

February 23, 2011



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WEDNESDAY, Feb. 23 (HealthDay News) -- A long-standing concern among parents and researchers has been that young people who are exposed to violent video games may become desensitized to violent acts and images, but a new study suggests that may not be the case.

Canadian researchers comparing gamers to non-gamers found that in the long run, gamers were just as likely to recall negative images in memory tests and to report the same levels of emotion in reaction to the pictures as the non-gamers.

"People who play video games didn't differ in memory, and physical arousal wasn't different between gamers and non-gamers. And there was no difference in how each group felt after seeing negative or violent pictures," said study author Holly Bowen, a doctoral candidate in the department of psychology at Ryerson University in Toronto.

The findings were published in the January issue of *Applied Cognitive Psychology*.

Video game violence differs from violence in television or the movies because people playing the games are actively involved in the aggression, and in some games, receive rewards and incentives for committing virtual violent acts, according to background information in the study.

Previous studies have suggested that violent video games may lead to more aggressive behavior and irritability, in addition to greater desensitization to violence, the current study reports.

Much of the research on video games and violence, however, has tested gamers soon after they played a game, and might not reflect long-term effects, said Bowen.

To assess whether violent video games affected the brain long-term, Bowen and her colleague, Julia Spaniol, recruited 122 undergraduate psychology students to participate in their study on emotional memory.

"Emotional memory is a really important part of your cognitive functioning. If you don't remember negative or harmful situations, you can't learn from them and avoid them in the future," said Bowen.

Ninety-six of the study volunteers were female, and the average age was 19 years old. Forty-five people in the group had played video games during the previous six months. The remaining 77 had no video game exposure.

Both male and female players reported playing *Grand Theft Auto*, *Final Fantasy* and *NHL* (National Hockey League) games. Males also listed the fighting games *Call of Duty* and *Tekken* in their top five. Females preferred playing *Guitar Hero* and *Rock Band* or the go-kart game *Mario Kart* to the violent videos, according to the study.

The researchers showed 150 images -- positive, neutral and negative -- to the study volunteers. Bowen said some of the images were violent and disturbing, such as a picture of a man holding gun to a woman's head.

An hour later, the researchers showed the study volunteers the images again, but randomly mixed in additional pictures as distracters.

If video gamers' brains had been desensitized from playing video games, the researchers theorized that they should be less able to recall the violent images.

But they found no differences in recall between the two groups. And, the gamers and non-gamers reported similar levels of physical arousal from the images, and described similar feelings when viewing the photos.

Bowen said while this study can't definitively say that violent video games aren't desensitizing people to violence, she said it does provide "another piece of the puzzle, and perhaps, video games aren't having long-term effects on cognition and memory."

She and her colleague noted, however, that a possible limitation to the study was that the volunteers described their arousal to violent images rather than being monitored for heart rate and other physiological responses, and that more study was needed.

"The premise here is that we think people who are exposed to violent video games might be desensitized to violence, and if they are, they should not remember disturbing, violent pictures as much," explained Tracy Dennis, an associate professor of psychology at Hunter College of the City University of New York.

"And, while this is an important study, what they're asking people to remember isn't necessarily linked to video game memories, so I think it's important to draw only moderate conclusions," said Dennis.

"A lot more research needs to be done on video game violence," she said, adding that in the meantime, parents should try to minimize their children's exposure to such violence, particularly games that reward or reinforce violence.

Dr. Eric Hollander, a psychiatrist from Montefiore Medical Center in New York City, said that some teens may be more vulnerable to video game violence. "Teens who don't get sufficient rewards or reinforcement from other activities may be vulnerable to the rewards gained from risky behaviors, such as video game or gambling addiction."

"With aggressive video games, teens are getting a high level of arousal and reward that they may not get with other games, and they may start to develop a more restrictive interest for one type of game," he explained, adding that a red flag for parents is if they see their child becoming less engaged in other activities that they used to enjoying doing, and they're only playing a certain type of video game.

More information

Read more about video game violence and its effects on children from the [American Academy of Child and Adolescent Psychiatry](#).