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Correlation between Violent Games and Aggressive Behaviors in Adolescents

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Abstract

The objective is to study any correlations between violent computer games, time spent playing videogames and aggressive behaviors in adolescents. The sample group used for the study was composed of junior high-school students and senior high-school students aged 12-19. The 400 samples recruited for the study were both males and females. The instruments employed in data collection were composed of the following: 1) Socio-demographic Data Questionnaire and 2) Aggressive behavior Measurement Scale. Data were analyzed using descriptive statistics. According to the findings, the samples playing violent games were found to score a higher mean on overall aggressive behavior and individual aggressive behaviors than the samples who played non-violent games. Moreover, violent games and time spent playing video games were found to be positively correlated with aggressive behaviors in adolescents, with statistical significance .01 ($r = .952$, $r = .542$, $p < 0.01$ respectively).

Keywords: Violent and Non-violent Games, Adolescents, Aggressive Behaviors

Introduction

At present, computer games are considered entertainment media that are gaining in popularity. And since the world is clearly stepping into the digital age, computer games are what adolescents are looking for. Once in contact with computer games, however, adolescents will become addicted and find it difficult to quit. Moreover, some computer games meet the criteria for impropriety in areas such as game structure, game concept, method of play, or behaviors of game characters that are expressed in the form of aggression. Nevertheless, such games are currently gaining in popularity (Mahaarcha, 2011).

According to a survey on information technology usage conducted in 2013 by the National Statistical Office among people aged 6 years and over, 22.2 million people use computers (35.0 percent) and 18.3 million people use the internet (28.9 percent). The aforementioned is an increase from year 2009, when only 17.9 million people used computers (29.3) and 12.3 million people used the internet (20.1 percent). People aged 15-24 have the highest usage ratio (50 percent), followed by those aged 6-14 (54.1 percent). The majority of users use computers and the internet to follow-up on news and to seek information (80.6 percent), followed by playing videogames (23.8 percent). Furthermore, according to an opinion poll of 10,800 samples aged 15 and over in every province nationwide, 20.4 percent admitted to having a family member who plays online games, 59.3 percent play at internet cafés and 38.5 percent play at home. Moreover, the CRM Market Research found that 86 percent of Thai children use internet cafés for playing videogames, earning the top rank out of four countries which also included the Philippines, Ukraine and Russia. According to the aforementioned statistics, it is clear that the population group with the most access to the internet are people aged 6-24 who use the internet to play games by up to 30-45 percent. According to epidemiological data of the current problem of child game-addiction in Thailand, up to 14.4 percent of Thai children (or one in eight children) are addicted to videogames (Pornnoppadol, 2009).

With game characteristics that create entertainment and excitement from the front of the monitor screen, added with the fact that players get to decide whether to win or lose their own games (with players becoming the hero in a fight against a screen-based villain), the image that aggression is normal and fun is created. Players copy the heroes who stand up to villains through the use of violence as a means of problem-solving. Players are influenced with the belief that they will win if they hurt others and that harming opponents through any means is correct. Finally, they become convinced that violence is the best method of overcoming other people.

Since the incidence of aggression by adolescents is frequent, such incidents are unavoidably linked to computer games, as can be seen from news images of violence caused by the hands of adolescents in domestic and foreign media, both of which depict headlines in a way that indicates computer videogames as the clear cause of adolescent aggressive behaviors by culprits. For example, in foreign news, a 17 year old adolescent and friend carried guns and bombs to attack Columbine High-school in Littleton, Colorado, USA. Thirteen people died and 23 more were injured before both of the culprits decided to commit suicide. The incident occurred in April 2009 in the form of a massacre, and the possession of firearms by both culprits caused a hypothesis that computer games may have been the cause for the incident and that both of the culprits imagined reality as a computer game, specifically a war game where characters walked along building alleys and scored by body count (www.aecnews.co.th). In addition, the news of the school-shooting at Sandy Hook, Connecticut, USA, killed over 26 people, 20 of whom were

children and students around 12 years of age. It was later reported that the perpetrator was obsessed with violent games (www.fapgamer.com). In Thailand, news of this type is not unheard of. For example, news of an 18-year old Matthayom 6 (12th Grade) student in a high-school copy of the hit game "Grand Theft Auto" or "GTA", committed the manslaughter and robbery of a taxi driver in line with the game's content, until he was arrested (www.hilight.kapook.com).

Studies have been conducted on the correlations between violent computer games and aggressive behavior in children and adolescents. For example, a study conducted by Gentile et al. (2004) examined the influence of violent video games on aggressive behaviors and the academic achievements of adolescents. The aforementioned study found that the samples playing violent games, displayed a high degree of physical and verbal aggression, coupled with lower academic achievements than the samples who did not play violent games. Furthermore, according to a study conducted by Bartholow and Anderson (2001) on the impact of violent games on emotions, cognition and aggressive behaviors, violent games resulted in increased aggressive thoughts, emotions and behaviors in the samples who played violent games, with statistical significance ($p<.001$). Moreover, a study conducted by Willoughby, Adachi, and Good (2011) the correlation between violent games and aggressive behaviors in adolescents, showed that samples who played violent games showed increased levels of aggression while samples who did not play violent games showed no increase in aggression. Finally, the aforementioned findings concur with a study conducted by Bartholow and Anderson (2002), which found that violent games increase the levels of aggression in adolescents and with greater occurrence in males than females.

However, other research found computer games to have almost no correlation with aggressive behaviors in adolescents. For example, a study conducted by Adachi and Willoughby (2011) the effects of violent and competitive games on aggressive behaviors in adolescents found no differences in the aggressive behaviors of the samples who played violent games compared to the samples who did not play violent video games. Furthermore, a study conducted by Ferguson (2010) and adolescents in Mexico, reported that, although up to 40 percent played violent videogames, only seven percent expressed aggressive behaviors. And according to a study by Kutner et al. (2008) the developmental role of videogames in adolescents, it was indicated that playing violent video games is a method of stress-relief and increases the intelligence of adolescents.

Due to the current surge in the popularity of violent computer games among Thai adolescents and reports of violence linked to computer games caused by adolescents and previous studies, the belief that playing violent computer games increases adolescent aggression requires research to truly determine the correlation of violent games to aggressive behaviors in adolescents. Therefore, the researcher is interested in studying the correlations between violent videogames and aggressive behaviors in adolescents, in order to create understanding of the

aforementioned relationship and clear observation of knowledge on the above-mentioned topic, which will aid planning for preventive and corrective solutions for aggressive behavior in adolescents.

Research Question

Do violent games and time spent playing videogames have correlations with aggressive behaviors in adolescents?

Research Objectives

To study potential correlations between violent computer games, time spent playing videogames and aggressive behaviors in adolescents.

Research Hypothesis

Violent games and time spent playing videogames are correlated with aggressive behaviors in adolescents

Conceptual Framework

Violent computer games are a form of entertainment media that stand out from other types of media, in that they are viewed as harmless children's playthings by parents, even with the presence of violence, competition and difficulty that challenges adolescents' will to win. The above-mentioned characteristics affect aggressive behaviors through several mental mechanisms, such as perceived physical, emotional and aggressive behaviors and so on. Therefore, the researcher used the General Aggression Model (GAM) for this research. The GAM was model created from the integration of different theories, namely, Social Learning Theory, Cognitive Neo Association, among others. The GAM describes a circular plan of interactions between people and their surroundings which, in the present study, is the stimulation of violence and aggressive behaviors affecting the decision-making processes and aggressive behaviors through a number of mental mechanisms, namely, physical stimuli, feelings of aggression, perception of aggression, and so on. Anderson and Bushman (2001) state that violent computer games affect short-term and long-term aggression. In the short-term, computer games increase mental mechanisms that subsequently cause aggressive behaviors. In the long run, computer games promote aggressive beliefs and attitudes, while promoting people to

resolve conflicts and anger through aggressive behaviors. According to the General Aggression Model (GAM) of Anderson and Bushman (2001) it is evident that violent games are correlated with the occurrence of aggressive behaviors in adolescents. However, according to the review of related literature, some research indicates that video games are not correlated with aggressive behaviors in adolescents under the above-mentioned conceptual framework.

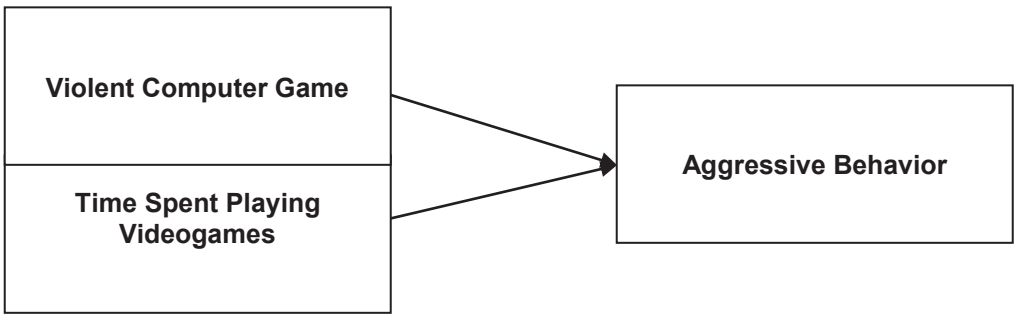

Figure 1 Conceptual Framework

Research Methodology

This research is a descriptive research with the purpose of studying the correlations between violent computer games, time spent playing videogames and aggressive behaviors in adolescents. The samples for this study were junior and senior high-school students studying in a public school located in the province of Patum Thani. The sample consisted of 400 people, both males and females, in the 12-19 age bracket. Data collection was conducted in February-March 2014.

Research Instrumentation

A two-part evaluation form was used as described below:

1. Sociodemographic Data Questionnaire – An assessment form created by the researcher containing eight multiple- and fill-in blank questions on age, gender, educational attainment, family financial status, parents' marital status, parents' occupations, type of games played, venues used for playing video games and time spent playing video games per day.

2. Aggressive Behavior Measurement Scale – In the present study, the researcher used the Aggressive Behavior Measurement Scale of Prapatsri Panyawachirachai (2007). Questions were divided into four components, namely physical aggression, verbal aggression, anger and hostility, for a total of 29 questions. Five-level scales were used: not at all accurate,

not very accurate, moderately accurate, quite accurate and very accurate. Twenty-seven items were positive questions, namely questions 1-4, 6-20 and 22-29 (not at all accurate = 1; very accurate = 5, while the remaining two are negative questions, namely Question 5 and Question 21 (not at all accurate = 5; very accurate = 1). Reliability score of the research instruments of 0.98 is obtained using Cronbach's alpha coefficient through a pilot study in 30 children and adolescents with attributes similar to those of the sample group.

Data Collection

The researcher proposed the research project for approval by the Institutional Review Board on Research involving Human Subjects, Thammasat University, Bangkok. Next, the researcher petitioned for a letter from the Faculty of Medicine of Thammasat University, to be presented to the University's Director in order to explain the research objectives and elicit cooperation, as well as permission for data collection. Once approval was granted by the university, the researcher met with the university's guidance/advisory professor for an introduction and notification of the objectives of the research, research methodology, data collection, research instrumentation and protection of the participants' rights in order to request cooperation in the research. Furthermore, the researcher submitted the questionnaires for the guidance/advisory professor for help in data collection. After the academic had completed data collection, the researcher went to receive the data in person. This research was conducted in compliance with ethical principles governing research involving human subjects, and the time required for completing the questionnaires was approximately 15-20 minutes.

Data Analysis

A software package was used during data analysis, to distribute frequency, percentage, mean and standard deviation, while the analysis of demographic data and aggressive behavior was conducted using Pearson's product moment correlation coefficient to test for correlations between videogames, time spent playing videogames and aggressive behaviors in adolescents.

Research Findings

Part 1 – Demographic Data

1.1 Sample Characteristics

A total of 400 samples were recruited for this research, of whom 224 males (56 percent) and 176 females (44 percent). The mean age was 15.3 years (Mean = 15.26, S.D. = 1.64), and 76.3 percent of the sample (305 people) lived with parents. Furthermore, 36.5 percent of the sample group's parents (146 people) worked freelance and 35.3 percent (141 samples) of the sample group's families earned a combined income between 3,000-15,000 baht per month, as shown in Table 1.

Table 1 Demographic Data

Demographic Data	Number (n)	Percentage (%)
Gender		
Female	176	44
Male	224	56
Age (Years)		
12-15 (Early-Adolescence)	212	53
16-18 (Mid Adolescence)	188	47
Educational Attainment		
Matthayom 1 (7th Grade)	64	16
Matthayom 2 (8th Grade)	68	17
Matthayom 3 (9th Grade)	72	18
Matthayom 4 (10th Grade)	68	17
Matthayom 5 (11th Grade)	74	18.5
Matthayom 6 (12th Grade)	54	13.5
Combined Family Income (baht per month)[1]		
3,000-15,000	112	28
15,001-30,000	141	35.3
30,001-45,000	41	10.3
45,001-60,000	56	14
60,001-75,000	4	1
75,001-90,000	8	2
90,000 and up	38	9.5

[1] At the time of writing (July 2016), 1 US dollar = 35 Thai baht.

Demographic Data	Number (n)	Percentage (%)
Parents' Marital Status	327	81.8
Married	73	18.3
Divorced		
Type of Habitation with Family	305	76.3
With both parents	18	4.5
With father	46	11.5
With mother	18	4.5
With grandparents	13	3.25
With aunts and uncles		
Parents' Occupation	146	36.5
Freelance	63	15.8
Trade	98	24.5
Civil Servant/State Enterprise Employee	84	21
Private Company	9	2.25
Farmer		

(n=400)

1.2 Shows the number and percentage of the sample group

The samples are divided into a group playing violent games and a group playing non-violent games.

Table 2 Number and Percentage of the Sample Group Categorized As Players of Violent Games and Players of Non-Violent Games

	Violent Games		Non-Violent Games	
	Number (n)	Percentage (%)	Number (n)	Percentage (%)
Gender				
Female	1	0.6	175	99.4
Male	163	72.8	61	27.2
Educational Attainment				
Matthayom 1 (7th Grade)	27	42.2	37	57.8
Matthayom 2 (8th Grade)	40	58.8	28	41.2
Matthayom 3 (9th Grade)	31	43.1	41	56.9
Matthayom 4 (10th Grade)	16	23.5	52	76.5
Matthayom 5 (11th Grade)	28	37.8	46	62.2

Matthayom 6 (12th Grade)	22	40.7	32	59.3

(n=400 samples)

According to Table 2, the majority of males (72.8 percent) played violent games, while the majority of females (99.4 percent) played non-violent games. However, when compared within respective educational attainments, regardless of whether the samples were in junior or senior high-school, non-violent games were more prevalent than violent games.

Table 3 Top Five Most Popular Games for Females

	Number (n)	**Percentage (%)**
Females		
No. 1 Cookie-Run	74	42.2
No. 2 Monopoly	51	28.9
No. 3 Cooking Games	21	11.9
No. 4 Dressing Games	18	10.2
No. 5 Farming Games (Heyday Gardening)	12	6.8

(n=176 Samples)

Table 4 Top Five Most Popular Games for Males

	Number (n)	**Percent (%)**
Males		
No. 1 GTA (Grand Theft Auto)	92	41.1
No. 2 Manhunt 2	75	33.5
No. 3 The God Father	25	11.2
No. 4 Killer	22	9.8
No. 5 God of War	10	4.5

(n=224 Samples)

According to Tables 3 and 4, the top five games played by female samples were Cookie Run (42.2 percent), Monopoly (28.9 percent), Cooking Games (11.9 percent), Dressing Games (10.2 percent) and Gardening/Farming Games (6.8 percent), whereas the top five games played by male samples were GTA (Grand Theft Auto) (41.1 percent), Manhunt 2 (33.5 percent), The God Father (11.2 percent), Killer (9.8 percent) and God of War (4.5 percent).

Table 5 Venues Where Children Play Games and Time Spent Playing Games

	Number (n)	Percentage (%)
Gaming Venues		
Game Shops Close to Home	36	9
Game Shops Close to School	8	2
Game Shops Close to Special Classes	-	
Friend's House	12	3
Department Store	-	
Home	334	86
Amount of Time Spent Playing Video Games (Hours per Day)	57	14.3
Less than 15 minutes	17	4.3
15 Minutes	54	13.5
30 Minutes	52	13
1 Hour	11	2.8
1.30 Hours	31	7.8
2 Hours	22	5.5
2.30 Hours	25	6.3
3 Hours	131	32.8
More than 3 Hours		

According to Table 5, the venues where the sample group used most to play video games was home (86 percent). On the time spent by the sample group on videogames, one out of three of the sample group spent more than three hours per day on video games (32.8 percent).

2. Analysis of Data from the Aggressive Behavior Measurement Scale

When analyzing variables for percentage, mean and standard deviation, the study found the following, as illustrated in Tables 6 and 7:

Table 6 Minimum and Maximum Scores, Mean and Standard Deviation of Aggression Scores (divided by gender)

	Normal Range	Mean Score for Violent Games	Mean Score for Non-Violent Games
Aggression			
Total Aggression Score	29-145	97.24	36.97
- Physical Aggression	9-45	30.07	10.39
- Verbal Aggression	5-25	17.24	6.14
- Anger	7-35	23.91	8.57
- Hostile	6-36	26.01	11.85

According to Table 6, the researcher used the Aggressive Behavior Measurement Scale according to the concept by Buss and Perry (1992) that was translated and developed to suit the context of Thai society by Panyawachirachai (2007), it is clear that the mean aggressive behavior score of the sample group who played violent games for aggregate and individual aspects is higher than the samples who played non-violent games, with the combined mean score of aggressive behaviors of the sample group who played violent games as high as 97.24 while the sample group who played non-violent games scored a mean of only 36.97.

Table 7 Minimum and Maximum Scores, Mean and Standard Deviation of Aggression Scores (divided by gender)

	Normal Range	Mean Score in Females	Mean Score in Males
Aggression			
Aggression Scores	29-145	37.46	80.70
- Physical Aggression	9-45	10.30	24.87
- Verbal Aggression	5-25	6.10	14.29
- Anger	7-35	8.39	19.94
- Hostile	6-36	12.65	21.59

Results in Table 7 confirm that the males scored higher on overall aggressive behaviors and individual behaviors than females, with overall mean aggressive behavior score of males as high as 80.70, against a mean of 37.46 for females.

3. Correlation Analysis of Violent Games, Play Duration and Aggressive Behaviors in Adolescents Using Pearson's Product Moment Correlation Coefficient

When the correlations between violent games, play duration and aggressive behaviors in adolescents were studied using Pearsons' Product Moment Correlation Coefficient, violent games were found to be positively correlated to a high degree, with aggressive behaviors in adolescents with statistical significance at .01 ($r = .952, p < 0.01$). In other words, the samples who played violent games to a high degree, had a high degree of aggressive behaviors. Furthermore, time spent playing videogames was found to be positively correlated to a moderate degree with aggressive behaviors with statistical significance at .01 ($r=.542, p.542<0.01$), meaning that the more time the sample group spent in playing videogames, the more aggressive behaviors would occur, as shown in Table 8.

Table 8 Correlations between Violent Games, Play Duration and Aggressive behaviors in Adolescents

Variables Studied	1	2	3
1. Aggressive Behavior	1.00		
2. Violent Games	.952**	1.00	
3. Time Spent Playing Games per Day	.542**	.578**	1.00

*$p < 0.05$, **$p < 0.01$

Discussion of the Findings

Part 1 – Demographic Data of Adolescents

1. Demographic Data

A total of 400 samples were studied in this research; 224 were males (56 percent) and 176 were females (44 percent). The mean age of the sample group was 15.26 years (S.D. = 1.64), and the sample group's age in mid- and late-adolescence was roughly equal (53 percent and 47 percent). Over half of the sample group lived with parents (76.3 percent); less than one-third of the sample group's parents were divorced (18.3 percent). The majority of the sample group's parents worked for hire (36.5 percent), and the family income for the majority of the sample group ranged from 3,000-15,000 baht. When comparing the number of samples who

played violent games with those who played non-violent games, it was found that the majority of males (72.8 percent) played violent games, while the majority of females (99.4 percent) played non-violent games. When compared within respective levels of education, however, the samples were found to play more non-violent games than violent games whether the samples were in junior or senior high-school. Furthermore, the type of game most frequently preferred, as divided by gender, revealed the top five games preferred by females to be Cookie Run (42.2 percent), Monopoly (28.9 percent), Cooking Games (11.9 percent), Dressing Games (10.2 percent) and Farming/Gardening Games (6.82 percent) while the top five games most frequently preferred by males were GTA (Grand Theft Auto) (41.1 percent), Manhunt 2 (33.5 percent), The God Father (11.16 percent), Killer (9.82 percent) and God of War (4.47 percent). Meanwhile, the venue most frequently used by the sample group for playing video games was home (86 percent). Furthermore, approximately one-third of the sample group spend over three hours per day on video games (32.8 percent). The findings of this study concur with previous studies conducted by Bartholow (2005), Rooij et al. (2010) and Charoenwanit and Sumneangsanor (2014) which found that children and adolescents with game addiction usually range in age from early to mid-adolescence, and the majority of these children and adolescents spend over seven hours playing video games each day, while most males choose more violent games than females.

2. Aggressive Behavior

When considering the mean scores of aggressive behaviors sorted according to the group that played violent games and the group that played non-violent games, the sample group that played violent games scores higher on overall and individual aspects for aggressive behaviors than the sample group that played non-violent games, with the overall mean aggressive behavior score of the group that played violent games as high as 97.2 percent while the sample group that played non-violent games scored a mean of only 36.97. Furthermore, when considering the mean score of aggressive behaviors as divided by gender, the male sample group scored a mean for overall aggressive behaviors as high as 80.7 percent, while the female sample group scored a mean of only 37.46. According to the research findings, it is evident that the male sample group scored a higher mean for aggressive behaviors than females because of the characteristics of games chosen by the majority of males. The male samples choose games with content about both physical and verbal violence. For example, GTA (Grand Theft Auto) is a game with internal content focused on giving freedom of choice to players in order of their actions. The IT allows players to use their imagination by inserting the player into the role of a criminal in a large city to seek ways to gain influence through criminal organizations with objectives and missions emphasizing criminal activities such as car-theft, bank robbery, assassination and other criminal activities in addition to taxi-driving, firefighting, management of

the prostitution business (pimping). Furthermore, the game "Manhunt" is filled with violence and cruelty to the point that it has been banned from certain countries, such as England, New Zealand and restricted in a host of other countries. The game's main plot has the player assume the role of a vicious fugitive who is in a mafia gang and whose mission is to hunt down and murder members of a rival gang. There are many methods to carry out such acts of killing with undescribable cruelty and sadism. Moreover, this game contains a mode that allows players to record their actions for later viewing, which are usual methods of survival by carrying out ambush and ninja-like assassinations with various weapons (www://hilight.kapook.com /view/27458).

These findings concur with a previous study by Gentile et al. (2004), who studied the influence of violent games on aggressive behaviors and academic achievements in adolescents, finding the samples who played violent games to express a high degree of both physical and verbal aggression with a lower degree of academic achievements than the samples who did not play violent games. Furthermore, a study conducted by Anderson and Bushman (2001) the impact of violent games on aggressive emotions, thoughts and behaviors. The study found that violent games increase aggressive thoughts, emotions and behaviors in the sample group that played violent games with statistical significance ($p<.001$). Moreover, a study conducted by Willoughby, Adachi, and Good (2011) on the correlations between violent games and aggressive behaviors in adolescents and found the samples who played violent games to show an increase in aggressive behaviors, while the samples who played non-violent games showed no increase in aggressive behaviors. The findings also concur with a study conducted by Bartholow and Anderson (2002), which found violent games to increase the level of aggressive behaviors in adolescents and such behaviors to occur more frequently in males than females.

Part 2 Discussion of the Findings According to Research Hypothesis

Hypothesis: Violent games and time spent playing videogames are correlated with aggressive behaviors in adolescents.

The research found violent games to be positively correlated with a high degree of aggressive behaviors in adolescents with statistical significance .01 ($r=.952$, $p<0.01$). In other words, the samples who played games with a high degree of violence would display a high degree of aggressive behaviors. Furthermore, time spent playing video games was found to be positively correlated to a moderate degree with aggressive behaviors with statistical significance at .01 ($r = .0542$, $p < 0.01$). In other words, the more time spent by samples in playing video games, the higher the degree of aggressive behaviors that will ensue.

The findings of this research can confirm the General Aggression Model (GAM) of Anderson and Bushman (2001), which described the interactive cycle between people and their

surroundings. In other words, aggressive stimuli and behaviors affect aggressive decision-making processes and behaviors through mental processes, e.g., physical stimuli for aggression, feelings of aggression, perception of aggression, and so on. Therefore, violent computer games can affect both long- and short-term aggression. Short-term, violent computer games increase mental mechanisms for aggressive behaviors to follow; in the long term, violent computer games promote aggressive beliefs and attitudes, with violent computer games promoting people to resolve conflicts and anger through aggressive behaviors. In addition, the most detrimental aspect of computer games is that they are accepted as a form of media entertainment that differs from other media, that is, computer games are viewed by parents as harmless toys for children, despite the presence of violence, competition and difficulty in challenges for adolescents to win. The aforementioned characteristics contribute to aggressive behaviors through various mental mechanisms, e.g., physical and emotional stimuli and perception of aggression, etc. (Mahaarcha, 2011) Aside from the influence of the content of violent videogames on aggressive behaviors, the time spent each day by adolescents on videogames also correlates affect aggressive behaviors in adolescents. In other words, the more time spent by adolescents on playing videogames, the more aggressive their behaviors will become. The findings concur with a previous study conducted by Anderson (2000) the correlations between violent games and aggressive thoughts, feelings and behaviors. The aforementioned study found the type of game to not be the only aspect affecting aggressive thinking, feelings or even behaviors in adolescents. However, the time spent by adolescents in video games also increases the level of aggressive thinking, feelings and behaviors in adolescents. Moreover, a study conducted by Lemmens et al. (2011) the impacts of types of games on aggressive behaviors founf aggressive behaviors to be correlated not only with the type of game played but also to be linked with the frequency and duration of time spent in playing video games each time.

Recommendations

1. Recommendations for Practical Application of the Research Findings

According to the aforementioned research findings, violent games and time spent playing video games are both factors correlated with aggressive behaviors in adolescents. Therefore, parties involved - families, businesses related to game production, or the general public - need awareness and must give importance to preventing and filtering games played by adolescents to suit the developmental age of each person. Beginning with the family, parents should give importance to screening the type of games played by their children to remain age-appropriate, and explain the penalties of violence if adolescents were to use the aforementioned

in real life. Parents should explain the difference between violent use in the game and reality. They should also explain that aggressive behaviors expressed by adolescents in video games cannot be applied to the real world. As for the business sector, apart from focusing on profits and sales obtained through game development for customers, game developers should consider the impacts of their games on society because the business sector's focus on profit-seeking from the sales of various games without consideration of the negative impacts on Thai youths may damage society and create additional problems. Moreover, the public sector should increase stringency in appropriately sorting games for different age-groups nationwide, while giving importance to penalties for violators, creating policies to prevent potential problems from playing games rather than issuing policies to treat problems created by playing violent games because doing so may only be a band-aid solution after the problem is beyond solving.

2. Recommendations for Future Research

2.1 Since the population in this study was sampled in Pathum Thani and due to the fact that children and adolescents who are addicted to video games exist in every region of the country, future studies should compare the impacts of violent video games on aggressive behaviors in adolescents nationwide in order to determine the extent of the problem and whether or not the factors influencing aggressive behaviors in adolescents nationwide are the same as the factors examined in the present study or otherwise.

2.2 An experimental study should be conducted by creating a program with the objective of reducing aggressive behaviors in conjunction with the promotion of awareness in choosing age-appropriate games and raising awareness in parents and guardians to recognize significant problems or potential impacts resulting from children playing video games in order to better decrease aggressive behaviors caused by adolescents playing violent video games.

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