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NEWS

RSNA Press Release

Violent Video Games Leave Teenagers Emotionally Aroused

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At A Glance

- Researchers used functional magnetic resonance imaging (fMRI) to compare the brain function of adolescents who had recently played a violent video game and adolescents who had played an exciting, nonviolent game.
- Adolescents who play violent video games show decreased activity in parts of the brain that control inhibition and increased activity in areas of the brain that are associated with emotional arousal.

CHICAGO — A new study has found that adolescents who play violent video games may exhibit lingering effects on brain function, including increased activity in the region of the brain that governs emotional arousal and decreased activity in the brain's executive function, which is associated with control, focus and concentration. The findings were presented today at the annual meeting of the Radiological Society of North America (RSNA).

"Our study suggests that playing a certain type of violent video game may have different short-term effects on brain function than playing a nonviolent—but exciting—game," said Vincent P. Mathews, M.D., professor of radiology at Indiana University School of Medicine in Indianapolis.

Video games are big business with nearly $10 billion in sales in the United States last year. But along with growing sales come growing concerns about what effects these games may be having on the young people who play them.

Dr. Mathews and colleagues randomly assigned 44 adolescents to play either a violent video game or a nonviolent video game for 30 minutes. The researchers then used functional magnetic resonance imaging (fMRI) to study brain function during a series of tasks measuring inhibition and concentration. One test used emotional stimuli and one did not.

fMRI measures the tiny metabolic changes that occur when a part of the brain is active. These changes will appear as a brightly colored area on the MR image, indicating the part of the brain that is being used to process the task. The two groups did not differ in accuracy or reaction time for the tasks, but analysis of the fMRI data showed differences in brain activation.

Compared with the group that played the nonviolent game, the group that played the violent video game demonstrated less activation in the prefrontal portions of the brain, which are

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involved in inhibition, concentration and self-control, and more activation in the amygdala, which is involved in emotional arousal.

"During tasks requiring concentration and processing of emotional stimuli, the adolescents who had played the violent video game showed distinct differences in brain activation than the adolescents who played an equally exciting and fun-but nonviolent-game," Dr. Mathews said. "Because of random assignment, the most likely factor accounting for these differences would be the group to which the volunteers were assigned."

The researchers hope to conduct additional research on long-term effects of violent video game exposure and the impact of these brain functioning differences.

"Additional investigation of the reasons for and effects of this difference in brain functioning will be important targets for future study, but the current study showed that a difference between the groups does exist," Dr. Mathews said.

Co-authors are Yang Wang, M.D., Andrew J. Kalnin, M.D., Kristine M. Mosier, D.M.D., Ph.D., David W. Dunn, M.D., and William G. Kronenberger, Ph.D.

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RSNA is an association of more than 40,000 radiologists, radiation oncologists, medical physicists and related scientists committed to promoting excellence in radiology through education and by fostering research, with the ultimate goal of improving patient care. The Society is based in Oak Brook, Ill.

Editor's note: The data in these releases may differ from those in the printed abstract and those actually presented at the meeting, as researchers continue to update their data right up until the meeting. To ensure you are using the most up-to-date information, please call the RSNA Newsroom at (312) 949-3233.

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