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Videogame Playing and Aggression Behaviour: A Correlation Study among School Students

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The purpose this study is to explore school students' videogame playing and its correlation to aggressive behaviour. Four hundred and six (406) videogame playing students from different socio-economic background in Chennai city of India and its suburban areas participated in the study. Data on aggressive behaviour from the students were collected in the Buss and Perry Aggression Questionnaire format. The General Aggression Model was used to predict the students' aggression. The study reveals that gender was significant in hostility, physical and verbal aggression. Further, analyses indicated that parents' education has a significant bearing on students' aggression behaviour.

Keywords: Videogame, aggression behaviour, purposive sampling, Chennai city, students

In the developed nations, as per Cesarone's (1998) observation, since late 1970s, videogames were popular recreation sport for adolescent people (i.e. interactive games run on computers or videogame console). In India videogame playing began with television monitor and cartridge-based console emerged and created its own space in the late 1980s. After a decade, people belonging to higher socio-economic strata started playing videogames on their mobile phones. The convergence of technologies has resulted in the adoption of multiple videogame platforms in Indian in this century only. Primarily a videogame playing provides the children and adolescent entertainment, joy, relaxation from routine schedule work, and socializing with friends. Anderson et al. (2007) establish children play violent videogames influenced their physical and verbal aggression behaviour. They established that physical and verbal aggressiveness was more pronounced in the behaviour of those children who played violent videogames.

Subrahmanyam et al. (2000) found that videogame playing in computer induces the youngsters to desensitisation and violent behaviour. Gentile et al. (2004) in their study found violent videogame play is linked with increasing hostility and aggressive behaviour among adolescents. Roberts, Foehr, and Rideout (2010) stated in their findings that on an average of 8 hours per week children and adolescents (8 to 18 years old) play videogames. Sebastian (2010) found that playing computer animation game is more popular and preferred entertaining activity to viewing television animation programs, watching animation films, using Internet or cell phones. Bajpai and Kulkarni (2011) found that 84 per cent of children (8 to 18 years old) played violent videogames alone. Also, their study found that there is gender difference on videogame play. Male players spend on an average 50 minutes on weekdays and 2 to 3 hours playing on the weekend. Similarly female players

spend 30 minutes on an average in weekdays and 1 hour on the weekend. Van Schie and Wiegman (1998) examined the effect of videogame play among 7th and 8th grade school students drawn from five elementary schools in Netherland. The study revealed that those players who liked to play aggression videogame were much likely to exhibit aggressive behaviour and a lesser amount of pro-social behaviour. In addition to this, the study found playing more aggression-based videogames tended to be less intelligent.

Sneed and Runco (1992) explored the impact of television and videogame on children (aged between 10 to 19 years). The study was conducted in two phase of responses from the participants - Phase I questions asked to parents and phase II questionnaire administered to the children (N=204). The study revealed that both parents and children have a negative attitude towards videogames, as well as parents are worried about their children's behaviour and academic situation. The present study investigates the videogame playing habits among school students with objectives: (i) to study the videogame usage pattern among school students in Chennai and its sub-urban areas, and (ii) its impact on aggressive behaviour among them.

Literature Review

Over the past three decades, a number of studies have been conducted in relation to videogame play and its effects either negative or positive among school students. Funk et al. (2004) explored the relationship corresponding to the media exposure to violence and the real-life violence among fourth and fifth grade school children in Midwestern city of United States. The study questionnaire explored independent variables in relation to demographic, media use and preferences. The variables measured children's exposure to real-life violence exposure and their attitude and empathy on children. It found that children have associated stronger pro-violence attitudes through videogame play and the movies they watched.

Cowell and Kato (2003) have studied the connection into adolescent computer game play and the players' psychological well-being. The study conducted among 305 students from four high schools in Japan. The findings suggested that playing videogame showed a higher aggression score for boys than girls. Bajpai and Kulkarni (2011) have examined media violence and its impact among children in India. The study conducted in five Indian cities namely Ahmadabad, Delhi, Lucknow, Hyderabad, and Kolkata. The core of the analysis focuses on the socio-economic strata, children's television viewing, and electronic game playing behaviours. The results stated that there is a high prevalence of violence depicted in all genres of television shows and computer/video games.

Krahe and Moller (2004) analysed violent electronic game play and hostile behaviour. This descriptive study conducted among 8th grade school students in Germany that focused on hostile attributes and aggression. The study describes how violent videogame playing influence the real-life physical aggression. Further, the study revealed that boys were more attracted towards electronic violent game play than girls. Gentile et al. (2004) examined the interconnection between children's attitude and exposure based on violent videogame playing. The survey conducted among 607 students from 7th and 8th graders from four Midwestern school, including one urban private school (N=61), two suburban public schools (N=350), and one rural public school (N=196) in the United States. It collected information about students' habit, attitude, and knowledge regarding the videogames, the amount of time spent on videogames and how many times they had argued with their teachers during past one year. The hypothesis was based on the general aggression model

theory. The study found that strong correlation of playing violent videogame exposure and physical fights.

Schutte et al. (1998) conducted an experimental study to examine videogame play and its behavioural effects. This study conducted at day-care centre with thirty-one children (15 boys, 16 girls ranging from 5 to 7 years old), found that all the participants played videogames on computer with keyboard and joystick as controls. These participants got alternative chance to play violent videogames (Karateka) or allocated non-violent videogame (jungle hunt). During the videogame play, participants' aggressive behaviour was observed. The study found that gender has no significant difference on aggressive behaviour. The participants who are likely to play violent videogames showed more aggression than others did. Furthermore, it indicates that young students, who play video games, subsequently mimicked characters similar to the videogame. Carnagey, Anderson, and Bushman (2007) observed the physical desensitisation based on influence of violent videogames. The players opted for random chance to play four violent games and four non-violent games for 20 minutes. After that, the participants watched a 10-minute video of real violence in four circumstances like prison fights, shooting, police confrontation, and courtroom outbursts. The participants' physical aggression was measured using a sub-scale of Bussy-Perry Aggression questionnaire. Videogame violence was evaluated using a 10-point Likert scale. This study found that sensibilities of violent videogamers were less bodily evoked by real-life violence compared to non-violent gamers.

Vandewater et al. (2005) have examined children's media use and family conflicts. The survey included 1075 children aged between 6 to 12 years old. Electronic games were categorised into mildly violent, non-violent and violent. The study revealed that playing mildly violent videogames and family conflicts were strongly associated with young children (aged 6 to 8 years old) than elder children (aged 9 to 12 years old). Kumarasuriar et al. (2011) have investigated the gender dissimilarity and their levels of aggression among adolescents in violent videogame play. This study recruited 994 school students from two secondary schools in Malaysia. The self-administered questionnaire mostly focused on demographic and aggression behaviour of the participants. The level of aggression was evaluated adapting a Buss-Perry Aggression Questionnaire (1992) focusing on four behaviour sub-scales namely: anger, verbal aggression, physical aggression, and hostility. The study results demonstrate that the gender difference influences physical aggression and hostility.

Theoretical Explanation

This study uses General Aggression Model (GAM) to understand the influence of videogame play and level of aggression among school students. The aggression behaviour is interpreted using GAM developed by Anderson and Bushman (2002). It paves the basics interpretation for social, cognitive, and biological influences that may affect aggressive outcomes. GAM proposes that there are two types of input variables: situational and individual. Both input variables influence aggression through the internal states they create. It means that internal states serve as mechanisms underlying the relationship between person and situation and outcomes of appraisal and decision-making processes. Affect, arousal, and cognition represent the three most significant internal states. A specific person variable (e.g., high trait hostility) or situational variable (e.g., viewing violent media) may influence one, two, or all three types of internal states. Violent media, for example, affect all three states. Moreover, the three internal states can influence each other.

Method

From among those who had played videogames, samples were collected purposively from the population of the age group between 9 to 17 years. This study was conducted at videogame playing places such as arcade, gaming lounge, Internet cafes and play stations in Chennai City and its peripheral suburban areas. The study applied non-probability (purposive sampling) technique to collect opinion from 406 respondents. The total sample size of the study was 406.

The first part of the survey questionnaire consists of videogamer's demographic information relevant to player's age, gender, education and family income, parent's education and occupation, number of children in their home, and videogame playing. The player's aggressive behaviour was measured using 12-point items questionnaire. Buss and Perry (1992) and Buss and Warren (2000) scale was adapted for assessing the aggression behaviour of the participants. Composition of aggression questionnaires were based on four sub-scales assessing anger, verbal aggression, physical aggression, and hostility. The respondents were requested to reveal their feelings and report behaviour related to them on a five point Likert scale 1 = Not at all like me to 5 = completely like me. The data were collected from March to June 2013 visiting the videogame parlours and other similar places. Each participant in the survey was asked to provide the his/her demographic data as well as school performance, video gaming habits, liking, etc. to measure the aggressive behaviour. The data collected utilising the questionnaires were analysed by using the Social Science Package Software (SPSS) 16 version. In this study, several statistical tests were conducted including descriptive, t-test and correlation.

Results

The study found that 88.2 per cent of male students (N=358) and 11.8 per cent of female students (N=48) had played video games. Besides, 61.6 per cent (N=250) participants were residing in the Chennai city and 38.4 per cent (N=156) from city's suburban areas (Table 1). Of the total participants, nearly (92.1 per cent) were school students and their numbers are: 8 students from 3rd grade; 23 students from 4th grade; 35 students from 5th grade; 32 students from 6th grade; 43 students from 7th grade; 55 students from 8th grade; 52 students from 9th grade; 81 students from 10th grade; 24 students from 11th grade; and 31 students from 12th grade. In addition to this number, the survey also conducted on 24 students studying diploma, 7 discontinued from school, and 1 illiterate (not considered as school students). Regarding the categories of school students, the study considered 139 students from corporation schools, 117 from matriculation schools, 67 from CBSE-pattern English teaching schools, 44 from Tamil Nadu state board aided schools, 5 Anglo Indian, and 22 from top-category (international) schools. Categories of students studying in different schools considered for the study were: 333 from co-education institutions, 31 from boys school and 10 from girls school.

Regarding parents' occupation, majority of the students' father (96.1 per cent) were working while the percentage of mothers as homemaker was 41.4. More than 60 per cent participants stated (N=257) that they have four members in their family. 167 participants stated that they were having a computer/laptop in their home while 239 stated no computer facility available in their house. 60.8 per cent students stated that they preferred evening hrs to play videogame. The study also revealed that 355 student participants played videogame on weekdays (including 208 students played videogames every day). Only fifty-one registered that they did not play videogame during weekdays. Inquiring into the place

of videogame playing, the study found that nearly half of the students (49.8 per cent) played games in their home (including some students play the game in friend's home) while 45.1 per cent played videogame at zone places/lounges/videogame parlours. The study also found around 3.7 per cent students played videogames in cyber cafés and 1.5 per cent played the game in schools.

Table 1. Participants demographic information

Gender	Male (N)	Per cent	Female (N)	Per cent
	358	88.2	48	11.8
Place of Residence	City (N)		Suburban (N)	
	250	61.6	156	38.4
Educational Qualification	School going		Others (N)	
	374	92.1	32	7.9

Factor Analysis of Students' Aggression

The study examined 12-item aggression questionnaire using exploratory factor analysis to determine whether students' aggression behaviour is linked to videogame play. Cronbach's alpha value for the 12 items was 0.839. The twelve items entered into factor analysis using primary components extraction with Varimax rotation. Four components with an

Table 2. Factor analysis associations amongst the variables for aggression behaviour to videogames play

Variables (from 1 to 12)	Factors			
	1	2	3	4
I wonder why sometimes I feel so bitter about things	.835			
Other people always seem to get the breaks	.822			
At times, I feel I have gotten a raw deal out of life	.818			
I have trouble controlling my temper				.443
Given enough provocation, I may hit another person		.884		
There are people who pushed me so far that we came to blows		.832		
I have threatened people I know		.719		
My friends say that I am somewhat argumentative			.842	
I cannot help getting into arguments when people disagree with me			.797	
I often find myself disagreeing with people			.676	
I will flare up quickly but get over it quickly				.803
Sometimes I fly off the handle for no good reason				.709
Eigen value	4.485	1.513	1.233	1.033
Variance	37.3%	12.6%	10.2%	8.3%

Factor 1: Eigen values 4.485 and 37.3% of variance

Factor 2: Eigen values 1.513 and 12.6% of variance

Factor 3: Eigen values 1.233 and 10.2% of variance

Factor 4: Eigen values 1.033 and 8.3% of variance

Extraction Method: Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalisation

Rotation converged in 5 iterations

Eigen value over 1 were found. Factor I : Hostility including questions 1, 2, 3, factor loading = 0.835 - 0.818; Factor II: Physical aggression including questions 5, 6, 7, factor loading = 0.884 - 0.719; Factor III: Verbal aggression including questions 8, 9, 10, factor loading = 0.842 - 0.676; Factor IV: Anger including questions 4, 11, 12, factor loading = 0.803 - 0.443. The question (No. 4) 'I have trouble controlling my temper' is factoring loaded 0.443 which is below 0.500. This is normally excluded in social science research. The four-factor model explained 68 per cent of the variance in students' aggression behaviour for videogame play. Factor I (Eigen value 4.485) accounted for 37.3 per cent of the variance, Factor II (Eigen value 1.513) accounted for 12.6 per cent of the variance, Factor III (Eigen value 1.233) accounted for 10.2 per cent of the variance, and Factor IV (Eigen value 1.033) accounted for 8.3 per cent of the variance (see, Table 2).

Independent Sample t-test

H0: There is no significant difference among gender with respect to aggression behaviour.

Table 3. Independent Sample t-test for variances amongst male and female players

Aggression	Group	N	Mean	Std. Dev	t value	df	Sig. (2-tailed) P
Physical	Male	358	10.1788	3.60849	3.133	404	0.002
	Female	48	8.4375	3.67224			
Verbal	Male	358	8.6760	3.48282	3.511	404	0.004
	Female	48	7.1458	3.73659			
Anger	Male	358	5.8324	1.84250	-0.151	404	0.880
	Female	48	5.8750	1.81747			
Hostility	Male	358	10.3296	3.81839	2.953	404	0.003
	Female	48	8.6250	3.23955			

p<0.5%

The independent sample t-test is carried out to interlink aggression points for mean scores for groups (males and females). The aggressive behaviour is measured using four sub-scales like physical, verbal, anger, and hostility. Table 3 reveals that there is a statistically significant difference in scores for males physical aggression (Mean = 10.17, Standard Deviation = 3.60) and females physical aggression (Mean = 8.43, Standard Deviation = 3.67; t (3.133) = 404, P = 0.002, two-tailed); Males verbal aggression (Mean = 8.67, Standard Deviation = 3.48) and females verbal aggression (Mean = 7.14, Standard Deviation = 3.73; t (3.511) = 69.201, P = 0.004, two-tailed); Males hostility (Mean = 10.32, Standard Deviation = 3.81) and females hostility (Mean = 8.62, Standard Deviation = 3.23; t (2.953) = 404, P = 0.003, two-tailed). Table 3 shows that there is an insignificant variation in score for male anger (Mean = 5.83, Standard Deviation = 1.84) and female anger (Mean = 5.87, Standard Deviation = 1.81; t (-.151) = 404, P = 0.880, two-tailed). Therefore, the null hypothesis rejected at 95 per cent confidence interval. It may be stated that there is a significant difference in the physical, verbal and hostility aggression behaviour of the male and female (except anger).

H0: There is no significant difference with respect to place of residence and aggression behaviour of players.

Table 4. Independent Sample t-test for differences amongst city and suburban students

Aggression	Residence	N	Mean	Std. Div	t value	df	Sig. (2-tailed) P
Physical	City	250	9.2280	3.38316	-5.374	404	0.000
	Suburban	156	11.1667	3.76715			
Verbal	City	250	8.0560	3.02547	-3.111	404	0.001
	Suburban	156	9.1987	3.91592			
Anger	City	250	5.9200	1.76353	1.147	404	0.252
	Suburban	156	5.7051	1.94843			
Hostility	City	250	9.3480	3.64858	-5.430	404	0.000
	Suburban	156	11.3782	3.69017			

$p < 0.5\%$

The t-test analysis exposed significant differences among place of residents with suburban student gamers more active in physical aggression ($M = 11.16$, $SD = 3.76$ contrast to city students ($M = 9.2$, $SD = 3.38$), $t (-5.374) = 404$, $P < 0.05$). A significant difference was noticed between the place of residence of suburban video gamers' verbal aggression ($M = 9.19$, $SD = 3.91$) compared to their city counterpart ($M = 8.05$, $SD = 3.02$), $t (-3.111) = 404$, $P < 0.05$). With respect to hostility, the differences between suburban and city students were (suburban: $M = 11.37$, $SD = 3.69$) more hostile than city students ($M = 9.34$, $SD = 3.64$), $t (-5.430) = 404$, $P < 0.05$). Therefore, the null hypothesis rejected at 95 per cent confidence interval. There was an insignificant difference found between the place of residence of suburban student videogamers' anger ($M = 5.70$, $SD = 1.94$) compared to the city students ($M = 5.92$, $SD = 1.76$), $t (1.147) = 404$, $P > 0.252$).

Pearson's Correlation

H0 - There is no relationship between family income and students' aggression behaviour.

Table 5. Correlation for family income and components of aggression

Variables		Family income	Aggression behaviour
Family income	Pearson correlation	1	-.147**
	Significance (2-tailed)		.003
	N	406	406
Physical aggression	Pearson correlation	-.147**	1
	Significance (2-tailed)	.003	
	N	406	406

** Correlation is significant at the .01 level (2-tailed)

Pearson's correlation study was conducted on monthly family income and students' aggression behaviour on four sub-scale such as: physical, verbal, anger, and hostile. The correlation (Table 5) reveals that physical aggression was negatively correlated ($r = -.147$, $p < .003$) to family income compared to other components of aggression. Whereas the null hypothesis rejected for physical aggression, however it accepted the other aggression components such as: physical, verbal and hostility. The results indicate that there is an association between monthly family income and students' physical aggression behaviour.

Partial Correlation

H0: There is no relationship between parents' education and students' aggression behaviour.

Table 6. Correlation amongst parents' education and components of aggression

Control variables			Father education	Mother education	Aggression
None	Father education	Correlation	1.000	.739	-.265
		Significance (2-tailed)	-	.000	.000
		df	0	404	404
Physical aggression	Mother education	Correlation	1.000	.721	
		Significance (2-tailed)	-	.000	
		df	0	404	
None	Father education	Correlation	1.000	.739	-.094
		Significance (2-tailed)	-	.000	.058
		df	0	404	404
Verbal Aggression	Mother education	Correlation	1.000	.737	
		Significance (2-tailed)	-	.000	
		df	0	404	
None	Father education	Correlation	1.000	.739	.033
		Significance (2-tailed)	-	.000	.509
		df	0	404	404
Anger	Mother education	Correlation	1.000	.742	.
		Significance (2-tailed)	-	.000	
		df	0	403	
None	Father education	Correlation	1.000	.739	-.126
		Significance (2-tailed)	-	.000	.011
		df	0	404	404
Hostility	Mother education	Correlation	1.000	.734	.
		Significance (2-tailed)	-	.000	
		df	0	404	

Cells contain zero-order (Pearson) correlations

The study computed a partial correlation between parental education and controlling for school students aggression behaviour. The four sub-scales physical, verbal, anger, and hostility methods were applied to evaluate the relationship. The analysis found that there is a significant relationship associated between parents' education and students' aggression behaviour ($r = .739, p < .01$). The result of the zero order correlation yielded that there was an association of strong negative correlation between parents' education controlling student's aggression behaviour.

Conclusion

This research explored the playing videogame and its impact among school students aggressive behaviour shows that the majority of the respondents were male (88.2 per cent)

compared to female (11.8). This suggests that most of the parents may not allow their daughters to play videogame outside from their home. This finding is consistent with the study of Sudha (2012) who examined the psycho-physiological impact of violent videogame playing children in southern Chennai city. This study used purposive sampling technique to collect data from the respondents aged between 13 to 18 years, who were playing videogame at game parlours and play stations. A total number of respondents 89.1 per cent were male (N=312) and 10.9 per cent were female (N=38). This study found that parents were not permitting their teenage daughters/girls to go out and play videogame at play centres in comparison to the similar activities for boys.

The t-test analyses are utilised to define the significant behavioural dissimilarity between gender and place of residence of the respondents. The results revealed that gender has significantly influenced by the aggression component namely, hostility, physical and verbal aggression. The study findings correlated uniformly with previous study (Kumarasurari et al., 2011), concerning the level of aggression influenced by videogame play. They found that gender has significant impact on physical aggression and hostility. The study found that the school students who were residing in the Chennai city and its suburban areas significantly influenced by hostility, physical and verbal aggression. The family income and school student's aggression behaviour were analysed using four-sub hypothesis of aggression. The findings of this study indicate that family income was associated with videogame players' physical aggression whereas the other subscale components of aggression such as verbal, anger and hostility were not associated with it. The findings are similar to the survey work of Barnett et al. (1997) which have established that there was no significant association between family income and participant's attitude towards videogame playing.

With respect to the parental education and students' aggression behaviour, the study supports that parent's education is related to student's level of aggression on videogame playing. In addition, parental education was associated with school students' aggression behaviour with all four parameters: anger, verbal, physical, and hostility.

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