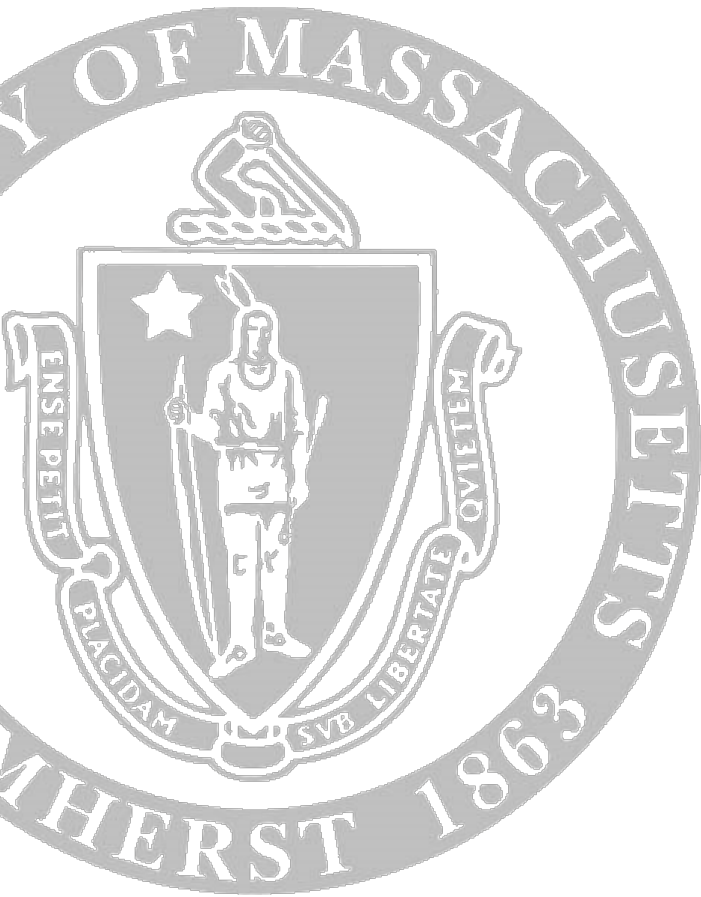


Sleep, circadian rhythms, and cognitive function



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Disclosures

■ **Current funding:**

- University of Massachusetts
- National Institutes of Health
 - National Heart, Lung & Blood Institute (NIH R01 HL111695)
 - National Institute on Aging (NIH R01 AG040133)

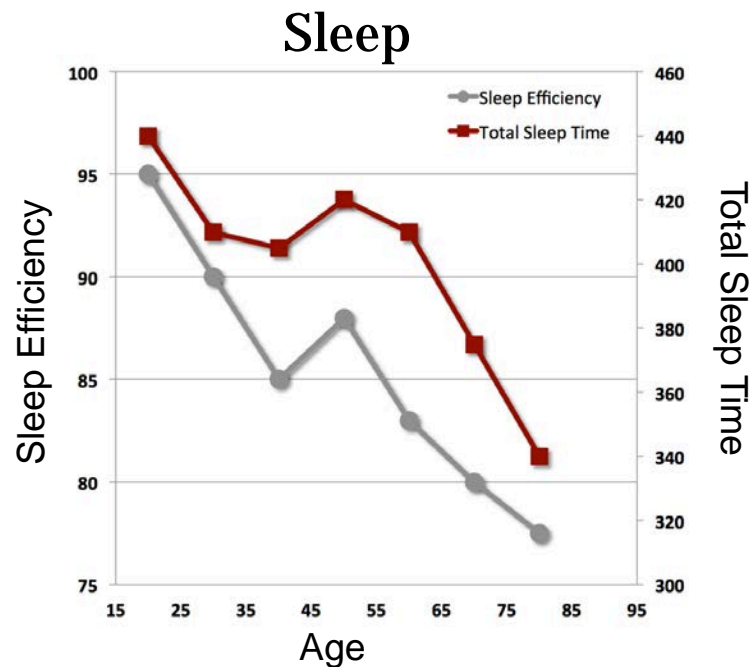
■ **Other financial relationships:**

- Past funding from: Avery Dennison, Jawbone

■ **Conflicts of interest:**

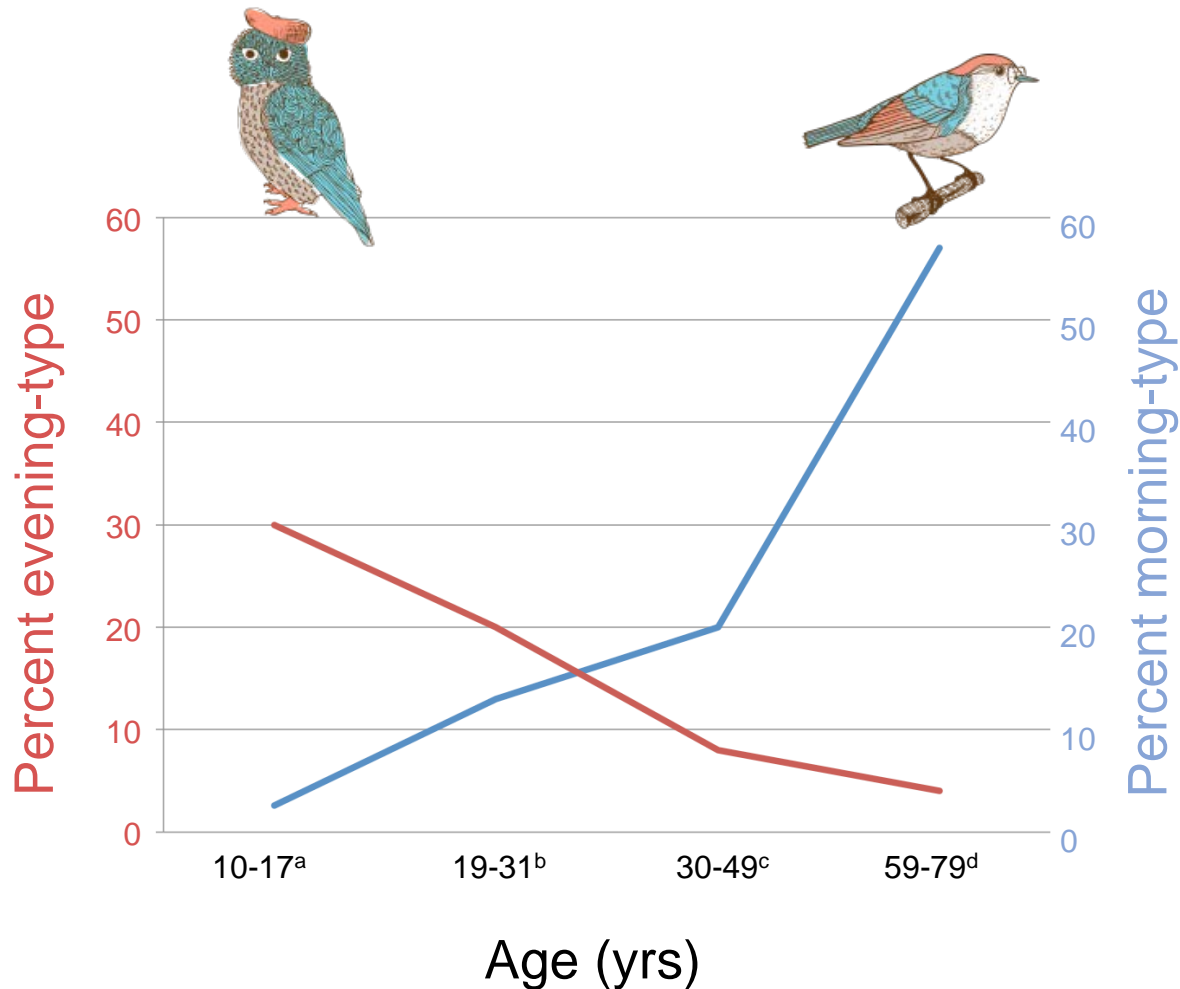
- National Institute on Aging and University of Massachusetts funds contributed directly to the work presented in this talk.

- Sleep impairments are prevalent in normal aging

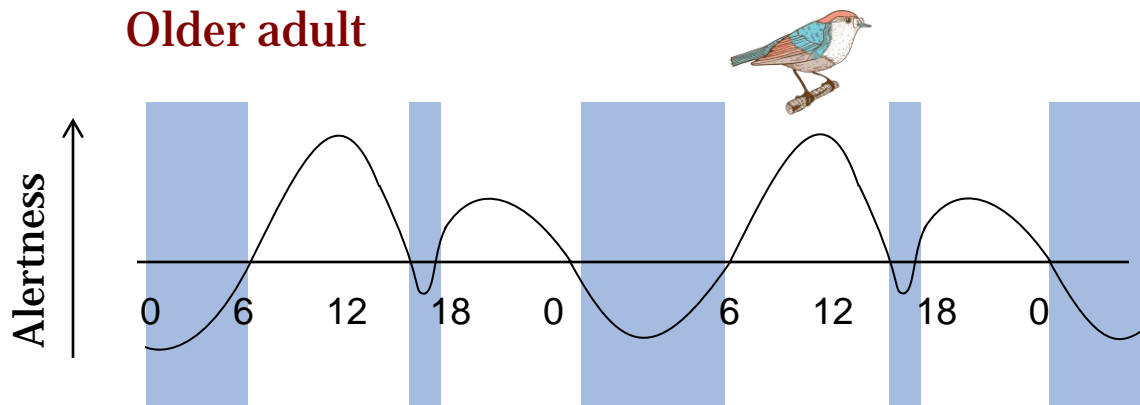
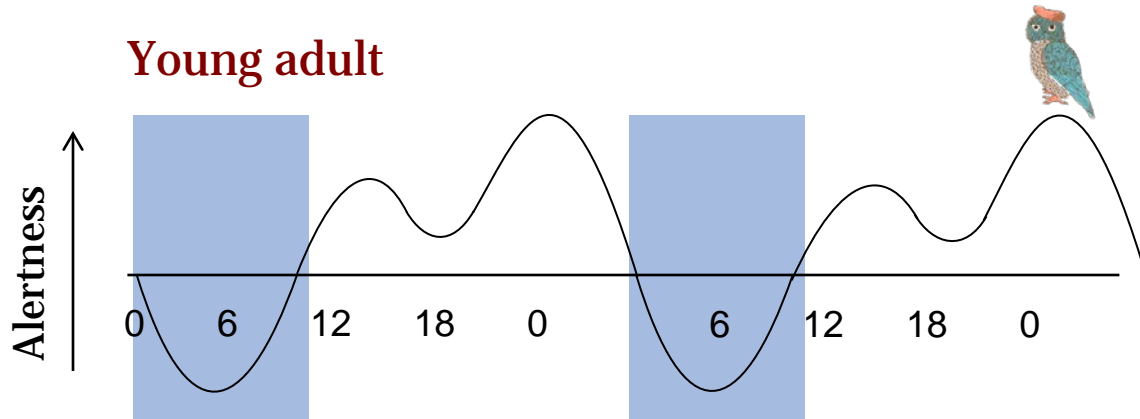


- Sleep impairments are prevalent in normal aging
- Cognitive impairments (e.g., long-term memory, executive functions) are prevalent as well
- Parallel trajectories with aging and evidence from young adults suggest that age-related changes in sleep and cognition may be related

Chronotype changes with age

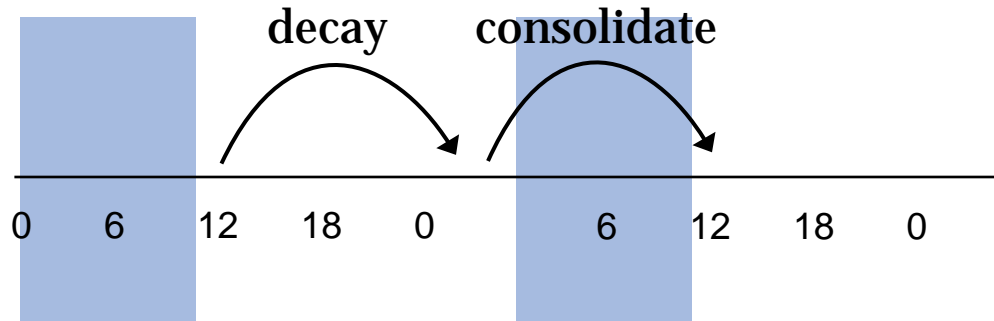


Shift in chronotype affects performance

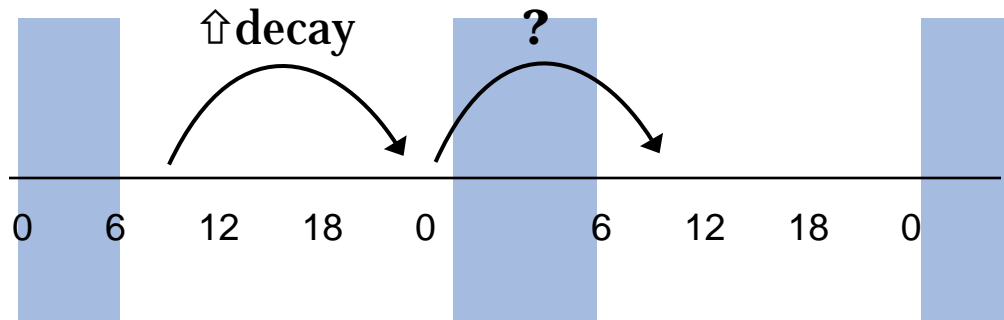


Sleep also contributes to cognitive performance

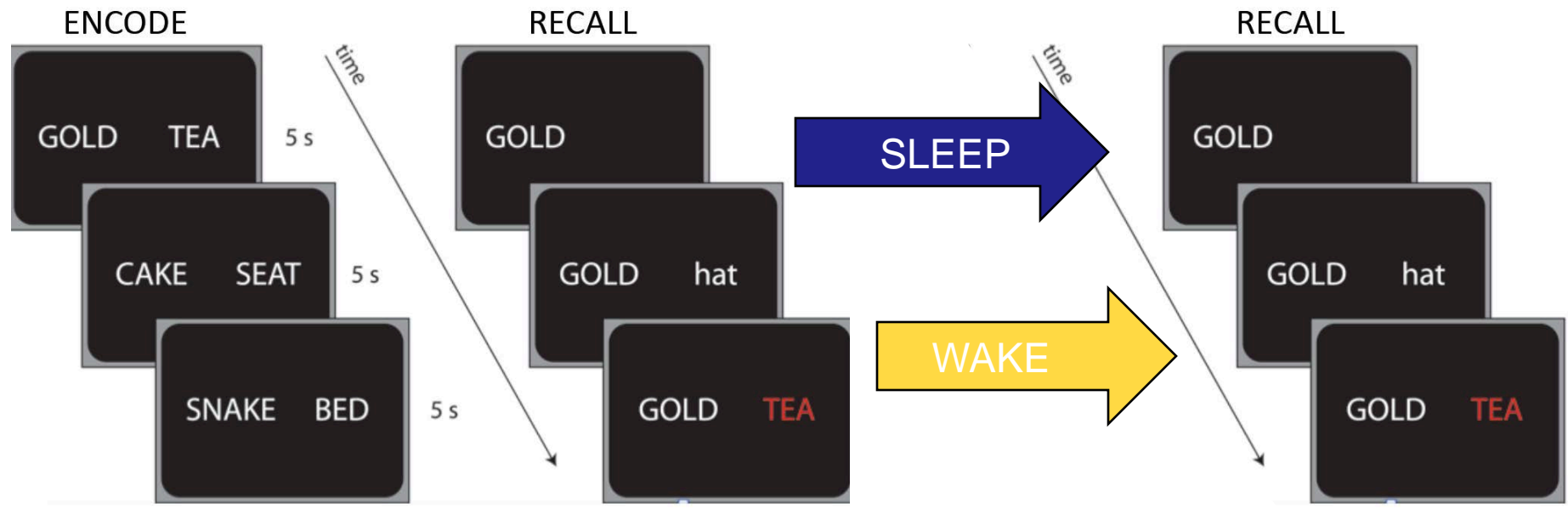
Young adult



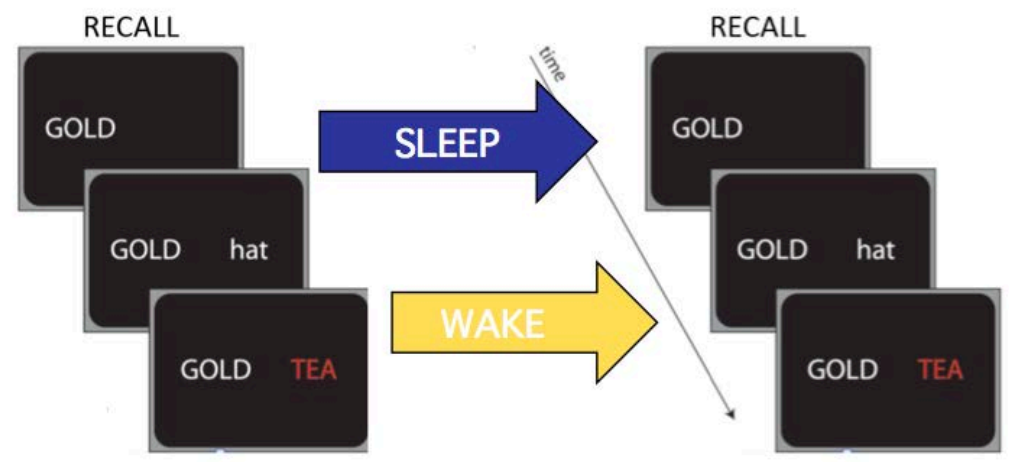
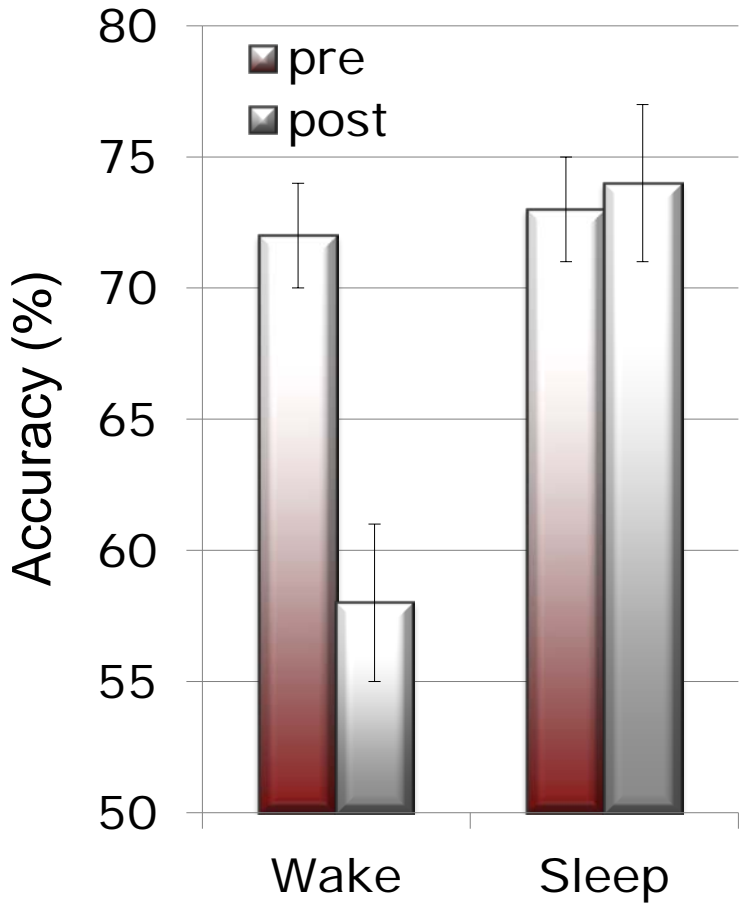
Older adult



Sleep benefits cognition in young adults

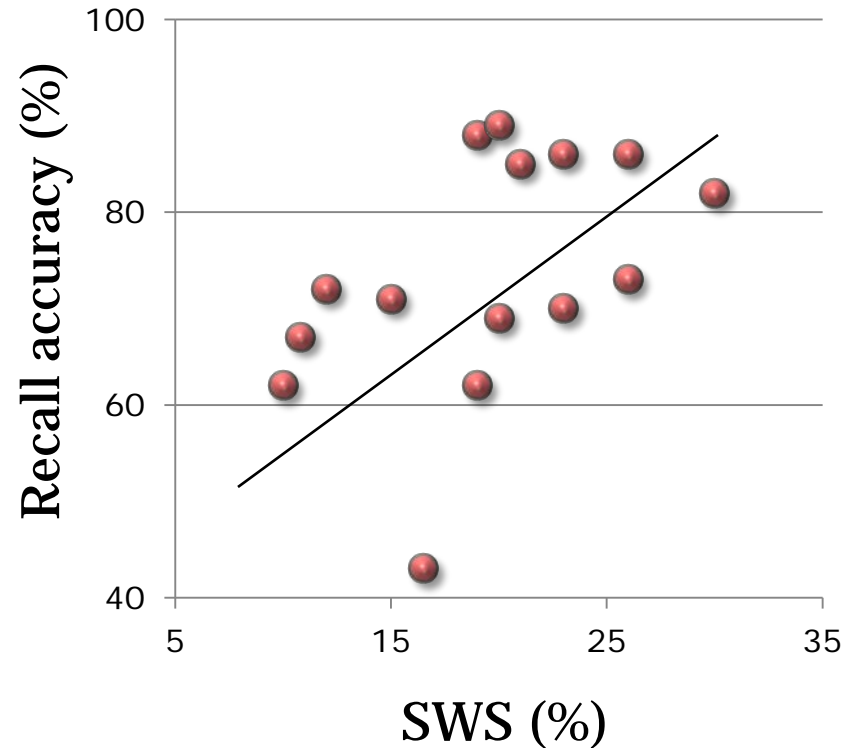
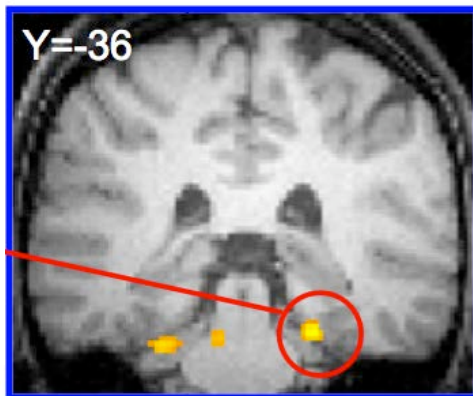


Sleep benefits cognition in young adults

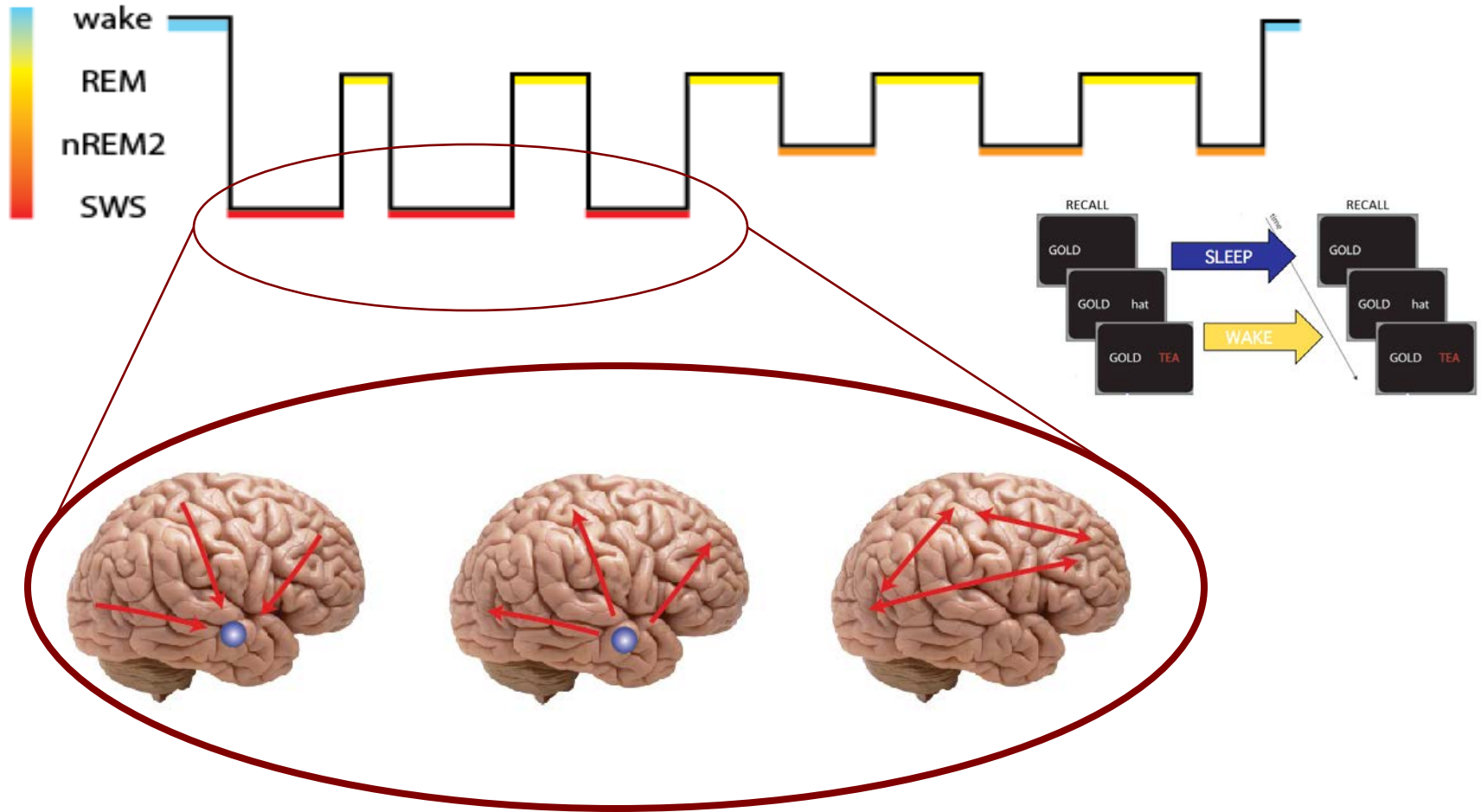


Sleep benefits cognition in young adults

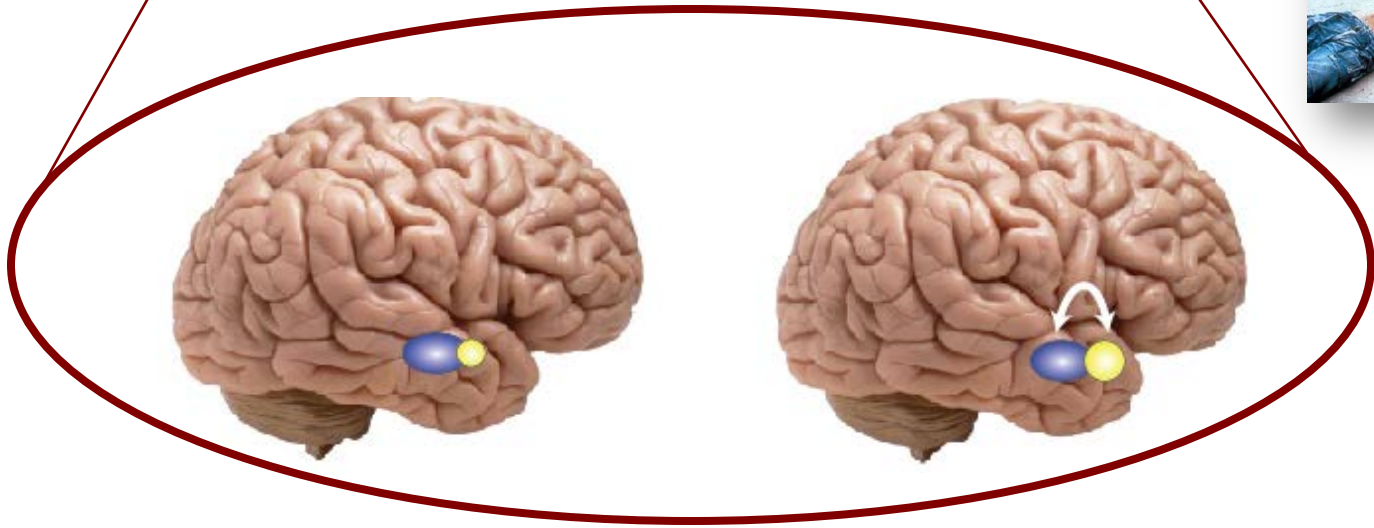
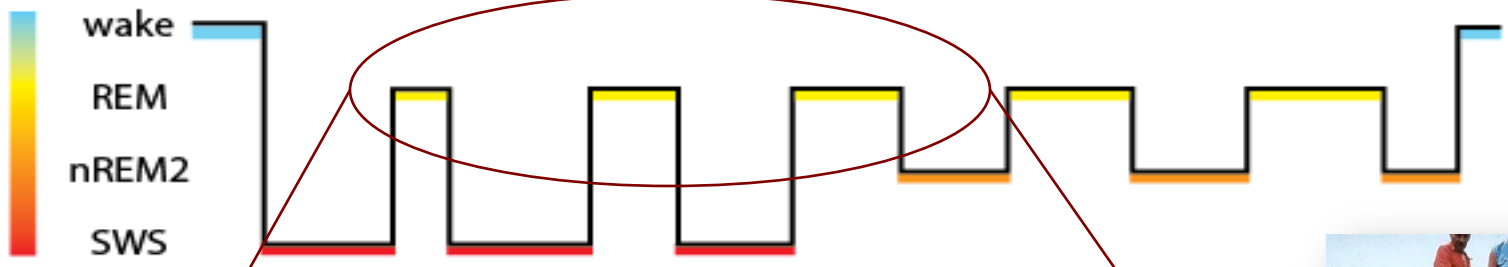
- Correlations between slow wave sleep (SWS) and change in declarative memory over sleep
- Parahippocampal gyrus activity during SWS



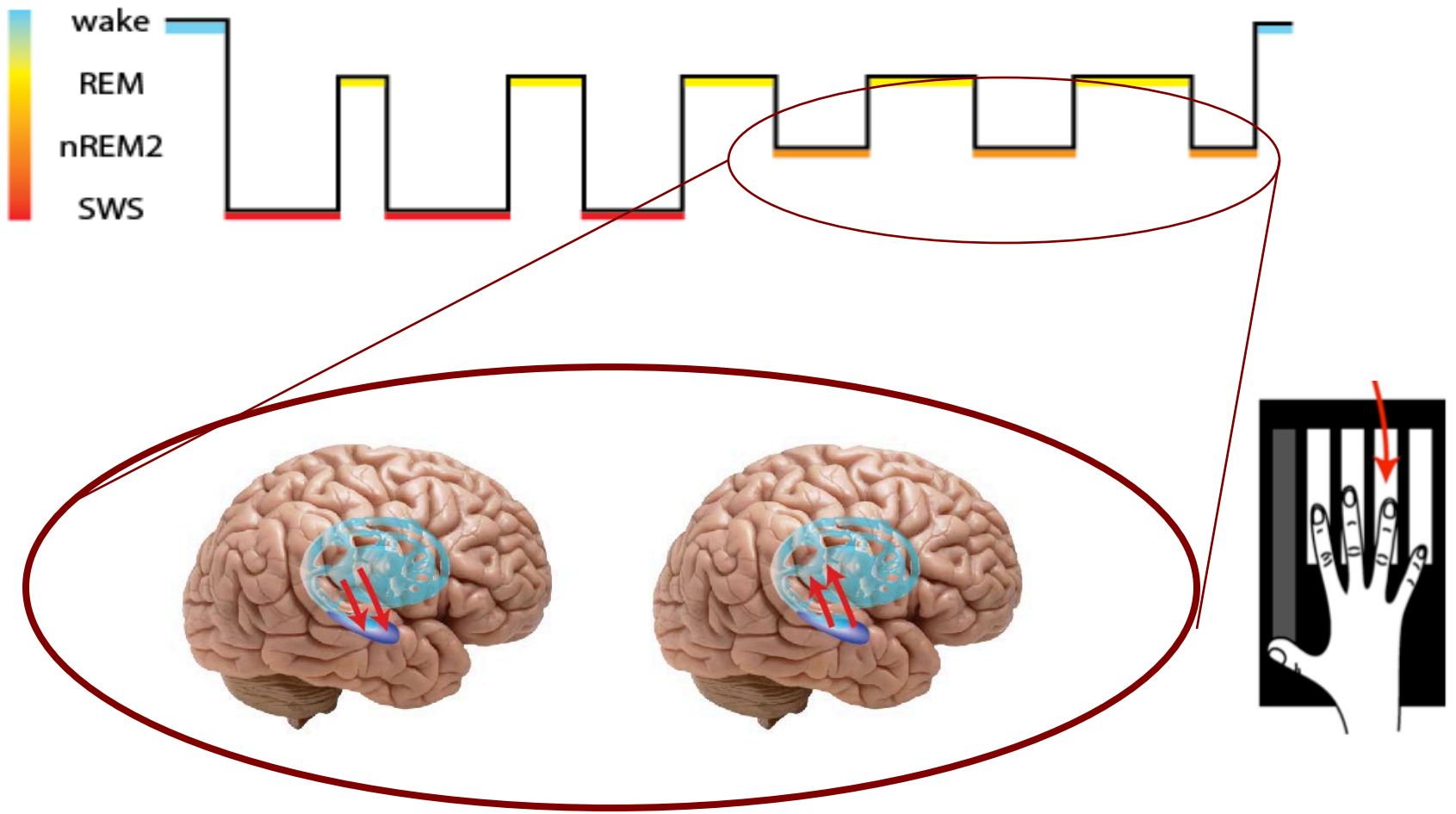
Declarative memories



Mood regulation and emotional processing

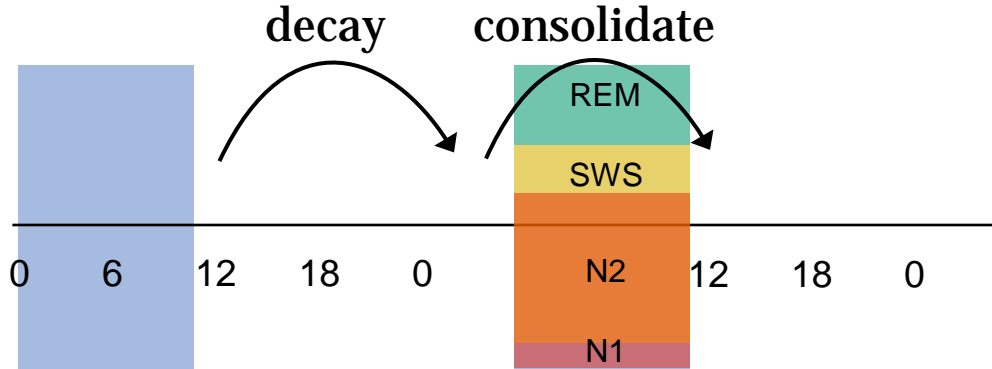


Procedural/skill memories

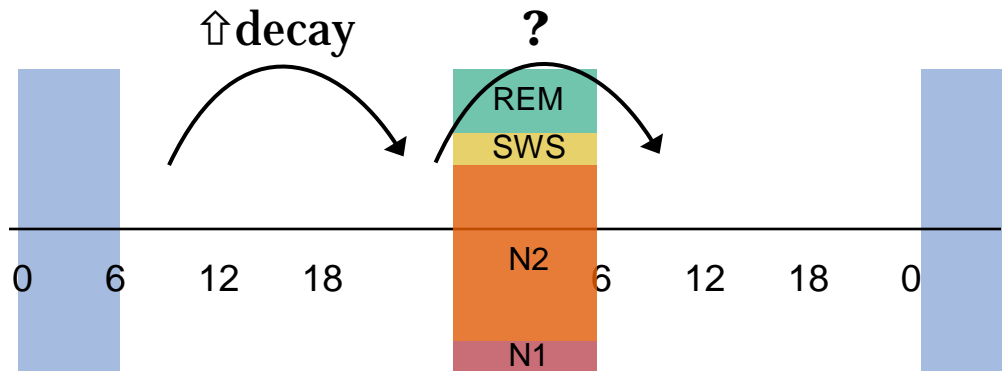


Sleep contributes to cognitive performance

Young adult



Older adult



Do changes in sleep change the function of sleep on cognition?

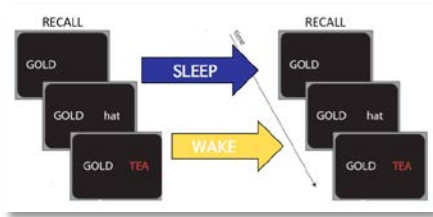
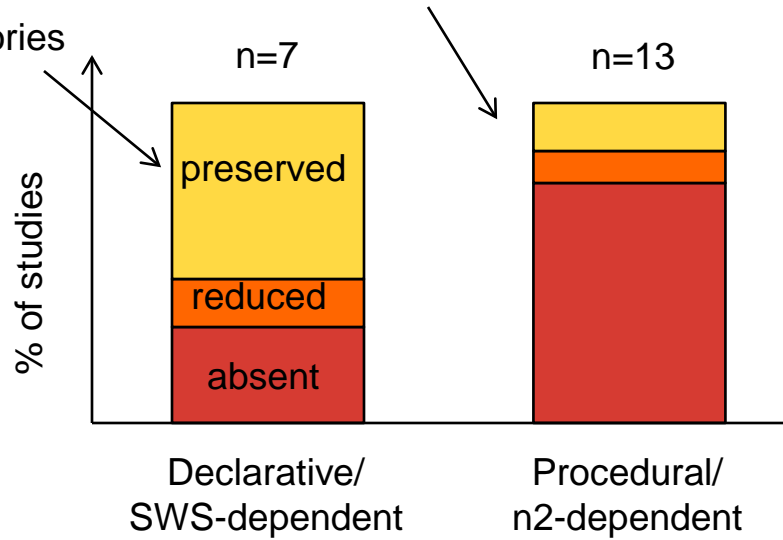
Is sleep-dependent cognitive processing reduced with age?

...it depends

Consolidation of declarative memories largely preserved

Consolidation of procedural memories is reduced

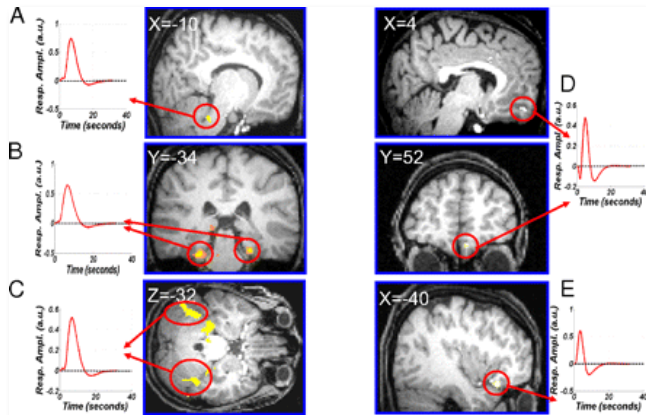
Consolidation of positive memories is preserved
negative memories is absent



- What are the implications of the deficit in procedural memory consolidation?



- Would an intervention to improve sleep (CBT, nap intervention) improve cognitive processing?



Thank you.

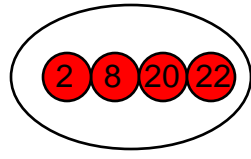


Is sleep-dependent cognitive processing reduced with age?

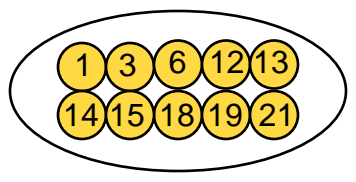
...it depends

Absent **Reduced** **Spared**

Declarative



Procedural



Emotional

