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SLEEP SPINDLES AND BDNF GENOTYPE IN VISUAL MEMORY

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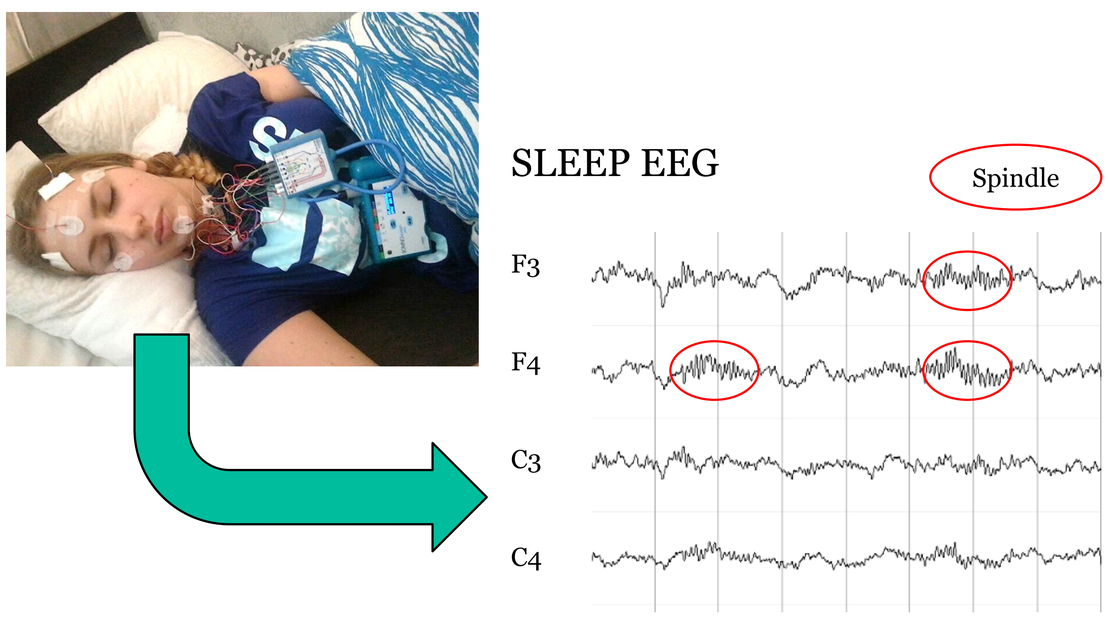
INTRODUCTION

- Sleep spindles are involved in memory replay during sleep, and are widely regarded a mechanism to promote overnight learning.
- Brain Derived Neurotropic Factor (BDNF) is a neurotrophin that affects synaptic plasticity.
- Certain polymorphism (rs6265) of BDNF gene has drawn interest regarding learning and memory.
- Higher neural response towards emotional stimuli in the carriers of methionine allele (i.e. Met Carriers)
- Two valine alleles (i.e. Val homozygotes) associated with increased plasticity in comparison to Met carriers.
- Few studies have assessed the BDNF genotype and overnight sleep spindles.

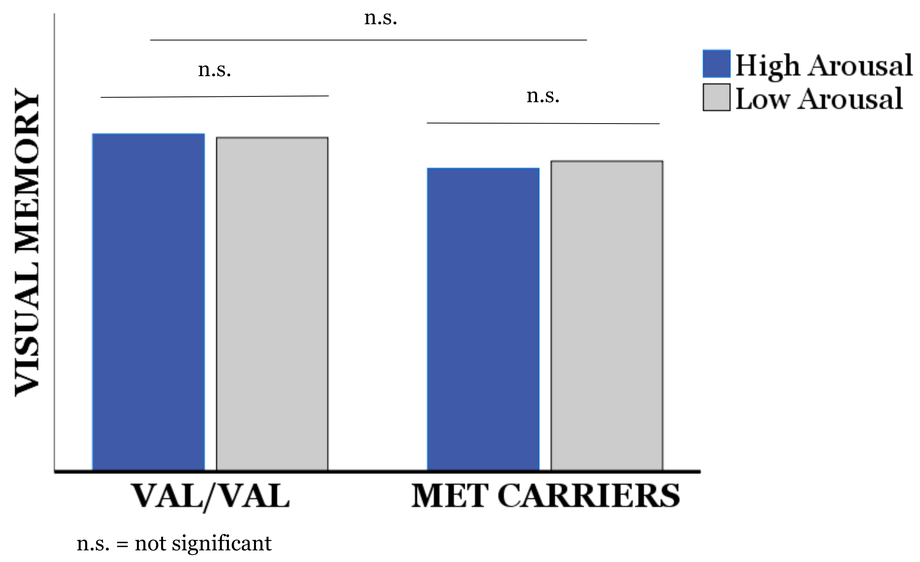
METHODS

- 155 adolescents (mean age 16.9 years; BDNF genotype distribution: 69 % Val homozygotes; 31 % Met carriers).
- Learning of 100 pictures in the evening, including pictures of both LOW and HIGH emotional arousal.
- Assessing recognition memory the following morning – 200 pictures, including 100 from previous nights.
- Overnight polysomnography (PSG) at home.
- Automated sleep spindle detection in N2 sleep stage.



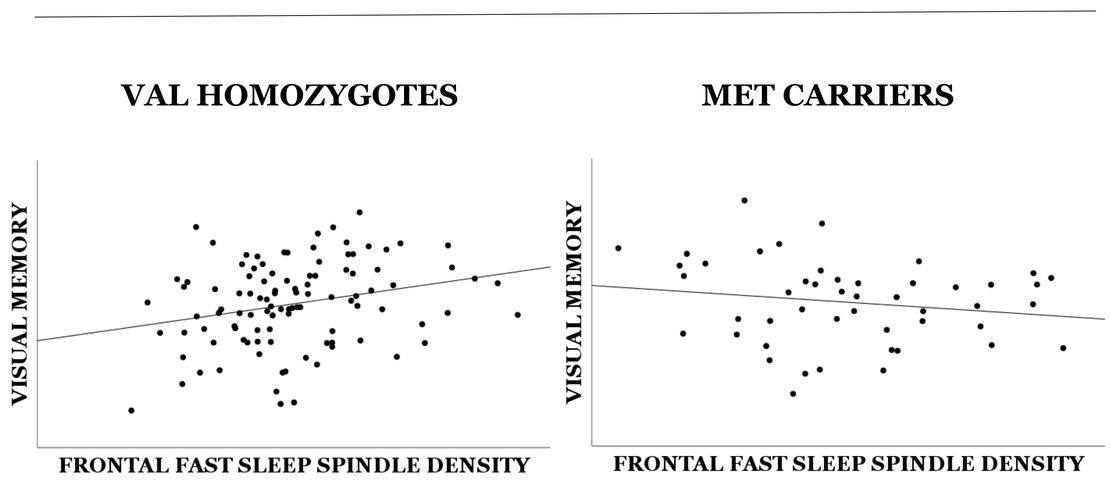
RESULTS

- No significant difference in **overnight memory** between the genotypes.
- **Arousal level** did not affect memory performance.



n.s. = not significant

- No difference in **spindle activity** between the genotypes.
- Sleep spindles predicted picture recognition performance **differently between the genotypes** ($p = 0.01$)



CONCLUSIONS

Sleep spindles promote or indicate overnight learning in Val homozygotes only.

Cellular, structural or functional factors may underlie these differences.

Adolescence may amplify or alter genotype-related differences.

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