Thomas, K., Baldwin, D. S., & Bolinger, E. (2019).** Preferential Consolidation of Emotional Memory During Sleep: A Meta-Analysis. *Frontiers in psychology, 10*, 1014. [3]**Schäfer, S. K., et al. (2020).** Sleep's impact on emotional recognition memory: A meta-analysis of whole-night, nap, and REM sleep effects. *Sleep medicine reviews, 51*, 101280; [4]**Stark, S. M., Kirwan, C. B., & Stark, C. E. (2019).** Mnemonic similarity task: A tool for assessing hippocampal integrity. *Trends in cognitive sciences, 23*(11), 938-951.