

Analgesic Properties of Computer Games

Results:

The concept of immersion describes a graded psychological experience that corresponds to the way in which we engage with tasks or stimuli. Selective attention is the psychological mechanism at the heart of an immersive experience. It is also known that selective attention may play an important role during the perception of pain, there is evidence that distraction from painful stimuli can increase pain tolerance. This convergence has led to a line of research where immersion in virtual tasks (e.g. computer games) is utilised for therapeutic purposes and pain relief. The first experiment adopted an Evoked Response Potential (ERP) methodology based on the auditory oddball paradigm. We developed a methodology where participants played a computer game whilst being exposed to a series of tones that were irrelevant to the game. Our participants were exposed to the oddball paradigm during several game conditions. The degree of demand experienced by participants was manipulated to yield easy, hard and impossible levels of difficulty. Participants experienced these three levels of difficulty on three display types: a small 5" display, a large TV display and a Head-Mounted Display (HMD). Our findings revealed that immersion was highest during hard/impossible levels of demand that increased the intrinsic motivation of the participant. However, we found no effect of display type on immersion.

Our second experiment focused on the motivational aspects of immersion and we once again exposed our participants to easy, hard and impossible levels of demand. Instead of using an auditory oddball task to capture ERP modulation, participants were exposed to repeated painful stimuli based on contact heat applied to the forearm. The aim of this experiment was to investigate whether ERP responses to painful stimuli were modulated by the level of game demand. This experiment failed to reveal any statistically significant findings and there were a number of methodological issues that may have been responsible for this null finding.

Area(s) of interest:

Immersion, Pain, Attention, ERP

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