

Watching violent TV, video games desensitizes teenagers and may promote more aggressive behavior

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Watching violent films, TV programmes or video games desensitises teenagers, blunts their emotional responses to aggression and potentially promotes aggressive attitudes and behaviour, according to new research published online today in the *Oxford Journal Social Cognitive and Affective Neuroscience* (Tuesday 19 October).

Although previous research has suggested that people can become more aggressive and desensitised to real-life violence after repeatedly viewing [violent media](#) programmes, little is known about how the extent of watching such programmes and the severity of the aggression displayed affects the brains of adolescents. "It is especially important to understand this because adolescence is a time when the brain is changing and developing, particularly in the parts of the brain that control emotions, emotional behaviour and responses to external events," said Dr Jordan Grafman, who led the research.

Dr Grafman, senior investigator at the National Institute of Neurological Disorders and Stroke, National Institutes of Health (Bethesda, USA), and colleagues recruited 22 boys between the ages of 14-17 to the study. The boys each watched short, four-second clips of violent scenes from 60 videos, arranged randomly in three lots of 20 clips. The degree of violence and aggression in each scene was low, mild or moderate, and there were no extreme scenes. They were asked to rate the aggression of each scene by pressing one of two response buttons at the end of each

clip to say whether they thought it was more or less aggressive than the previous video. The boys were positioned in a [magnetic resonance imaging](#) scanner that collected data on their [brain function](#) while they watched the videos. They also had electrodes attached to the fingers of their non-dominant hand to test for skin conductance responses (SCR). This is a method of measuring the electrical conductance of the skin, which varies with moisture (sweat) levels and is a sensitive way of measuring people's emotions and responses to internal or external stimuli.

Dr Grafman said: "We found that as the boys were exposed to more violent videos over time, their activation in brain regions concerned with emotional reactivity decreased and that was reflected in the data from the functional MRI and in the skin conductance responses."

Data from the SCR showed that the boys became more desensitised towards the videos the longer they watched them and also that they were more desensitised by the mildly and moderately violent videos, but not the ones that contained a low degree of violence. Data on brain activation patterns showed a similar effect. In particular, the area known as the lateral orbitofrontal cortex (lOFC), which is thought to be involved in emotions and emotional responses to events, showed increasing desensitisation over time, and this was most marked for the most aggressive videos (showing moderate violence) in the study.

The researchers also found that boys who had the most exposure to violent media in their daily lives, as measured by screening tests and questions in their initial meeting with the researchers, showed the greatest desensitisation.

Dr Grafman said: "The important new finding is that exposure to the most violent videos inhibits emotional reactions to similar aggressive videos over time and implies that normal adolescents will feel fewer

emotions over time as they are exposed to similar videos. This finding is driven by reduced posterior brain activation and therefore the frontal lobe doesn't react as it normally would.

"The implications of this are many and include the idea that continued exposure to violent videos will make an adolescent less sensitive to violence, more accepting of violence, and more likely to commit aggressive acts since the emotional component associated with aggression is reduced and normally acts as a brake on aggressive behaviour. No prior study has examined this from the complete perspective we had that included behaviour, brain activation, and SCRs in adolescent brains."

As the study recruited only boys, it is not possible to say whether the same effect would be seen in girls. "The incidence rate of aggression in females, even in female teenagers that are exposed to some of the same biopsychosocial challenges as male adolescents, is low and raises the questions of what brain mechanisms and autonomic differences are associated with this gender difference," write the authors.

They conclude: "We propose that exposure to aggressive media results in a blunting of emotional responses, which in turn may prevent the connection of consequences of aggression with an appropriate emotional response, and therefore may increase the likelihood that aggression is seen as acceptable behaviour."

Dr Grafman believes that the findings of the study can be extrapolated to the way people would behave in real life situations. "The electronic media concerned with aggression does stimulate structures in the brain that are typically activated when people imagine being aggressive and, we assume, when they actually are aggressive. Most people can distinguish between playing a video game and real live behaviour, but given the right circumstances where the rules are a bit more ambiguous

(what if a bully provokes me) and provocative (someone is trying to take my lunch money), would an adolescent tend to be more aggressive and accept that aggression as normal behaviour given prior exposure to video games? I think so. Particularly if they are a heavy user of games and, in our device-driven world, that will be more and more likely in the future."

More information: [1] "Fronto-parietal regulation of media violence exposure in adolescents: a multi-method study". *Social Cognitive and Affective Neuroscience*. Published online under advance access.

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