COGNITIVE CONTROL OF PAIN IN AGING
– COMPARISON OF DIFFERENT PAIN MODULATION STRATEGIES

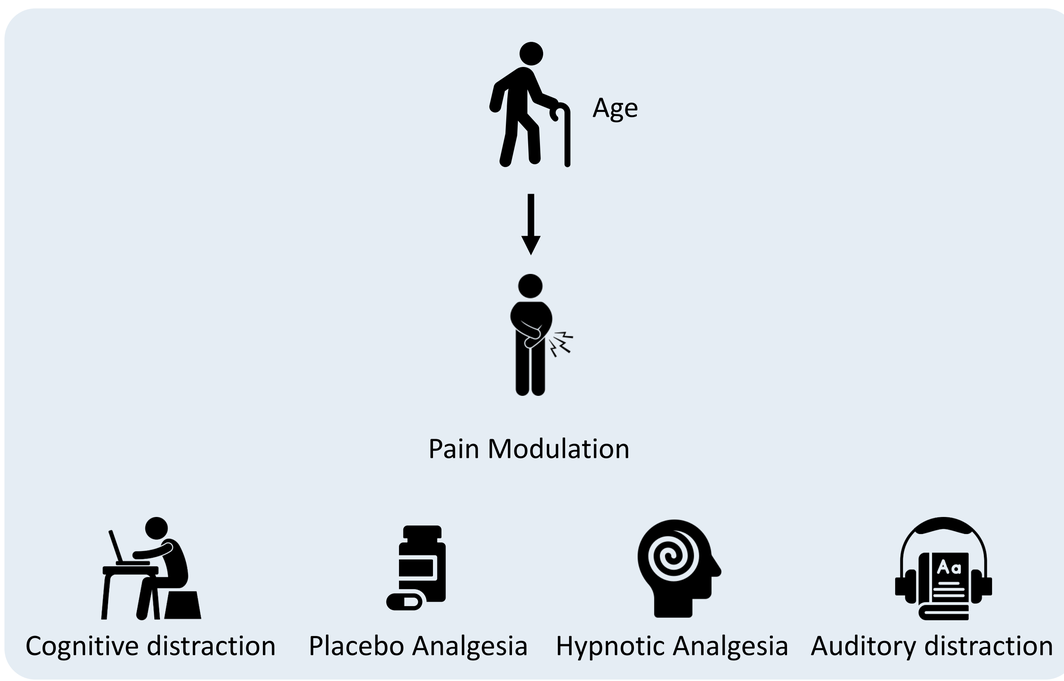
A.M. Dierolf[1]; M. van der Meulen, Marian [1]; W. Miltner[2]

[1] Universität Luxemburg; Department of Behavioural and Cognitive Sciences; Institute for Health and Behaviour; Stress, Pain, and Gene-Environment Interplay,

[2] Friedrich-Schiller-Universität Jena, Klinische Psychologie

INTRODUCTION

While older people report acute and chronic pain more often than younger people, and, therefore, would benefit significantly from non-pharmacological pain treatment [1,2], little is known about how age affects different psychological strategies of pain modulation. The few studies on cognitive distraction from pain suggest a reduced pain relief in older adults [3-5], whereas studies on placebo analgesia revealed inconsistent results [6-10]. So far, auditory distraction and hypnotic analgesia have hardly been investigated in aging. Moreover, the role of age-related decline in executive functions [3, 5, 11], interoception [12] and lifestyle needs further investigation.



healthy young and older adults

Session 1:
Informational interview:
- neuropsychological tests to assess cognitive impairment
- handover of questionnaires on (A) sleep quality, (B) sportif activity, (C) chronic stress and interoceptive sensibility & sample devices (salivettes) for chronic stress assessed with the cortisol awakening response

Session A:
comparison of cognitive pain modulation strategies using EEG

assessment of interoception, interoceptive accuracy (Schandry task)

cognitive pain modulation strategies + control conditions

distraction via working memory load → 0-back and 1-Back working memory task	placebo analgesia Transcutaneous Electrical Nerve Stimulation (TENS), in reality inert device (on/off)	control trials without and with focused hypnotic analgesia	control trials without and with distraction via verbal input

Session B:

Executive functions:
Go NoGo and Attentional Network task in counterbalanced order with Sternberg task and Color Word Stroop task

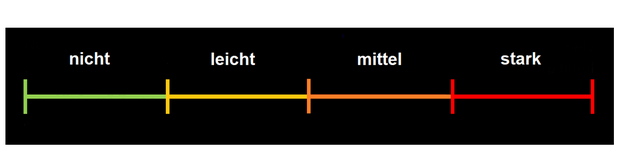
hypnotic Susceptibility test
STANFORD HYPNOTIC SUSCEPTIBILITY SCALE, FORM C

Design and procedure PAGES II. Note that Session A and B are in counterbalanced order.

Material and Methods

In session A healthy young and older participants' interoceptive accuracy is measured, after which participants perform one of the four listed pain modulation strategies. In a separate session B, participants' executive functions and hypnotic suggestibility are measured. The EEG will be recorded throughout both sessions together with peripheral measures, such as ECG (electrocardiogram). Acute pain will be realized with individually calibrated electric pulses to the inner forearm. Selected intensity result in no painful, mildly painful and moderately painful stimulation. Several saliva samples are taken throughout session A to measure the hormonal response to pain and pain modulation. In session B three core executive functions are tested with one test each. Additionally, the Attentional Network Task will be used to test orienting, alertness, and executive control.

At the beginning of the first session, a short cognitive test battery is realized to rule out mild-cognitive impairment. Moreover, participants will receive psychological questionnaires to fill out and saliva sampling devices for the cortisol awakening response.



Conclusion

The here presented study will contribute to a better understanding, which pain modulation strategies are preserved in older adults, and how they are affected by age-related cognitive deficits, interoception, and the lifestyle factors sleep quality, physical exercise and chronic stress. This will help to tailor non-pharmacological pain treatments to the need of this population and hopefully to develop and optimize treatments for chronic pain patients.

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CONTACT

Angelika Dierolf, PhD
University of Luxembourg
angelika.dierolf@uni.lu