Stress Research Institute

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The effect of sleep loss on emotional working memory

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Main aim

To examine the effect of sleep loss on working memory using positive, negative and neutral pictures and manipulating level of complexity.

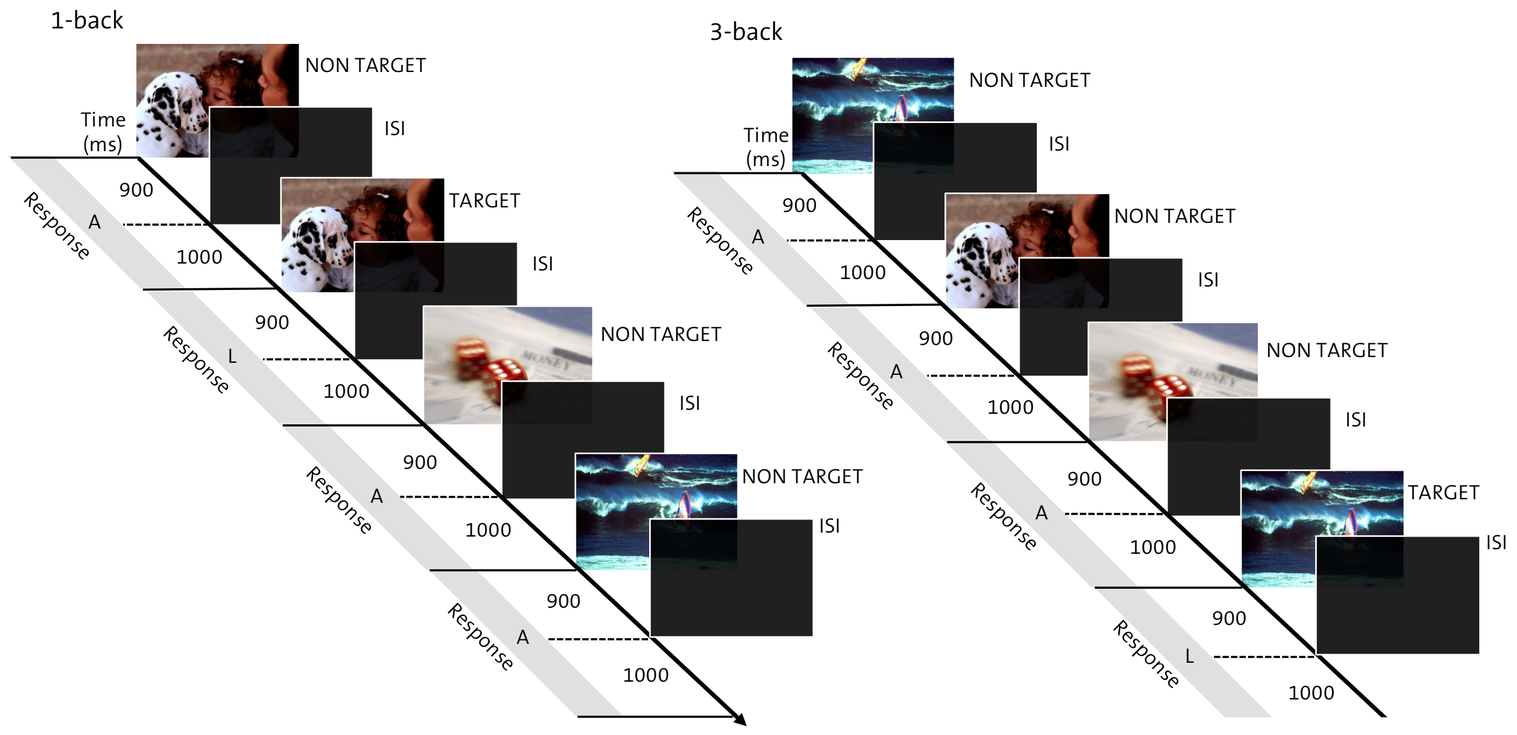
Background

- Emotional stimuli differently affect working memory (WM) performance.
- Sleep deprivation has a known impact on both emotion and WM.

Methods

- 61 subjects (26 women), age: 23.4 (3.4)
- Non sleep deprived (n=31)
- Total sleep deprivation (n=30)
- Sleep deprived ≈ 32 hours without sleep
- Emotional (1 & 3)-back task *(Figure 1)*

Figure 1. N-back task, 1-back (low complexity) and 3-back (high complexity)



Results

Accuracy (d') (Figure 2)

- Sleep deprived less accurate (p = .02)
- 3-back more difficult than 1-back (p < .001)

Response time (figure 3)

- Slower responses for 3-back than 1-back (p < .001)
- Responses to positive pictures faster (p = .01), especially for sleep deprived (p = .004)

Figure 2

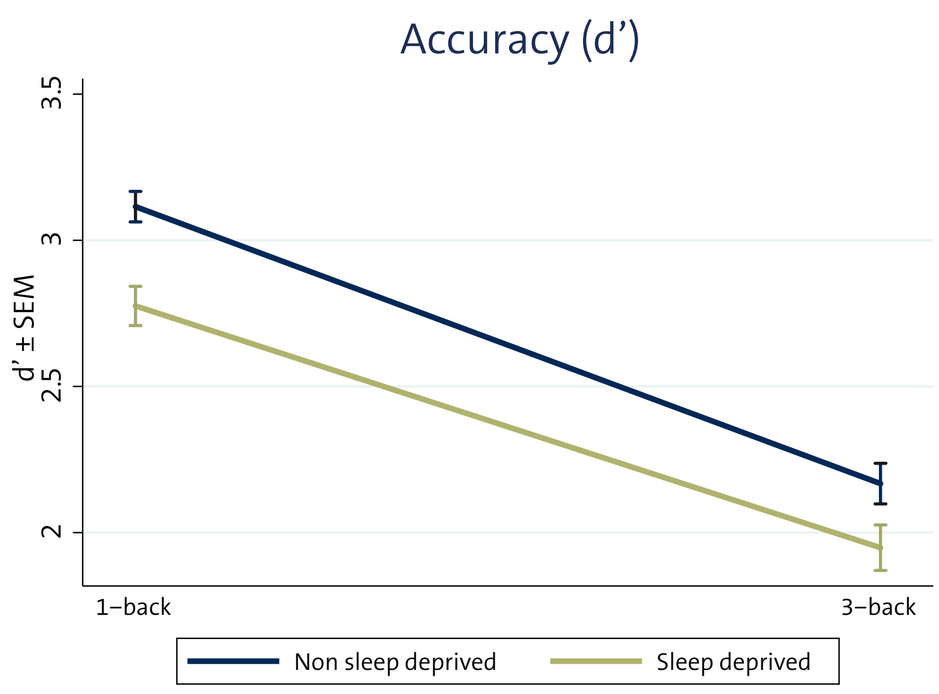
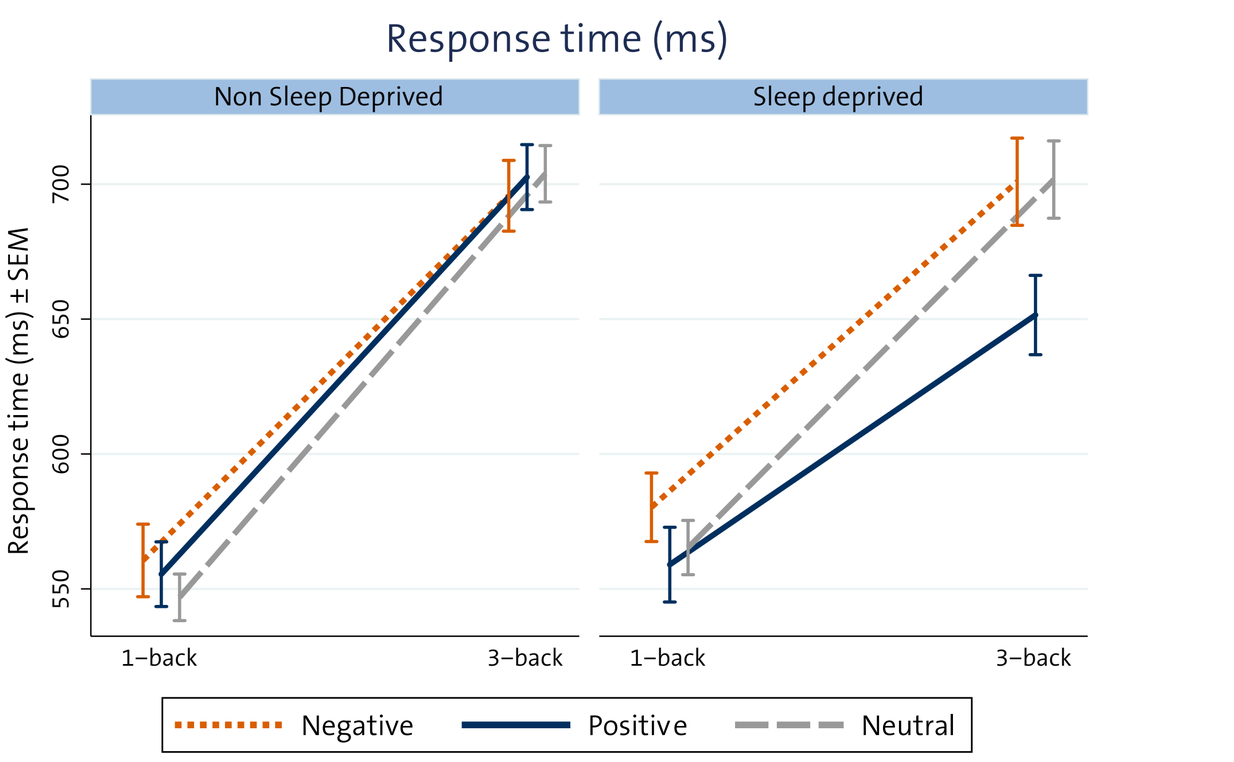


Figure 3



Conclusion

- Working memory accuracy is overall negatively affected by sleep loss.
- Emotional content moderates the effect of sleep loss on working memory in terms of response time.

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