

REM sleep fragmentation effect on emotional memory and reactivity: an experimental study on healthy subjects.

Thursday, September 11, 2025 4:00 PM (10 minutes)

Recent evidence in sleep disorders shows that REM sleep fragmentation (frequent cortical arousals and sleep stage transitions disrupting REM sleep continuity) interferes with overnight amygdala adaptation to emotional events, possibly explaining the excessive emotional reactivity reported in these patients. However, sleep in clinical populations features multiple sleep alterations besides REM sleep fragmentation that could contribute to the diurnal dysregulation of affective responses. To disentangle the effect of REM sleep fragmentation from other confounding, we induced REM sleep fragmentation in good sleepers via vibrotactile stimulation, evaluating its effects on overnight emotional processing.

Seventeen healthy participants (23.18 ± 3.94 y) underwent two experimental conditions (Fragmentation/Control, counterbalanced) encompassing: stimuli encoding and baseline emotional memory/reactivity assessment (eMR-test; T0); nocturnal polysomnography; post-sleep eMR-test (T1); follow-up eMR-test 48hrs later (T2). REM-sleep continuity was disrupted during the Fragmentation night by inducing cortical arousals via wrist vibrotactile stimulation. The eMR-tests consist of self-report evaluation (self-assessing manikin), physiological responses (Skin Conductance Response, SCR; Heart Rate Deceleration, HRD), and behavioural memory (Old/New paradigm) for negative/neutral stimuli.

During the Fragmentation night, REM duration decreased ($p < 0.001$), while NREM1 duration and REM sleep fragmentation index increased (all $p > 0.001$), without altering other sleep parameters (all $p > 0.170$). Analyses highlighted the effects of REM sleep fragmentation on HRD measures only (all $p \leq 0.002$). HRD values decreased at T1 in the Control condition ($p = 0.007$), stabilising at T2 ($p > 0.999$), while no changes occurred over sessions in the Fragmentation condition (all $p > 0.529$).

REM sleep fragmentation disrupts psychophysiological habituation processes, altering parasympathetic (HRD) reactions to emotional stimuli without affecting their subjective evaluation and consolidation.

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Primary author: VISELLI, Lorenzo (University of L'Aquila, Department of Biotechnological and Applied Clinical Sciences, 67100 L'Aquila (AQ), Italy)

Co-authors: Prof. D'ATRI, Aurora (University of L'Aquila, Department of Biotechnological and Applied Clinical Sciences, 67100 L'Aquila (AQ), Italy); Dr ARNONE, Benedetto (University of L'Aquila, Department of Biotechnological and Applied Clinical Sciences, 67100 L'Aquila (AQ), Italy); Dr COLOMBO, Costanza (University of Padova, Department of General Psychology, 35131 Padova (PD), Italy); Prof. TEMPESTA, Daniela (University of L'Aquila, Department of Biotechnological and Applied Clinical Sciences, 67100 L'Aquila (AQ), Italy); Dr CORIGLIANO, Domenico (University of L'Aquila, Department of Biotechnological and Applied Clinical Sciences, 67100 L'Aquila (AQ), Italy); Dr FESTUCCI, Fabiana (University of L'Aquila, Department of Biotechnological and Applied Clinical Sciences, 67100 L'Aquila (AQ), Italy); Dr NACCARATO, Federica (University of L'Aquila, Department of Biotechnological and Applied Clinical Sciences, 67100 L'Aquila (AQ), Italy); Dr SALFI, Federico (University of L'Aquila, Department of Biotechnological and Applied Clinical Sciences, 67100 L'Aquila (AQ), Italy); Dr AMICUCCI, Giulia (University of L'Aquila, Department of Biotechnological and Applied Clinical Sciences, 67100 L'Aquila (AQ),

Italy); Prof. FERRARA, Michele (University of L'Aquila, Department of Biotechnological and Applied Clinical Sciences, 67100 L'Aquila (AQ), Italy); Prof. CELLINI, Nicola (University of Padova, Department of General Psychology, 35131 Padova (PD), Italy)

Presenter: VISELLI, Lorenzo (University of L'Aquila, Department of Biotechnological and Applied Clinical Sciences, 67100 L'Aquila (AQ), Italy)

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