

Sleep Deprivation and the Effect on Memory in Adolescents

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How is a memory created :

1 Acquisition (awake)

The first stage where the human brain receives a new experience or is taught something new

2 Consolidation (asleep)

When a memory becomes stable in the brain due to it being transformed into long-term memory

3 Recall (awake)

Is the ability to reference the memory in the future/ retrieve the information at a later date

- Acquisition and Recall are processes that both occur while we are awake
- Consolidation can only occur while we sleep. If consolidation isn't met then memories become unstable.

First Experiment:

This experiment is known as “Memory encoding is impaired after multiple nights of partial sleep restriction,” which was conducted by Cousins, Sasmita, and Chee in 2017.

The findings of this experiments were:

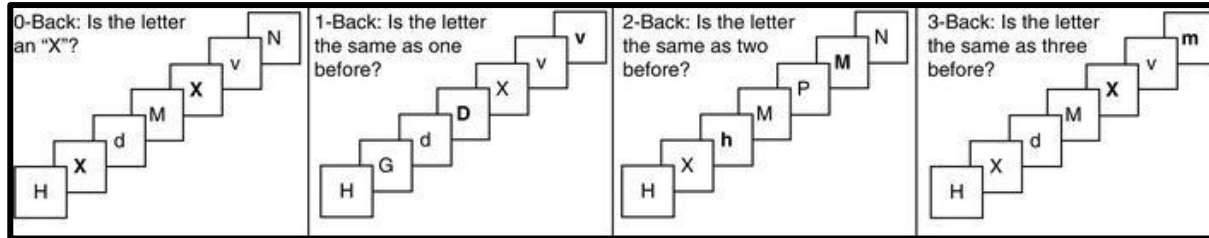
- Children who were sleep deprived had more difficulty encoding a picture into their long-term memory compared to adolescents who had the opportunity to sleep for the recommended amount.
- Cousins et al. (2017) also suggested that many nights of sleep deprivation causes a “deficit in the ability to effectively encode new information.”



Second Experiment:

This experiment is known as “Working Memory and Sleep in 6- to 13-Year-Old Schoolchildren,” and it was conducted by Steenari et al. in 2010.

Working Memory is a temporary storage that holds incoming, task-relevant information and integrates it with other information from long-term memory. In order to assess working memory function, the experimenters used the n-back task paradigm:



This experiment had many similar aspects as the other experiment in which when examining patients they found people who slept less were more likely to respond incorrectly.

However a key difference is when Steenari et al. mentioned that “lower sleep efficiency and was associated with a higher percentage of incorrect responses in working memory tasks”

Solution: Maximizing quantity/quality of sleep

Some ways to maximize the amount of sleep adolescents get are :

- Wake up and go to sleep at the same time each day
- Avoid caffeine or sugar food before going to bed
- Don't eat close to bed time
- Make your mind relax

We must also get quality sleep so make sure to :

- Create a pleasant sleeping environment (such as creating a dark room, increasing or decreasing temperature)
- Keep your room quiet as you sleep

Conclusion:

To summarize, sleep deprivation in adolescents increasingly worsens memory retention rate. As seen in the experiments, successive nights of sleep deprivation causes ineffective encoding and even difficulty with recalling information.

When children sleep, their brains consolidate memories.

However, if they get an inadequate amount of sleep, it prevents them from creating a vivid memory they can remember.



