Chapter 7.9
Learning Processes and Violent Video Games

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ABSTRACT

Though video games can produce desirable learning outcomes, such as improved performance in school subjects, they also can produce undesirable outcomes, such as increased aggression. Some of the basic learning principles that make video games (particularly violent video games) effective at teaching are discussed in this chapter. A general learning model is presented to explain how video games can produce a variety of effects in their users. This model explains both the immediate, short term effects and cumulative, long term effects of video games. Implications of these principles are discussed in relation to education. The issue of addressing violent video games' effects on aggression is also examined.

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LEARNING PROCESSES AND VIOLENT VIDEO GAMES

Video games have become an immensely popular medium in the 35 years since their introduction. The annual sales of video games and their accessories in the U.S. reached $10.5 billion in 2005, exceeding the $9 billion grossed by films in the U.S. box office that same year (ESA, 2007; MPAA, 2007). Though the growth in popularity and sales of video games has been driven more by their ability to entertain than by their ability to teach, many groups, including teachers, businesses, the

U.S. military, and researchers, have recognized the value of video games as effective teaching tools. On one hand, video games are effective teaching tools because they take advantage of several basic learning principles and instructional techniques, such as the use of effective forms of reinforcement and an adaptable level of difficulty. On the other hand, it has come to the public attention that most popular video games, 89% of video games by one estimate, contain violence (Children Now, 2001). This has led to considerable social concern over the potential negative effects of video games, especially the potential of such video games to increase aggression. When examined within the framework of the general learning model (GLM), it is apparent that these divergent outcomes (education and increased aggression) are not competing explanations of video game effects. Rather, both the often intended, positive effects of video games and the unintended negative effects result from the same short-term and long-term psychological learning mechanisms. The success of violent video games as teaching tools suggests ways that education could be improved, both with and without video games. Parents, educators, and policy makers should be aware that video games can teach a wide variety of information and skills and even produce personality changes in their users, for good or ill. What outcomes a particular video game produces depends primarily on its content, regardless of the original intent of the creators or users. This chapter describes some of the principles and mechanisms underlying violent video game effects, as well as some of the societal implications.

What Do Video Games Teach?

Positive Effects

Many groups, including educators, businesses, and military personnel, use video games to teach information and develop skills. Video games have been developed and used effectively to teach a variety of traditional school subjects, such as algebra, geometry, and biology (Corbett, Koedinger, & Hadley, 2001; Ybarrondo, 1984). Other video games are used to teach children skills such as photography and computer programming (Abrams, 1986; Kahn, 1999). Educational video games are effective at improving the development of early math and reading skills in children (Murphy, Penuel, Means, Korbak, Whaley, & Allen, 2002). Video games also have proven effective in helping children with asthma and diabetes to manage their own health behaviors (Lieberman, 1997; McPherson, Glazebrook, Forster, James, & Smyth, 2006). Simulation video games have proven effective in teaching some of the skills that they model as well, from those that teach people with severe learning disabilities how to shop for groceries to games teaching teamwork to pilots (Brannick, Prince, & Salas, 2005; Standen & Cromby, 1996).

Many businesses use educational video games to teach their employees job skills. Cisco teaches their employees about the basic tools of network security with a video game. Volvo uses an online computer game to teach financial and regulatory information to their car sales employees (Flood, 2006). The Mayo Clinic uses a video game called "Name That Congenital Abnormality" to teach residents medical information (Yaman, 2004). Canon reports improvements in training speed due to the use of a video game to teach printer repair skills to their employees, compared to traditional training methods. Video games are not just used by technologically oriented businesses; the ice-cream manufacturer Cold Stone Creamery created a video game to teach employees how to serve ice cream quickly and without errors (*Business Week*, 2007).

The U.S. military extensively uses video games in training. The U.S. Army's Program Executive Office for Simulation, Training, and Instrumentation (PEO STRI) now spends over $2 billion each year creating simulators to train members of the branches of the armed forces (Blake, 2007). These