

How video games affect a child's brain

An international study looking at more than 17,000 adolescents aged between nine and 19, from 2010 to 2017, found playing violent video games led to increased physical aggression over time

PARIETAL LOBE Processes sensory information – movement and touch – within seconds. **Applied in games that require real-time action**

FRONTAL LOBE Stress interrupts higher thought processes, leading to mood, cognitive and behavioural changes over time

PREFRONTAL CORTEX Brain's command and control centre dictates personality, goals, and values. **Studies suggest gaming can boost brain cell connections**

ANTERIOR CINGULATE CORTEX

Plays key role in cognitive, motor, and emotional processing – regulating blood pressure and heart rate. **Activated by shooting in video games**

AMYGDALA Controls stress response. When it senses danger, it instantly sends distress signal to hypothalamus

VENTRAL TEGMENTAL AREA

During gaming, feel-good chemical dopamine travels to prefrontal cortex. **Mood is elevated by intense visual stimulation, risking game addiction**

HYPOTHALAMUS Triggers fight-or-flight response. **Repeated fight-or-flight responses lead to state of chronic stress**

Conclusion: Analysis of 24 studies found students who played violent video games such as *Grand Theft Auto*, *Manhunt* and *Call of Duty* (pictured) were about twice as likely to be sent to school principal's office for fighting or hitting non-family member during eight-month period

