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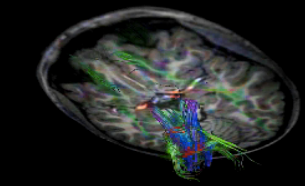


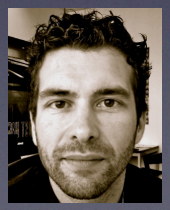
LEARNING OUTSIDE AWARENESS (WP2c)

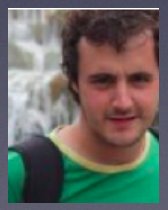
CLEP - Centre for the Psychology of Learning and Experimental Psychopathology

http://ppw.kuleuven.be/english/clep/

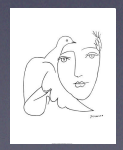
UR2NF - Neuropsychology and Functional Neuroimaging Research Unit

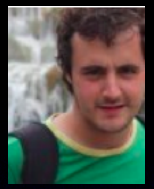
http://dev.ulb.ac.be/ur2nf/









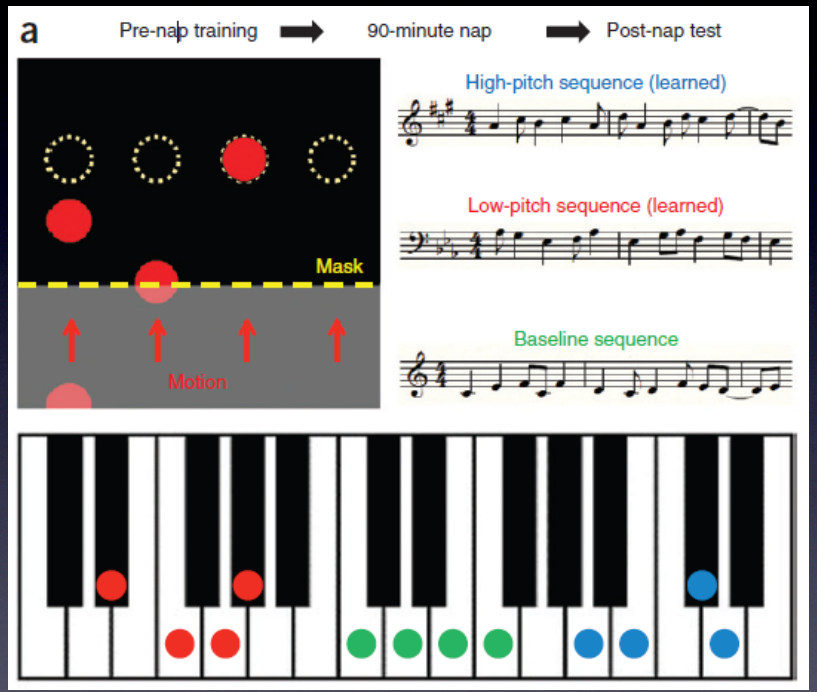
1. CAN WE MODULATE RECENT MEMORIES DURING SLEEP ?

1.a. Effects of within-sleep, non-awakening auditory stimulations on the memory consolidation of emotional and neutral declarative memories

1.b. Effects of boosting slow oscillatory activity (using transcranial direct current stimulation [tDCS]) on the consolidation of neutral and emotional memories

Cued memory reactivation during sleep influences skill learning

James W Antony[1], Eric W Gobel[1], Justin K O'Hare[2], Paul J Reber[1,2] & Ken A Paller[1,2]

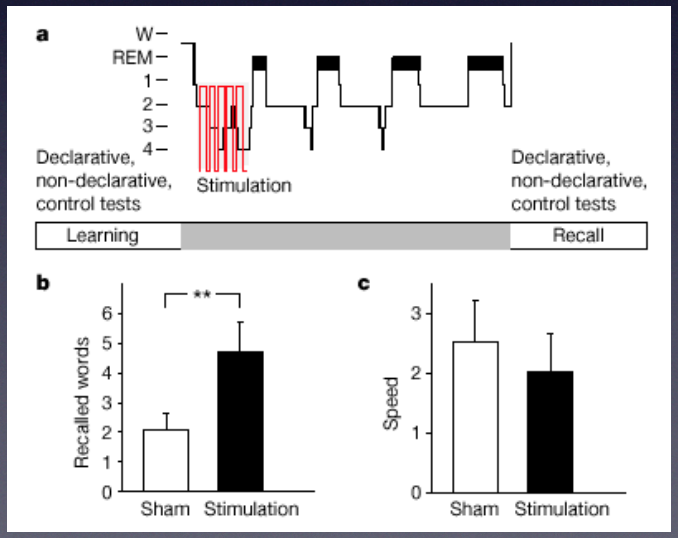


doi:10.1038/nature05278
nature

LETTERS

Boosting slow oscillations during sleep potentiates memory

Lisa Marshall[1], Halla Helgadóttir[1], Matthias Mölle[1] & Jan Born[1]



Tickling memories during sleep ?

a. Learning (wakefulness)

1. ***neutral*** *word pairs (N=30) associated at learning with the auditory presentation of* ***emotionally colored sounds*** *(crying baby).*

"paper-umbrella"

2. ***neutral*** *word pairs (N=30) associated at learning with the auditory presentation of* ***emotionally neutral sounds*** *(ringing bell).*

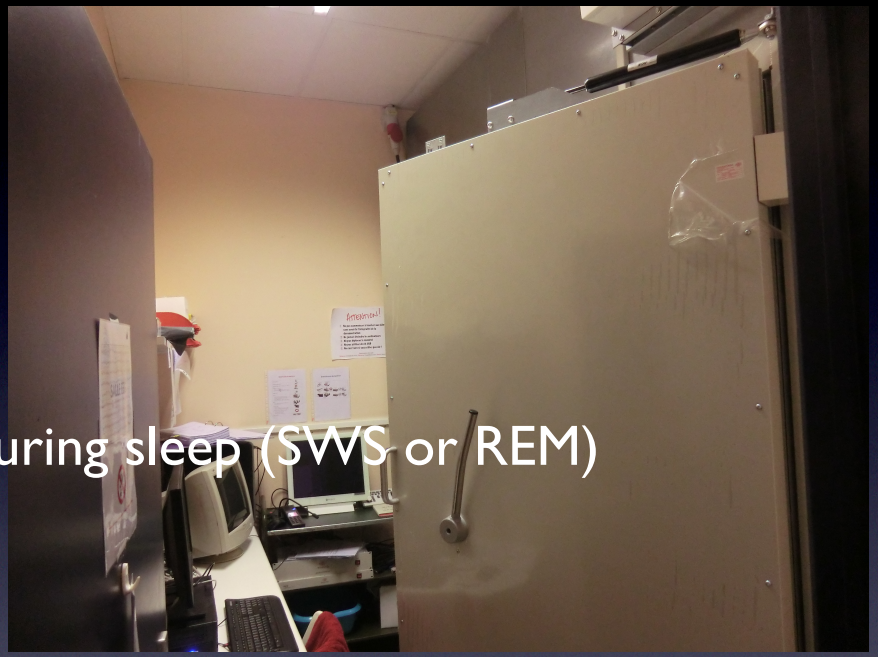
"paper-umbrella"

3. ***Emotionally colored*** *word pairs (N=30) associated at learning with the auditory presentation of* ***emotionally colored sounds.***

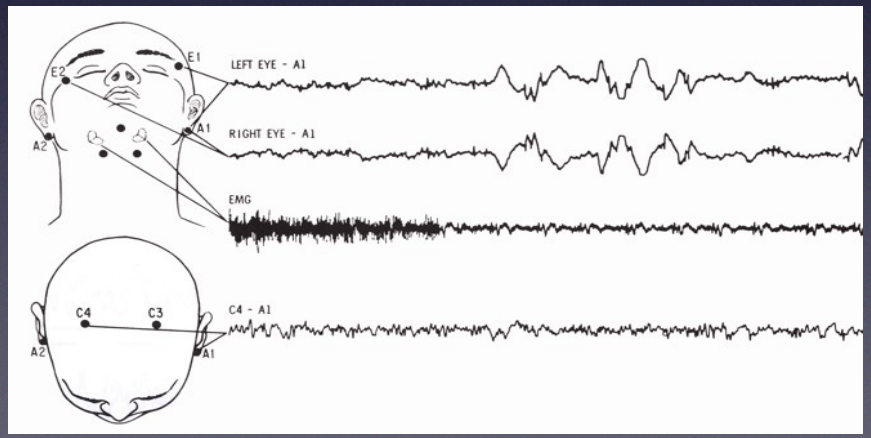
"suicide-loneliness"

4. ***Emotionally colored*** *word pairs (N=30) associated at learning with the auditory presentation of* ***emotionally neutral sounds.***

"suicide-loneliness"



b.1. 50 % auditory cues presented again during sleep (SWS or REM)



Tickling memories during sleep ?

a. Learning (wakefulness)

1. **neutral** word pairs (N=30) associated at learning with the auditory presentation of **emotionally colored sounds** (crying baby).

"paper-umbrella"

2. **neutral** word pairs (N=30) associated at learning with the auditory presentation of **emotionally neutral sounds** (ringing bell).

"paper-umbrella"

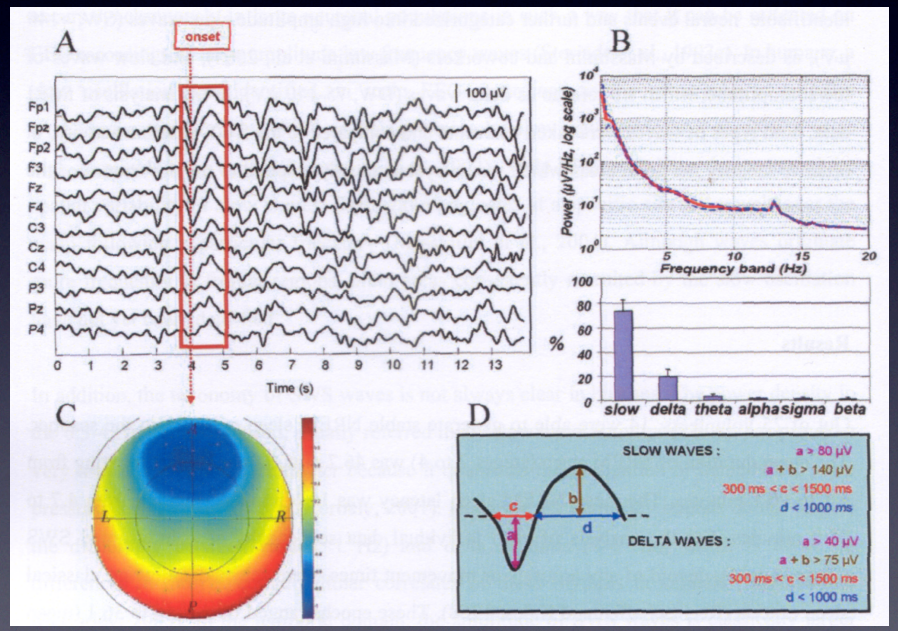
3. **Emotionally colored** word pairs (N=30) associated at learning with the auditory presentation of **emotionally colored sounds.**

"suicide-loneliness"

4. **Emotionally colored** word pairs (N=30) associated at learning with the auditory presentation of **emotionally neutral sounds.**

"suicide-loneliness"

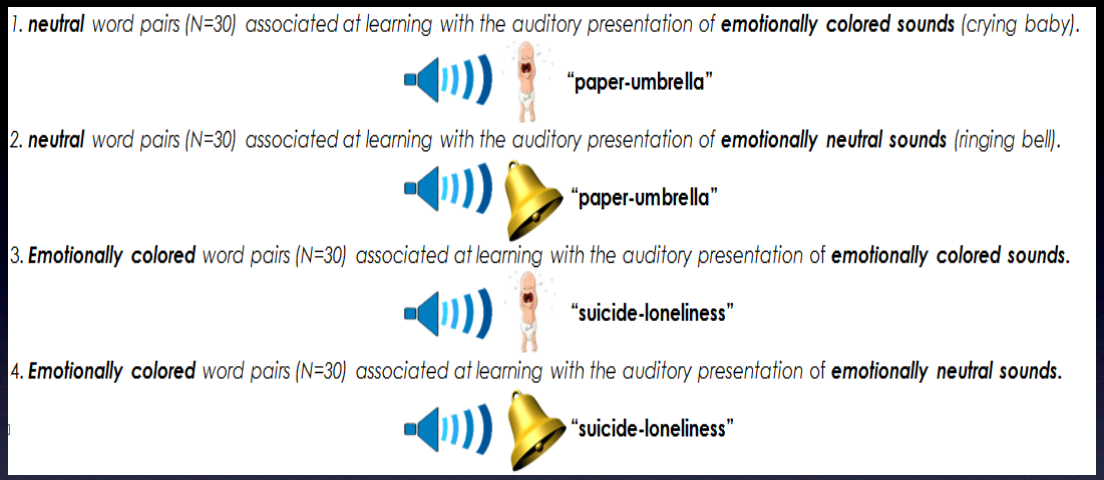
b.2. slow transcranial direct current stimulation (tDCS) during sleep



Dang-Vu TT (2008) Proc Natl Acad Sci U S A 105 (39)15160-5

Tickling memories during sleep ?

a. Learning (wakefulness)

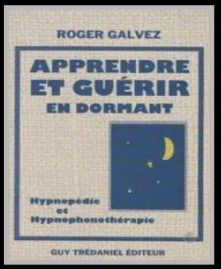


b. 50 % auditory cued presented again during sleep (SWS or REM)

OR b. slow transcranial direct current stimulation (tDCS) during sleep

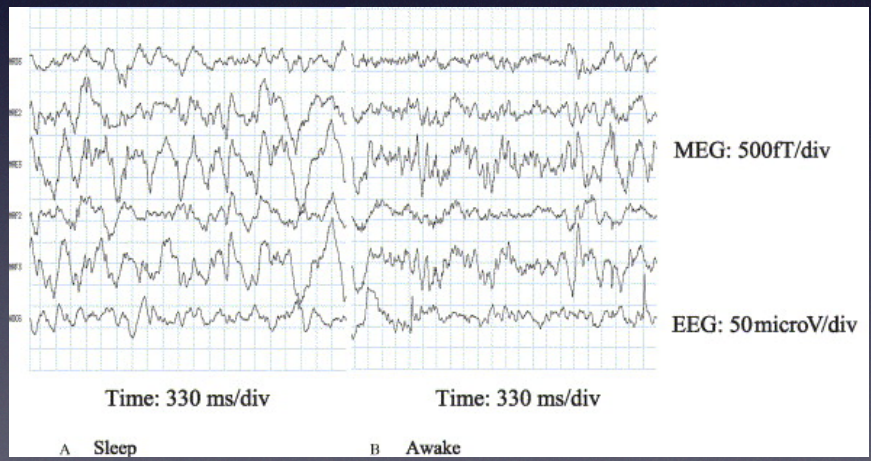
c. Testing cued vs. uncued X emotional vs. neutral pairs (wakefulness)

2. CAN WE LEARN DURING SLEEP ?



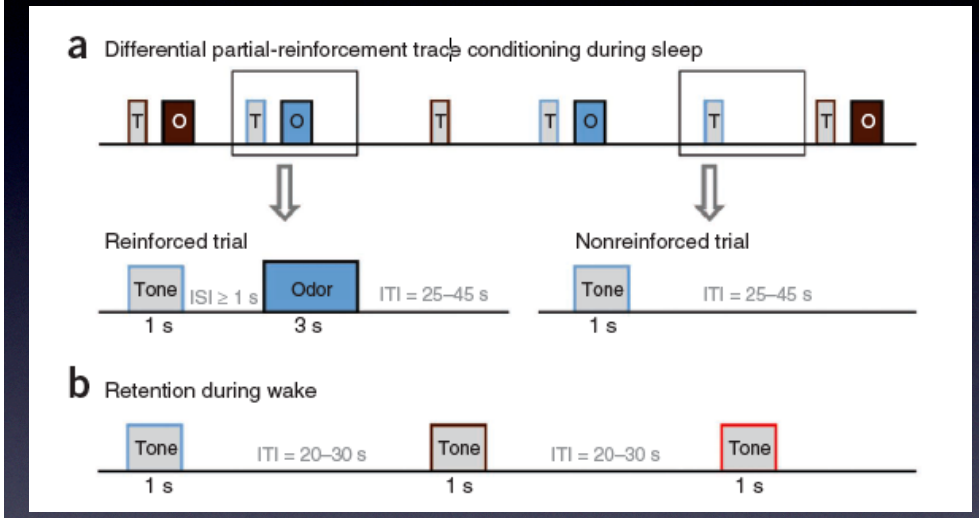
2.a. Is it possible creating new associations during sleep ?

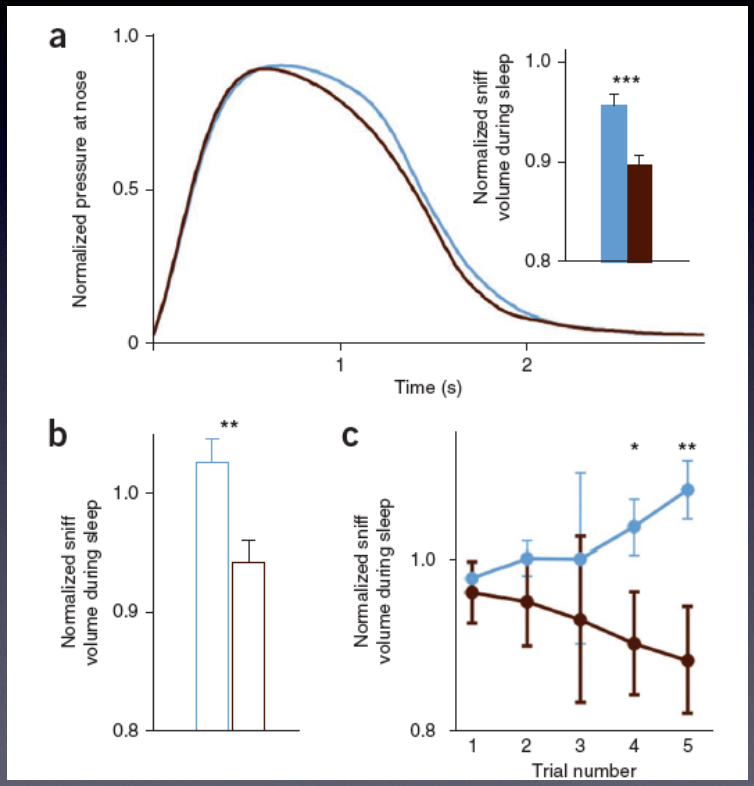
2.b. More than stimulus-response associations ?



Humans can learn new information during sleep

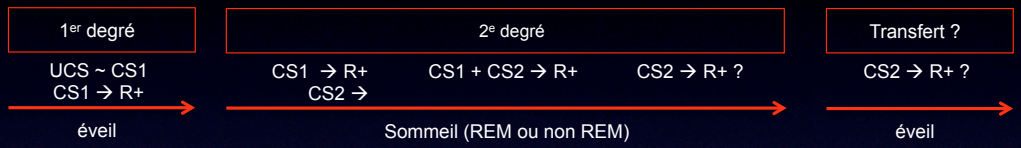
Anat Arzi[1], Limor Shedlesky[1], Mor Ben-Shaul[1], Khitam Nasser[2], Arie Oksenberg[2], Ilana S Hairston[3] & Noam Sobel[1]





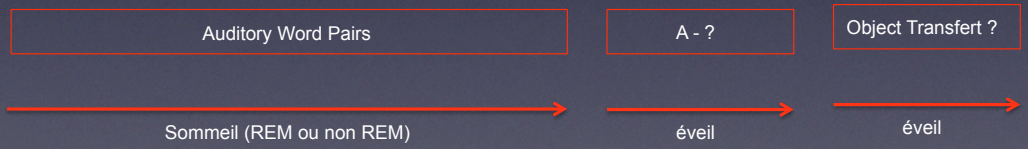
(trace vs. delay) conditioning during sleep ?

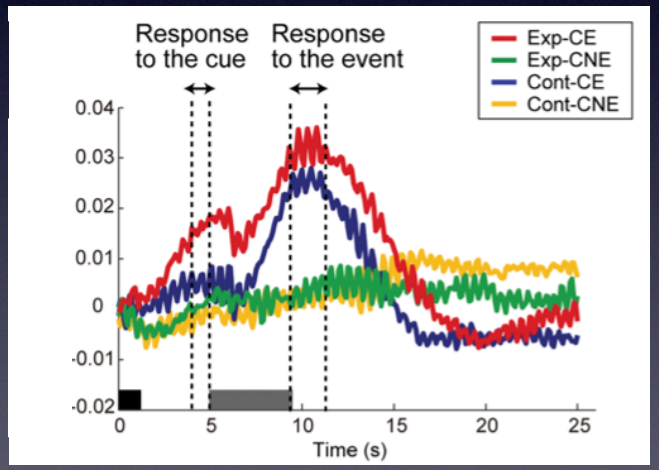
- **Second-order conditioning: wake → sleep**



- **Pre-conditioning: sleep → wake**

- **Paired word associations in sleep → priming at wake**





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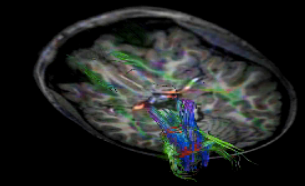

LEARNING OUTSIDE AWARENESS (WP2c)

- during sleep ?
- what type of material/associations ?
- playing with reconsolidation/prediction errors ?
- …
- WP = Work in Progress ! See you next year !