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CHANGING HUMAN TIME PERCEPTION IN VIRTUAL REALITY EMOTIONAL PRIMING: A TRANSCRANIAL DIRECT CURRENT STIMULATION STUDY

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Background: Emotions can alter time perception. Emotional content change levels of arousal, which has been shown to have an impact in time perception decision making. Manipulating emotional states, such as through priming, can help understand the impact of those on human time perception. Extant literature mainly conducts research in laboratory settings. Virtual Reality (VR) allows for more immersive experiences of reality, closer to real-life environments, promoting a more ecological setting albeit still artificial. However, it remains unclear whether emotional priming administered in VR produces a stronger effect compared with that administered through the usage video and still stimuli, and whether time perception is influenced by this. Also, emotional regulation processing (especially in negative valence emotional states), has been associated with the dorsolateral prefrontal cortex (DLPFC). With modern neuromodulation techniques such as transcranial direct current stimulation (tDCS) it has become possible to modulate these areas and observe the effect of behavioural and implicit tasks.

Aims: As such, this project's main goal is to determine whether emotional priming administered through VR has a differential effect compared with more standard emotional priming procedures, whether emotional priming administered within a virtual environment has an impact on time perception, and finally whether by modulating the DLPFC it is possible to suppress the effects of emotional priming in time perception.

Method: To assess this, we have planned three studies. The first of which, currently in its last stages, consists in elaborating a database of virtual reality emotional experiences (VREs) including for each information such as self-reported valence, arousal and dominance, galvanic skin response, heart rate and self-reported multifactorial emotionality. Those VREs thus validated will then be used for priming fear, happiness, sadness or a neutral emotional state in the two subsequent experiments. These will study the impact of VR emotional priming in a bisection task (Experiment 2), and the effect of a single session of tDCS over the DLPFC on fear emotional priming and its consequences in time perception (Experiment 3).

Preliminary results: Experiment 1's preliminary results show high physiological and self-reported activation of various basic emotions upon presentation of any emotional content, including neutral experiences.

Keywords: Time perception; Emotional priming; Virtual reality; Neuromodulation

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