Does sleep affect learning during a virtual reality exposure therapy for specific phobia?

Geneviève Forest, Ph.D., Éric Lord, Frédérick Michaud & Stéphane Bouchard, Ph.D.

Université du Québec en Outaouais, Gatineau, Canada

INTRODUCTION

- Intensive complex learning results in increased REM sleep on subsequent nights
- This increased REM sleep appeares to be related to learning efficiency
- Sleep deprivation results in impairments in information consolidation
- REM sleep is particularly related to the consolidation of complex and emotionnaly charged information

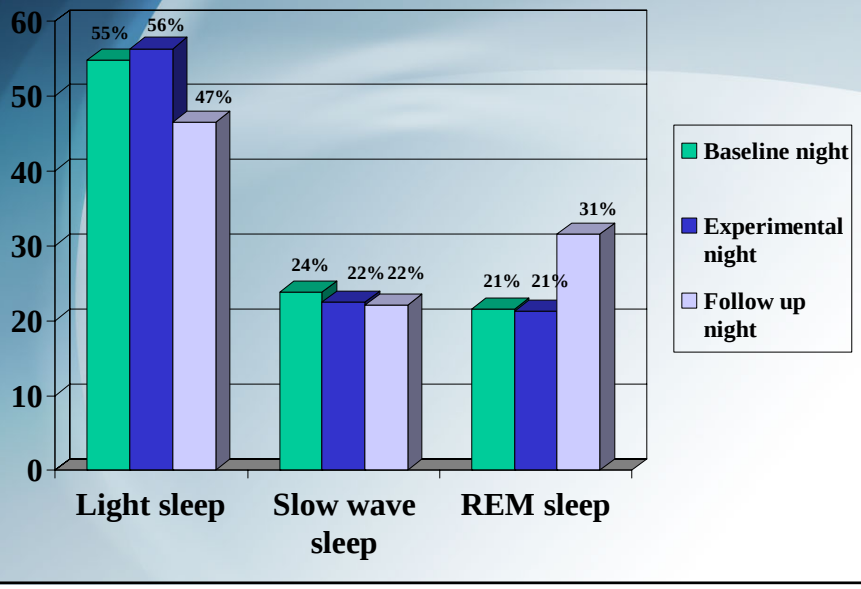
METHODS

- A man suffering from aviophobia
- Underwent two intensive 3 hours CBT with VR:
  - CBT involves the processing of emotionally charged information in order to learn new associations between the threatening stimuli and their consequences
  - the person learns how to control the anxiety elicited by the feared object through VR
- Sleep recordings were performed during the treatment with VR

DESIGN

Day1	Day 2	Day 3	Day 4	Day 5
		Clinical observation and questionnaires	Questionnaires	
		Intensive CBT with VR		Intensive CBT with VR
				Clinical observation and questionnaires
Adaptation night	Baseline night	Experimental night	Follow up night	

RESULTS



DISCUSSION

- REM sleep plays a role in the processing of psychological and emotionally charged information involved during a CBT with VR
- There may be a delay in this process, suggesting the existence of a "REM sleep windows" (Smith, 1995):
  - « A time after acquisition when there are increases in REM sleep over normal levels"
  - Theses windows varies "with the strain and type of learning task and the number of trials per session

DISCUSSION

- This particular « REM sleep window » could be directly related to the treatment efficiency
- If this window is perturbed somehow (sleep deprivation, sleep disturbances, nightmares, etc.), impairment in the consolidation of information could ensue, and consequently affect the outcome of the therapy