

# Content and Ratings of Mature-Rated Video Games

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**Objectives:** To quantify the depiction of violence, blood, sexual themes, profanity, substances, and gambling in video games rated M (for “mature”) and to measure agreement between the content observed and the rating information provided to consumers on the game box by the Entertainment Software Rating Board.

**Design:** We created a database of M-rated video game titles, selected a random sample, recorded at least 1 hour of game play, quantitatively assessed the content, performed statistical analyses to describe the content, and compared our observations with the Entertainment Software Rating Board content descriptors and results of our prior studies.

**Setting:** Harvard University, Boston, Mass.

**Participants:** Authors and 1 hired game player.

**Main Exposure:** M-rated video games.

**Main Outcome Measures:** Percentages of game play depicting violence, blood, sexual themes, gambling, al-

cohol, tobacco, or other drugs; use of profanity in dialogue, song lyrics, or gestures.

**Results:** Although the Entertainment Software Rating Board content descriptors for violence and blood provide a good indication of such content in the game, we identified 45 observations of content that could warrant a content descriptor in 29 games (81%) that lacked these content descriptors. M-rated video games are significantly more likely to contain blood, profanity, and substances; depict more severe injuries to human and non-human characters; and have a higher rate of human deaths than video games rated T (for “teen”).

**Conclusion:** Parents and physicians should recognize that popular M-rated video games contain a wide range of unlabeled content and may expose children and adolescents to messages that may negatively influence their perceptions, attitudes, and behaviors.

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**T**HE ENTERTAINMENT SOFTWARE Rating Board (ESRB) assigns age-based rating symbols and content descriptors that appear on video game boxes to inform consumers about game content.<sup>1</sup> To receive a rating, game manufacturers submit videotaped footage and other information to the ESRB for review by 3 independent raters. We previously quantified the content of video games rated E (for “everyone”) and T (for “teen”) and observed content that could warrant ESRB content descriptors in games lacking such content descriptors.<sup>2-4</sup> Although video games rated M (for “mature”) continue to raise concerns and attract media attention, to our knowledge, no study to date quantifies the content of potential concern to physicians,<sup>5,6</sup> parents, and others<sup>7</sup> or the correspondence between game content and the ESRB content descriptors displayed on the game box.

Recent studies document the increasing popularity of video games among children and adolescents, with 91% of 8- to 18-year-olds reporting that they played a console video game at least once.<sup>8</sup> In the last 5 years,

the average time spent playing video games by 8- to 18-year-olds nearly doubled from 26 to 49 minutes per day.<sup>8,9</sup> The results indicate an average of 2.1 video game consoles per home, with 31% of children and adolescents surveyed reporting 3 or more consoles.<sup>9</sup> Children and adolescents with video game consoles in their rooms reported significantly more time spent playing video games, while parental rules restricting TV and video game use appear to reduce reported video game play time.<sup>9</sup> Unfortunately, the same survey did not ask about M-rated video games played. However, 27% and 65% of respondents reported they had played *Duke Nukem* or *Grand Theft Auto*, respectively; 12% reported playing a game of which their parents would disapprove; and only 17% indicated that their parents check the ratings on games.<sup>9</sup>

In addition, the most recent Federal Trade Commission report on marketing violent entertainment to children cited industry data showing that in 2002 consumers purchased nearly 40% of M-rated video games for children younger than 17 years.<sup>10</sup> The Federal Trade Commission also reported that 69% of unaccompanied chil-

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**Violence:** Intentional acts in which the aggressor causes or attempts to cause physical injury or death to another character. We exclude actions that lead to unintentional physical harm, the effects of natural disasters, or the presence of dangerous obstacles not attributed to another character. Note that characters include humans and nonhumans (eg, monsters, ghosts, animals, and personified robots) that attack the player or other characters.

**Planning Violence:** Precursor acts in which a character selects, modifies, or acquires a weapon; acquires ammunition; aims prior to committing violence; or discusses detailed plans for killing or injuring other characters.

**Depictions of Injury:** An injured or dead character lying on the ground or remnants of blood from a known violent act.

**Portrayal of Violence:**

**Mild:** The most severe depiction of violence in the game involves minor auditory or visual representations of injury and pain that primarily serve to notify the player that a character is injured (eg, characters grunt or turn red when injured but do not scream or bleed).

**Moderate:** The most severe depiction of violence involves more realistic representations of injury and pain (eg, characters scream, fall over, or bleed when injured).

**Strong:** The most severe depiction of violence involves graphic representations of injury and pain that exaggerate or focus attention on suffering (eg, characters scream in agony or bleed excessively when injured or when otherwise physically tortured).

**Blood:** A red fluid originating from an injured human or any colored fluid originating from an injured creature.

**Sexual Themes:** Behaviors (eg, provocative touching or moaning) or dialogue related to sex and prostitution, as well as depictions of exposed breasts, buttocks, or genitals. We otherwise exclude pronounced cleavage, large breasts, and provocative clothing as sexual material given the vague ESRB definition of "suggestive themes" (ie, "mild provocative references or materials").

**Profanity:** Use of abusive and vulgar language, anatomical references without the use of such words, and obscene gestures involving the middle finger or its full-arm equivalent. We include use of "God," "Jesus," and "hell" only when characters use these words abusively, but we otherwise exclude taunts, mean language, or words censored by bleeps.

**Substances:** Use of alcohol, tobacco, or illicit drugs; scenes in which the player views images related to at least 1 substance; or scenes in which characters discuss drug deals or using substances. We exclude medicinal herbs, tonics, or ambiguous "potions."

**Gambling:** Characters betting money for prizes.

**Figure 1.** Definitions of content used in the study. ESRB indicates Entertainment Software Rating Board.

dren aged 13 to 16 years participating in its mystery shopper survey successfully purchased M-rated video games.<sup>10</sup> Industry data also identified M-rated *Grand Theft Auto: San Andreas* and *Halo 2* as the best-selling video games of 2004.<sup>11</sup> A national study of 5756 students in Canada found that approximately 22% of boys in grades 3 through 6 and 50% of boys in grades 7 through 10 identified 1 or more M-rated video games among their 3 favorite games.<sup>12</sup> Thus, while the M-rating should theoretically lead to restrictions on children's exposure to the content in these games, the limited existing data suggest that many children younger than 17 years currently play M-rated video games.

Legislative efforts to restrict the sale of violent video games to minors<sup>13</sup> and lawsuits covered in the popular media demonstrate the public concern about the potential health impacts of video games on children.<sup>5,6</sup> With respect to video games, a meta-analysis of experimental and nonexperimental studies found that playing violent video games increased aggression in children and young adults.<sup>14</sup> A recent experimental study of mostly adults, designed to detect only moderate or large effects, did not find an increase in aggressive thoughts or behaviors after 1 month of playing an M-rated online fantasy game.<sup>15</sup> Given the very limited evidence, understanding the effects of video games on brain processing, learning, attitudes, and behaviors requires additional research, and cur-

**Table 1. ESRB Content Descriptors Assigned to Game Titles**

ESRB Content Descriptor	No. (%) of Game Titles*	
	Random Sample (n = 36)	All M-Rated (N = 147)
<b>Violence</b>		
Intense violence	3 (8.3)	22 (15.0)
Sexual violence	0	0
Violence	30 (83.3)	112 (76.2)
Animated violence†	2 (5.6)	8 (5.4)
Fantasy violence	0	0
Cartoon violence	0	0
Mild violence	0	2 (1.4)
Mild animated violence†	0	0
Mild fantasy violence	0	0
Mild cartoon violence	0	0
<b>Blood</b>		
Blood and gore	20 (55.6)	81 (55.1)
Blood	13 (36.1)	49 (33.3)
Animated blood and gore†	1 (2.8)	3 (2.0)
Animated blood	1 (2.8)	5 (3.4)
<b>Sexual themes</b>		
Strong sexual content	3 (8.3)	8 (5.4)
Mature sexual themes‡	1 (2.8)	8 (5.4)
Suggestive themes	1 (2.8)	3 (2.0)
Nudity	0	2 (1.4)
Partial nudity	1 (2.8)	3 (2.0)
<b>Profanity</b>		
Strong language	9 (25.0)	32 (21.8)
Strong lyrics	1 (2.8)	1 (0.7)
Language	0	0
Lyrics	0	0
Mild language	1 (2.8)	3 (2.0)
Mild lyrics	0	0
<b>Substances</b>		
Use of alcohol	0	0
Use of tobacco	0	0
Use of drugs	1 (2.8)	5 (3.4)
Alcohol reference	0	0
Tobacco reference	0	0
Drug reference	0	1 (0.7)
<b>Humor</b>		
Mature humor	0	2 (1.4)
Crude humor	0	0
Comic mischief	1 (2.8)	2 (1.4)
Gambling	0	1 (0.7)

Abbreviations: ESRB, Entertainment Software Rating Board; M, mature. \*Columns sum to 89 and 353, respectively, because some game titles received more than 1 content descriptor.

†The ESRB no longer uses the word "animated" in this content descriptor.

‡The ESRB no longer uses the word "mature" in this content descriptor.

rently, health care professionals must offer advice to parents in the absence of good data from rigorous longitudinal studies. To our knowledge, this study provides the first set of quantitative data available to physicians and parents to help them better understand the content of M-rated video games and the accuracy of the rating information provided.

## METHODS

We created a database of all 147 M-rated video game titles scheduled for release on the major video game consoles (Xbox [Microsoft Corporation, Redmond], GameCube [Nintendo of

**Table 2. ESRB Content Descriptors Assigned to Games in Sample Compared With Observed Content**

Game Title	Console	Year Released	ESRB Content Descriptor	Observed Content				
				Violence	Blood	Sexual Themes	Profanity	Substances
<b>Action</b>								
<i>Brute Force</i>	Xbox (Microsoft Corp, Redmond)	2003	Blood, violence	Yes	Yes	No	Yes	No
<i>Drakengard</i>	PS2 (Sony Computer Entertainment America, Foster City, Calif)	2004	Blood and gore, violence	Yes	Yes	No	Yes	No
<i>Gungrave</i>	PS2	2002	Blood, violence	Yes	Yes	No	Yes	Yes
<i>Hitman: Contracts</i>	Xbox	2004	Blood and gore, intense violence, strong language, strong sexual content, use of drugs	Yes	Yes	Yes	No	Yes
<i>Max Payne</i>	PS2	2001	Blood, violence	Yes	Yes	Yes	Yes	Yes
<i>McFarlane's Evil Prophecy</i>	PS2	2004	Blood and gore, violence	Yes	Yes	No	Yes	No
<i>Nightshade</i>	PS2	2004	Blood, violence	Yes	Yes	No	No	No
<i>Ninja Gaiden</i>	Xbox	2004	Blood and gore, violence	Yes	Yes	No	No	No
<i>Rune: Viking Warlord</i>	PS2	2001	Animated blood and gore, animated violence	Yes	Yes	No	No	Yes
<i>Syphon Filter: The Omega Strain</i>	PS2	2004	Blood, strong language, violence	Yes	Yes	No	Yes	Yes
<i>The Chronicles of Riddick: Escape From Butcher Bay</i>	Xbox	2004	Blood, intense violence, strong language	Yes	Yes	Yes	Yes	Yes
<i>Twisted Metal: Black</i>	PS2	2001	Blood and gore, violence	Yes	Yes	No	Yes	No
<b>Action adventure</b>								
<i>Genma Onimusha</i>	Xbox	2002	Blood and gore, violence	Yes	Yes	No	No	No
<i>Grand Theft Auto: Vice City</i>	PS2	2002	Blood and gore, strong language, strong sexual content, violence	Yes	Yes	Yes	Yes	Yes
<i>Metal Gear Solid: The Twin Snakes</i>	GCN (Nintendo of America, Redmond)	2004	Blood and gore, suggestive themes, violence	Yes	Yes	Yes	Yes	Yes
<i>Onimusha 2: Samurai's Destiny</i>	PS2	2002	Blood and gore, violence	Yes	Yes	Yes	Yes	Yes
<i>Resident Evil 3: Nemesis</i>	GCN	2003	Blood and gore, violence	Yes	Yes	No	No	Yes*
<i>Rogue Ops</i>	Xbox	2003	Blood, mild language, violence	Yes	Yes	No	Yes	Yes
<i>Run Like Hell</i>	PS2	2002	Blood and gore, strong language, violence	Yes	Yes	Yes	Yes	Yes*
<i>The Thing</i>	Xbox	2002	Blood and gore, violence	Yes	Yes	No	Yes	No
<b>Shooting</b>								
<i>Cold Winter</i>	PS2	2005	Blood and gore, intense violence, strong language	Yes	Yes	No	Yes	Yes
<i>Red Faction II</i>	Xbox	2003	Blood and gore, violence	Yes	Yes	No	Yes	No
<i>Resident Evil Dead Aim</i>	PS2	2003	Blood and gore, violence	Yes	Yes	No	No	Yes
<i>Robocop</i>	Xbox	2003	Blood, violence	Yes	Yes	No	No	Yes
<i>Silent Scope Complete</i>	Xbox	2004	Blood, violence	Yes	Yes	No	Yes	No
<i>Soldier of Fortune II: Double Helix</i>	Xbox	2003	Blood, violence	Yes	Yes	No	Yes	Yes
<i>Unreal II: The Awakening</i>	Xbox	2004	Blood and gore, violence	Yes	Yes	Yes	Yes	Yes

(continued)

America, Redmond], and PlayStation 2 [Sony Computer Entertainment America, Foster City, Calif]) in the United States by April 1, 2004. Using data from the ESRB<sup>1</sup> and several video game Web sites,<sup>16-18</sup> we verified the release of each game title, recorded the ESRB-assigned content descriptors, and classified each game title by 1 of 10 primary genres.

We randomly selected 25% (n=37) of the 147 M-rated video game titles to play. However, given the postponed release of *Painkiller* until 2006, we played only 36 games. All of the games played remain available for sale or rental. When possible, we

purchased or rented the games with their original game manuals intact. For consistency, a research assistant with considerable video-gaming experience played the entire random sample of video games and recorded all game play on DVD for later coding. The player first read the manual and played the game to become familiar with the game features, then restarted the video game from the beginning and recorded at least 1 hour of game play, including any required game introductions and setup.

One of us with considerable video-gaming experience (K.T.) reviewed and manually coded all of the recorded game play us-

**Table 2. ESRB Content Descriptors Assigned to Games in Sample Compared With Observed Content (cont)**

Game Title	Console	Year Released	ESRB Content Descriptor	Observed Content				
				Violence	Blood	Sexual Themes	Profanity	Substances
<b>Adventure</b>								
<i>Eternal Darkness: Sanity's Requiem</i>	GCN	2002	Blood and gore, violence	Yes	Yes	No	Yes	No
<i>Fatal Frame II: Crimson Butterfly</i>	PS2	2003	Blood, violence	Yes	No	No	No	No
<i>Shadow Man: 2econd Coming</i>	PS2	2002	Blood and gore, strong language, violence	Yes	Yes	No	Yes	Yes*
<i>Silent Hill 2</i>	PS2	2001	Blood and gore, violence	Yes	Yes	Yes	Yes	No
<b>Fighting</b>								
<i>Kengo: Master of Bushido</i>	PS2	2000	Animated blood, animated violence	Yes	No	Yes	No	No
<i>Pride FC</i>	PS2	2003	Blood, strong lyrics, violence	Yes	Yes	No	No	No
<b>Role-Playing</b>								
<i>Fallout: Brotherhood of Steel</i>	Xbox	2004	Blood and gore, mature sexual themes, strong language, violence	Yes	Yes	Yes	Yes	Yes
<b>Sports</b>								
<i>BMX XXX</i>	PS2	2002	Comic mischief, partial nudity, strong language, strong sexual content	Yes	No	Yes	Yes†	Yes*
<b>Strategy</b>								
<i>Legion: The Legend of Excalibur</i>	PS2	2002	Blood, violence	Yes	Yes	Yes	No	Yes

Abbreviations: GCN, Nintendo GameCube; ESRB, Entertainment Software Rating Board; PS2, Sony PlayStation 2.

\*Game contains alcohol, tobacco, or drug references but was released before the ESRB began assigning these content descriptors.

†Game contains explicit language and song lyrics.

ing standard coding instruments (available on request) and then 2 of us (K.T. and K.H.) entered the data into Microsoft Access (Version 2002; Microsoft Corporation). We used the same coding methods as in our earlier studies in which we obtained excellent agreement between coders ( $\kappa=0.93$ ).<sup>2-4</sup> In addition, to assess the consistency of our method in this study, 1 of us (K.M.T.) independently coded all 36 games for evidence of each specific type of content for comparison with a  $\kappa$  statistic.

**Figure 1** provides the definitions of content we used.<sup>2-4</sup> To quantify the amount of violence in each game, we divided the recorded game play into 1-second intervals and noted whether each second of game play contained acts of violence. For each second of game play not already coded as “committing violence,” we coded the second as “planning violence” if it showed a character planning acts of violence, as “depicting injuries” if it depicted injuries from violence, or as “not violent” if it failed to meet either of these criteria. To further characterize the overall portrayal of violence, we used the 3 categories defined in Figure 1 to separately code the highest (and most severe) portrayal of injuries depicted to human and nonhuman characters using a method previously shown to provide good agreement between independent coders.<sup>4</sup> We also noted the types of weapons used for violence, whether the player could select or modify these weapons, whether violence resulted in injury or death, the number of human and nonhuman deaths from violence, whether injuring or killing human and nonhuman characters was rewarded or was required to advance in the game, and whether destroying objects was rewarded or required to advance in the game, although we did not code the destruction of objects as violence. To quantify the amount of blood, we noted whether each second of game play depicted blood and further identified whether each second depicted human or nonhuman blood. We did not code blood as a depiction of injury unless the blood came from a known act of violence. We also noted whether the game de-

icted the mutilation or severing of body parts. To quantify the amount of sexual themes, we noted whether each second of game play depicted sexual behaviors, sexual dialogue, and/or nudity. We also noted the sex of the characters involved and whether the player could play each game as a male or female character. To quantify profanity, we counted each occurrence and noted the specific gesture or word(s) used. We noted whether the profanity occurred in the game as dialogue, written text, or song lyrics. To quantify the amount of alcohol, tobacco, and drugs in the game, we noted whether each second of game play depicted any type of substance, and we separately noted whether each second involved substance use. Finally, we counted the number of seconds of game play that depicted gambling.

We performed statistical tests using SAS statistical software (Version 9.0 for Windows; SAS Institute Inc, Cary, NC).

## RESULTS

**Table 1** lists ESRB content descriptors by type and compares the 89 content descriptors assigned to the 36 video game titles in the random sample with the 353 content descriptors assigned to all 147 M-rated video game titles. No statistically significant difference exists between the 2 distributions of content descriptors. The range of content descriptors reflects continued changes to the ESRB rating system. For example, in 2003, the ESRB added new content descriptors for violence (intense violence, sexual violence, fantasy violence, and cartoon violence) and for substances (alcohol reference, tobacco reference, and drug reference). Overall, 98% of game titles rated M received content descriptors for violence (ie, descriptors under that

**Table 3. ESRB Content Descriptors for Violence and Blood Compared With Observations of Violence and Blood**

Game Title	Violence, %		Blood, %		Deaths per Hour		Depiction of Injuries From Violence		Rewards	Weapons
	Acts	All	Human	All	Human	All	Human	Nonhuman		
<b>Action</b>										
<i>Brute Force</i>	28.4	39.5	2.8	10.1	33	132	Strong	Strong	RD,RI,RK	B,E,G,K,P*
<i>Drakengard</i>	61.6	74.7	29.7	36.6	1140	1142	Strong	Strong	RD,RI,RK	E,F,G,K,M,P*
<i>Gungrave</i>	50.2	60.3	14.4	14.5	618	702	Strong	Moderate	RD,RI,RK	B,E,F,G,K,P,O*
<i>Hitman: Contracts</i>	8.7	44.4	21.5	33.4†	109	133	Strong	Strong	RI,RK	B,G,T,O*
<i>Max Payne</i>	7.3	22.4	15.9	15.9	62	62	Strong	...	RD,RI,RK	G,P,O*
<i>McFarlane's Evil Prophecy</i>	42.5	50.9	0.9	43.0†	3	514	Strong	Strong	RD,RI,RK	B,E,F,G,K,M,P*
<i>Nightshade</i>	37.6	46.2	2.6	9.1†	39	266	Moderate	Strong	RD,RI,RK	B,E,K,M,P*
<i>Ninja Gaiden</i>	30.1	38.5	17.1	18.1†	118	126	Strong	Strong	RD,RI,RK	B,F,G,K,M,P*
<i>Rune: Viking Warlord</i>	8.1	34.2	27.7	31.2	28	72	Strong	Moderate	RD,RI,RK	B,F,K,M,P,O*
<i>Syphon Filter: The Omega Strain</i>	28.4	45.6	15.1	15.1	119	119	Strong	...	RD,RI,RK	B,E,G,K,P*
<i>The Chronicles of Riddick: Escape from Butcher Bay</i>	10.7	31.7	20.7	21.1	34	35	Strong	Strong	RD,RI,RK	B,G,K*
<i>Twisted Metal: Black</i>	53.1	60.9	3.7	3.7†	60	60	Strong	...	RD,RI,RK	E,F,G,P,O*
<b>Action adventure</b>										
<i>Genma Onimusha</i>	40.9	55.4	10.9	27.7	61	132	Strong	Strong	RD,RI,RK	B,K,M,P*
<i>Grand Theft Auto: Vice City</i>	6.3	10.4	3.3	3.3	32	32	Strong	...	RD,RI,RK	B,E,G,K,O*
<i>Metal Gear Solid: The Twin Snakes</i>	7.6	15.3	5.5	5.5	5	5	Strong	...	RI	B,G,O*
<i>Onimusha 2: Samurai's Destiny</i>	14.7	22.5	6.5	9.7	67	95	Strong	Strong	RD,RI,RK	B,G,K,P*
<i>Resident Evil 3: Nemesis</i>	14.0	36.8	31.9	33.6†	78	79	Strong	Strong	RD,RI,RK	E,G,K,P*
<i>Rogue Ops</i>	5.9	24.5	8.0	8.0	26	26	Strong	...	RD,RI,RK	B,E,G,P*
<i>Run Like Hell</i>	6.4	11.7	1.7	10.6†	6	36	Strong	Moderate	RD,RI,RK	B,E,G*
<i>The Thing</i>	4.7	21.3	4.5	17.6†	12	57	Strong	Strong	RD,RI,RK	E,F,G,P*
<b>Shooting</b>										
<i>Cold Winter</i>	15.5	37.8	27.9	28.2†	59	68	Strong	Moderate	RD,RI,RK	E,F,G,P,O*
<i>Red Faction II</i>	39.7	50.5	23.7	23.7†	200	200	Strong	...	RI,RK	E,G,P*
<i>Resident Evil Dead Aim</i>	11.1	29.7	13.5	13.7	58	58	Strong	...	RI,RK	B,G*
<i>Robocop</i>	26.2	33.3	6.0	6.0	103	108	Strong	Moderate	RD,RI,RK	B,E,F,G,P*
<i>Silent Scope Complete</i>	48.1	54.4	1.9	1.9	339	339	Moderate	...	RD,RI,RK	E,G,P
<i>Soldier of Fortune II: Double Helix</i>	19.0	33.1	14.1	14.1	98	98	Strong	...	RD,RI,RK	E,G,K,P*
<i>Unreal II: The Awakening</i>	22.2	31.4	4.0	6.6†	12	109	Strong	Strong	RI,RK	B,E,G,P*
<b>Adventure</b>										
<i>Eternal Darkness: Sanity's Requiem</i>	6.4	13.3	0.5	4.2†	1	31	Strong	Strong	RD,RI,RK	B,K,M*
<i>Fatal Frame II: Crimson Butterfly</i>	11.7	20.7	0	0	10	23	Moderate	Moderate	RI,RK	O*
<i>Shadow Man: 2econd Coming</i>	10.8	53.9	2.9	41.9†	29	50	Strong	Strong	RD,RI,RK	B,G,K,M*
<i>Silent Hill 2</i>	4.7	13.4	1.0	12.5†	2	14	Strong	Strong	RI,RK	B,G,O*
<b>Fighting</b>										
<i>Kengo: Master of Bushido</i>	48.4	58.8	0	0	0	1	Moderate	Moderate	RD,RI,RK	K,M*
<i>Pride FC</i>	18.1	20.5	8.0	8.0	0	0	Strong	...	RI	B
<b>Role-Playing</b>										
<i>Fallout: Brotherhood of Steel</i>	17.0	38.8	9.6	30.8†	17	155	Moderate	Strong	RD,RI,RK	B,G,T,O*
<b>Sports</b>										
<i>BMX XXX</i>	0.8	1.3	0	0	0	0	Moderate	Moderate	RD,RI	O
<b>Strategy</b>										
<i>Legion: The Legend of Excalibur</i>	35.1	43.6	25.5	25.5†	149	154	Strong	Moderate	RD,RI,RK	B,F,K,M,P,O*

Abbreviations: B, body as weapon; E, explosive as weapon; ESRB, Entertainment Software Rating Board; F, fire as weapon; G, gun as weapon; K, knife or sword as weapon; M, magic as weapon; O, other weapon; P, projectile as weapon; RD, game rewards destruction of objects; RI, game rewards injuring characters; RK, game rewards killing characters; T, toxic substance as weapon.

\*Player can select weapons.

†Game depicts the mutilation of body parts.

heading in Figure 1); 94%, for blood; 14%, for sexual themes; 24%, for profanity; 4%, for substances; 3%, for humor; and 1%, for gambling.

**Table 2** lists game titles in the random sample by genre, along with their console and release year, and compares the content we observed with the ESRB-assigned content descriptors. Overall, we identified 45 observations of content that could warrant a content descriptor in 29 games (81%) that did not receive these content descriptors from the ESRB. This statistic excludes images

and dialogue related to alcohol, tobacco, and illicit drugs in games released before 2003 when the ESRB assigned content descriptors for only the use of these substances. We did not observe content indicated by 4 ESRB-assigned content descriptors in 4 games (11%) within 1 hour of game play, although we note that this content occurs later in these games. We also know from extended play of some games that content for which the ESRB did not assign a content descriptor sometimes occurs after 1 hour of game play (eg, a sexually provoca-

**Table 4. ESRB Content Descriptors for Sexual Themes Compared With Observed Sexual Themes**

	Duration of Game Play, s	Duration of Observed Sexual Themes, s (% of Game Play)			
		Total	Dialogue or Writing	Behavior	Partial Nudity
Strong sexual content and partial nudity <i>BMX XXX</i>	4193	1739 (41.5)*	653 (15.6)†‡	344 (8.2)†‡	1211 (28.9)†
Strong sexual content <i>Grand Theft Auto: Vice City</i>	4228	203 (4.8)*	83 (2.0)†‡	121 (2.9)†‡	21 (0.5)†
<i>Hitman: Contracts</i>	4121	75 (1.8)*	0	75 (1.8)†‡	0
Mature sexual themes <i>Fallout: Brotherhood of Steel</i>	4209	177 (4.2)*	133 (3.2)†	138 (3.3)†	39 (0.9)†
Suggestive themes <i>Metal Gear Solid: The Twin Snakes</i>	4700	8 (0.2)	8 (0.2)†	0	0
No descriptors <i>Kengo: Master of Bushido</i>	4407	5 (0.1)	0	0	5 (0.1)‡
<i>Legion: The Legend of Excalibur</i>	4055	12 (0.3)	0	0	12 (0.3)†
<i>Max Payne</i>	3741	77 (2.1)*	77 (2.1)‡	0	0
<i>Onimusha 2: Samurai's Destiny</i>	4647	214 (4.6)*	77 (1.7)†‡	200 (4.3)†‡	7 (0.2)†
<i>Run Like Hell</i>	4047	108 (2.7)	2 (0)†	11 (0.3)†‡	97 (2.4)†
<i>Silent Hill 2</i>	4127	8 (0.2)	0	8 (0.2)§	0
<i>The Chronicles of Riddick: Escape From Butcher Bay</i>	3911	6 (0.2)	6 (0.2)‡	0	0
<i>Unreal II: The Awakening</i>	4153	59 (1.4)	0	0	59 (1.4)†

Abbreviation: ESRB, Entertainment Software Rating Board.

\*Game depicts prostitution.

†Female characters engage in this activity.

‡Male characters engage in this activity.

§Nonhuman characters engage in this activity.

tive female character in *Ninja Gaiden* and tobacco use in *Soldier of Fortune II: Double Helix*. We found excellent agreement between the 2 of us (K.M.T. and K.T.) who coded all of the games for each type of content ( $\kappa = 0.97$ ).

**Table 3** summarizes our observations of violence and blood. All 36 games involved intentional acts of violence (100%), with 35 games (97%) receiving content descriptors for violence. We observed wide variation in the amounts of violence in the games, with games containing an average of 22% violent game play time (range, 0.8%-62%). Including the additional game play associated with planning violence and depiction of injuries increases the average to 36% of game play time directly related to violence (range, 1.3%-75%). We also observed 28 games (78%) that rewarded or required the player to destroy objects.

Overall, 35 games (97%) received content descriptors for blood and we observed blood in 33 (92%) of 36 games, with 18% of game play time depicting blood (range, 1.9%-43%) and 12% of game play time depicting human blood (range, 0.5%-32%). We did not observe blood within 1 hour of game play in 2 games (6%) that received content descriptors for blood. These results indicate that ESRB content descriptors for violence and blood provide a good indication that an M-rated video game contains such content.

We observed 6011 character deaths from violence in approximately 42 hours of game play, occurring at an average rate of 145 character deaths per hour (range, 0-1142). This included 4268 human deaths, occurring at an average rate of 104 human deaths per hour (range, 0-1140). Overall, we identified 24 games (67%) that depicted deaths from violence of nonhuman characters, including the player, and 33 games (92%) that depicted deaths from violence of human characters, including the

player. All 36 games (100%) rewarded or required the player to injure characters, while 33 games (92%) rewarded or required the player to kill.

Analysis of the overall portrayal of violence shows that all 36 games (100%) depicted injuries to human characters and 25 (69%) of 36 games depicted injuries to nonhuman characters, including injuries to the player. Examining the portrayal of violence to human characters, we found that 6 (17%) of 36 games portrayed violence characterized as “moderate” and 30 games (83%) portrayed violence characterized as “strong.” Examining the portrayal of violence to nonhuman characters, we found that 9 (25%) of 36 games portrayed “moderate” violence and 16 games (44%) portrayed “strong” violence.

Table 3 also shows that games depicted an average of 4 types of weapons (range, 1-7), with players able to select weapons in 33 games (92%), and that 35 games (97%) depicted weapons other than the body. A total of 24 games (67%) used the body as a weapon, 27 (75%) used guns, 22 (61%) used projectiles, 18 (50%) used knives or swords, 18 (50%) used explosives, 10 (28%) used fire, 10 (28%) used magic, 2 (6%) used toxic substances, and 13 (36%) used other weapons (eg, automobile, club, broken bottle). These findings represent a subset given our limited game play time.<sup>2-4</sup>

**Table 4** lists game titles by ESRB content descriptor for sexual themes and shows our observations of characters engaging in dialogue or behaviors related to sex or showing exposed breasts, buttocks, or genitals. We observed sexual themes in 13 (36%) of 36 games, with 5 games (14%) receiving content descriptors for sexual themes. On average, the 13 games in which we observed sexual themes depicted sexual themes for 4.9% of game play time (range, 0.1%-42%). Expanding our definition of sexual themes to

**Table 5. ESRB Content Descriptors for Profanity Compared With Observed Profanity**

Game Title	No. of Observed Uses of Profanity per Hour		
	Total	Dialogue or Writing	Song Lyrics Gestures
Strong language			
<i>BMX XXX</i>	201	166	35
<i>Cold Winter</i>	3	3	
<i>Fallout: Brotherhood of Steel</i>	13	13	
<i>Grand Theft Auto: Vice City</i>	23	23	
<i>Hitman: Contracts</i>	0	0	
<i>Run Like Hell</i>	16	16	
<i>Shadow Man: Second Coming</i>	17	17	
<i>Syphon Filter: The Omega Strain</i>	3	3	
<i>The Chronicles of Riddick: Escape From Butcher Bay</i>	57	56	1
Strong lyrics*			
<i>Pride FC</i>	0	0	
Mild language			
<i>Rogue Ops</i>	5	5	
No descriptors			
<i>Brute Force</i>	3	3	
<i>Drakengard</i>	2	2	
<i>Eternal Darkness: Sanity's Requiem</i>	1	1	
<i>Gungrave</i>	7	7	
<i>Max Payne</i>	9	9	
<i>McFarlane's Evil Prophecy</i>	3	3	
<i>Metal Gear Solid: The Twin Snakes</i>	1	1	
<i>Onimusha 2: Samurai's Destiny</i>	1	1	
<i>Red Faction II</i>	9	9	
<i>Silent Hill 2</i>	3	3	
<i>Silent Scope Complete</i>	1	1	
<i>Soldier of Fortune II: Double Helix</i>	1	1	
<i>The Thing</i>	21	21	
<i>Twisted Metal: Black</i>	4	4	
<i>Unreal II: The Awakening</i>	7	7	

Abbreviation: See Table 5.

\*The ESRB content descriptor for "strong lyrics" is not limited to profanity ("profanity and explicit references to sexuality, violence, alcohol, or drug use in music.")

include pronounced cleavage, large breasts, or provocative clothing would imply sexual themes in 17 games (47%). We observed the depiction of prostitution in 6 (17%) of 36 games. Overall, 32 games (89%) contained playable male characters, 12 games (33%) contained playable female characters, and 10 games (28%) allowed the player to select among a list of characters or personalize characters. Games were significantly more likely to depict female characters partially nude than male characters ( $P < .007$ ), based on a 2-sided binomial exact test.

**Table 5** lists game titles by ESRB content descriptor for profanity and presents the observed uses of profanity per hour in dialogue, writing, lyrics, or gestures. We observed the use of profanity in 24 games (67%), with 11 games (31%) receiving content descriptors for profanity. The sample included 15 games (42%) that did not receive content descriptors for profanity when we ob-

served such content and 2 games (6%) that received content descriptors for profanity for which we did not observe within 1 hour of game play. On average, the 24 games in which we observed profanity contained 17 uses of profanity per hour (range, 0.8-201). These observations include a game (*Twisted Metal: Black*) that did not receive a content descriptor for profanity despite containing use of the words "motherfucker," "bitch," and "piss." The game that received a content descriptor for mild language (*Rogue Ops*) contained the same words and number of uses per hour as the group of 15 games with unlabeled profanity.

**Table 6** lists game titles by ESRB content descriptor for substances and shows the percentage of game play depicting substances. We observed the depiction or use of substances in 21 (58%) of 36 games, with only 1 game (3%) receiving a content descriptor for substances. We found 17 games (47%) depicted alcohol, 8 games (22%) depicted tobacco, and 5 games (14%) depicted illicit drugs, with 12 (33%) of 36 games depicting characters using substances. On average, the 21 games in which we observed substances depicted substances for 3.4% of game play time, with 1.1% of game play time depicting substance use.

We did not observe gambling for money in any of the games, with no games receiving a content descriptor for gambling.

Compared with our prior analyses, this study suggests that nearly all M-rated (100%) and T-rated (98%) video games contain violence. Remarkably, M-rated video games contained a significantly smaller percentage of violent game play than did T-rated video games (22% for M-rated video games vs 36% for T-rated video games) based on a 2-sided Wilcoxon rank sum exact test ( $P < .008$ ). However, game players are significantly more likely to encounter blood in M-rated video games than in T-rated video games (2-sided Fisher exact test,  $P < .001$ ). Partly because of the increased presence of blood, M-rated video games depict more severe injuries to human ( $P < .001$ ) and nonhuman characters ( $P < .001$ ) than do T-rated video games, based on 2-sided Wilcoxon rank sum exact tests. We also observed a higher rate of human deaths in M-rated video games than in T-rated video games (2-sided Wilcoxon rank sum exact tests,  $P < .001$ ), a result driven by the 23% of T-rated video games that do not depict deaths. Conditioning on the subset of M-rated and T-rated games that depict human deaths, we did not observe different rates.

In terms of other content, M-rated video games are significantly more likely than T-rated video games to contain profanity ( $P < .001$ ) and substances ( $P < .001$ ) but not sexual themes, based on 2-sided Fisher exact tests. Overall, M-rated video games are significantly more likely to contain unlabeled content than are T-rated video games (81% for M-rated video games vs 48% for T-rated video games), based on a 2-sided Fischer exact test ( $P < .001$ ).

Because most video games contain more than 1 hour of game play, we emphasize that our method means that we miss some content. **Figure 2** shows the cumulative percentage of the different types of content found as a function of game play time for this sample, which demonstrates that by playing each game for approximately

**Table 6. ESRB Content Descriptors for Substances Compared With Observed Substances**

Game Title	Duration of Game Play, s	Duration of Observed Substances, s (% of Game Play)			
		Total	Alcohol	Tobacco	Drugs
Use of drugs					
<i>Hitman: Contracts</i>	4121	43 (1.0)	6 (0.1)	0	43 (1.0)
No descriptors					
<i>BMX XXX*</i>	4193	27 (0.6)	13 (0.3)	0	14 (0.3)
<i>Cold Winter</i>	4115	111 (2.7)	39 (0.9)	72 (1.7)†	0
<i>Fallout: Brotherhood of Steel</i>	4209	466 (11.1)	466 (11.1)†	0	0
<i>Grand Theft Auto: Vice City</i>	4228	224 (5.3)	149 (3.5)†	0	114 (2.7)
<i>Gungrave</i>	3896	347 (8.9)	47 (1.2)†	300 (7.7)†	0
<i>Legion: The Legend of Excalibur</i>	4055	133 (3.3)	133 (3.3)†	0	0
<i>Max Payne</i>	3741	215 (5.7)	86 (2.3)	29 (0.8)†	100 (2.7)
<i>Metal Gear Solid: The Twin Snakes</i>	4700	90 (1.9)	0	90 (1.9)	0
<i>Onimusha 2: Samurai's Destiny</i>	4647	476 (10.2)	342 (7.4)*	181 (3.9)	0
<i>Resident Evil 3: Nemesis</i>	4082	207 (5.1)	207 (5.1)	0	0
<i>Resident Evil Dead Aim</i>	4063	69 (1.7)	69 (1.7)	0	0
<i>Robocop</i>	4062	153 (3.8)	39 (1.0)	0	114 (2.8)
<i>Rogue Ops</i>	3936	33 (0.8)	0	33 (0.8)†	0
<i>Run Like Hell</i>	4047	30 (0.7)	30 (0.7)	0	0
<i>Rune: Viking Warlord</i>	5781	76 (1.3)	76 (1.3)†	0	0
<i>Shadow Man: Second Coming</i>	4125	66 (1.6)	66 (1.6)	0	0
<i>Soldier of Fortune II: Double Helix‡</i>	4212	18 (0.4)	18 (0.4)†	0	0
<i>Syphon Filter: The Omega Strain</i>	4071	35 (0.9)	35 (0.9)†	0	0
<i>The Chronicles of Riddick: Escape From Butcher Bay</i>	3911	124 (3.2)	0	124 (3.2)	0
<i>Unreal II: The Awakening</i>	4153	83 (2.0)	0	83 (2.0)†	0

Abbreviation: See Table 5.

\*Game contains alcohol and drug references in song lyrics but did not receive an ESRB content descriptor for "mild lyrics" ("mild references to profanity, sexuality, violence, alcohol, or drug use in music").

†Game depicts use of this substance.

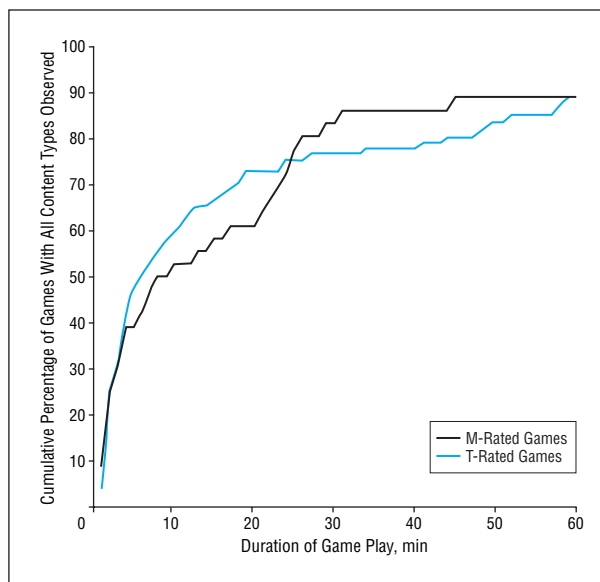
‡Game depicts use of tobacco during an optional training sequence that was excluded from analysis.

1 hour, we observed approximately 90% of content indicated by the ESRB content descriptors. These findings are consistent with our prior sample of T-rated video games<sup>2</sup> as also shown.

**COMMENT**

The results of our study suggest that parents and physicians should pay careful attention to the actual content of any M-rated video game that their children might play, particularly since the M-rating indicates that the intended audience is for ages 17 years and older. Compared with our studies of T-rated video games, we found significantly more blood, severe injuries, and human deaths in M-rated games, although we also found a significantly smaller percentage of violent game play in M-rated video games. We believe that current discussions about restricting children's access to violent games may miss the reality that both T-rated and M-rated games contain significant amounts of violence.

These results confirm that the presence of an ESRB content descriptor means that game players likely will find the indicated content in the game but that parents should not interpret the absence of a content descriptor to mean the absence of content. Parents should recognize that the content descriptors on M-rated video games usually do not provide information about all types of content in the game, notably the depiction of substances. Our



**Figure 2.** Cumulative percentage of video games with all content types observed by duration of game play.

observation that 20 (56%) of 36 games depicted substances while only 1 game (3%) received a content descriptor for substances should motivate consideration of children's exposure to substances in video games (and more broadly in all media<sup>19</sup>). While some might argue



about the need to provide content descriptors for M-rated video games given the intended audience of ages 17 years and older, we note that the ESRB does not provide specific criteria for assigning content descriptors. Even within a rating category, the ESRB assigns content descriptors to some games but not others with the same content, which creates confusion for parents who seek accurate and consistent rating information. We emphasize that the ESRB should provide greater clarity about its content descriptors and rating standards. In addition, since our studies consistently found content for which the ESRB did not assign content descriptors, we continue to believe that the ESRB should play the video games before assigning its ratings and provide assurance to parents and to the public about the quality of the rating information.

This study relies on the same methods and consequently implies the same methodological limitations as our other studies of video games.<sup>2-4</sup> In this study, our random sample represented only 25% of M-rated video games with 1 game in the sample not reaching the market prior to completion of the study. In the context of evolving games and ratings, this sample represents a cross-section of M-rated video games. We did not unlock additional material in games by entering codes (eg, from Web sites<sup>16-18</sup>), but parents should know that codes can alter game play. The ESRB's recent decision to change the rating of *Grand Theft Auto: San Andreas* from M to AO (for "adults only") resulted from the ability of players to unlock sexually explicit content.<sup>20</sup> Parents should look for the ESRB warning "Game Experience May Change During Online Play" and recognize that online game play may not reflect the game's original rating and content descriptors.

We emphasize that no study or rating system can replace parental engagement with children and adolescents experiencing video games and that more research is needed to understand the health impacts of video games on children and adolescents.

## CONCLUSIONS

Parents and physicians should recognize that popular M-rated video games contain a wide range of content and may expose children and adolescents to messages that may negatively influence their perceptions, attitudes, and behaviors.

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