HRV-biofeedback in virtual reality enhances attention, short-term memory and self-referential episodic memory

Lukas Bögge\textsuperscript{a}, Itsaso Colás-Blanco\textsuperscript{a}, Pascale Piolino\textsuperscript{a,b}

a) Memory, Brain & Cognition Laboratory (MC2Lab), Institute of Psychology, University of Paris, France
b) Institut Universitaire de France (IUF), France

1. Introduction

Hypotheses

H1) HRV-biofeedback persistently improves self-referential episodic memory and cognitive control.

H2) Improvements correlate with biofeedback-evoked changes in HRV.

2. Methodology

Randomized blinded placebo-controlled experiment

Biofeedback Group (BG) – Active Control Group (CG)

Cognitive pre-test 1 week pause 6 x training 1 week pause Cognitive post-test

Episodic memory – Remember, Know, Guess paradigm

Lists of adjectives

Self-reference

No self-reference

DV: Objective recollection

Executive functions – SART, D2-R, Digit span, TMT, Stroop

DV: Attention, short-term/working memory, cognitive flexibility, inhibitory control

3. Results

Linear mixed effect models verified significant or near significant group by test interaction effects for measures of self-referential episodic memory (Fig. 1), attention and short-term memory (Fig. 2). Cognitive improvements correlated moderately to strongly (Spearman) with changes in HRV (Tbl. 1).

4. Discussion

References