

Manipulation of Emotion in Immersive Virtual Reality environments: Methodological Validation.

Results:

The main objectives of this work were to test if it was possible to conciliate Virtual Reality techniques with the recording of neurophysiological data, and to develop and validate new methodological paradigms to study the psychobiology of emotion. The first study consisted in selecting 3D stimuli similar to those used in the traditional methodological approach to study emotion. We selected 131 stimuli, which were normalized and validated using the Self-Assessment Manikin, in a sample of 214 healthy subjects. The results obtained were consistent with previous studies conducted with 2D stimuli, allowing the development of a Database of Affective 3D Pictures. In the second study, we tested if the induction of emotions with 3D stimulation techniques caused more intense emotional responses than with 2D techniques. To that end we recorded behavioral and peripheral physiological measures associated with the visualization of the three Scenarios in two modalities (2D vs.3D). Results suggested that 3D visualization causes more intense emotional responses. The third study aimed at testing the interference of emotional information in the neurocognitive processing, through Event-related Potential analysis in a dual-task auditory oddball paradigm. Our results showed that emotional induction through 3D stimulation recruits more attentional resources than through 2D stimulation, causing a greater interference in the cognitive processing. Finally, in the fourth study, we presented indexes of brain activation obtained through Functional Magnetic Resonance Imaging (fMRI) when subjects were exposed to the Scenarios in two modalities (2D vs. 3D). Results indicate that 3D visualization is associated to higher activation of the amygdala complex.

Published works:

Papers:

-Dores, A.; Barbosa, F.; Almeida, I.; Castelo-Branco, M.; Monteiro, L.; Reis, M.; de Sousa, L., & Castro Caldas, A. (online only). Effects of emotional valence and tridimensionality of visual stimuli on brain activation: an fMRI study. *Neurorehabilitation*. DOI: 10.3233/NRE-130987.

-Monteiro, L.; Silvério, J.; Barbosa, F. & Marques-Teixeira, J. (2011). Dados normativos da indução de Emoções em Ambientes de Realidade Virtual. *Saúde Mental*. Vol. XIII N°6, 10-19.

Area(s) of interest:

Psychophysiology, Emotion, Virtual Reality.

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