

# Social Media

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**W**hat is so “social” about social media? In short, social media are interactive media. These media are immensely popular among teens, as evidenced by the nearly ubiquitous use of Facebook and the growing popularity of Twitter. Through the capacity to both view and create content online, social media provide new risks and opportunities for adolescents. This chapter will review what makes social media unique and popular among teens, followed by a discussion of these risks and benefits. Our goal is to provide an understanding of social media as a set of tools, inherently neither good nor bad, whose outcome is determined by how they are used.

## What Are Social Media?

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The first version of the Internet, known as Web 1.0, allowed content to be viewed by a consumer. A typical Internet user could double-check the high school football team schedule or find the location of a movie theatre. In contrast, Web 2.0 allowed users to both read and write content. An Internet user could now blog a play-by-play of last night’s football game or write a review of the movie seen last weekend. Social media represent a set of Web 2.0 tools that are centered on interaction and the sharing of content with others. The idea of interacting and sharing content via media is a remarkable concept in the area of media studies. In traditional media, such as television, a corporation created the content and the viewer consumed this content. Messages were unidirectional, a single arrow pointing from the corporation to the consumer. In the new world of social media, Internet users are both creators and consumers of content. Messages flow in all directions, from corporations to users, among users, and back to corporations through a seemingly endless array of potential paths. Today’s adolescents have increased capacity to interact

**Figure 9.1** The social media landscape.



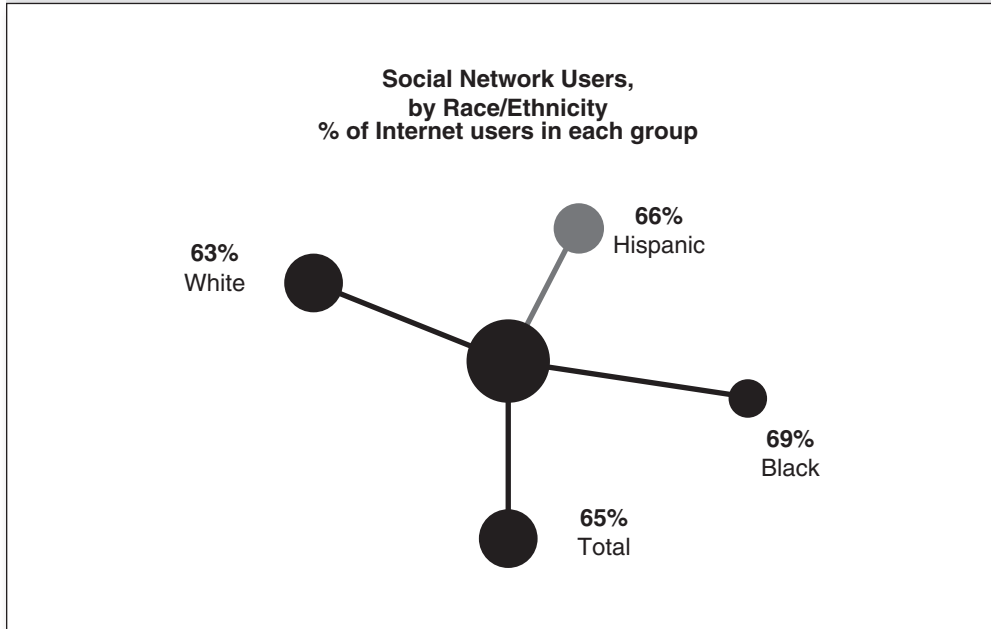
SOURCE: FredCavazza.net.

with one another and the larger world using media, enhanced opportunities to explore and experiment via media, and probably an increased likelihood of being influenced by media. Let us now consider the most popular social media sites used by teens.

## Social Media Sites Popular Among Teens

Social media websites (SMWs) include social networking sites (SNSs), such as Facebook ([www.facebook.com](http://www.facebook.com)) and LinkedIn ([www.linkedin.com](http://www.linkedin.com)). At present there are several different types of SNSs available, some with a more targeted audience and others aiming for more general appeal. Common SNSs used by adolescents include Facebook and Twitter.

Facebook originated in 2004, created by a Harvard University student, for students of that university to connect and communicate (Ahn, 2011). Since then, it has expanded to its current status, such that anyone over the age of 13 can register and create a profile page. While initially considered a social networking site only for elite college students, Facebook has significantly

**Figure 9.2** Social Network Users by Race/Ethnicity

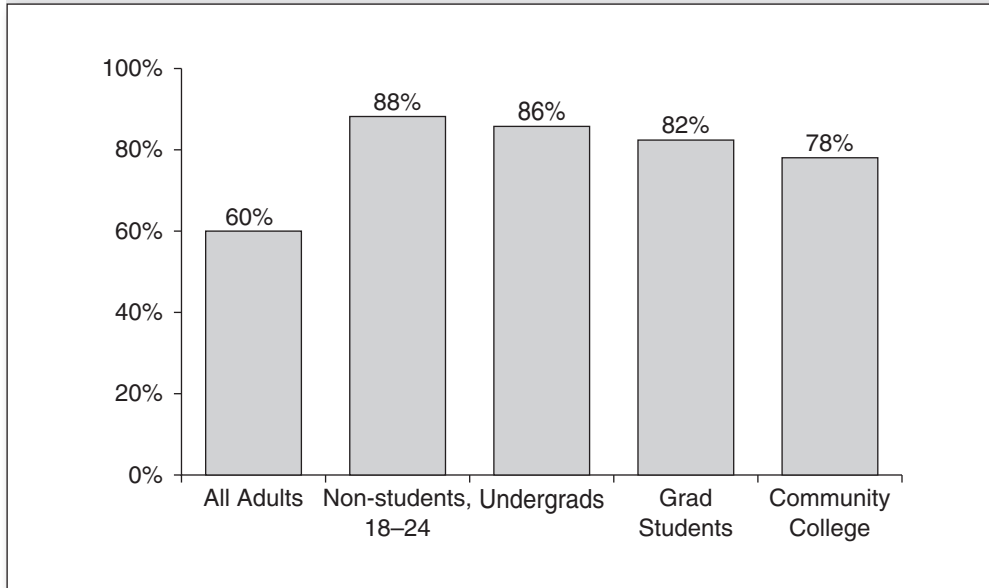
SOURCE: Graphic by [www.eMarketer.com](http://www.eMarketer.com) based on data from Madden and Zickuhr (2011).

expanded into a site visited by nearly all ages and ethnicities (see Figure 9.2). Recently, the fastest growing age segment on Facebook was adults (Lenhart, 2009). The mission of Facebook, as posted on its website, is “to give people the power to share and make the world more open and connected” (<http://www.facebook.com/facebook/info>).

Facebook allows members to create an online profile, communicate with other profile owners, and build an online social network. Creating a profile allows members to display interests and hobbies, upload pictures and videos, and post comments, called status updates, about current events or emotions. Facebook users can also join groups about topics they are interested in, communicate with friends via email or instant messaging, and link their profiles with others in a process referred to as “friending” (Ahn, 2011; Moreno, 2010). Thus, SNSs are an important medium for self-expression, communication with friends, and peer feedback (Moreno, 2010).

Twitter ([www.twitter.com](http://www.twitter.com)) is an SMW in which short text comments, limited to 140 characters and also called microblogs or “tweets,” are shared with users, creating an ongoing, continuously updated stream of information. Twitter began in 2006 as a site focusing on microblogging. In addition to generating tweets, Twitter users can “follow” the Twitter posts of other Twitter users. Followers are notified of and given the opportunity to view every tweet generated by the person they are following.

These sites are extremely popular (see Figure 9.3); Facebook recently surpassed Google for total number of daily hits (Childs, 2010). One study reported that 73% of teens between the ages of 12 and 17 owned an SNS profile, while another study found that

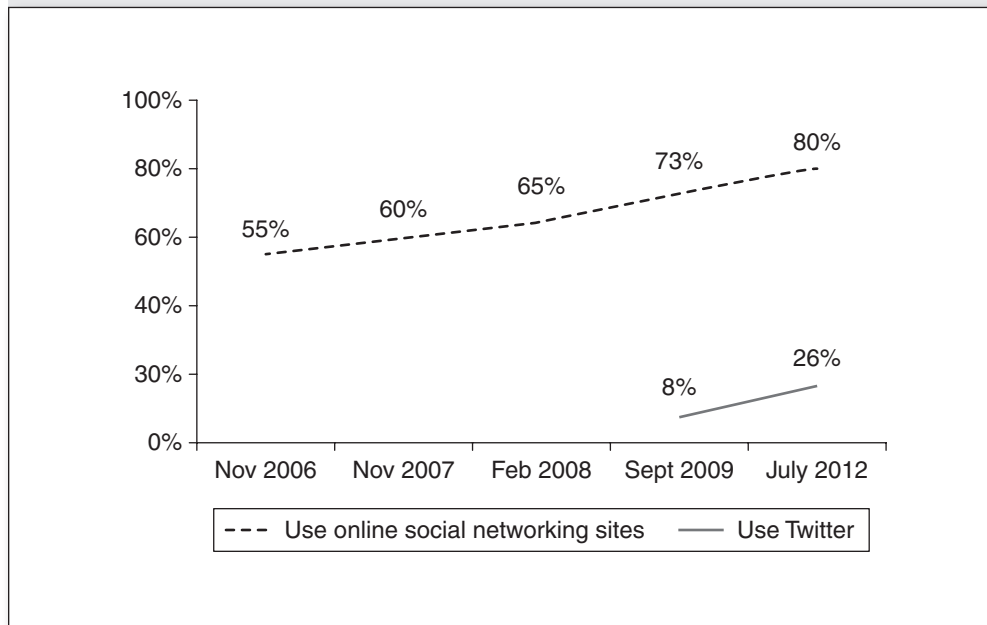
**Figure 9.3** College students and social networking sites.

SOURCE: Pew Research Center's Internet & American Life Project 2010 tracking surveys. All include landline and cell phone interviews. N for all adults = 9,769; n for 18- to 24-year-old non-students = 717; n for four-year undergraduates = 246; n for graduate students = 112; n for community college students = 164.

22% of teenagers logged onto their favorite SNS more than 10 times per day (Lenhart & Madden, 2007b; Patchin & Hinduja, 2010). Facebook is used by over 90% of U.S. college students (Ellison, Steinfield, & Lampe, 2007). Even younger children are participating in SNS activities; one study found that 18% of 8- to 10-year-olds used an SNS daily (Rideout, Foehr, & Roberts, 2010).

Twitter's popularity grew more slowly than Facebook's (see Figure 9.4). Twitter was initially popular among young adults, but its popularity has filtered down to the college age group. It is likely that Twitter will continue to grow in popularity among the adolescent age group, particularly given the presence of teen stars such as Justin Bieber. As of December 2012, Twitter was the 10th most popular website in the world ("Top Sites," n.d.). Popular Twitter feeds, such as those created by Lady Gaga, can have as many as 20 million followers (Topping, 2012).

Like any other type of media, social media are not inherently good or bad. The impact of social media is dependent on the type and frequency of their use. Media reports as well as research have highlighted potential benefits and risks for adolescents interacting with social media. Among these concerns is the potential for social media to influence health behaviors. Adolescents are uniquely positioned to be particularly vulnerable to the effects of social media. They are early adopters of new media and highly susceptible to peer influences (Ellison et al., 2007; Lenhart & Madden, 2007a; Lenhart, Madden, & Hitlin, 2005; Lenhart, Purcell, Smith, & Zickuhr, 2010). The vast majority of adolescents go online every day, and many go online more than once a day (Lenhart et al., 2005; Sun et al., 2005).

**Figure 9.4** Teen social network and Twitter use—trends over time.

SOURCE: "Twitter Use 2012," Aaron Smith and Joanna Brenner, May 31, 2012. Reprinted with permission from Pew Internet, Pew Research Center. <http://www.pewinternet.org/About-Us/Our-Research/Use-Policy.aspx>.

## Risks Associated With Social Media Use

### Influence

Previous research has shown strong links between what adolescents observe and how they behave (Bandura, 1986). This can apply to what adolescents observe in media as well as what they observe around them in their lives. The impact of this observation is particularly strong when it involves observing other adolescents, who can influence attitudes, intentions, and behaviors (Wood, Read, Mitchell, & Brand, 2004). For example, adolescents who perceive that their peers are sexually active are more likely to report the intention to become sexually active (Kinsman, Romer, Furstenberg, & Schwarz, 1998).

Another strong source of influence on adolescent attitudes, intentions, and behaviors is the media (Dalton et al., 2009; Dalton et al., 2003; Gidwani, Sobol, DeJong, Perrin, & Gortmaker, 2002; Titus-Ernstoff, Dalton, Adachi-Mejia, Longacre, & Beach, 2008). Many research studies conducted over the decades have consistently shown that exposure to risky behaviors (e.g., alcohol or tobacco use, sexual behaviors) through traditional media is associated with initiation of these behaviors (Dalton et al., 2009; Gidwani et al., 2002; Robinson, Chen, & Killen, 1998; Wichers et al., 2010). It is clear that adolescents can learn these behaviors through media and be influenced to try them themselves.

Given the influence of both peers and traditional media on adolescent behavior, it is worth considering how social media may influence teens. Social media are a form of media created by adolescents, and thus they combine both peer and media effects. Through a single website such as Facebook, millions of adolescents are now linked to millions of other adolescents online. Each of these ties represents a potential path of influence. Social media have been described as bringing together the power of interpersonal persuasion with the reach of mass media. Professor B. J. Fogg described “mass interpersonal persuasion” as “the most significant advance in persuasion since radio was invented in the 1890s” (Fogg, 2008).

Social media’s potential influence on adolescent attitudes and behaviors is only beginning to be explored through research. In one study, adolescents who viewed alcohol references on their peers’ Facebook profiles found them to be believable and influential sources of information (Moreno, Briner, Williams, Walker, & Christakis, 2009). Another study found that adolescents who perceived alcohol use to be normative based on others’ Facebook profiles were more likely to report an interest in initiating alcohol use (Litt & Stock, 2011). Studies are beginning to illustrate social media as a widespread, available, and consistently accessed source of media for today’s adolescents and young adults.

## Displays of Health-Risk Behaviors on Social Media

The extensive and powerful influence that social media can exert leads to the question of which behaviors are being promoted via social media. Social media displays include photographs and text created and displayed by peers and viewed by peers. Are these social media displays typically health promoting, discussing fitness or adequate sleep? Or do they promote health-risk behaviors? Health-risk behaviors include any behaviors linked to morbidity and mortality among adolescents, such as substance use or risky sexual behavior. Several studies have illustrated that adolescents’ displays on SNSs like MySpace and Facebook frequently include health-risk behaviors, such as alcohol use (see Table 9.1), substance use, or sexual behaviors (Aboujaoude, Koran, Gamel, Large, & Serpe, 2006; McGee & Begg, 2008; Moreno, Parks, & Richardson, 2007; Moreno, Parks, Zimmerman, Brito, & Christakis, 2009). It is interesting to note that these health-risk behaviors are commonly displayed in patterns consistent with studies of offline behavior, such as survey research. For example, adolescents who display references to religious commitment are less likely to display references to sexual behavior (Gannon & Moreno, 2013, *in press*). Additionally, an adolescent who displays one health-risk behavior, such as sexual activity, is more likely to display other such behaviors, such as alcohol or drug use (Moreno, Parks, et al., 2009). This suggests that patterns of adolescent behavior that have been researched and understood in offline life for decades are now being displayed publicly online by adolescents themselves.

The display of health-risk behaviors by a single adolescent can provide insight into that adolescent, but social media can tell us more. Social networking sites provide a visual depiction of an adolescent’s social network, as well as the ability to understand how attitudes or behaviors are present or absent within particular peer groups. A 2010 study found that adolescents were more likely to display references to sexual behavior if a peer displayed similar references (Dunton, Liao, Intille, Spruijt-Metz, & Pentz, 2010). Research in this area is only beginning, but it is clear that social networking sites may provide a new lens through which we can better see how particular risk behaviors diffuse within and beyond peer groups.

**Table 9.1** Categories and examples of alcohol use references.

<p>N = 341 references to alcohol use from 400 adolescents' MySpace profiles</p> <p>Explicit versus figurative use categories were applied to alcohol references without personal context provided, references with personal context provided were evaluated using SLT or CRAFFT criteria.</p>		
Category	Explanation	Examples
<b>Explicit versus figurative use:</b>		
Explicit Use N = 168 (49.3%)	Explicit text statements or photographs depicting profile owner drinking alcohol	<i>"I love drinking beer"</i>
Explicit Intoxication N = 58 (17%)	Explicit text statements referring to profile owner being intoxicated	<i>"I was so loaded on Friday"</i>
Figurative N = 39 (11.4%)	Statements that reference alcohol use but not use by the profile owner	<i>"Beer: breakfast of champions!"</i>
<b>Social Learning Theory:</b>		
<b>Motivations:</b>		
Peer pressure N = 16 (4.7%)	References to peer pressure as a reason to drink or use of peer pressure to motivate others to drink	<i>"I like to get drunk, if you like vodka then you are my friend"</i>
<b>Associations:</b>		
Sex N = 3 (0.9%)	References to alcohol use in association with sex	<i>"Beer and a cock, what more could you ask for?"</i>
Games N = 14 (4.1%)	Drinking games included beer pong, keg stands, and other drinking-related games and activities	<i>"Beer pong rematch this weekend!"</i>
Dancing/partying N = 75 (22%)	References to dancing or being at a party in association with alcohol use	<i>"My hobbies include drinking and partying"</i>
<b>Consequences:</b>		
Positive emotional consequences N = 2 (0.6%)	References that highlight positive mood, feeling, or emotion associated with alcohol use	<i>"A glass of wine and I'm just fine"</i>
Category	Explanation	Examples
Negative emotional consequences N = 2 (0.6%)	References that highlight negative mood, feeling, or emotion associated with alcohol use	<i>"I don't like the person I am when I'm drunk"</i>

(Continued)

**Table 9.1** (Continued)

Positive Social consequences N = 6 (1.8%)	References that highlight perceived social gain associated with alcohol use	<i>"When I'm drunk I'm very outgoing"</i>
Negative social consequences N = 3 (0.9%)	References that highlight perceived poor social outcomes associated with alcohol use	<i>"I'm embarrassed that I drank Bailey's out of a shoe"</i>
Negative physical consequences N = 7 (2.1%)	References that describe adverse physical consequences or outcomes associated with alcohol use	<i>"I'm exhausted and hung over"</i>
<b>CRAFFT:</b>		
Problem drinking N = 11 (3.2%)	Text references that met the CRAFFT problem drinking criteria	<i>"Blacked out drunk at 7a.m."</i>

SOURCE: Moreno and colleagues (2010).

While health-risk behaviors are commonly displayed on SNSs, displays of the negative consequences of these behaviors are uncommonly noted. One study found that displays of negative consequences of alcohol use, such as hangovers or embarrassment, were rare (McGee & Begg, 2008). This is important because adolescents are more likely to mimic risky behaviors if they do not perceive that they have consequences. For example, seeing a peer skateboard down a steep hill without harm may lead another teen to try this stunt. While the complete picture is not yet known, it is reasonable to hypothesize that risky information that adolescents choose to display on social media may influence peers' attitudes and behaviors. These displays are prevalent, peer generated, and thus likely persuasive.

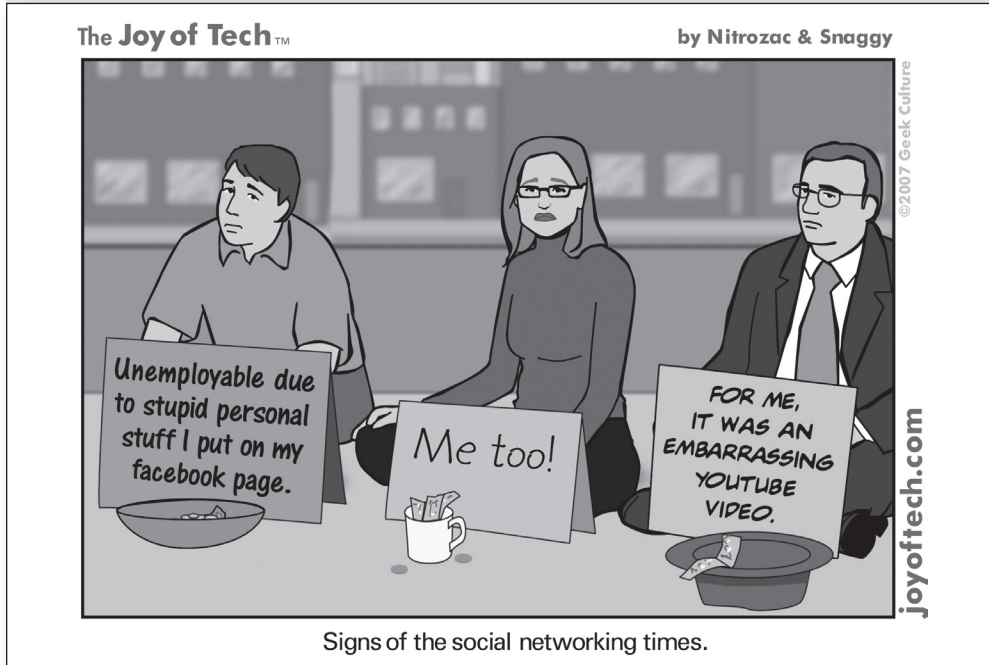
The displaying of health-risk or risqué behaviors may also have impact on an adolescent's future. Studies have shown numerous ways in which social media content can have negative impact. Such content may offend or confuse potential employers, college admissions personnel, adult role models, or romantic partners (Livingstone, 2008; Luscombe, 2010; Muise, Christofides, & Desmarais, 2009) (see Figure 9.5). While teens may post this information intending it for their friends, they may not realize that their audience of "friends" is over 1,000 people linked to their Facebook profile. An adolescent may not realize that the Facebook privacy settings have recently been reconfigured and that the content that was once digitally protected is now open to a global audience. Their every tweet is recorded and stored in the Library of Congress. Social media are social, and this often means that the concept of privacy in regard to what an adolescent displays is a constantly shifting illusion.

## Cyberbullying

Bullying is a serious problem that has the potential to cause both mental distress and psychological harm to victims. The Internet and social media have provided new venues through which children and young adults can hurt their peers. This phenomenon has come to be



Figure 9.5



known as cyberbullying, defined by Smith and his colleagues (2008) as “an aggressive, intentional act or behavior that is carried out by a group or an individual, using electronic forms of contact, repeatedly and over time against a victim who cannot easily defend him or herself” (p. 376). These electronic forms of contact seem to present endless opportunities, as they include social media websites such as Facebook and Twitter in addition to text messaging, email, blogs, online gaming, chat rooms, forums, instant messaging, video messaging, and picture messaging. Many people conceptualize cyberbullying as a particular entity or behavior. However, examples of online harassment include aggressive behavior, insults, denigration, impersonation, exclusion, outing others’ sexual preferences, hacking, stealing information, breaking into accounts, and creating damaging websites or profiles to defame another person (Willard, 2006). Not all adolescents are aware of the scope of the definition of cyberbullying. If you ask an adolescent if he has ever been “cyberbullied,” he may reply that he has not. But if you clarify by asking if he has ever had anyone hack into his Facebook account or impersonate him online, he may remember several such incidents.

Cyberbullying can be just as harmful, if not more harmful, than traditional “schoolyard” bullying (see Table 9.2). Traditional bullying occurs face-to-face, and there is often a physical component to the harassment. In contrast, online bullying offers perpetrators the advantage of anonymity. This can cause the perpetrator to act without regard for consequences, as well as reduce accountability and guilt for his or her behavior (Li, 2007). For victims, not knowing who their perpetrator is can lead to increased anxiety, especially if they fear encountering this person in their offline life (Shariff & Gouin, 2006).

Traditional bullying generally occurs at a specific time and place, such as on the playground during recess. In contrast, cyberbullying can occur anywhere and can potentially take place

**Table 9.2** Cyberbullying versus traditional bullying.

Description	Cyberbullying	Bullying
General Characteristics		
Face-to-face, with a physical component		X
Can happen 24/7, anywhere	X	
Can rapidly, widely, and easily spread embarrassing info	X	
Repetitive, aggressive acts or behaviors	X	X
No direct feedback from victim	X	
Bully Characteristics		
Bully acts without regard for consequences	X	X
Bully feels less guilty because he or she does not have to face victim	X	
Bully can be anonymous	X	
Bully does not fear punishment	X	
Effects on Victim		
Harmful psychological effects	X	X
Anxiety and fear of encountering bully in "real life"	X	
Higher levels of depression and low self-esteem	X	X
Fewer friends and trouble adjusting socially	X	
Enforcement		
Hard to track down perpetrator	X	
Enforcement can be difficult (due to free speech rights)	X	

24 hours a day. Victims can therefore feel constantly harassed. Even if they remain offline, increased anxiety can occur if the victim continually worries about what is being posted without his or her knowledge. In addition, the nature of the Internet as a communication tool makes it easy to rapidly and widely spread embarrassing information (Raskauskas & Stolz, 2007).

Similar to offline bullying, cyberbullying can have substantial psychological effects on victims. Children and adolescents who are victims of cyberbullying often have higher levels of depression and lower self-esteem (Ybarra, Espelage, & Mitchell, 2007). Victims consistently report academic problems, such as falling grades and lower attendance, which is likely a result of the victim's preoccupation with the bully and the situation (Beran & Li, 2007). Problems such as emotional distress, anger, sadness, detachment, externalized hostility, and delinquency are also common among victims (Patchin & Hinduja, 2006). In addition, victims are less likely to be prosocial and are more likely to internalize their problems, which can prevent them from

making friends and adjusting socially (Arseneault et al., 2006). Many of these effects have also been seen in victims of traditional bullying, supporting the idea that cyberbullying represents a serious problem.

A survey by the Pew Research Center found that 32% of adolescents reported having experienced some form of online harassment (Lenhart, 2007). Of these teens, girls ages 15 to 17 were most likely to have experienced cyberbullying, with 41% reporting having been harassed. Boys ages 12 to 14 years were least likely to be victims, with 22% reporting that they had been the targets of online harassment. A study by Hinduja and Patchin (2009) found that 11% of respondents identified themselves as cyberbullies, while almost half of those surveyed reported having witnessed these behaviors online. The varied prevalence rates may be explained by definitions of cyberbullying that differ among studies. Despite this variation in prevalence, these numbers indicate that a sizable minority of students are involved in cyberbullying in some way, whether as bullies or as victims.

Since cyberbullying occurs online, it is often difficult if not impossible to restrict cyberbullying behaviors. Parents cannot constantly supervise their children, nor do they have knowledge about everything their children encounter online. For this reason, cyberbullies often do not fear punishment (Kowalski & Limber, 2007). Parents are not usually as technologically proficient as their children and are often unaware of how to regulate or monitor their child's Internet use (Ybarra et al., 2007). Free speech rights also make it difficult to remove offensive postings or websites made by cyberbullies. If the cyberbullying occurs anonymously, it can be nearly impossible to track down the perpetrator (Li, 2007).

School efforts to combat cyberbullying have been lukewarm at best. School administrators are often fearful of becoming involved in cyberbullying incidents for fear of legal repercussions surrounding First Amendment rights, especially because many instances of cyberbullying occur at home and after school hours. In addition, if school officials are unaware of the potential negative effects of cyberbullying, they may not view it as a problem that deserves immediate attention (Hinduja & Patchin, 2009). Hinduja and Patchin state that behavior or speech can be restricted if it "substantially or materially disrupts learning; interferes with the educational process or school discipline; utilizes school-owned technology to harass; or threatens other students or infringes on their civil rights" (p. 116). At the legislative level, cyberbullying is not explicitly included in criminal laws, which provide the guidelines for law enforcement responsibilities. However, 47 states have enacted laws that address electronic forms of harassment (National Conference of State Legislatures, 2012).

## Sexting

The term *sexting* refers to sending, receiving, or forwarding sexually explicit messages or pictures. These messages can be sent over a cell phone via texting, or over the Internet via email or a social networking site. One 2011 survey found that 20% of teens had sent or posted nude or seminude photos or videos of themselves (National Campaign to Prevent Teen Pregnancy, 2008). Sexting does not typically represent a random or anonymous event; rather, it usually takes place in the context of existing offline relationships. A 2011 study found that in most cases of sexting, the sexual photos were intended to be viewed only by a romantic partner, such as a boyfriend or girlfriend (Dowdell, Burgess, & Flores, 2011). Two recent studies have deepened our understanding of sexting as more common than previously thought. In

one study of high school students, 17% of females and 18% of males had sent a sext, and 31% of females and 50% of males had received one (Strassberg, McKinnon, Sustaita, & Rullo, 2012). A second 2012 study focusing on high school students found that 28% of teens had sent a sext, and 31% had asked someone else for a sext (Temple, Paul, van den Berg, McElhany, & Temple, 2012). This study was the first to note that sexting was associated with an increased likelihood of having engaged in sexual behavior.

Why would a teen want to engage in sexting? Social media are a form of identity exploration, and part of adolescence is developing a sexual identity. Adolescents may use sexting as a way to explore the boundaries of their own sexual identities, and doing this through media may give an illusion of safety or anonymity. This feeling of anonymity may be just enough to get a teen to do something through the Internet that he or she might not be ready to do in front of another person.

One controversy in the area of sexting is how it should be addressed at the school or legal level. Sending a nude or seminude photo of an underage person can be considered distribution of child pornography. If this occurs across state lines—for example, if one teen goes to school in Washington, DC, and sends a seminude photo as a sext to a teen in Baltimore, Maryland—this becomes distribution of child pornography across state lines, a federal felony. It is reasonable to suspect that most law enforcement officials would prefer to spend their time chasing adult sexual predators rather than teens who sext, but the laws remain unclear on how these cases should be handled. News reports have highlighted stories about adolescents who have been charged with felony child pornography or juvenile-law misdemeanors as a result of sexting messages that reached beyond the intended audience (O’Keeffe & Clarke-Pearson, 2011). Other consequences of sexting include emotional distress and school suspensions. (Sexting is covered in additional detail in Chapter 5, but here we place it in the context of the social media landscape.)

## Online Solicitation

Given the anonymity of the Internet and the ease with which identity can be disguised on social media (see Figure 9.6), concerns have been raised about online solicitation of

children using SNSs. One study assessed the online patterns of sexual offenders (both Internet and non-Internet offenders) from 2008 to 2009 and found that nearly three-quarters of past offenders were unwilling to answer questions about their use of SNSs (Dowdell et al., 2011). Past offenders who did admit to using SNSs named MySpace as the site they most commonly visited. Over half of the Internet offenders admitted to disguising their identity while on the Internet, and 63.3% reported that they initiated conversations about sexual activity during their first contact with a stranger online (Dowdell et al., 2011).

Although a previous study had demonstrated that youth were less likely to be solicited on an SNS than in a chat room, the danger is still

**Figure 9.6**



SOURCE: Cartoon by Rob Cottingham (RobCottingham.com).

present and measurable (see Ahn, 2011). A national survey of 10- to 15-year-olds who had used the Internet within the past half year found that 15% had experienced an unwanted sexual solicitation while online (Ybarra et al., 2007). However, despite concerns about adults soliciting adolescents for sexual activities, most recent studies have found that sexual solicitation most often occurs between two teenagers. Concerns that the anonymity of the Internet would give rise to an outbreak of adults preying on unknowing adolescents have not been borne out by the research. Rather, social media appear to provide new opportunities for adolescents to experiment with their identities, sometimes in ways that are harmful to themselves and others.

## Benefits of Social Media

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The Internet and social media can be beneficial for many reasons. Users can communicate with family and friends, create rewarding social connections, and even obtain information about academics, news, and other events. While many problems are associated with social media use, the fact remains that there are significant benefits of this emerging form of communication.

### New Opportunities for Education and Prevention

Social media may present new opportunities for parents and pediatricians to discuss complex and challenging topics with their adolescents, such as sex, alcohol, and depression. Previous work has illustrated that references to health-risk behaviors, such as sexual behavior, alcohol consumption, and tobacco use, are commonly displayed by adolescents on social media (Moreno et al., 2010; Primack et al., 2011).

Preliminary evidence suggests that displays of sexual material on Facebook are associated with the reported intention to become sexually active (Connell, 2009). Adolescents who have engaged in sexting behaviors have been found to be more likely to report that they have begun dating and have engaged in sexual activity compared to those who have not sexted (Temple et al., 2012). In this 2012 study, sexting was also associated with risky sexual behaviors, but only among girls. Given these research findings, if parents notice sexual references on their adolescent's social media profile or displayed on his or her peers' profiles, they can take this as an opportunity to start a discussion. Such references may represent an interest in sexual behavior or an intention to become sexually active. If a parent finds a sext on a teen's cell phone, this represents an opportunity to discuss sexual identity and how to represent oneself using social media, as well as a chance to have "the talk" about sex overall. Using social media clues, parents may have a unique window in which to discuss sexual decision making or safe sex practices with their children prior to sexual initiation. Framing the discussion around a media representation of sex can pave the path to what can be a difficult conversation to initiate.

Other evidence suggests that displayed references to alcohol use on Facebook profiles are associated with alcohol use in real life. And it turns out that, just as discussions of alcohol use with teens in the clinical setting carry a different impact than some other kinds of talk regarding alcohol consumption, the context and content of the discussion matter. A 2011 study evaluated displays of alcohol use on the Facebook profiles of underage college students and found that Facebook displays that described problem drinking, such as driving while drinking or blacking out, were associated with higher scores on a problem drinking evaluation

(Moreno, Christakis, Egan, Brockman, & Becker, 2011). In comparison, displays of alcohol use on Facebook that did not include descriptions of intoxication or problem alcohol use were less likely to be associated with high scores on the problem drinking evaluation. Consider the teen who tells you in clinic that he had a beer at a party once: This patient is unlikely to trigger a flurry of referrals for alcohol abuse. Similarly, the Facebook display describing the “wine and book club night with the girls” is less worrisome than the “can’t remember how I got home last night” status update. Physicians and parents can use common sense when reading adolescents’ status updates that contain references to alcohol use, and consider both context and content. A concerning display about alcohol use should prompt a follow-up conversation. A 2012 study illustrated that older adolescents are open to discussing social media content with trusted adults, and that their preferred approach would be for the adult to “ask questions” rather than “make accusations” (Moreno, Grant, Kacvinsky, Egan, & Fleming, 2012).

Finally, one of the more prevalent and concerning illnesses among adolescents is depression. This problem is difficult to recognize and diagnose, and it is challenging for depressed adolescents to find ways to seek help (Eisenberg, Downs, Golberstein, & Zivin, 2009). Thus, it may be surprising that social media are places in which disclosures of depression symptoms are often displayed. A 2011 study found that approximately one-quarter of older adolescents displayed depression symptoms consistent with DSM-IV (*Diagnostic and Statistical Manual of Mental Disorders*, fourth edition [American Psychiatric Association, 2000]) criteria on their Facebook pages (Moreno, Jelenchick, et al., 2011). If you consider the date and time stamp on each of these disclosures, 2.5% of the profile met DSM-IV criteria for a current major depressive episode. Further, these comments were often noted and responded to by peers using the social media site. In this way, peers used social media to respond to these disclosures and provide support or encouragement (see Table 9.3). Social media may present new ways for peers to provide such support to friends when depression symptoms are present.

The follow-up study found that these displayed depression symptoms were associated with an increased likelihood of reporting depression symptoms during a clinical screening (Moreno, Christakis, Egan, Jelenchick, et al., 2011). These results are promising, although it is important to recognize that we do not advocate diagnosing depression formally using Facebook. A diagnosis of depression is based on symptom patterns over time and is best diagnosed in the clinical setting. However, social media may provide a new lens through which signs of depression can be recognized earlier and lead to improved treatment and outcomes.

The Media Practice Model identifies key factors in adolescents’ use of media and hypothesizes that adolescents select and interact with media based on who they are—or who they want to be—at the moment. Thus, the model posits that behaviors and disclosures made through media reflect actual behaviors and traits, or behavioral intent (Brown, 2000). Indeed, sexting appears to be a media expression of adolescent sexual intent or behavior rather than a distinct phenomenon limited to the digital world. While further work is needed to understand how this knowledge can be translated into clinical practice or educational interventions, parents and physicians can use these social media displays to prompt important conversations.

## Connection and Social Capital

Participation in social media offers individuals a form of social capital, which is an important feature of healthy, effective societies (Putnam & Goss, 2002). Social capital consists of

**Table 9.3** Examples of Depression Symptom Displays and Comments; Responses From Online Peers

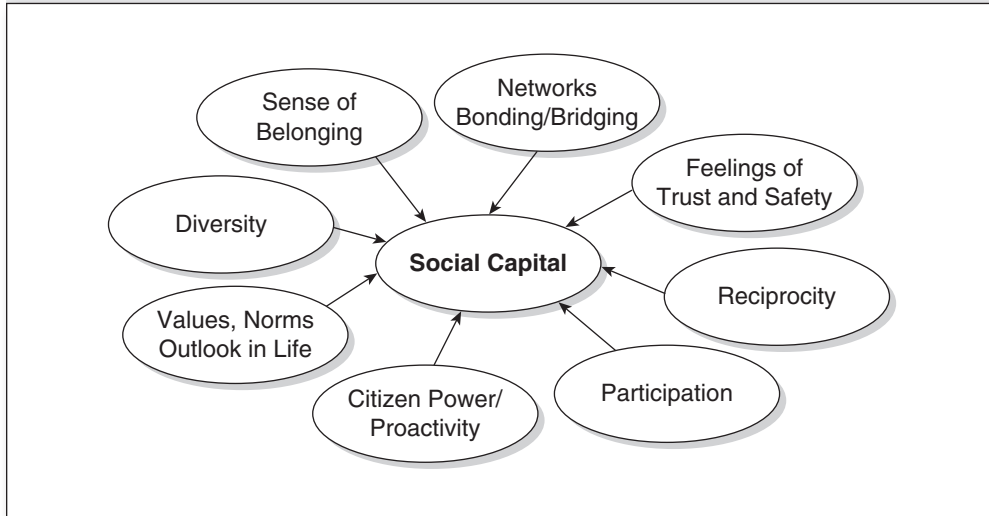
<b>Example 1:</b> 18-year-old female	
<b>Status update</b>	<i>"Feeling so bad today, like nothing is going to get better!"</i>
<b>Responses from peers</b>	<i>"Hang in there baby!"</i> <i>"It will get better, I promise"</i> <i>"Want to get coffee tomorrow?"</i>
<b>Example 2:</b> 19-year-old male	
<b>Status update</b>	<i>"Like a knife to my heart, like a bullet to the chest. . . . can't stop crying"</i>
<b>Responses from peers</b>	<i>"I'm coming over and I'm bringing the X box"</i> <i>"Are you ok?"</i>
<b>Example 2:</b> 20-year-old female	
<b>Status update</b>	<i>"Feel like I can't do anything right these days, sad and frustrated, blech."</i>
<b>Responses from peers</b>	<i>"But we love you!"</i> <i>"Yes, you are great!"</i> <i>"I agree"</i> <i>"Want us to take you out tonight?"</i>

SOURCE: Moreno, Jelenchick, and colleagues (2011).

the resources available to people through their social interactions, and researchers have postulated that individuals with greater social capital have large, diverse social networks, whereas people with smaller, less diverse networks have less social capital (Valenzuela, Park, & Kee, 2009) (see Figure 9.7).

Increasingly, these social networks have come to include online interactions—individuals consciously choose to invest in their social capital by engaging in social media and social networking websites. Internet communications, particularly through social media, are unique in that they combine aspects of mass media with interpersonal communication in order to build relationships between groups of individuals without a physical connection (Pasek, More, & Romer, 2009).

The term *social capital* has been used in many different ways and has a wide range of definitions. All of these definitions are based on the idea that social networks have value and that individuals can derive benefit from their interactions and relationships with others (Ahn, 2011). Given that SNSs allow individuals to create much larger social networks than they could offline, it seems logical that using an SNS could help adolescents build social capital. One 2007 study found that increased Facebook use was positively correlated with bridging and bonding in college students (see Ahn, 2011).

**Figure 9.7** Components of social capital.

SOURCE: Boeck, Fleming, and Kemshall (2006).

There are several hypothesized ways in which online social networks could benefit adolescents. For instance, SNSs allow adolescents to access health information that they might be too uncomfortable to ask their pediatrician about, such as sexual health information. Further, they allow adolescents with chronic diseases to join online support groups to help them deal with new diagnoses or share stories with others who understand their situation in life (O’Keeffe & Clarke-Pearson, 2011). Additionally, SNSs give adolescents the benefit of being able to start and maintain relationships despite physical distance (Jent et al., 2011). This may be particularly salient for adolescents who move frequently or have family members who live abroad.

## Civic and Political Engagement

Adolescents are increasingly using the Internet and social media to obtain information. According to a 2009 survey by the Pew Research Center, 62% of teens use the Internet to get information about current events and politics online (Lenhart et al., 2010). Many campaigns and organizations have used social media as a platform for fostering civic and political engagement among users, particularly adolescents and young adults. In a recent article on this subject, Valenzuela and his colleagues (2009) noted that “investment in social networks enables individuals to develop norms of trust and reciprocity, which are necessary for successful engagement in collective activities” (p. 877).

Some organizations have developed social networking aspects within their own websites to develop online communities through which users can learn about issues that are important to them and consequently participate in offline activities related to a certain cause. For example, TakingITGlobal is an organization that provides youth worldwide with an online community to facilitate education, social entrepreneurship, and civic engagement.



On this website ([www.tigweb.org](http://www.tigweb.org)), users can find other individuals—locally or globally—who are interested in similar political and civic issues and with whom they can converse, develop projects, or promote events, campaigns, and causes (“About TIG,” 2012). Another use of the social networking platform occurred during the 2008 presidential election, when the Obama campaign created the website [my.barackobama.com](http://my.barackobama.com) to enlist volunteers to engage in campaign activities.

Other campaigns and causes have used existing social networking sites for promotion and engagement. For example, the human rights activism organization Amnesty International relies on Facebook to share news, promote events, facilitate discussion among followers, and even to organize major protests (Stirland, 2007). In terms of global impact, Facebook has been credited for contributing to the political revolution in Egypt in 2011. This social networking site was used to channel public sentiment, organize protests, and rapidly share information (Sutter, 2011).

## Academic Work

Social media and social networking sites offer students collaborative environments in which they can interact with other students or teachers to enhance traditional classroom-based learning. The ubiquity of social media and social networking sites cannot be understated. A 2010 survey by the Kaiser Family Foundation found that 74% of all 7th to 12th graders had at least one profile on a social networking site, while another study found that 98% of college students had a Facebook profile (Egan & Moreno, 2011; Rideout et al., 2010). Using social media for educational purposes may offer schools a way to incorporate learning into a medium that students are familiar with and are already using (Strasburger, 2012).

Websites such as Edmodo, Wiggio, and Edublogs can be used in schools to facilitate learning and connect students to their peers and their teachers. For example, Edmodo ([www.edmodo.com](http://www.edmodo.com)) is a microblogging platform set up similarly to Facebook (“Features,” n.d.). It is safe and easy to use, in that students are not required to set up an account with their email address. Students can upload pictures and videos, take quizzes, create calendars, and share information with others. Teachers can send reminders, monitor their students’ work, and even send text messages to students.

Some educators also believe that allowing and encouraging their students to post their schoolwork on social media websites provides them with motivation to perform higher-quality work, since their assignments and projects are shared with a broad audience. By using social media websites, students can collaborate on projects and receive feedback on their work from teachers and other students. Parents also have the opportunity to see their child’s work and get a better sense of what is happening in the classroom (McMullen, 2012). A 2011 study by Pollara and Zhu examined the use of Facebook in a high school and university science-mentoring project to determine if the implementation of social networking would improve mentor-mentee relationships and increase student participation and dialogue. The researchers found that students and mentors who interacted regularly had a stronger relationship than those who did not. Students who were surveyed about their experience stated that they believed they had learned more by using the social media page, that it was helpful for achieving their project goals, and that they would like to use Facebook in the future for educational purposes (Pollara & Zhu, 2011).

An interesting application of the video chatting site Skype was implemented at Marquette University to connect Spanish language students in the United States with English-learning

counterparts in South America. Students were able to receive weekly one-on-one tutoring with a native language speaker. College students have also been noted to use Facebook to reflect on the university experience and exchange practical and academic information, indicating that educators have the potential to share information on this platform (Selwyn, 2009). In addition to academic applications, educational institutions are using social media to communicate with students. For example, Twitter is used by many universities to relay important announcements to students (Silverman, 2012).

## Conclusion

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Throughout this chapter we have explored what makes social media “social,” and which social media sites are currently most popular among adolescents. We fully expect that the popularity of these sites will change over time, and that new ones will arise. However, the driving forces of social media—interaction, connection, social capital—are likely to stand the test of time and be present in any popular social media site of the future. Thus, the inherent risks and opportunities presented by social media are likely to evolve over time but remain fundamentally constant.

Research in this area is still in its nascent stages, and much work remains to be done. Future research should explore how to translate what we have learned about social media and how adolescents use them into prevention messages and health education. Social media provide new opportunities to target health messages to groups at risk. Social media messages can also be distributed quickly and cheaply, resulting in an effective intervention that is easily scalable to the population level.

Research is needed on how to prevent the negative risks associated with social media, such as cyberbullying. On the positive side, future research can give us a better understanding of how to expand the “naturalistic” experiments that are already taking place on Facebook, such as peers providing support when depression symptoms are disclosed. There is much to be learned, but this new knowledge rests on a foundation of research around traditional media, adolescent behavior, and communication science. In many ways, social media provide us with a new lens through which we can view the ancient phenomenon of adolescent behavior.

## Exercises

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1. Should social media be monitored? If so, what group would be the best candidate to do so: law enforcement, health professionals, or school officials? For what ages would it be appropriate to monitor media behaviors?
2. Many adolescents feel constantly connected to media through smartphones and tablet computers. Is it possible for college students to take breaks from social media without compromising their educational and social experiences?
3. How do you feel when you are not online? Do you feel as if you are missing out on an important part of your social life?
4. Consider some ideas and strategies for providing education about the risks and benefits of media use to the next generation of adolescents.

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# Video Games

Jeanne Funk Brockmyer

**V**ideo games (including games played on dedicated systems, personal computers, and cell phones) are no longer the emerging phenomena they were in the 1990s. Instead, these games have established themselves as a permanent leisure choice for all age groups, and particularly for children and adolescents. This chapter will review the history of video games and describe current research in the following areas: time commitment, game preference, game ratings, the impact of violent games, physical and mental health risks, the potential for positive applications, public policy issues, and recommendations for parents. The term *video games* includes all electronic games played on any platform.

## The Development of Video Games

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The first video game was introduced about 40 years ago. In the early 1970s, adult consumers became fascinated with the first arcade version of Pong, which was basically a simple visual-motor exercise. Soon home systems and cartridge games became available, and video games became popular across all age groups. In the early 1980s, consumers became disenchanted with uninspiring copycat games, and sales dropped precipitously. At this point, video games were dismissed as just another vanishing toy fad.

The industry recovered in the second half of the 1980s, when special effects were improved, new game accessories were made available, and games with violent content were promoted. In addition, the industry introduced cross-media marketing, with game characters featured as action figures and in movies. At the same time, children became targeted consumers. Beginning with *Mortal Kombat*, violent games with ever more realistic graphics became an

industry staple. The typical goal of violent games is to maim or kill one's opponent, and in many cases players can choose the level of realism of the battle, including very graphic portrayals of injuries. The introduction of "massively multiplayer online games" (MMOGs) and their most popular subset, "massively multiplayer online role-playing games" (MMORPGs), further strengthened the popularity of game-playing (see Figure 10.1). Spurred by the mega-hit *World of Warcraft*, MMORPGs gained wide acceptance in the early 2000s.

**Figure 10.1** A massively multiplayer online game (*League of Legends*).



"Casual games" are another category that has maintained gaming's popularity. These games are often free, typically have very simple rules, and do not require a lengthy time commitment or special skills. *Pac-Man* is considered the first casual game, debuting in 1980 as an arcade game. Most casual games are now played via the Internet, and women are the most frequent consumers of this game genre (Casual Games Association, 2011).

In 2006, gaming was again revolutionized via systems with wireless controllers, such as the Wii, which detect movement in three dimensions. Another feature allows the user to remain connected to the Internet while the console is on standby. Fueled by the success of multifunctional systems, wireless controllers, and the instant accessibility of embedded and Internet games via cell phones, sales of video games and related products now typically exceed several billion dollars annually worldwide (Entertainment Software Association, 2012).

## Time Commitment

Video games are now well established as one of the most popular choices in the array of leisure activities available across childhood and adolescence. A 2010 report by the Kaiser Family Foundation indicated that, among 8- to 18-year-olds, "The transformation of the cell phone into a media content delivery platform, and the widespread adoption of the iPod and other MP3 devices, have facilitated an explosion in media consumption among American youth"



(Rideout, Foehr, & Roberts, 2010, p. 3). In another Kaiser study that included children ages 6 months to 6 years, 11% of children played video games on a typical day (Rideout & Hamel, 2006). In 2011, the Youth Risk Behavior Survey was conducted among students in Grades 9 through 12. Survey results were obtained nationally by the Centers for Disease Control and Prevention (CDC) and locally by state and local education and health agencies (CDC, 2012). Survey results indicated that nearly one-third (31.1%) of the sample played video or computer games for three or more hours on an average school day.

Gender differences in time commitment to game-playing are consistently reported, with boys playing more than girls at all ages (Hamlen, 2010). Understanding gender differences is critical to grasping the implications of some game-playing habits, so gender-specific information will be selectively highlighted throughout this chapter.

International studies also demonstrate the popularity of video games, as well as gender differences. For example, Gentile, Choo, Liau, Sim, and Li (2011) reported that most children in their sample of elementary and middle schoolers from Singapore played video games, with boys generally playing more than girls. In a study of German middle schoolers, only about 10% reported that they had never played video games, although, again, boys played more than girls (Krahe & Möller, 2011).

Most time-use studies identify a small group of players who spend considerable time playing each week. The possibility that some become addicted to video games has been debated for some time and will be discussed later in this chapter.

## Why Are Video Games Popular?

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The reason for the popularity of video games has received some scientific attention. Funk, Chan, Brouwer, and Curtiss (2006) used focus groups to directly examine the game-playing experiences of children and young adults. Pure entertainment value was mentioned by both groups. Children noted pride in game accomplishments as a primary motivator for play, while adults described relief from boredom and positive mood changes. Interacting with others was described as a social benefit of game-playing by both children and adults. Some adults reported that engaging in antisocial activities through the fantasy of video games is appealing. Both children and young adults noted becoming highly absorbed in game-playing; this experience was described in both positive and negative terms, with both children and adults noting that absorption in some games could be scary. These findings are generally consistent with those reported by other researchers (Olson, 2010; Przybylski, Weinstein, Murayama, Lynch, & Ryan, 2012; Ryan, Rigby, & Przybylski, 2006).

The experience of being psychologically engaged is an important aspect of game-playing for many (Brockmyer et al., 2009; Przybylski, Rigby, & Ryan, 2010). Because those who research this topic come from different research traditions, there is some definitional confusion. Terms such as *immersion* and *engagement* are used interchangeably by some, but have very specific meanings for others. Regardless of terminology, it is believed that becoming deeply involved in playing video games may precipitate an altered state of consciousness. When positive, this may be an example of the “flow” state described by Csikszentmihalyi and Csikszentmihalyi (1988). *Flow* is a term used to describe the intense feelings of enjoyment that occur when a balance between skill and challenge is attained in an activity that is intrinsically

rewarding. It is believed that being in a flow state may enhance learning and make a person more susceptible to suggestion. It has been proposed that being deeply engaged in playing video games could impact how the effects of game content carry over into real-world behavior, which could be especially important in the case of violent content (Brockmyer et al., 2009; Przybylski et al., 2010).

In summary, some consistent themes emerge from research on reasons for playing video games. On the most basic level, video games are purely entertaining. Most research has been done with young adults, who seem to enjoy arousal, competition, and avoidance of boredom. Children also report that the competitive quality of game-playing is important. Both children and adults acknowledge the social interaction opportunities provided by playing video games and describe periods of intense involvement in game play, which seems to enhance the experience.

## Game Ratings

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As video games became a common leisure choice for children and adolescents, researchers and policymakers, as well as some members of the general public, became concerned about the increasing realism and graphic violence of many popular games. As a result, pressure was placed on the industry to self-regulate by the threat of government-imposed regulation. The Entertainment Software Rating Board (ESRB) was established in 1994 by the Entertainment Software Association (ESA) (see <http://esrb.org>).

The ESRB's system is age based and covers console games, PC software, and Internet games (Entertainment Software Rating Board, 2012). The age-based ESRB game classifications are presented in Table 10.1. Each game is rated independently by three trained raters. Raters come from a variety of occupational and ethnic backgrounds and are paid for their work. Because a solely age-based system did not seem adequate, content descriptors were added to highlight content in the following areas: violence, sexual themes, and language. Other specific descriptors such as the presence of alcohol and tobacco use may be added at the discretion of each individual rater. Rating information appears on game packaging (see Figure 10.2). Some researchers have found that the ratings provided by the ESRB do not correspond to content, particularly violent content, as perceived by consumers (see, e.g., Thompson, Tepichin, & Haninger, 2006).

The gaming industry asserts that violent games account for only a small percentage of sales and that the ultra-violent games are only bought by adults. In 2000, a Federal Trade Commission (FTC) investigation found that children were targeted consumers for violent video games as well as for other violent media. In a later report, however, the FTC noted that the video game industry had made great strides in restricting the marketing of violent M-rated games to children (FTC, 2009). In addition, the FTC noted that rating information was more prominently displayed and that retailers were doing a better job of restricting children's access to games rated for mature audiences.

In addition to possible inadequate capture of violent content, there are other concerns about the usability of the game ratings system. First, many parents are either not aware of or misperceive the ratings' descriptors (Becker-Olson & Norberg, 2010). One survey of 94 parents of children ages 5 and under found that even well-educated parents lacked familiarity

**Table 10.1** Summary of Primary ESRB Rating Categories

Rating	Age Description
Early Childhood (EC)	Age 3 and older. No inappropriate content.
Everyone (E)	Age 6 and older. May have minimal violence and language.
Everyone 10 and older (E10+)	Age 10 and older. Mild violence, mild language, and minimally suggestive themes.
Teen (T)	Age 13 and older. Violence, suggestive themes, crude humor, minimal blood, infrequent strong language.
Mature (M)	Age 17 and older. Intense violence, blood and gore, sexual content, strong language.
Adults Only (AO)	Age 18 and older. Prolonged scenes of intense violence and/or graphic sexual content and nudity.
Rating Pending (RP)	Submitted to the ESRB, awaiting final rating.

SOURCE: Adapted from information presented at <http://www.esrb.com>.

**Figure 10.2** ESRB rating information appears on video game packaging.



with video game ratings (Funk, Brouwer, Curtiss, & McBroom, 2009). In a recent survey, parents expressed a desire for one ratings system that could be applied to all entertainment media (Gentile, Maier, Hasson, & de Bonetti, 2011).

Another problem is that, for some, ratings appear to make mature content more desirable, a “forbidden fruit” effect. In research on the Pan European Game Information system (similar to the ESRB age-based system), Dutch youth ages 7 to 17 read descriptions of fictitious video games—some with age ratings, some with content ratings, and some with no rating—and then rated how much they would like to play the game. The more restrictive the age label, the more attractive the video games were judged to be. Labels had a stronger effect for boys than for girls, and there was no difference between age-based labels and violent-content labels: Both types of restrictive labels made video games forbidden fruits. The researchers suggested that parents need to be more directly involved in choosing and personally monitoring children’s games (Bijvank, Konijn, Bushman, & Roelofsma, 2009).

In summary, the video game ratings provided by the ESRB do give information about game content and about the age appropriateness of this content from the perspective of the ESRB raters. There are continuing problems, however, including lack of agreement with consumer perceptions of content, failure to enforce ratings, lack of consumer familiarity with ratings, and the possibility that restrictive ratings actually make games with mature content seem more desirable to children and youth.

## **A Closer Look at Violent Video Games**

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### **The Appeal of Violent Video Games**

One of the most interesting questions about violent video games is why they are so popular (see Figure 10.3). In addition to previously discussed reasons for the general popularity of video games, violent content seems to have unique appeal. The reasons behind the attraction to violent media have long been a subject of professional study and debate (Funk, 2000). Industry spokespersons often cite catharsis or tension release as a benefit of exposure to many forms of violent media, but this claim has been disproven in a sizable body of research (Bushman, Chandler, & Huesmann, 2010). Some have suggested that children and adolescents may seek out violent entertainment to meet their need for new experiences, and for pure physiological arousal (Raney, Smith, & Baker, 2006). For children and adolescents, it is most likely that media violence is appealing to different individuals for different reasons. Personal history seems to be a key variable, with callous children who have been overexposed to violence looking for continuing arousal, while anxious and emotionally reactive children may be trying to master anxiety-provoking experiences (Cantor, 1998).

There has been minimal research directed specifically to understanding the attraction of violent video games. In the focus groups described earlier, participants reported enjoying engaging in antisocial activity during game-playing, such as extreme defiance of authority and rule-breaking (Funk et al., 2006). Jansz (2005) suggests that the reason that violent video games are so appealing to adolescent males is because they provide the adolescent with the opportunity to choose to experience different emotions, some gender appropriate (anger) and some not as socially acceptable (fear).

### **The Importance of a Preference for Violent Video Games**

Over the past several years, researchers have given considerable attention to the importance of the widespread preference for violent video games. Neuroimaging research shows that even brief exposure to violent media affects cortical networks that regulate behavior, possibly decreasing control over a variety of behaviors, including reactive aggression (Kelly, Grinband, & Hirsch, 2007). Behavioral research suggests that there may be a cumulative effect of long-term exposure to violent media (Prot, Anderson, Gentile, & Swing, 2013, in press; Krahe, B., 2013). For example, in research with American 3rd through 5th graders, children's consumption of media violence early in the school year predicted higher verbally, relationally, and physically aggressive behavior, as well as less prosocial behavior later in the school year (Gentile, Coyne, & Walsh, 2011).

**Figure 10.3** Example of a violent video game (*Gears of War: Judgment*).



## An Integrative Theoretical Model

Craig Anderson and his colleagues have proposed an integrative theoretical model to explain the occurrence of aggression: the General Aggression Model, or GAM (Swing & Anderson, 2010). They have applied this model to understand the possible effects of playing violent video games. In the GAM, there is continuous reciprocal interaction between the person and the environment. Three key elements contribute to this cycle: input variables related to both what the person brings to the situation and the current environment; the person's current internal state; and outcomes that result from decision processes. The continuous reciprocal interaction among these variables can influence both current and future cycles of aggression.

## Mechanisms

Commonly recognized mechanisms for the effect of exposure to violent video games are summarized in Table 10.2. Short-term effects, either observable behavioral change or change in some specific aspect of thinking or emotion, are the immediate result of a specific game-playing experience. Short-term effects may be representative of real-life experience, and they may be long-lasting and cumulative; however this is not proven in the laboratory setting. Long-term effects are determined by examining relationships among certain behaviors, personality characteristics, cognitions, and game-playing habits, such as a preference for violent games. In some cases, long-term effects are examined by studying the same group of individuals over a period of time. Some studies examine both immediate (short-term) effects and longer-term relationships by combining experimental manipulations with surveys or longitudinal data collection.

**Table 10.2** Mechanisms to Explain the Impact of Violent Video Games

Mechanism	Description	Time Span
Observational learning	After observation of the behavior of others, these behaviors are integrated into the individual's behavioral repertoire	Both short term and long term
Imitation	Learned behaviors are taken from the repertoire and exhibited	Short term
Schema development	Knowledge structures about the typical organization of daily experience develop as a way to manage information efficiently	Long term
Script development	Specific types of schemas for events develop to guide behavioral reactions	Long term
Priming	Violent media activate aggressive schemas	Short term
Automatization of aggressive schemas	Repetitive priming of aggressive schemas makes them chronically accessible	Long term
Arousal	Physiological arousal occurs in response to a particular stimuli; aggressive stimuli cause aggressive arousal	Short term
Excitation transfer	Misattribution of the source of aggressive arousal occurs; this could lead to aggression	Short term
Cognitive desensitization	The belief that violence is common and mundane decreases the likelihood that moral evaluation will inhibit aggression	Long term
Emotional desensitization	Numbing of the emotional response to violent actions or experiences decreases the likelihood that moral evaluation will inhibit aggression	Long term

NOTE: For a comprehensive discussion of these theoretical mechanisms, see Anderson and colleagues (2004).

Regarding the effect of exposure to violent video games in the short term, observational learning and imitation of game actions are possible. Increased aggressive arousal is a well-established short-term effect of playing violent video games. Misattribution of the source of aggressive arousal could lead to aggressive behavior (excitation transfer). In other words, a child who is shoved in a crowded school hallway could misinterpret this random and innocent act as being intentional and then deliberately shove someone else.

Over the longer term, game-playing has many characteristics of a powerful learning environment. In the case of violent video games, players experience repeated demonstrations of

violent behavior, coupled with the reward of “winning” for choosing built-in violent strategies. Successful players will consistently choose the preprogrammed violent alternatives and receive cycles of positive reinforcement, which may increase the likelihood that these aggressive behaviors will be internalized and accessible later, outside the game-playing situation.

From another perspective, it is possible that the actual structure of experience could be affected by repeated exposure to violent video games (Bushman et al., 2010; Funk, 2006). Children learn general social rules and specific behaviors from observation, practice, and reinforcement. The development and internalization of behavioral scripts is one component of this process. A behavioral script is a set of situation-specific expectations and behavioral guidelines. A behavioral script helps an individual to predict what will happen in a certain situation and to implement a preprogrammed sequence of behaviors without really thinking about it. For example, most adults have driving scripts: Find the keys, walk to the car, open the door, get in the car, shut the door, put on the seat belt, turn on the ignition, and so forth. A restaurant script is another common example: Walk in the door, be seated, order, eat, pay, leave. Scripts may be triggered by internal or by situational cues, causing the individual to behave based on the previously internalized set of guidelines. Though they increase efficiency, scripts are not always entirely accurate and may cause an individual to misinterpret or disregard new information. Perceived experience may even be altered to conform to a script. This explains why it can be difficult to get used to a new car: Your driving script must be altered to accommodate differences in the location of the windshield wipers and other controls.

During childhood and adolescence, scripts are constantly being developed and revised in response to many different types of learning experiences. In theory, a person could develop and internalize scripts for aggression based in part on playing violent video games. Exposure to violent video games can also prime existing aggressive scripts; if this happens over and over, the scripts will become easily accessible to guide behavior. Games with more realistic storylines may be even more likely to foster script development, as they have an added element of pseudocredibility.

## Desensitization to Violence

Desensitization to violence is a possible outcome of exposure to media violence, as well as a mechanism that may explain the link between such exposure and aggressive behavior (Brockmyer, 2013). Desensitization may be one of the most important unintended consequences of exposure to media violence, as it could affect many social interactions, including a person’s willingness to respond to others in need. Recent research has examined both psychophysiological and behavioral indicators of desensitization following exposure to violent video games. For example, Englehart, Bartholow, Kerr, and Bushman (2011) combined electroencephalographic and behavioral measures to examine the short-term impact of playing a violent or nonviolent video game. The primary physiological measure of interest was the P3 amplitude. A smaller P3 response to violent images indicates weaker activation of aversive motivation (motivation not to perform a behavior), in this case to the use of aggression. After game-playing, participants viewed violent and nonviolent pictures while their brain activity was measured, and then they completed a competitive reaction time task. Participants with low prior exposure who played a violent game had smaller P3 amplitudes than low-exposure participants who played a nonviolent game and demonstrated more aggressive responses

during the reaction time task. The authors concluded that their results demonstrated short-term desensitization after playing a violent video game and that this desensitization explained increased aggression (Englehart et al., 2011). Bushman and Anderson (2009) measured behavioral responses after study participants had played either a violent or nonviolent video game or had viewed a violent or nonviolent movie. They found that individuals were less likely to aid someone in need after either playing a violent video game or viewing a violent movie (as opposed to the nonviolent alternative), suggesting short-term desensitization to the needs of others.

It is possible that long-term exposure to violent video games may result in a degree of permanent desensitization, as demonstrated by lower empathy. In research with children ages 5 to 12, more exposure to video game violence was related to lower scores on vignettes measuring empathy in everyday situations (Funk, Buchman, Jenks, & Bechtoldt, 2003). Krahe and Möller (2010) surveyed a large sample of 7th and 8th graders in Germany twice over a 12-month period. Self-reports of habitual violent media (including violent video games) usage were related to self-reports of lower empathy and more physical aggression at the end of the 12-month period. Analyses suggested that higher aggressive and lower prosocial behavior resulted from aggression becoming a normalized behavior, which could indicate desensitization. Similar findings were reported by Krahe, Möller, and their colleagues (2011). In addition, higher exposure to media violence was associated with greater enjoyment of the violent scenes presented during the experiment. In a 2010 meta-analysis (described in detail below), exposure to violent video games was significantly related to lower empathy (Anderson et al., 2010).

In summary, psychophysiological, behavioral, and survey data all indicate a need for additional research into the possible desensitizing effects of exposure to violent video games.

## Evaluating Research on the Effects of Exposure to Violent Video Games

For over three decades researchers have been examining the effects of exposure to violent video games. In this research area, it is important to use multiple study methods and to examine both short- and long-term effects. Though there are still those who disagree, it must be recognized that most available research on violent video game effects does report some type of negative ramifications, ranging from immediate increases in aggression to longer-term effects, including desensitization to violence. But how much attention should be given to a minority of studies with different outcomes? Meta-analytic research (reanalysis that combines the results of many studies looking at the same question) has promise for resolving any remaining controversy.

In 2010, Anderson and his colleagues conducted meta-analyses of research from Japan and Western countries (Anderson et al., 2010). They included studies that met strict, well-established research criteria, such as those that used the amount of time spent playing *violent* video games (not all video games) as the measure of exposure to violent video games. Some unpublished studies were included (from, e.g., conference presentations) when they met these stringent criteria. Combining almost 400 studies, Anderson and his colleagues' sample included over 130,000 participants. As found in previous smaller-scale studies, exposure to video game violence was positively associated with aggressive behavior, aggressive cognition, and aggressive affect, as well as to desensitization, lower empathy, and less prosocial behavior.



Ferguson and Kilburn (2010), who had previously conducted more limited meta-analyses, criticized the 2010 paper by Anderson and his colleagues, stating that the work was biased and its conclusions based on misinterpretation. These concerns were subsequently addressed by three of the meta-analysis paper's authors (Bushman, Rothstein, & Anderson, 2010), who noted, "We rely on well-established methodological and statistical theory and on empirical data to show that claims of bias and misinterpretation on our part are simply wrong" (p. 182). An informed reader will find that Bushman and his colleagues' response is well reasoned and conclusive and their meta-analysis definitive. It seems clear that exposure to violent video games can lead to negative outcomes for some individuals. This conclusion is supported by the American Psychological Association's 2005 policy statement recommending the reduction of all violence in video games and interactive media marketed to children and youth.

### High-Risk Players and a Relative Risk Model

Several researchers have attempted to determine what personality or other factors may explain or change the relationship between playing violent video games and various outcomes. Obviously not all players who play first-person shooter games actually kill someone (although there may be other more subtle effects for many players that are difficult to measure, such as desensitization). A relative risk model suggests that the more risk factors a person has, the more likely it is that there will be a negative outcome. Exposure to violent video games can be conceptualized as one potentially modifiable risk factor for aggressive behavior. First recognized in the mid-1990s, high-risk players are those who may be drawn to violent video games because of preexisting adjustment problems (Funk & Buchman, 1996b). Game-playing may then have a causal role in either perpetuating preexisting problems or in contributing to the development of new problems. For example, some children with academic problems may use video games as either an escape from schoolwork or as an area in which they can excel. Although there could be temporary benefits, such as an increase in self-esteem, over the long term academic problems may worsen because of this strategy, leading to a decrease in self-esteem (Funk & Buchman, 1996a).

Importantly, risk factors may be balanced by protective factors (Funk, 2003). Protective factors include such external factors as supportive and involved parents, socioeconomic stability, and individual characteristics such as an even temperament and cognitive strengths. Gentile and Bushman (2012) presented data to support a risk and resilience model to explain media violence effects in general. They surveyed 3rd through 4th graders (including self and peer reports), as well as their teachers and parents, at two different times over the course of a school year. The researchers examined both risk and protective factors known to be related to aggressive behavior, including gender (female gender is protective; male gender increases risk), prior physical victimization, hostile attribution bias (the tendency to interpret neutral behavior as aggressive), parental monitoring of child's media use, and previous child aggressive behavior. Increased risk at the first survey was associated with increased aggressive behavior at the time of the second survey. Having more protective factors at the beginning of the study was associated with less aggression at the end of the study. The greatest risk of aggression occurred with multiple risk factors. Important to the present topic, exposure to media violence seemed to have an impact similar to that of the other risk factors that were assessed, which was likewise moderated by protective factors.

Regarding violent video games specifically, two factors may be important risks for negative impact. The tendency for players to become deeply engaged in game play has already been discussed. Personality characteristics are another potentially important risk factor (Chory & Goodboy, 2011). Przybylski and his colleagues (2010) found that individuals high in trait aggression had a stronger preference for violent games than those without that characteristic. For such players, greater exposure to violent content may result in more impact, although this possibility needs further research. Hartmann, Toz, and Brandon (2010) examined relationships between empathy and justification of violence as these related to guilt in response to committing acts of virtual violence. They found that unjustified virtual violence triggered a stronger guilt response in players than when the violence was “justified,” especially for players with stronger empathy. It is possible that individuals with lower trait empathy are more drawn to virtual violence, both justified and unjustified, and more susceptible to negative impact from this experience. Of interest, when shooting a virtual opponent was presented as being justified, even the more empathic players did not report feeling guilty.

Research on factors that may affect the impact of exposure to violent video games is intriguing and suggestive; however, much more work is needed to fully understand individual differences in the risk for negative outcomes from exposure to violent video games, as well as those characteristics that are protective. It is clear that a preponderance of research indicates that exposure to violent video games increases the relative risk of aggression and desensitization to violence.

Next we will consider other risks and benefits associated with playing video games.

## The Negative Impact of Gender Stereotypes

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The objectification, sexualization, and mistreatment of women in video games is another area of concern (see Figure 10.4). Women are often portrayed as helpless victims or brainless sex objects, and these stereotypes in video games are acknowledged even by those who do not regularly play video games (Dill & Thill, 2007). Although some recent games include powerful women, most of these are depicted with unrealistically sexualized body types. Brenick, Henning, Killen, O'Connor, and Collins (2007) found that males were more likely than females to find these stereotypic depictions to be acceptable. Yao, Mahood, and Linz (2010) examined the relationship between exposure to a sexually explicit video game with female objectification content and participants' subsequent willingness to sexually harass a female. Male college students first played either a sexually explicit video game or one of two control games. Then they were given a mixture of words and nonwords and asked to determine whether or not the stimulus was a word. How fast they made this decision was the variable of interest, with faster reaction time indicating greater accessibility to the ideas represented by the words. Two groups of stimuli were administered; each group contained two sets of words. The first group of stimuli was designed to compare participants' reaction time to either sexual words or neutral words. The second group included either words that described women as sex objects or words with nonobjectifying descriptions of women. Those who played the sexually oriented video game had faster reaction times in responding to sexual and sexually objectifying words compared to their response time for neutral words and nonwords, and compared to participants in the two control conditions. In addition, after finishing the reaction time task,

**Figure 10.4** *World of Warcraft* is an example of a sexually explicit video game that objectifies women.



participants completed a scale that indicated their likelihood of sexually harassing a female coworker in several scenarios. Playing the sexually explicit video game was associated with a higher self-reported likelihood of sexually harassing a female. The authors concluded that exposure to sexually oriented video games with themes of female objectification may encourage men to view women as sex objects, as well as increase the possibility of inappropriate behavior toward women.

## Video Games and Health Risks

### Physical Injury

Since video games first became popular, there have been case reports of various types of negative health impact, primarily temporary musculoskeletal injury (see, e.g., Greene & Asher, 1982). The introduction of wireless gaming systems such as the Wii created new opportunities for injury. In addition to simply pushing buttons or moving levers, Wii players control games using physical gestures, resulting in a new category of video game-related musculoskeletal injuries. Sparks, Chase, and Coughlin (2009) reviewed all documented Wii injuries

reported to the independently run website *WiiHaveAProblem.com* from November 2006 to November 2008. Nine types of injury were identified, including eye injuries, lacerations, bruises, fractures, dislocated knees (“Wii knee”), and tendonitis (“Wiiitis”). Not surprisingly, hand laceration/bruising was the most common injury, and most injuries were associated with playing the Wii sports games. Similar findings were identified in a more recent follow-up (Sparks, Coughlin, & Chase, 2011). The authors suggest that injury is more likely to occur in players who are unfamiliar with or underestimate the Wii’s unique user interface. Supervision of children’s play seems important to minimize the occurrence of such injuries.

Excessive game play has resulted in serious injuries and even fatalities. There have been a few troubling reports of “eThrombosis” (a thrombosis is a blood clot) occurring in people who sit at a computers for long periods (Murrin, 2004; Ng, Khurana, Yeang, Hughes, & Manning, 2003). One recent fatality in a 20-year-old was reported following frequent online play for up to 12 hours at a time (Little, 2012). Researchers suspect that immobility and the sometimes odd positions associated with extensive game play could cause blood clots in susceptible individuals. They recommend regular leg exercises and periodic intermissions during prolonged game play.

Fife and her colleagues (2009) evaluated reports of carbon monoxide poisoning attributed to gasoline-powered electric generator use following a hurricane. Seventy-five percent of pediatric poisonings, including one death, were attributed to generators being used specifically to power video games or televisions.

Fortunately, extreme physical risks associated with video game play are all avoidable with good judgment.

## Seizures

The risk of video or computer game–related seizures in photosensitive individuals, even those without a previous seizure history, is well established (Chuang et al., 2006). These seizures seem to be triggered by specific features, including the display flicker of the screen, screen brightness, distance from the screen, and the specific pattern of the images. Treatment alternatives include avoidance of video games, and medication for those whose seizures are persistent. It is important to note that researchers believe that individuals with epilepsy who do not have photosensitivity (estimated at greater than 95%) may safely play video games. Regarding online multiplayer games, reports are emerging of a variety of types of seizures in a small group of players (Chuang, 2006). Chuang suggests that factors such as anxiety, excitement, and stress may play a role in triggering seizures.

## Cardiovascular Reactivity

Researchers have identified increases in the cardiovascular reactivity of children and adolescents during video game play (Borusiak, Bouikidis, Liersch, & Russell, 2008; Wang & Perry, 2006). This finding is important, as it has been suggested that cardiovascular reactivity may serve as either a marker or mechanism for the development of essential hypertension or coronary disease. Stamatakis and Hamer (2011) studied the relationship between all forms of screen time, cardiovascular disease, and death in Scottish adults. They found that higher screen time was associated with more cardiovascular disease. They speculate that

this association results from metabolic disturbance and increased inflammation as a result of what they term “recreational sitting” (p. 298), but recommend additional research to confirm this finding and better understand the mechanisms.

## Obesity

Like all media consumption, playing video games may contribute to a sedentary lifestyle, with its accompanying health risks. Obesity is a particular risk associated with a sedentary lifestyle. However, results of research examining relationships between playing video games and being overweight have been mixed. A meta-analysis done by Marshall, Biddle, Gorely, Cameron, and Murdey (2004) identified a small but significant relationship between being overweight and television viewing and video game play in 3- to 18-year-olds. However, the authors stated that the relationships between these types of sedentary behavior are complex and need to be considered in context with other contributing factors, such as consumption of high-calorie snacks during media involvement. Chaput and his colleagues (2011) studied how food intake might be affected by game play. They compared food intake in male adolescents following either an hour of playing a soccer video game play or an hour of sitting. More food was eaten after playing the video game, although hunger ratings were the same in both conditions. Even considering the additional caloric expenditure of game play, there was a significant calorie surplus in the video game condition, and players did not eat less than usual the rest of the day. The authors suggest that playing video games may impair sensations of being full and/or trigger a mental stress-induced need for a reward—in this case, food.

## Attention Problems

Past research indicates that there is an association between television viewing and attention problems for some viewers. More recently, a similar association has been found with video game play (Swing, Gentile, Anderson, & Walsh, 2010). The reason for this relationship is still under study, but researchers hypothesize that the fast pace and immediate feedback inherent in video games makes it more difficult to focus on less exciting tasks. Impairment in cognitive control, which is the ability to maintain goal-directed information processing in the presence of distracters, may also be important. Bailey, West, and Anderson (2010) studied adults who were either high or low video game consumers using both behavioral (i.e., Stroop performance) and event-related brain potential (ERP) measures to examine the influence of video game experience on proactive cognitive control. Proactive control is a future-oriented form of control that enhances planning. Both behavioral and brain wave indicators showed that the gamers with more game experience did worse than low game consumers at tasks involving proactive control. Brain wave indicators of proactive control were relatively impaired in high game consumers. The researchers suggest that video game experience may have a specific negative effect on proactive cognitive control processes, resulting in attention problems.

## Adjustment Disorders

There is some evidence that some individuals who play video games for excessive periods of time may have particular psychological problems. Van Rooij and his colleagues (2010)

identified a small group of players who met their criteria for pathological game-playing. In other words, these players experienced a range of symptoms including withdrawal effects when game play was not possible, devoted inordinate resources to game-playing, and missed out on typical face-to-face social interactions because they preferred game-play. It has been suggested that playing video games is potentially damaging to mental health because it is a socially isolating activity. However, others believe that preexisting depression comes first and draws players, particularly to Internet multiplayer games (Weaver et al., 2009). Lemmens, Valkenburg, and Peter (2011) found that many indicators of lower psychosocial well-being were present before pathological gaming started, but by displacing social interactions, pathological gaming also contributed to increased loneliness in adolescents. Lemmens, Valkenburg, and Jochen also studied relationships between aggression and pathological gaming in adolescents. Across males and females, more violent game play was associated with more aggression. In addition, higher levels of pathological gaming with any content predicted an increase in physical aggression among boys. The authors suggest that excessive gaming leads to a variety of psychosocial problems, including conflict with parents about stopping excessive play. This, in turn, may lead to irritability and aggression.

Somewhat different findings were reported by Shen and Williams (2011), who examined the connections between online gaming and psychosocial well-being. They found that the associations between game use and adjustment were complicated, with some increase in positive social interactions via the Internet, although such interactions took time away from face-to-face social interactions, which were generally a better source of social support.

## Addiction

It appears that most excessive video game play takes place online. Some have suggested that a diagnostic category named "Internet addiction" should be added to the upcoming revision of the *Diagnostic and Statistical Manual of Mental Disorders* (used to make mental health diagnoses). This designation would likely include other Internet activities in addition to gaming (e.g., social networking, shopping, gambling). It has been suggested, based on MRI and fMRI studies, that addiction to playing video games has a similar brain base as any other addiction (Han, Bolo, Daniels, & Arenellac, 2011). Small sample MRI studies suggest that medication that is effective for other addictions is also effective for video game addiction (Han, Hwang, & Renshaw, 2011). However, there is not yet consensus about whether or not addiction to Internet activities, or, in particular online gaming, is distinctive enough to warrant its own diagnosis (Pies, 2009; Gentile, D.A., Coyne, S. M., & Bricolo, F., 2013).

Deep psychological engagement has been identified as a primary reason for excessive game-playing. Billieux and his colleagues (2011) studied frequent players in a Swiss online café. Problematic use of MMORPGs was associated with the desire to play to experience immersion. The other predictor of problematic use was "urgency," a component of impulsivity defined as the tendency to act rashly when experiencing negative emotion. Interestingly, this aspect of impulsivity has also been found to play an important role in the occurrence of other addiction-related disorders.

In summary, there does appear to be a group of players whose video game play is excessive, leading to the life disruption seen in many addictions. Medication offers one treatment avenue, and specific psychotherapies are emerging (K. S. Young, 2011), but treatment may be difficult to access since this syndrome is not formally recognized by the primary diagnostic system that drives reimbursement for practitioners.

## The Positive Potential of Video Games

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Recent research suggests that exposure to prosocial video games can increase prosocial behavior (Greitemeyer & Osswald, 2010). There are a growing number of video games whose primary purpose goes beyond pure entertainment. Termed “serious games,” these are designed for some purpose other than pure entertainment. This genre includes games with health and mental health applications, as well as games whose purpose may be educational, political, public policy related, or business oriented. Hundreds of serious games have been developed, and many are available through the Social Impact Games website (<http://www.socialimpactgames.com>). The Serious Games Initiative began formally in 2000, introduced by the Woodrow Wilson International Center for scholars with the goal of developing games to address policy and management issues. In 2004, subgroups of this movement were designated to help develop practice standards. These included Games for Health, focusing on games with health care applications, and Games for Change, focusing on social issues. Some applications of this genre are discussed below.

### Skill Improvement

There is now a considerable body of experimental research that indicates that video games can be used to improve skills such as visual attention and visual-spatial skills, although the generalizability of such skills seems variable (Bavelier et al., 2011). For example, video games that use neurofeedback have been used to improve attention maintenance in children with attention deficit hyperactivity disorder (ADHD) (Lim et al., 2010). One system developed by SmartBrain Technologies, in conjunction with NASA, uses off-the-shelf video games from such popular platforms as Sony PlayStation and Microsoft Xbox (see <http://www.smartbraintech.com/gamelist/>). Although the use of neurofeedback in the treatment of ADHD has general research support, published studies on the use of the video games as the agent of the feedback are just emerging.

There is also general agreement that video game play can improve visual-motor skills (Bavelier et al., 2011). This may be especially important for professions such as surgery (Lynch, Aughwane, & Hammond, 2011). Some researchers have used standard video games to enhance surgical skills, giving entertainment games a “serious” purpose. For example, Plerhoples, Zak, Hernandez-Boussard, and Lau (2011) demonstrated that playing *Monkey Ball* on an iPhone for just 10 minutes decreased subsequent errors on basic tasks performed on a laparoscopic surgery simulator by surgery residents with no prior laparoscopic experience. It should be noted that some believe that training on these types of action video games produces learning that transfers well beyond the training task (Green & Bavelier, 2012). This is one reason to support the judicious integration of video games into the classrooms of children and adolescents.

## Video Games in Education

Video games have been called natural teachers (Gentile & Gentile, 2008). As previously noted, the game environment is a powerful combination of carefully graded challenge and immediate feedback and reward. These principles create an ideal learning environment, particularly when the playing environment is immersive (Krotoski, 2010).

Educational games are video games that are specifically designed to teach, while at the same time entertaining. Educational gaming systems are available for all age groups. Sometimes called “edutainment,” this type of serious game delivers instruction or other messages packaged as entertainment. For example, the V.Smile system provides a “dynamic learning platform” for 3- to 9-year-olds, with games that address skill development in the areas of language, logic, and cognition. The LeapFrog family of games and devices is designed for players from early childhood through high school, with the line of products’ stated goal being to instill a “lifelong love of learning.” One of their most interesting products is the FLY Fusion. The student uses a special pen and notebook to take notes. The FLY Fusion Pentop is then connected to a computer and the writing is turned into typing. With additional software, this miniature computer can perform a range of tasks, including playing games for entertainment. Unfortunately, peer-reviewed research on the efficacy of these commercial systems is lacking.

Within the classroom, computer-assisted instruction, including games, has been an option for many years. However, there has been resistance to fully integrating games into the curriculum, despite the obvious fact that using video games as one teaching approach strengthens student engagement in the learning environment and is more adaptable to each student’s changing mastery level than a lecture approach. Researchers blame this resistance on the negative beliefs about video games held by parents and teachers (Bourgonjon, Valcke, Soetaert, de Wever, & Schellens, 2011). M. F. Young and his colleagues (2012) reviewed over 300 studies evaluating the effectiveness of using video games to enhance student achievement. They found some evidence for effectiveness in language learning, history, and physical education, but not in science and math. They made several recommendations for future development of game-based learning, including developing partnerships among educators and game developers.

“Blended learning environments” take advantage of the latest advances in virtual and mixed-reality technologies (Kirkley & Kirkley, 2005). Virtual reality technology allows the individual to become immersed in a programmable synthetic environment where real-life physical limitations are not an issue. Mixed reality is the experience of a blended virtual and real world; in other words, some elements of the real world, such as physical space, are blended with digital objects. Although exciting, the applicability of these environments to classroom instruction continues to be limited by the nature of most current classrooms and by funding both for game development and for hardware.

“Location-based” games involve a variant of the blended learning environment (Avouris & Yiannoutsou, 2012). These games utilize all the current technologies available on which to play games, including mobile phones, computers, personal digital assistants, fax machines, television, and newspapers. Game play evolves and progresses via a player’s location. Thus, location-based games almost always support some kind of localization technology—for example, satellite positioning such as GPS. “Urban gaming” or “street games” are typically



multiplayer location-based games played out on city streets and built-up urban environments. The exciting potential of this emerging educational application (as well as ways to deal with its possible problems, such as invasion of privacy) is ready to be more fully developed and more widely used.

Video games are also used to create simulations designed to reproduce aspects of a real or fictional reality. This is another diverse group of games, with applications ranging from the military to the vehicular, the social, and the medical. M. F. Young and his colleagues (2012) suggest that there is a need to more clearly delineate the differences between video games and simulations, but the considerable overlap in definition and use make this difficult.

## Games for Health

Games for Health includes serious games with a variety of health-related applications (see <http://www.gamesforhealth.org>). A new academic journal was launched in early 2012 to promote high-quality research on this genre (see <http://www.liebertpub.com/overview/games-for-health-journal/588/>).

### *Exergames*

Although not specifically designed to improve health, popular exergames (also known as exertainment and active gaming), such as the series of *Dance, Dance Revolution* (DDR) games and the multitude of games available for the Wii system, appear to be having a positive impact on well-being and fitness. In January 2011, the American Heart Association and Nintendo of America cosponsored a conference to begin to examine the potential health benefits of active-play video games (Lieberman et al., 2011). At the conference, emerging research on physiological, academic, cognitive, and therapeutic applications was reviewed. Conference participants concluded that, at present, most games are active enough for only modest vigorous energy expenditure. Other exergaming benefits include positive social interactions, some improvement in academic performance, and increased effectiveness in rehabilitation for many disorders.

### *Brain Fitness Games*

Brain fitness games have become popular with those who hope to avoid mental deterioration. The company MindFit has developed computer software that reputedly promotes brain fitness (<http://www.mindfit.com>). The player starts by doing a self-assessment that takes about one hour. The results of the assessment are compared to norms to determine the strengths and weakness of the user. The Individualized Training System (ITS) is an interactive system that “learns” about the users through their performance, offers an individualized training schedule, and responds to user performance both during and at the end of the training. As the training progresses, the ITS adjusts the level of difficulty of each task depending on the user’s specific performance. Brain Age, published and developed by Nintendo (<http://brainage.com>), features a variety of puzzles, including Stroop tests, mathematical questions, and Sudoku puzzles, all designed to help keep certain parts of the brain active. Brain Age games have different levels but do not automatically adjust the degree of

difficulty based on play success or failure. Unfortunately, peer-reviewed, published research on specific systems is lacking on this game genre, particularly in regard to possible applications for cognitive enhancement for children, although the theoretical arguments are logical (Baxter, 2011).

### *Games for Coping With Medical Conditions*

Several video games have been developed specifically for children with serious or chronic medical conditions. For example, the *Diabetic Dog Game* demonstrates how managing Type 1 diabetes requires maintaining blood sugar at a normal level. In this game, the player's dog has Type 1 diabetes, and the goal of the game is to avoid letting the dog's blood sugar get too high or too low. The player is rewarded for stable levels with credits towards buying food for the dog or improving the dog's food bowl or doghouse. Unfortunately, despite the game's being developed and promoted by the official website of the Nobel Prize (see <http://www.nobelprize.org/educational/medicine/insulin/about.html>), no efficacy studies have been reported. A similar game developed to improve cancer knowledge does have some evidence of effectiveness. The efficacy of *Re-Mission* was investigated in a multisite, randomized controlled study with 375 adolescent and young adult cancer patients (Beale, Kato, Marin-Bowling, Guthrie, & Cole, 2007). Participants who played *Re-Mission* improved significantly in cancer knowledge compared with those who played a commercial (control) game. These encouraging results suggest that video games can be an effective medium for health education in adolescents and young adults with serious or chronic illnesses.

### *Psychotherapy*

Several games have been developed specifically for use in psychotherapy. In the area of mental health, the game *Earthquake in Zipland* was developed to help 7- to 14-year-olds cope with divorce (see <http://www.ziplandinteractive.com>). The player goes on a quest to reunite a divided island. The game uses metaphor, music, and the game interface to help children examine difficult feelings within a therapeutic context.

*The Journey to Wild Divine* (see Figure 10.5) is a computer program that links biofeedback hardware with the computer (see <http://www.wilddivine.com>). Although the website states that the Wild Divine products are only for educational, entertainment, and leisure use, this game has become a very useful and kid-friendly way for psychotherapists to help children learn relaxation techniques.

Games have also been developed (most of them not thoroughly researched) to promote AIDS prevention, to relieve stress associated with cancer, to alert children to the dangers of child predators, to treat phobias and depression, to provide pain distraction, to aid rehabilitation, to promote relaxation, and to enhance self-esteem, among other things (see <http://www.socialimpactgames.com> for game descriptions and availability).

## **Games for Change**

More and more games are being developed to address social issues. Many are available without cost, primarily over the Internet, or for a nominal fee. Although most have not

**Figure 10.5** *The Journey to Wild Divine* is designed to help children deal with divorce.



been formally researched to determine the effectiveness of the message delivered, some have found a large audience, as demonstrated by the number of downloads. These games target the development of critical thinking about issues where there is no one right answer and difficult choices must be made—for example, regarding the pros and cons of various fuel sources. Designers believe that the games can raise public awareness and empower youth to work for positive social change, thus the designation “Games for Change” (see Figure 10.6). The group’s website has many resources for players, designers,

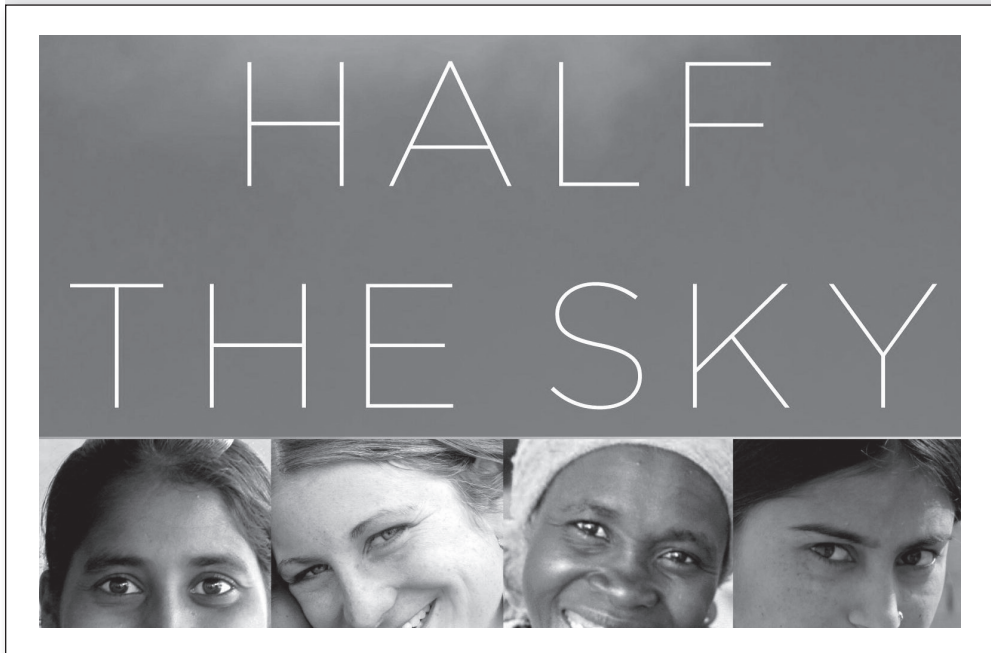
**Figure 10.6** New logo of Games for Change.



and funders (see <http://gamesforchange.org>). Games for Change offers guidance to such diverse organizations as AARP and Heifer International on how to integrate gaming into various programmatic initiatives.

*Half the Sky* is one of the newest examples of how Games for Change works to address social issues, in this case the worldwide oppression of women, as part of a transmedia campaign (see Figure 10.7). Television, social and mobile games, the Web, and inspirational online videos are being used to bring awareness and drive engagement worldwide. Funding for the campaign is coming from the Ford Foundation, the United Nations Foundation, and USAID (the U.S. Agency for International Development, an independent agency that provides economic development and humanitarian assistance around the world in support of the foreign policy goals of the United States).

**Figure 10.7** *Half the Sky* is part of a transmedia campaign that addresses the worldwide oppression of women.



## Public Policy and Practical Recommendations

In the realm of video games, most of the public policy debate centers on violent games. It has been proposed that the sale of violent video games to minors be banned or at least closely regulated, with harsh punishments for retailers who violate this regulation. This does not appear to be a viable option for many reasons, especially First Amendment considerations. In 2003, video games were declared to be a medium for artistic expression, and as such they are considered protected speech (U.S. Court of Appeals, Eighth Circuit,

2003). However, some argue that exceptions to the First Amendment already exist for children. For example, children are restricted from exposure to various forms of what is deemed to be obscenity. Several communities and states have attempted to impose legal consequences on retailers who sell violent video games to minors, but all these laws have been overturned by the courts. Until recently, however, the Supreme Court had never agreed to hear a case with these issues (see Figure 10.8). Then in 2005, the State of California passed a law that prohibited the sale or rental of a defined class of violent video games to minors using a modification of an existing obscenity law, based on the premise that exposure to such games could cause psychological harm to children. The Ninth Circuit Court rejected this argument, refusing to recognize a violence-based notion of obscenity, and struck down the law because it violated the children's right to access the speech. In other words, the Court ruled that the law violated children's right to be exposed to extremely violent video games. When the State of California appealed the ruling, the Supreme Court agreed to hear the case. On June 27, 2012, the Supreme Court ruled in the case, called *Brown v. Entertainment Merchants Association*. In a seven-to-two decision, the court found that there is no compelling evidence that video games, even those with extreme, graphic, gratuitous violence, are more damaging to children than other forms of violent media with a long history of being protected speech (see <http://www.supremecourt.gov/opinions/10pdf/08-1448.pdf>).

Interestingly, opposing *amicus curiae* briefs had been submitted about the relevant scientific research, each with support from two different groups of researchers. Those claiming that violent games were not damaging had much weaker academic records with respect to relevant publications, according to an analysis by Sacks, Bushman, and Anderson (2011), published before the Supreme Court's decision was announced. For example, only 17% of the group claiming no harm had published at least one scientific article on violence or aggression, while 100% of the group expressing concern about the effects of violent video games had published such research. Scientifically speaking, it appears that the credibility of the experts who express concern about violent video games is stronger than those who deny that negative effects have been demonstrated.

In the majority decision written by Justice Scalia, it appears that the ruling was based in part on weighing the scientific evidence, and in part on considering precedent as well as constitutional issues. Justice Scalia appeared to agree with the "no harm" group in their belief that, even if behavioral changes are observed in experimental situations, such changes are not important in real life. It should be noted that many studies clearly indicate otherwise (see Anderson et al., 2010).

There are alternatives to imposed regulation. Children are attracted to violent games in part because of advertisement. As noted earlier, limiting the marketing of violent games to younger audiences has been a priority for the Federal Trade Commission, and there has been progress (FTC, 2009). Some believe that parents must take more responsibility for monitoring children's video game exposure. However, problems with game ratings have already been discussed, and many parents still do not realize that popular video games often have very violent content. Parents need to educate themselves about the content of their child's favorite games, preferably by playing the games themselves at all levels, as content may change dramatically over the course of a game. If this is not possible, then they can search on the name of the game on the Internet and look for game clips, often posted by fan groups called "clans." Parents

**Figure 10.8** U.S. Supreme Court justices.

should become familiar with how the existing ratings system considers features such as violence and sexual material so they can use these guidelines to help them decide what games are consistent with their value system. The presence or absence of violence against humans, and especially against women and minorities, may be one way for parents to decide if a particular game is acceptable for their child to play.

Parents can at least partially insulate their children against possible negative violent video game effects by sensitizing them to the embedded messages about violence so that they can think about the validity of these messages. For example, is violence really fun? Older children and adolescents can be encouraged to watch news reports about current world conflicts and local violent crime and then discuss these with their parents. Parents can also counter the potentially desensitizing impact of embedded messages about violence by sharing their own ideas about conflict resolution and the use of violence to solve problems, and about the real-life consequences of violence.

Many of today's video games have strong potential for positive impact. There is a need for additional resources to be devoted to the development of games that can benefit society. In addition, promoting existing games that teach, develop skills, or deliver positive messages should be a priority for the game industry. Parents, educators, and health care providers also have a role in increasing children's access to games with constructive goals.

## Conclusion

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It is clear that video games have considerable positive potential, and it is vital that this potential continue to be developed. The “serious games” movement is an important step in this direction. However, at the present time, many of the most popular games require and reward violent actions. Given the preponderance of research findings on violent games, it is reasonable to be concerned about their potential impact on some children and adolescents. Game developers need support and encouragement to put in the additional effort necessary to develop interesting, commercially viable games whose appeal does not rely primarily on violent actions with unrealistic outcomes.

## Exercises

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1. Design a serious game in the Games for Change subgroup. Describe its purpose and action.
2. What do you think about the Supreme Court ruling? Should children be protected from exposure to ultra-violent video games? If so, what is the best way to protect them?
3. Do you think people can become addicted to video games? What is your evidence?
4. Design a media literacy program to counter the effects of a video game with justified and rewarded human violence. See Chapter 12 in this book for ideas and examples.
5. Look for clan clips on the Internet for five popular video games. Write down your reactions to what you view. Now look up the ESRB ratings for these games. Are the ratings consistent with what you saw?

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