

Dreaming in Pink



Does Pink Noise During Sleep Improve Deep Sleep and Memory?

Pink Noise: Sounds similar to white noise, but with more low-frequency activity

Thalamus and Sound Processing

Sound waves

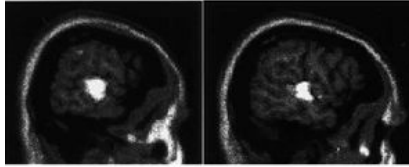
Ear (cochlea)

Nerves - action potential

Thalamus

Auditory cortex

MRI of audio-stimulated brain in Awake and Asleep States

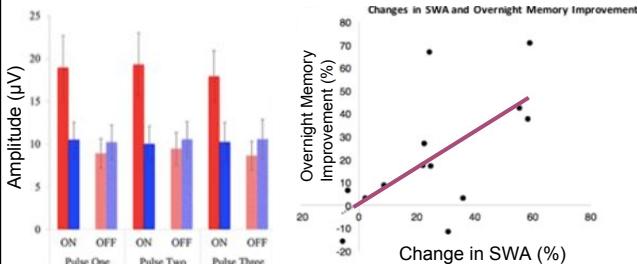


Awake

Asleep

Deep Sleep and the Thalamus

- Thalamus generates synchronized action potentials which create slow wave sleep
- Acoustic stimulation using pink noise can increase both the amount and amplitude of slow wave activity (Palambros et al., 2017).

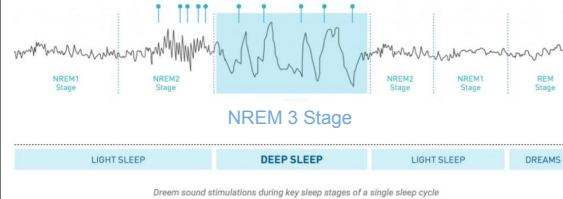


Why do you want more deep sleep?

More slow waves + increased amplitude = improved memory recall

The Dreem Headband

- Uses EEG sensors to detect when the body enters deep sleep
- Stimulates slow-wave oscillations using pink noise



Hypothesis: The product improves the number of deep sleep waves significantly, and their local amplitude, thus improving memory.

2 week pre-testing to determine baseline sleep patterns

Randomly selected groups

A: Control - wears Dreem Headband, no pink noise during deep sleep

B: Experimental - wears Dreem Headband, pink noise during deep sleep



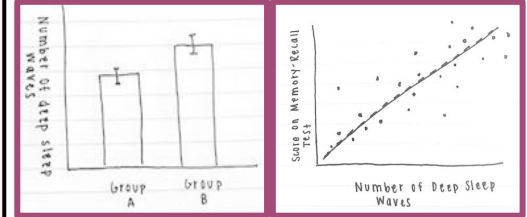
4 week tests



- EEG records amount of slow-wave sleep in participants
- Word recall test measures memory improvement

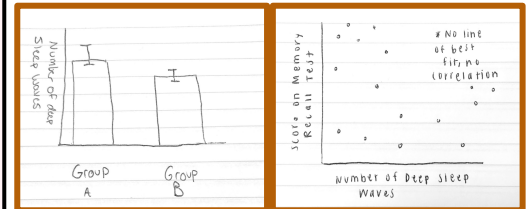
Data Analysis / Expected Results

CASE #1: Dreem Headband increases number and amplitude of deep sleep waves (below)
-Increased deep sleep waves → more restorative, deep sleep → improved memory



→ The Dreem Headband works as advertised.

CASE #2: -Dreem Headband decreases number and amplitude of deep sleep waves (below) OR no significant difference (not pictured)
-no observable pattern in memory retention (below) OR negative correlation (not pictured)



→ The Dreem Headband does not work as advertised.

Acknowledgements

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