

Positive and Negative Themes in Popular Video Games Based on Entertainment Software Review Board Ratings

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Abstract

Video games have become a major part of a child's recreational time. The objective of this study was to determine whether or not the number of positive and negative themes in video games differ based on their Entertainment Software Review Board rating. Thirty of the most popular games in 2016 were reviewed and scored based on a rubric made a priori. Mature, Teen, and Everyone rated games did not show significant difference in the frequency of positive themes (3.7, 3.1, 3.2, respectively; $P = .425$). Mature and Teen games did not show significant difference in the frequency of negative themes (5.0, 4.0, respectively; $P = .414$), whereas Everyone games did have a significantly less number of negative themes than the Mature games (1.9, 5.0, respectively; $P = <.001$). Based on these data, parents should consider being more conscientious in buying games that are rated as T for Teen.

Keywords

video games, themes, pediatrics

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Introduction

As children age, parents question whether the activities that their children take part in are beneficial to their cognitive and psychosocial development. Video games have become a major part of a child's recreational time. As such, the American Academy of Pediatrics released recommendations for the amount of screen time that children should get. They suggest that children ages 2 to 5 years should not have more than 1 hour of screen time per day. Additionally, children over the age of 6 years should not have screen time that interferes with their sleep and should have dedicated periods of media-free time. These recommendations are as expected given the continued debate as to the reported role of video games in the development of children. Unfortunately, the current literature has not been able to come to a consensus as to whether or not video games are harmful to a child's development. One study suggests that children who play violent video games are more likely to demonstrate delinquent behavior as adolescents and even as young adults.¹ Another study has suggested that children who are playing violent games are more prone to hostile thoughts and behaviors in the laboratory setting inferring that this can be extrapolated to real life.² These studies give credence and support to the notion that parents

should consider worrying about the games that their children are playing. Alternatively, however, there are studies demonstrating promising cognitive benefits for children. These benefits include increasing altruistic behaviors,³ promoting creativity,⁴ fostering social interaction skills,⁵ and improving multitasking abilities.⁶ Furthermore, one study showed that violent video games had no effect on decreasing altruistic behaviors.⁷ In the studies mentioned, the games that were chosen had obvious violent or negative components to them. Some of these games include mature, violence-based games like Call of Duty, a game inherently violent focusing on simulated combat with simulacrum of actual firearms. This confounds the reported conclusions, as it focuses narrowly on mature-themed video games with obviously

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violent themes. To further classify the potential effects of video games on youth, a question that should be asked is what are the effects of the seemingly benign games that are marketed for younger age groups.

The Entertainment Software Review Board (ESRB) reviews games before they are sold and rates them as either E for everyone, T for teen, or M for mature. This gives consumers an idea about what kind of content they can experience in the video game. To rate a game, a minimum of 3 raters review a game to objectively judge the content of the game. Hypothetically, children of younger ages should not be playing games that are rated as M for mature, rather they should be playing games that are rated E for everyone. The objective of this study was to determine whether or not the number of positive and negative themes in video games differ based on their ESRB rating.

Methods

A content analysis study was conducted to examine the number of positive and negative themes in popular video games during the year 2016. Games were selected from lists titled as the most popular games of 2016 from websites such as ign.com and forbes.com. Ten of the most popular games from each rating were chosen based on the rating they received from the ESRB. We included games that were rated E for everyone, T for teen, and M for mature only. A total of 10 games from each category were chosen, for a total of 30 games for this study. Games were not excluded by online play, multiplayer modes, genre, or by release date.

A rubric for scoring games was generated before the games were chosen. The rubric had a total of 20 themes with 11 negative themes and 9 positive themes. Each game was then scored by a single viewer against this rubric by watching gameplay videos that were available via YouTube or streaming platform Twitch. Themes only had to appear once in the game.

To analyze the results, a Kruskal-Wallis test was used to identify if there was statistical significance in the difference of negative or positive themes between the 3 groups of games. Further analysis included an independent sample *t* test to compare the mean number of negative themes between the different groups. We also looked at the mean, median, and the range of positive and negative themes for each category.

The institutional review board at Pennsylvania State Hershey Medical Center deemed the study exempt.

Ethical Approval and Informed Consent

This study was submitted to the institutional review board at Pennsylvania State Hershey Medical Center

under “STUDY00008196,” which deemed the study exempt. Our study did not include human subjects and there was no chart review necessary, meaning we did not need to access protected patient information. Our research focused on video games and therefore did not need ethical approval or informed consent.

Results

Table 1 describes the games that were included in this study. The average year of release was 2015. There were 3 fighting games, 7 first-person shooter games, 7 action adventure games, 7 action role-playing games, 3 turn-based strategy games, and 3 sports games. Tables 2 and 3 outline the percentage of games within a category that had the positive or negative theme. The most common negative themes among all games were physical violence (83%, $n = 25$), gun violence (73%, $n = 22$), and blood/gore (60%, $n = 18$). The most common positive themes among all games were promoting socialization with a computerized character (70%, $n = 21$), increasing attention span (66%, $n = 20$), and promoting perseverance (50%, $n = 15$).

To analyze our data, a Kruskal-Wallis test was run to investigate whether or not there was a statistical difference of the mean number of positive themes and the mean number of negative themes among the 3 categories. The result of this test is shown in Table 4. M-rated games had a mean of 5.0 negative themes per game, T-rated games had a mean of 4.0 negative themes per game, and E for everyone games had a mean close to 2 negative themes per game ($P = .001$). M-rated games had a mean of 3.7 positive themes per game, T-rated games had a mean of 3.1 positive themes per game, and E for everyone games had a mean of 3.2 positive themes per game ($P = .425$).

An independent-samples *t* test was conducted to compare the means for the negative themes between the categories, as shown in Tables 5 to 7. The difference between the mean amount of negative themes between E games and T games and E and M games was found to be significant ($P = .005$, $P < .001$, respectively). The difference between the mean amount of negative themes between T games and M games was found to not be significant ($P = .414$).

Discussion

There is a significant difference in the number of negative themes per game depending on the category, but not in the number of positive themes. The lack of a statistical significance in positive themes can suggest that all games regardless of ESRB rating have the potential for

Table 1. Video Game Descriptions.

Name	Year Released	Rating	Genre	# Positive Themes	# Negative Themes
Super Smash Bros Wii U	2014	E	Fighting	2	3
Mario Kart 8	2014	E	Racing	1	2
Pokémon Sun and Moon	2016	E	RPG	4	2
Minecraft	2009	E	Sandbox	3	2
The Legend of Zelda: Breath of the Wild	2017	E	Action/adventure	4	3
Civilization V	2010	E	Turn-based strategy	4	2
The Witness	2016	E	Puzzle	2	0
NBA 2k17	2016	E	Sports	6	2
Rocket League	2015	E	Sport	3	2
New Super Mario Bros. U	2012	E	Action/adventure	3	1
Uncharted 4: A Thief's End	2016	T	Action/adventure	3	6
Overwatch	2016	T	First-person shooter	4	4
The Last Guardian	2016	T	Action/adventure	4	2
No Man's Sky	2016	T	Action/adventure	2	2
Destiny	2014	T	First-person shooter	4	2
Horizon Zero Dawn	2017	T	Action RPG	3	6
XCOM 2	2016	T	Turn-based strategy	4	4
Injustice 2	2017	T	Fighting	1	6
Tekken 7	2015	T	Fighting	2	4
Final Fantasy XV	2016	T	Action RPG	4	4
Dishonored 2	2016	M	Action/adventure	4	5
Titanfall 2	2016	M	First-person shooter	4	3
Fallout 4	2015	M	Action RPG	5	5
The Witcher 3: Wild Hunt	2015	M	Action RPG	3	5
Mass Effect: Andromeda	2017	M	Action RPG	4	4
Resident Evil 7: Biohazard	2017	M	First-person shooter	4	4
Grand Theft Auto V	2013	M	Action/adventure	3	11
Call of Duty: Infinite Warfare	2016	M	First-person shooter	4	6
Doom	2016	M	First-person shooter	3	3
Battlefield I	2016	M	First-person shooter	3	4

Abbreviations: E, everyone; T, teen; M, mature; RPG, role playing game.

Table 2. Positive Themes Included in This Study.

Themes	% of E Games With Theme	% of T Games With Theme	% of M Games With Theme
Promotes problem-solving	40%	40%	40%
Promotes planning and budgeting skills	40%	30%	30%
Promotes socialization with computerized character	60%	60%	90%
Promotes leadership skills	20%	10%	10%
Promotes team-based cooperation	40%	40%	30%
Promotes perseverance	30%	40%	80%
Promotes good sportsmanship	20%	10%	0%
Time management skills	30%	10%	0%
Helps in increasing attention span	40%	70%	90%

Abbreviations: E, everyone; T, teen; M, mature.

Table 3. Negative Themes Included in This Study.

Themes	% of E Games With Theme	% of T Games With Theme	% of M Games With Theme
Use of alcohol	20%	30%	20%
Use of drugs	0%	0%	30%
Use of tobacco	0%	40%	10%
Blood and gore	0%	80%	100%
Physical violence	90%	90%	70%
Gun violence	40%	90%	90%
Sexual content	10%	30%	50%
Sexual humor	20%	0%	10%
Profanity	0%	40%	100%
Derogatory comments	0%	0%	10%
Theft	10%	0%	10%

Abbreviations: E, everyone; T, teen; M, mature.

Table 4. Mean Number of Positive and Negative Themes Based on ESRB rating.

	E (N = 10)	T (N = 10)	M (N = 10)	Kruskal-Wallis P Value
Positive themes				.425
Mean (SD)	3.2 (1.40)	3.1 (1.10)	3.7 (0.67)	
Median	3.0	3.5	4.0	
Range	1.0-6.0	1.0-4.0	3.0-5.0	
Negative themes				.001
Mean (SD)	1.9 (0.88)	4.0 (1.63)	5.0 (2.31)	
Median	2.0	4.0	4.5	
Range	0.0-3.0	2.0-6.0	3.0-11.0	

Abbreviations: ESRB, Entertainment Software Review Board; E, everyone; T, teen; M, mature; SD, standard deviation.

Table 5. Comparing E Games and T Games by Mean Number of Negative Themes.

	E (N = 10)	T (N = 10)	t Test P Value
Number of negative themes			.005
Mean (SD)	1.9 (0.88)	4.0 (1.63)	
Median	2.0	4.0	
Range	0.0-3.0	2.0-6.0	

Abbreviations: E, everyone; T, teen; SD, standard deviation.

Table 6. Comparing E Games and M Games by Mean Number of Negative Themes.

	E (N = 10)	M (N = 10)	t Test P Value
Number of negative themes			<.001
Mean (SD)	1.9 (0.88)	5.0 (2.31)	
Median	2.0	4.5	
Range	0.0-3.0	3.0-11.0	

Abbreviations: E, everyone; M, mature; SD, standard deviation.

the same amount of positive benefit. This is because the ESRB cannot directly imply that a game can be positive.

They are strictly a rating system for how negative a game is. Another possibility is that even though positive

Table 7. Comparing T Games and M Games by Mean Number of Negative Themes.

	T (N = 10)	M (N = 10)	t Test P Value
Number of negative themes			.414
Mean (SD)	4.0 (1.63)	5.0 (2.31)	
Median	4.0	4.5	
Range	2.0-6.0	3.0-11.0	

Abbreviations: T, teen; M, mature; SD, standard deviation.

themes are seen in all games regardless of ESRB rating, it does not necessarily mean that the positive effect is passed on to the player. It is also difficult to presume that amid all the gun violence and bloody gore in the game that children are benefiting from any positive themes that might be in the background. For example, one of the positive themes that we studied was whether or not the game promoted socialization with a computerized character. In some of the violent shooting games, children have to engage in dialogue with computerized characters and can choose their responses from several preset options. At times, this can change the outcome of a situation. While this could be happening, we would need to investigate if children are actually paying attention to this aspect of the game or if they just focus on the violence. This notion is something that would need further studies to evaluate. In terms of the negative themes, E for everyone games had significantly less negative themes than the M for mature games and the T for teen games. These were anticipated findings given that the E for everyone games are marketed toward younger ages. However, there was no statistically significant difference between the number of negative themes for the M games and the T games. The M games, such as *Call of Duty* or *Grand Theft Auto*, are video games that are violent and not desirable for children. However, T games need to be reconsidered, as parents may be buying them for their children as an alternative to the M games. As shown in this study, the T games and M games had an insignificant difference in the amount of negative themes. Parents may be purchasing the T games because they think that they are better than the M games but they may need to consider being more conscientious in buying games that are rated as T for teen. Some parents may also be relieved by the fact that some games like *Call of Duty* have the option to turn off the profanity; however, this does not change the inherent violent nature of the game.

There are some limitations to this study to be taken into consideration. One limitation might be the sample size of video games chosen. Ideally, the more video games per categorical ranking may have provided us with a different and possibly more accurate mean in

terms of number of themes found per category. The genre of the game may also impact the kind of themes that come up in the games and this was not controlled for. Our rubric system included a theme even if it appeared only once in the game. This can be improved on with trying to do a percentage of the time that theme appears in the game to help validate the tool. Also, each negative and positive theme was weighted the same. For example, from a parental consumer perspective gun violence may be viewed as more negative than physical violence but we did not take this into consideration. The rubric also judges negative themes more accurately as these themes are more objective, while the positive themes are more subjective. This could be a reason why the mean number of positive themes between the categories was not statistically significant. Online gameplay was not included but this adds another complex factor that can expose the child to another form of negativity as they interact with other players of any age group. With the popularity of online games like *Fortnite*, children may come into contact with individuals who they do not know and this can come as a danger to their safety offline as well. More recently, sexual predators were arrested for trying to reach out to children on popular online games such as *Fortnite* and *Minecraft*. Finally, the games were viewed by a single viewer and this may have introduced an unknown bias to the results.

This study has shown that there is roughly the same amount of negative themes in T games and M games, future studies should look into how many parents are buying T games as an alternative to the M games as well as what their perceptions are of buying a T game versus an M game. It also would be interesting to see how many parents are aware of what kind of games their children are buying and playing. While identification is needed when buying mature video games from video game stores, there is no such restriction on teen games. In this digital age, children can purchase games and download them directly onto their consoles or devices if the parental guidance controls have not been set up. Therefore, it is possible that any child can buy them without knowledge from their parents.

Author Contributions

F.G. and L.R. contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript.

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