

The impact of future relevance on dream content and sleep-dependent memory processing

ABSTRACT:

Background

Sleep is beneficial for human memory, but in addition to cementing memory for the *past*, the sleeping brain may process past experiences in order to help us prepare for the *future*.

Aim of the study

The current project tested the hypotheses that learning experiences with particular relevance to the future are 1) preferentially consolidated during post-training sleep and 2) preferentially incorporated into dream content.

Method

Participants trained on two learning tasks, and were tested on their memory following either a night of sleep or a day of wakefulness. To test the impact of “future relevance” on dreaming and memory consolidation: 1) Immediately after learning, future relevance of the learning tasks was experimentally manipulated by informing some participants that they would later be tested on what they have learned. 2) During a morning interview, participants rated the degree to which “future projection” was more generally present in their dreams and waking thoughts.

Results

Manipulating the future relevance of the learning tasks significantly enhanced memory at delayed test, across both wake and sleep intervals. Test expectation did not significantly affect the incorporation of the learning tasks into dreaming. However, the morning interview data demonstrated that overall, a full 30% of dream reports were rated as stemming from an impending future occurrence.

Conclusions

These findings support our hypothesis that future events are a strong contributor to dream content in all sleep stages. At the same time, contrary to our hypotheses, the future relevance of a learning task enhanced its consolidation during wakefulness, as well as during sleep.

Keywords

Sleep, Memory, Dreaming, Future-relevance, Prospective memory

Published Work:

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