

Virtual Reality and Aggression: From Research to Clinical Application

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Using video games as a virtual reality (VR) environment is a powerful tool for designing neuroimaging experiments. Possible applications of VR in fMRI experiments are manifold, ranging from basic research to clinical applications. It permits the simulation of unrestricted social interactions, and the creation of highly controlled stimuli for neuroscientific experiments by enabling a systematic control of various stimulus aspects. In our studies, we established the usability of video games as a virtual reality environment to observe brain activity in a semi-naturalistic behavior, we used video games to stimulate aggression in a clinical setup for investigating influences of quetiapine on the brain aggression network, and we showed that using VR as social feedback enhances the reward value in neurofeedback experiments. We plan to keep exploring VR use in clinical applications and research by studying the self-regulation of fronto-limbic connectivity in aggressive and impulsive behavior, in the human brain. We speculate that by using VR with our neurofeedback training experiments, patients with Borderline and antisocial personality disorders will be able to better regulate their prefrontal cortex-limbic connectivity, and hence may reduce their (auto-)aggressive behavior.