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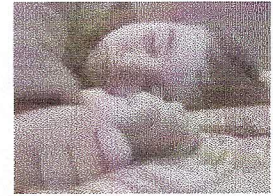


at helping us improve our memory.

Now, what is "memory"? how does the process of memory work?

Dr. Bill Klemm, Professor of Neuroscience at Texas A&M University, explains a very important concept below.

- Alvaro



### Getting from Here to There: Making Memory Consolidation Work

By Bill Klemm, Ph. D.

Until consolidation has occurred, a short-term memory is very vulnerable, as all of us have experienced from looking up a phone number only to have some distraction cause us to lose the number before we can get it dialed.

What is "consolidation"?

Brain researchers use the term "consolidation" for the process whereby short-term memory gets made more permanent.

Here, I would like to discuss some aspects of consolidation that many people may not know about: why sleep is so important, why memory must be practiced, and how testing promotes consolidation.

#### 1. Over-training: You Can Learn Too Much

Experiments have shown that human memory performance unexpectedly deteriorated if learning sessions were increased to four 60-minute sessions at regular intervals on the same day. In other words, the more the subjects were trained, the poorer they performed. However, this interference did not occur if subjects were allowed to nap for 30-60 minutes between the second and third sessions.

It is hard to explain why over-training disrupts performance, but I suspect that as training trials are repeated the information starts to interfere with memory consolidation, perhaps because of boredom or fatigue in the neural circuits that mediate the learning. Napping must have a restorative function that compensates for the negative effects of over-training. What all this suggests is that memory consolidation would be optimized if learning occurred in short sessions that are repeated but only with intervening naps and on different days with regular night-time sleep. In other words, repeating long study periods in the same day on the same task can be counter-productive. This is yet another reason why students should not cram-study for exams. Learning should be optimized by rehearsing the same learning material on separate days where normal sleep occurred each night.

Sources:

