Behavioural Effects of Playing Violent Immersive Games among Adolescents in Secondary Schools in Central India

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Abstract

The research paper aims to study the Behavioural effects of playing violent immersive games among adolescents in secondary schools of Central India. In Madhya Pradesh (Central India), rapid industrialization and urban development provides many opportunities for economic and social growth on one hand, but also resulting in mental health disparities especially in adolescents. Adolescence is a period of dynamic brain development where they learn from the society, behaviors of people and environment surrounding their community. Through this study the researcher aims to measure the level of aggression among boys and girls and also to assess the relationship between playing violent immersive video games and Aggression. The population for this study will include school students (males and females) in Madhya Pradesh, India of age group 13-16 years. The population selected is more exposed to violent videogames and such games are more popular in this age bracket. For the present study, 100 samples (50 boys and 50 girls) will be selected by random sampling method. The samples will be school student boys and girls from public schools private schools who play violent immersive games which comprise of games that deal with racing, arerna based fights, aim and shoot and satanic games for duration of six months or more . In this study, univariate and bivariate tables will be prepared. The data will be analyzed by using simple statistical tools such as averages, percentages, mean, standard deviation and t-test and Pearson product moment correlation.

Keywords: Aggression, Engagement, Madhya Pradesh, Physio - Psychological, Play

1. Introduction

Video, computer, online, and virtual reality games are icons of popular culture and are being criticized in all mass media outlets as well as the research community for the harmful health implications like potential addiction and other associated conditions. With the advancement of

technology, educators and policymakers are looking at the innovative technical tools such as video games, virtual worlds, and Massive
Multi-Player Online Games. (MMPOGs) Buckless, 2014; Gómez, 2014.
As electronic games have assumed an important place in the lives of children and adolescents, Cognitive processes should be understood as a broader component much of which is not often taught and tested in school Children are known to acquire digital literacy not in a formal way, through play, and neither schools nor other educational institutions take sufficient account of this important aspect. A perspective on multimedia design for training and education suggests that it should combine the most powerful features of interactive multimedia design with the most effective principles of technologically-mediated learning. Gros, B. (2007).
Backlund and Hendrix (2013), in their meta-analysis reported positive outcomes in learning when using serious games in the educational process.
The majority of previous reviewers, especially regarding cognitive outcomes, broadly identify the beneficial contribution of game-based learning. Results indicate that games can be as effective as traditional learning modes, revealing their effectiveness in promoting knowledge acquisition (Smetana & Bell, 2012; Backlund & Hendrix, 2013; Clark et al., 1987, Warren et al., 2016). Another merit is that students can achieve their learning goals through playfulness and problem-based learning (Tsekleves et al., 2014), thereby leading to self-efficacy and transfer of learning (Gegenfurtner et al., 2014).

2. Body of paper

Playing games has been highlighted as a key facilitator of cognitive growth as part of our informal education. Recreational video games played on a handheld console connected to a television have been largely overlooked as a form of informal education.
Indeed, they are commonly regarded as inconsequential, with no educational value beyond eye-hand coordination, and as something that needs close monitoring from educators, parents, business owners, politicians and policymakers.
Children who play video games frequently do so in social groups, such as with friends or family members. Surveys show that gaming frequency is positively associated with more peer interaction outside of school, the evidence for this though is insufficient and we cannot assume that gaming can lead to enhanced social development of a child.
Another aspect that some studies and research throws light on is the association between gaming and aggression in both laboratory and survey settings, as well as in several meta-analytical studies. It has generally been indicated that there is a lack of a strong association between playing games (even violent ones) and aggressive behaviour.
Another substantial impact was seen is the effectiveness of games not only in the cognitive domain but also in the affective and behavioural domains (Ritzhaupt et al., 2014; Tsekleves et al., 2014; Fu et al., 2016; Jordi Carenys & Soledad Moya (2016).

Some evidence proves that gaming is an unhealthy behaviour . This evidence consists of problematic gaming associated behaviours such as hyperactivity, probelms with self control, time distortions during gaming, problems with attention to name a few.
Some immersive games have a plot where the conflict and the resolution portrays violence which then could be reflected by the player in the lines of diminished empathy, increased aggression and apathetic behaviors. Thus, the period of adolescence and the impact of immersive gaming at this age is very important. In-depth researches of this period are of great significance in today's context for the growth of any individual, family, society, as well as the nation. Therefore the present study is taken up to study the effect of playing violent immersive video game on aggression level of boys and girls.

2.1 Review of Literature

The reviews of the literature for the present investigation took into consideration studies by **Ozmert et al (2015)** who examined the behavioural effects of TV viewing in 7th and 8th grade Turkish adolescents. They found out that unchecked television media viewing is linked to psychosocial health issues such as stereotyped cultivation, poor school performance, and sleep disorders.TV viewing durations and aggressive behaviour were shown to have a positive connection (r= 0.11, P=0.012) as reported by parents. Another study by **De Bruijn et al (2017)** conducted a prospective study to analyze the internet and game behaviour at secondary school children and looked into secondary school children's internet and gaming use, as well as the compulsiveness of their use and its relationship to other health behaviours. It also assessed the preliminary outcomes of a freshly established school health promotion scheme, which was introduced in January 2008 at a secondary school in the Netherlands. This programme was a pilot project for a case-control study and was one of the first to include seven health behaviours in one educational session. Personal information, internet and gaming usage (Compulsive Internet Use Scale), and other health related behaviours were all addressed in questionnaires along with a link to alcholism, body mass index, physical activity and psychosocial wellbeing. These two studies gave us a number of findings that merit more consideration and investigation like media usage and its link to academic performance. **Mossle et al (2016)** worked on investigating the role of specific inappropriate media usage patterns and their link to academic performance in adolescents. A key finding was demonstrated in a cross-sectional survey of 5,529 fourth grade students and a longitudinal panel study of 1,157 primary school children. It basically indicated that the more the time students spent consuming media and the more violent its contents were, the worse their school grades were, even when vital factors such as family, educational or immigrant background were controlled for. This study too looks at many such factors.
This study is also inspired by another study from Fanti, Vanman, Henrich & Avraamides (2010) that looked into the desensitisation to violence over a short period of time. This study's findings suggested that repeated exposure to media violence reduces the psychological impact of media violence in the short term, therefore desensitizing viewers to media violence. As a result, viewers

became less empathetic to victims of violence and actually enjoyed the violence depicted in the media more. Furthermore, a curved pattern better represented desensitisation to media violence, whereas a linear pattern better represented desensitisation to comidic situations. There is also specific literature that throws light upon sleeping patterns and media usage which is considered indirectly in the study **Garrison et al (2011)** studied media use and child sleep: the impact of content viewed, timing and environment. Children's Sleep Habits Questionnaire was deployed to derive sleep measurements. Media diaries captured time, content title, and co-use of television, video- game, and computer usage; titles were coded for ratings, violence, scariness, and pacing. Nested linear regression models built for this study investigated the impact of timing, content, and co-use on the sleep problem score. They reported that on average, youngsters consumed 72.9 minutes of media screen per day, with 14.1 minutes occurring after 7:00 pm. Eighteen percent of parents stated that their children had at least one sleep difficulty; children who had a bedroom television consumed more media and were more likely to have a sleep problem.In regression models, each additional hour of evening media usage was related with a substantial increase in the sleep difficulty score (0.743 [95% CI: 0.373-1.1114]), as did daytime use with violent content (0.398 [95% CI: 0.121-0.676]). Daytime violent use had a larger influence in the presence of a bedroom television (P =.098) and in low-income children (P =.07).They came to the conclusion that violent content and evening media consumption were linked to higher sleep issues.

Another pressing question was answered by a study done by **Barlett et al (2009)** who looked at how the length of effects of the initial short-term increase in aggression and physiological arousal continue after violent video game play. Participants in Study 1 (N=91) completed pre- and post-video game measures of aggressive thoughts, aggressive sentiments, and heart rate. Then, after 4 or 9 minutes of delay, participants performed Time 3 measures. Study 2 followed a similar protocol, but participants (N=91) completed the hot sauce paradigm after a 0, 5, or 10min delay to assess aggressive behaviour. First, after playing a violent video game, aggressive thoughts, aggressive behaviour, and heart rate all increased. Second, results of the delay condition revealed that the increase in aggressive feelings and aggressive thoughts lasted less than 4Wminute, whereas heart rate and aggressive behaviour lasted 4–9Wminute. While the link to aggression and gaming has been observed by many studies, another study by **Mitra & Chatterjee (2011)** suggests that socio demographic variables too impact aggression in adolescents. This study was to investigate the role of socio-demographic variables such as family characteristics, residence, parental education, socioeconomic level, and peer group influence on aggressive behaviour in adolescents. A prospective cross-sectional study of 767 adolescents aged 10 to 19 years old of both sexes was done. When compared to joint families, high risk violent behaviour was found to be strongly related with nuclear families and single parents. Adolescent street dwellers and urban slum dwellers were much more at risk than those who had suitable housing. Poor maternal education was also discovered to have a substantial affect. Finally, a negative peer group impact was discovered to have a detrimental impact on aggressive behaviour.

We also looked at what are the factors that made these games so attractive for the target audience and referred to the study by **Marije Nije Bijvank et al (2009)** looked at the Pan European Game

Information classification system for video games (e.g., 18+) and studied the factors that may boost the attractiveness of games for children younger than the age rating. The study included 310 Dutch teenagers. The design was a 3 x 2 (participant gender) x 7 (label: 7+, 12+, 16+, 18+, violence, no violence, or no label control) x 2 (game description: violent or nonviolent) mixed factorial. The first two criteria were between subjects, whereas the final two were within subjects. The investigations also included three personality variables (reactance, trait aggression, and sensation seeking). Participants assessed how much they desired to play each game after reading fake video game descriptions. Results revealed that restrictive age labels and violent-content labels increased the attractiveness of video games for all of the age groups (even 7- to 8-year-olds and girls). Finally we looked at a study by Allahverdipour, Bazargan, Farhadinasab & Moeini (2010) that investigates the relationship between psychological well-being, game play, aggressive behaviours, with regards to children to show the threat of video-computer game playing. According to the findings, participants spent an average of 6.3 hours each week playing video games. Furthermore, 47% of participants said they have played one or more severely violent games. Excessive gamers reported having suffered poorer mental health than low or moderate users. Participants who began gaming at an earlier age were more likely to have poorer mental health outcomes. The study concludes that there is a curvilinear relationship between video game playing and mental health outcomes, with "moderate" gamers faring best and "excessive" gamers showing mild increases in problematic behaviours.

2.2 Rationale of the study

Evidence shows that video games, played among teenagers which belong to middle and low-income countries is expanding substantially, necessitating further research into the relationship between violent video games and aggressive behaviour. Lack of or insufficient enforcement of copyright protection, as well as the sale of video games which have not been rated appropriately to in these countries, have heightened public concern about the potential negative implications of playing violent video games with respect to aggression, behaviours, cognitive performance, attitudes, behaviours, academic performance, and children's psychological well-being.

We observe that experimental studies of the short-term effects of aggressive game material on player aggression yield inconsistent findings. **Hilgard J, Engelhardt CR, Rouder JN** 2017.As a result, existing studies cannot support the claim that violent video games have a significant long-term predictive impact on aggression in children. However, a number of findings merit more consideration and investigation within a country as diverse as India.

In Central India, studies related to this are very scarce. Rapid industrialization and urbanization provides many opportunities for economic and social well being on one hand, but also resulting in mental health disparities especially in adolescents. It needs scientific investigation and also warrants the need to understand the effect of this on aggression level of boys and girls which has not been evaluated yet. With this background information, the need is

identified by the researcher to undertake a study to understand the effects of playing violent immersive video games among secondary school students on their level of Aggression

Hence, an attempt has been made to assess the relationship between violent video games and its effects on level of Aggression among adolescents.

2.3 Research Problem

The present paper studies The behavioural Effects of Violent Immersive Games among Adolescents in Secondary Schools of Central India

Objectives of the study

1. To measure the level of aggression among boys and girls.
2. To measure the difference in the level of boys and girls playing violent video games
3. To assess the relationship between playing violent video game and Aggression level of students.

Hypotheses of the study

1. There will be significant difference in the level of Aggression among boys and girls playing violent video games.
2. There will be significant relationship among playing violent video game and a ggression level of students.

Operational Definitions

- ***Aggression:*** Aggression may be defined as a harmful behavior which violates social convention and which may include deliberate intent to harm or injure another person or object (Bandura 1973)
- ***Population and Sample :***
  The population for this research consisted of school students (boys and girls) studying in Central India of age group 13-16 years. The population selected is more exposed to violent immersive videogames. For the present study, 100 samples (50 boys and 50 girls) were selected by random sampling method. The samples were boys and girls from public schools and private schools or those found in cafes who played violent immersive games that deal with racing, arerna based fights, aim and shoot and satanic games for duration of six months or more. Popular games like PUBG, Call of Duty, Carmegeddon and Fortnite were played by the subjects studied.

2.4 Tools Used

- Part 1 – Questions to assess demographic data

- Part 2 - Questions to identify violent immersive video game played by school going adolescent students
- Part 3 Aggression Inventory
- For this study, Aggression is measured using an aggression inventory from Dr. G.P. Mathur and Dr. Raj Kumari Bhatnagar, India. This aggression scale consists of 55 statements. Each statement describes different forms of individual's aggression in different situations. It is a Likert type 5 point scale with positive and negative statements.
- The study was done using google forms data filled up by their parents.

2.5 Descriptive Analysis of Variables

The data was run through descriptive statistics as seen in Tables below

Table 1: Frequency Distribution by the Age of the child

Age of the child	Percentage
13 years	36
14years	30
15 years	15
16 and above years	19
Total	100

According to the above table, 36% of the youngsters were 13 years old, 30% were 14 years old, and 19% were 16 years or older.

Table 2: Frequency Distribution by the Gender of the child

Gender of the children	Percentage
Male	**50**
Female	**50**
Total	**100**

From the above table, it was noted that 50% were male and 50% were female.

Table 3: Frequency Distribution based on Father's Education

Education of the Father	Percentage
High school	**28**
Higher Secondary	**24**
Graduate	**31**
Post Graduate	**17**
Total	**100**

Table 3 shows that 31% of the dads of the children were graduates and 17% of the fathers of the children were postgraduates.

Table 4: Frequency Distribution based on Mother's Education

Mother's Education	Percentage
High school	**32**
Higher Secondary	**28**
Graduate	**26**
Post Graduate	**14**
Total	**100**

According to Table 4, 28% of the moms of the children have finished higher secondary education, and 26% are graduates.

Table 5: Frequency Distribution by Father's Occupation

Father's Occupation	Percentage
Govt job	**24**
Business/self employed	**36**
Private job	**27**
Others	**13**
Total	**100**

Table 5 shows that 36% of the dads in the samples were self-employed or active in business. 27% of the sample's fathers worked in the commercial sector, while 24% worked for the government.

Table 6: Frequency Distribution by Mother's Occupation

Mother's Occupation	Percentage
Govt job	**7**
Business/self employed	**15**
Private job	**20**
Others	**40**
House wife	**17**
Total	**100**

Table 6 shows that 15% of the moms of the children were in business. 40% of the children's mothers worked in jobs that did not provide a consistent monthly income, while 20% worked in the private sector. Only 17% of the mothers were stay-at-home moms.

Table 7: Frequency Distribution by Family Income

Income of the Family	Percentage
Rs. 10,000 and less	47
10,001 to 20,000	27
20,001 and above	26
Total	100

According to Table 7, 47% of the samples' monthly household income was Rs. 10,000/- or less, while 27% earned Rs. 10,000 to 20,000/-.

Table 8: Frequency Distribution by Duration of playing Violent Immersive Games

Duration of Playing	Percentage
6 months to 1 year	44
1 to 3 years	21
3 to 6 years	26
6 years and above	9
Total	100

According to the above data, the bulk of the children (44%) spent 6 months to one year playing violent video games.

26% of the youngsters had been playing for 3 to 6 years, and 9% had been playing for more than 6 years.

Table 9: Frequency Distribution by Place of playing Violent Immersive Games

Venue of the game play	Percentage
Home	36
Friends house	9

Videogame centre/ Pub G Cafe	**55**
Total	**100**

According to Table 9, 55% of the samples have visited a video game centre or a pubg cafe.36% of the youngsters had played at home, whereas 9% had played

Table 10: Frequency Distribution by Frequency of Playing Violent Video Games

Frequency of Playing	**Percentage**
1to 3 days in a week	**55**
4to 6 days in a week	**17**
Daily	**28**
Total	**100**

Table 10 shows that around 55% which is more than half the sample size , played violent immersive video games for one to three days weekly. 28% of the children played the game daily whereas 17% of the samples studied played videogames for 4 to 6 days weekly.

Table 11: Frequency Distribution by number of hours of Playing Violent Video Games

Number of hours of Game play	**Percentage**
Less than 1 hour	**51**
1 to 3 hours	**38**
4 to 6 hours	**11**
Total	**100**

Table 11 indicates that 51% of the samples played violent immersive video game for less than an hour in a day and 38% of the adolescents said that they played the game from 1 to 3 hours in a day and another set of 11% of the samples studied said that they had played the game for 4 to 6 hours daily.

Table 12: Frequency Distribution by Favourite Genre of Game

Favourite Genre of Game	Percentage
Racing game	23
Fighting game	29
Shooting game	38
Satanic game	10
Total	100

Table 12 shows that 38% of the children largely liked playing games related to shooting, 29 % of the samples liked playing arena and fighting games , whereas 23% of the samples studied enjoyed played racing and road rage related games.

Table 13: Frequency Distribution by Parents Reaction towards Game playing

Parents Reaction	Percentage
Happy	16
Unhappy	41
Don't bother	43
Total	100

Table 13 reveals that 48% of the children did not bother when they lost game whereas 33% and 19% of the samples felt unhappy and became irritable respectively when they had lost the game.

2.5 Hypothesis Tested

Hypothesis 1 :There is significant difference in the Aggression levels among boys and girls playing violent immersive video games

Table 13: Mean, Standard deviation and t-value to find significance difference in boys and girls in the level of aggression

	Gender	N	Mean	S.D	t-value	Level of Significance
Aggression	Boys	50	12.03	3.56	2.89	Significant
	Girls	50	11.06	3.9		

From table 13, it is clear that there exist significant difference in mean scores of male and female children on aggression level of children playing violent games. The mean score of male children on aggression level was 12.03 and the mean score of female was 11.06. As shown in the table the computed t-ratio of the sample was 2.89, which is significant at both 5 percent and 1 percent level of significance. Thus, from the hypothesis, there is significant difference in the level of Aggression among boys and girls playing violent video games is accepted. Further, the aggression level among boys is higher than girls while playing video games.

Hypothesis 2: There is significant relationship among playing violent video game and Aggression level of students.

In the present study, the correlation analysis is used to find out the strength of relationship between video game play and aggressive behaviour.

Table 14: Relationship between aggression and playing violent game

Variable	N	Df	Calculated value of 'r'	Level of significance
Aggression	100	98	0.43	Significant
Violent video game				

It is inferred from the above data that there is a positive and significant statistical relationship at **(0.05 level of significance)** between aggression and violent immersive game play. Through presenting the result of the second Hypothesis, we find the existence of positive statistical relationship between aggression and violent immersive video game play by children. The calculated r value for aggression and emotional intelligence is 0.43. Thus, hypothesis No. 2 is accepted it means there is a significant relationship between playing violent video game and Aggression level of students

2.6 Result

Following are results of the present study:

36% of the children were of ages 13, 30% were aged 14, and 19% were aged 16.There were equal number of males and females studied for this but significant difference in the level of Aggression among boys and girls playing violent video games was seen.

31% fathers of the children were graduates, and 17% of the fathers of the children were postgraduates. 28% of the mothers of the children had finished higher secondary education, and 26% of the moms were graduates. 36% of the fathers in the samples were self-employed or active in business. 27% of the sample's fathers worked in the commercial sector, while 24% worked for the government. 40% of the children's moms worked in jobs that did not provide a consistent monthly income, whereas 20% worked in the private sector.

17% of the mothers studied for this were stay-at-home moms. 47% of the samples' monthly household income was Rs. 10,000/- or less, while 27% earned between Rs. 10,000 and 20,000/-.

The majority of youngsters (44%) had been playing violent video games for 6 months to a year. 26% of the youngsters had been playing for 3 to 6 years, and 9% had been playing for more than 6 years. 55% of the samples had previously visited a video game centre/ pub G cafe. 36% of the youngsters had played at home, whereas 9% had played at a friend's house. Approximately half of the samples (55%) played violent immersive video games one to three times each week 28% of the children played every day, whereas 17% of the samples played 4 to 6 days per week.

38% of the youngsters in the samples had played during the day on weekends, 53% had played in the evening, and 9% had played late at night. 51% of the youngsters had played violent video games for less than an hour per day, 38% had played for 1 to 3 hours per day, and 11% had played for 4 to 6 hours per day.

38% had played games related to shooting, 29% had played games related to fighting in an arena, and 23% had played games related to car race and road rage. While we observed that 84% of the children’s parents were aware of theiur ward’s playing habits, 16.% of the children reported that their parents were unaware of their playing habits.

There exists a significant difference in mean scores of male and female children on aggression level of children playing violent games. We accept both hypothesis and understand that there is significant difference on the level of aggression among male and female children playing violent video games.Further, the aggression level among male children is higher than female children while playing video games. There is a positive significant statistical relationship at (0.05 level of significance) between aggression and violent immersive video game play by children.

3.Conclusion

Following are some findings of the present study:

1.There is significant difference in the level of Aggression among boys and girls playing violent video games

2. There is significant relationship among playing violent video game and Aggression level of students.

3. This paper can be useful for game developers, gaming platforms, game distributers and sellers and educational institutes, agencies giving censorship and viewership rating and parents.

4. Through this study it may be assumed that unchecked tech if given to the masses can create a havoc but it needs further verification.

5. Mothers and Fathers education level seems to impact the nurturing of adolescent child and their gaming behaviors.

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