# Encyclopedia of Children, Adolescents, and the Media

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Edited by

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It is only on average, or across the groups of boys and girls, that we find gender differences in electronic game play.

—*Teena Willoughby*

***See also*** Aggression, Electronic Games and; Computer Use, Gender and; Computer Use, Rates of; Electronic Games, Cognitive Scripts and; Electronic Games, Effects of; Electronic Games, High-Risk Players of; Electronic Games, Rates of Use of; Electronic Games, Types of; Electronic Games, Violence in; Electronic Media, Children's Use of; Gender, Media Use and; Internet Use, Gender and; Internet Use, HomeNet Study and; Internet Use, Rates and Purposes of

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## ELECTRONIC GAMES, HIGH-RISK PLAYERS OF

There has been considerable debate in recent years about the risks associated with violent electronic game play by children and adolescents, with some arguing for powerful effects and others suggesting the effects are trivial. However, many of these debates overlook one important consideration: Not all players are affected equally. As Michael Slater and colleagues argue in their downward spiral model of media effects, some youth may be relatively unscathed by media violence exposure, whereas others may be especially vulnerable to its influence. In other words, there may be what Jeanne Funk has called *high-risk players* of electronic games.

Many risk factors for youth violence have been identified; this entry focuses mainly on risk factors identified in scholarship on electronic games. The surgeon general's report on youth violence contains a more comprehensive set of risk factors. With respect to electronic games, it is important to remember that individual risk factors are not causes of gaming effects. Instead, they should be viewed as a set of conditions that facilitate the prediction of gaming effects, especially when several are present at once. A growing body of literature suggests how developmental, personality, social, and emotional factors, along with exposure to certain game content and technology, may put particular children at higher risk for negative game play outcomes such as aggressive behavior.

### AGE AND DEVELOPMENTAL DIFFERENCES

Age and cognitive development of children may put them at greater risk for harm from electronic game play, with younger children being most susceptible. Because these children tend to focus on perceptually salient attributes of media such as video games, their attention may center on flashy violent content and exclude other contextual features, making them more susceptible than older children to the influence of violent content. Furthermore, Jeanne Funk suggests that children are at higher risk than adolescents because they lack the ability to measure their behavior in light of moral standards and the behavior of others. Without these influences, children are less likely to feel guilty about aggressive behavior and may internalize the violent worlds of popular video games as models for acceptable behavior. Although most evidence points to children being at higher risk, certain adolescents may also be at high risk because of their greater willingness and ability to engage in reckless behavior and because they may develop stronger, more complete scripts for violent behavior as a function of repeated electronic game play over time.

### TRAIT AND PERSONALITY PREDISPOSITIONS

As suggested in the general aggression model (GAM) developed by Craig Anderson and colleagues, certain trait or personality attributes may make electronic game players more at risk for aggressive behavior. In one study, Anderson and Karen Dill surveyed

227 students and found real-life game play to be associated positively with aggressive behavior and delinquency, especially among males and individuals with greater trait aggression. Indicators of aggressive personality, which may include aggression and irritability, have been shown to relate positively to aggressive outcomes in both survey and laboratory studies of media violence effects. Children and adolescents with some form of aggressive personality are especially likely to be high-risk players of electronic games.

Several other personality factors may impact risk levels. Sensation seeking has been shown to create more robust positive relationships between violent media exposure (including video games) and aggression among teens. Type A personalities have been found to experience a greater level of arousal while playing electronic games than Type B personalities, increasing the risk of addiction for Type A personalities. Addiction or dependency on electronic games may result in more frequent rehearsal of violent in-game behaviors, thereby strengthening cognitive scripts for aggression as suggested by the GAM. There are other personality factors that may put players at higher risk as well, especially when several are present at once.

## SOCIAL AND EMOTIONAL FACTORS

Social problem-solving deficiencies are one reason both bullies and victims tend to be higher-risk game players. Bullies also display acceptance of intimidation of others, a general lack of empathy for victims in games, and low levels of remorse for violent behaviors. Victims tend to be highly emotionally reactive to the intimidation of bullies and may seek violent video games as a means of acting out their opposition to bullies without fear of reprisal. Although electronic games do not create bullies and victims, they may emphasize extant behavior patterns. Indeed, Michael Slater and colleagues found that victimization and sensation seeking moderate the relationship between use of violent media and aggressive behaviors, such that violent content reinforces experiences of anger.

Lack of parental influence may also place children at higher risk for gaming effects. Poor bonding with parents and peers has been associated with increased levels of emotional distress and instability. Children and adolescents with impaired emotional regulation skills may not experience, or may seek to maintain, a certain degree of negative arousal. When electronic games are used as a source of this arousal, children are at higher risk for addiction to or dependence on electronic games. When games are taken away, addicted or dependent children may experience symptoms of withdrawal. The positive effects of parental influence, however, may diminish when children reach adolescence and attempt to assert their independence from their parents.

## THE ROLES OF USE, CONTENT, AND TECHNOLOGY

Children and adolescents who regularly play electronic games for extended periods of time are at higher risk for several reasons. In addition to strengthening aggressive personality, consistent with the GAM, excessive play may also be symptomatic of addiction or dependency. Most games have an addictive reward structure, making it easy for a child to lose track of time and get caught up in the experiences of a game to the exclusion of all else (called a *flow* or *presence* state). As Jeanne Funk documents, playing frequently can have negative effects because it displaces other, developmentally appropriate pursuits. She also notes that a strong preference for violent electronic games further adds to the high-risk status of players.

Indeed, certain types of game content and technology should put players at greater risk. Over time, games have evolved into increasingly realistic experiences, and young people who play newer violent electronic games, such as those taking place from a first-person perspective, may be more likely to identify with aggressive game characters than those who play older games with less salient models. Given the continual push by the gaming industry to provide players with more realistic experiences, the next generation of electronic games may have more potential to harm. A few studies have examined the role of virtual reality (VR) technology on game-induced aggression; VR technology strengthened aggressive outcomes among certain players compared to standard game technology. As games incorporate more realistic graphics and interfaces, such as ones allowing for real punching and kicking instead of just button pushing, they may place those players at higher risk due to the repeated rehearsal of actual violent behaviors.

*—Paul Skalski and Stacy Fitzpatrick*

***See also*** Aggression, Electronic Games and; Electronic Games, Addiction to; Electronic Games, Age and; Electronic Games, Cognitive Scripts and; Electronic

Games, Gender and; Electronic Games, Violence in; General Aggression Model (GAM); Media Genre Preferences; Television Violence, Susceptibility to

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## ELECTRONIC GAMES, HISTORY OF

The roots of modern electronic games can be traced to coin-operated electromechanical games, such as *Championship Fast Draw* from 1964. Elements like the high score and one- and two-player options were part of this early game. The first electronic game is possibly an interactive game similar to table tennis that was developed by William Higinbotham in 1958. It was played on an oscilloscope at Brookhaven Laboratory in Upton, New York. The gaming industry expanded greatly during the 1970s and 1980s, especially after the advent of the data cartridge and handheld games. Online gaming became increasingly popular in the 1990s. Today, the main driver of the development of electronic games is the growing power of the hardware, which makes games more and more realistic and complex.

### MANY FATHERS

The first interactive computer game, *Space War,* was developed by Steve Russell, a student at the Massachusetts Institute of Technology, in 1961. Russell never filed for a copyright or a patent for his game. The next important step in the development of electronic entertainment was made by Ralph Baer. He worked for Sanders Association in New York, a military contractor. Between 1967 and 1972, Baer developed the first gaming machine, Odyssey, which was brought out by Magnavox. Odyssey had several games, including one that simulated ping-pong. Russell and Baer are known as the forgotten fathers of the electronic gaming business because their innovations brought them no economic success. At the time, computers were too expensive to be used as a gaming platform for *Space War,* and Magnavox did not have the marketing power to make Odyssey popular.

The first well-known figure in the electronic gaming business is Nolan Bushnell. His first exposure to electronic games was *Space War,* which he played in college. He developed a version of this game for coin-operated machines and gave it the name *Computer Space,* but it had no real success. He then founded Atari, which developed many legendary electronic games, such as *Pong,* the first big success on the market. Atari had to pay Magnavox for the licenses to *Pong* and *Space War.* Until 1974, *Pong* machines were in nearly every bar in the United States. A third of the machines were made by Atari and the rest by other companies through a license. In 1975, Atari released a consumer version of *Pong,* which sold 150,000 copies in the first year. This was the beginning of electronic home entertainment.

### COMPETITION AND TECHNICAL DEVELOPMENT

In the following years, a number of new companies, games, and machines entered and left the market. A major innovation in these years was the data cartridge. After the advent of the cartridge, the game was no longer stored in the read-only memory of the gaming machine, which made it possible to buy new games for gaming machines. This changed the distribution structures of the industry; companies now had the ability to develop new games for the existing hardware and to work as developers and publishers of gaming software.