Computer games and violence: Is there really a connection?

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ABSTRACT

The relationship between videogames and violent behaviour was analysed in a representative sample of 9889 Norwegian youth ageing from 13 to 18 years. Videogames were separated in eight different categories. A hypothesis of the relationship between videogames and violence was put forward as a starting – point for reasoning. A unique correlation between violent videogames, specifying first person shooters and action games, and violent behaviour was found. By controlling for age and gender, the effect of first person shooter games disappeared for youth in - between 9th to 12th grades, and the action videogames remained as the significant predictor. Only first person shooter was a significant predictor in 8th grade.

Keywords
Videogames, violence, adolescence.

INTRODUCTION

In several severely violent incidents the perpetrators have been intensively occupied with violent video games. In some cases, the violent act has been almost identical to self-constructed scenarios characterizing a game of specific interest titled Doom. These incidents have lead many to believe that there is a clear connection between utilization of video games and violent behaviour. When serious incidents occur, there is a tendency towards inferring that such a connection exists. However, violence is a phenomenon of a complex causational relationship. By emphasizing a strong causational relationship between (violent) video game usage and violence in society in general, would bee a too simple inference to draw for a significantly much more complex correlational relationship. Therefore, a multifaceted approach will be necessary in order to understand the relationship between video game usage and the expression of violence in society. Video Games have been around in a relatively short period of time but have become increasingly popular. Some studies indicate that boys between 8 and 13 years play video games at least near ten hours a week (Anderson & Bushman, 2001). It is also reported that violent video games are popular. Buchman & Funk (1996) found that fantasy and violent games accounted for 50% of student's favourite games.

A large literature argues that there exists a relationship between violent video films and violent behaviour (see Anderson & Bushman, 2001 for a review). Since there are many similarities between films and modern video games, one might infer a relationship of a similar nature. Some researchers (Dill & Dill, 1998) have moved even further in calling attention to a pre-existing more significant relationship between usage of videogames and tendency towards violence in social life, emphasizing the active role of the player, the realism of the game, the immediate reward for violent behaviour and identification with the aggressor.

There are several hypothetical models on how violence might influence behaviour. In the Dill & Dill (1998) review five hypotheses are presented:

- Firstly, the construction, elaboration and priming of aggressive thought networks or scripts through game play, may increase the probability of violent behaviour.
- Secondly, extended exposure towards violence could weaken inhibitions on acting violent.
- Thirdly, it might seem possible that exposure to violence affects the level of behavioural patterns of empathy adolescents feel towards/direct toward victims of violence in a tendency of decrease. Some experimental studies demonstrate such effects in the short term.
- The social context of exposure can justify behaviour mechanisms of aggression. If for instance the person was exposed to a social context focusing on saving the world from invasion or terrorist acts, violent behaviour would be justified. Justification of violence has a greater impact or effect on violent behaviour than exposure to non-justified acts of violence.
- Alber Bandura's social learning theory (Bandura, 1973) demonstrates that modelling and reinforcement are important factors teaching children to act aggressively. Both factors are present in violent video games.
- A last possible impact worth mentioning is that video games might change adolescents' worldview towards perceiving the world as a dangerous place. This increased fear might influence youth's belief systems towards accepting violence as the normal behaviour pattern and as a consequence, lower the threshold for violent behaviour.

It is important to note that an alternative theory has been presented. According to the theory of 'Aggression Catharsis', exposure to predominantly violent videogames leads to a decreased tendency toward aggressive behaviour. Aggression catharsis theory further specifies that engaging in activities that lead to exposure of aggressive behaviour, (i.e. game activities) might even lead to reduction in tendency towards violent behaviour due to a "venting off" effect of aggressive energy or desires.

Not many studies exist that set that address the proposed relationship between violent behaviour and video games. Some researchers claim that there is a relationship between video games and violent behavior (Dill & Dill, 1998; Anderson & Bushman, 2001; Ballard & West, 1995) while others claim that no such relationship exists (Scott, 1995) or that methodological problems interfere with the likelihood of drawing conclusions. (Griffiths, 1999). Sherry (2001) concluded in a Meta study encompassing 25 countries ,

that there seems to be a correlation between video games and violence but specifying the effect of this correlation to be smaller than the correlation found between exposure of television and violence. Sherry demonstrated a greater correlation for games involving fantasy and human characters than for games where the violence was introduced in a sport setting. However, the lack of games from different categories made detailed analysis difficult. Dill & Dill (1998) argues, that there haven' t been a significant number of studies that have directed enough attention to the potential correlation between different types of video games and their unique contribution to violent behaviour or effect on violence.

Griffiths (1999) categorized games into nine categories: racers (e.g. motor sports), adventures (e.g. fantasy, rescue), puzzlers (e.g. brainteasers), sport simulations (e.g. football), platforms (e.g. jump to and from platforms), platform blasters (e.g. platforms with shooting), beat'em ups (e.g. games with punching and kicking), shoot'em ups (e.g. shooting and killing with weapons), and weird games (i.e. games that do not fit any of the already outlined categories. In the present study we have been using a similar categorization of games (see table 1).

Game category	**Main characteristics**	**Elements that might lead to violent behavior**	**Protective elements**
Role play	Games where the player takes on the characteristics of a character.	Might be associated with out-group culture. Identification with perpetrator	
Adventure	Fantasy and fiction. Focus on exploration.		
Strategy	Focus on planning and reasoning. Some strategy games include violence		Focus on strategy and intellectual abilities might be protective
Platform	Solving puzzles and exploring platforms.		
Action and fight	Being a person, killing, influence violence, perform crimes	Identification with the aggressor. Priming. Role modelling. Reinforcement of violent behaviour (scripts) as resolution to social conflicts Weakening of inhibition	

First person shooter	Games with punching, kicking and shooting or killing with weapons.	Rush Skills in violent behavior Reinforcement of violent behaviour Weakening of inhibition	Competition Focus on technical skills
Sports	Simulation of sports.		Competition
Racers	Competition between motorized vehicles	Rush thrill	Competition and play

Table 1. Overview of game categories and possible psychological mechanisms leading to or protecting from violent behavior.

Theoretically, we would expect that different types of games showed a different impact on a tendency towards violent behaviour in general. We would expect action games and first person shooter games to be associated with violence, while puzzles and strategy games would not.

As described earlier, some studies indicate a relationship between violent behavior and exposure of video games, while others conclude that there is no such relationship. In most of these studies, samples between 100 and 700 have been used. This has had several implications. First, only analysis including aggregated groups has been possible. The probability of finding large enough groups of violent children is low. Second, low sample size makes inquiries on the question regarding age or development difficult. Up to date, no studies have managed to assess the influence of videogames of a violent character from a developmental perspective (Kirsh, 2002). Therefore, important aspects of the relationship between violence and videogames may be overlooked. If for instance, the correlation between video games and violence vary with age, a study including respondents in one age group might conclude differently from a study including respondents from a different age group.

Several studies indicate that adolescents are more vulnerable to violence during certain developmental periods of adolescence. In general, the level of aggressive behaviour of adolescents is higher for boys than for girls. Although, an increase for both groups from age 11 to 14, and a decrease from 15-17 have been scientifically proved. The peak for aggressive behaviour is between 13 and 15 years (Loeber & Stouthammer-Loeber, 1998). The presence of conflicts in an array of social relations is an indispensable point to emphasize. Conflicts between parents and adolescents and in-between siblings, are at its peak around early adolescence. This covariates with the frequency of use of computer games from about 7.5 hours a week in early adolescence to 3,5 later in adolescence (Kirchs, 2002). The reason for this peak in aggressive behaviour has been explained as a combined effect of psychosocial factors and biological changes in the human body (Spear 2000). A peak in preferences for violent videogames and violent behaviour in the same age groups can interrupt the analyses. A significant association between violent videogames and violent behaviour can be an affect of age instead of a unique effect of violent videogames on violent behaviour. The same argument can be used for

including gender in the analyses, witch has not been done earlier (Anderson & Bushman, 2001). Boys are more violent than girls are. If they also prefer violent games more than girls do, there is an increasing possibility of measuring primarily a gender effect, not a gaming effect.

In addition individual differences between youth in the same age cohort suggest that only certain individuals are involved in violent behavior. It might even be so that only those with the greatest number of risk factors associated with development of violent behavior are susceptible to the negative consequences associated with playing violent video games (Kirsh, 2002).

Even if a relationship between video games and violence is found, this may not be a causal relation. We can not exclude the possibility that children with tendency toward violence also would prefer to play violent games. It has been established, that highly aggressive boys prefer violent video games (Kirsh, 2002). In this case, the cause of the relationship is characteristics within the child itself and not violent games as such. In addition, violent children might be associated with social contexts that promote violence, for instance, gangs or neighbourhoods with high crime rates. In this case, the heavy use of video games might be a result predominantly of socialisation. There are for instant examples of violent youth gangs looking at violent videos or playing violent video games prior to going out to perform violence on the streets. A possible explanation to the covariance over age between usage of video games and violent behavior could be that the gaming represents stimulation in a period where more moderate stimuli offer less excitement.

A first step in the investigation of the association between violent videogames and violent behaviour is to establish whether there is such a unique connection. To enable such analysis, a large representative sample is needed. The uniqueness with the present study is that it consists of a representative sample of 9887 adolescents from age groups ranging from 13 to 18, with a response rate of 93%. This allows for finding large enough groups of violent adolescents in the different age groups, who plays different categories of video games, in order to resolve some of the issues discussed previously.

In the present study, the specific component of exposure for specific categories of games on self reported violent behavior was analyzed. We both looked for preferences for particular games and how exposure correlates with violent behaviour. In addition, we included a developmental perspective in the discussion of the relationship between a peek in violent behaviour during early adulthood and usage of violent video games.

METHOD

Participants

In 2002 11,373 students from 73 schools in grades 8 to 13 (ages 13 to 19) comprised the sample of the Young in Norway 2002 study. Each grade was equally represented. Every school in the country was included in the register from which the schools were selected. Schools were drawn with probability, according to size (proportional allocation). The sample was stratified according to geographical region and school size - which in Norway is closely related to degree of urbanisation. In Norway 98.5% of the

age cohorts between 12 and 16 attend the ordinary public junior high schools. After graduating from these, 97% begin in senior high school. Due to drop out and courses that take less than 3 years to complete, about 80% of the 18-year olds are still in high school. The only exclusion criterion was a severe lack of reading capability. We excluded 1.5% due to this, the majority being either seriously mentally retarded or immigrants and refugees recently having arrived in the country.

Procedures

Consent from the Ministry of Research and Education, the local school authorities and the school boards was obtained. Parental informed consent was given for all students below the age of 16 (junior high-school), and a passive parental informed consent was given for older students (senior high-school). The questionnaire took two regular school hours of 45 min. to complete. The students put the completed questionnaires in an envelope and sealed it themselves. In order to avoid students influencing each other's responses, all eligible students at each school completed the questionnaire at the same time. Students who had consented to participate but who were not present in class during those two hours completed the questionnaire together on a later occasion. The response rate was 93%. Students who were younger than 12 years were excluded in the present analyses. We also excluded the student in the last year in senior high school due to a very low participation rate (67%). This resulted in a net sample of 9887 students in ages 13 to 18 years.

Measures

Violent behaviour was measured by three questions: how many times did you fight with weapon the last year, beaten or kicked somebody, or threatened to harm somebody. Participants reported the frequency of their involvement in these behaviours during the previous 12 months. Their reporting of behaviours was recorded on a six-point scale (never this year (0), once (1), 2 to 5 times (2), 6 to 10 times (3), 11 to 49 times (4), more than 50 times (5)). The three items were summed up to a mean score.

Frequency of video games playing was measured by questions about how often they used to play videogames. To measure preference for different types of videogames, we asked how many days the last month they had been playing eight different categories of video games. The possible answers was no days, 1 to 5 days, 6 to 10 days, 11 – 20 days, and more than 20 days. The eight categories were the following: role-play, adventure, strategy, action and fight (beet' em -up), first-person shooter, sport, and racers. In each category, there were examples specifying the most-selling games at that time.

RESULTS AND DISCUSSION

Prevalence of video game playing and violent behaviour

As can be seen from table 1, almost all of the boys played video games, independent of age. It is only a small decrease from 96 to 91 percent from the youngest to the oldest participants. Among the girls, there was a more significant decrease, from 77 percent to 43 percent. Self-report violent behaviour has its highest peak among boys in 9th and 10th grade, and for girls in 8th to 10th grade. According to table 1, it is not an obvious connection between a peak in violent behaviour and a peak in prevalence of video games playing in general.

Table 1: Prevalence of video game playing and self-report violent behaviour, separate by gender and grade/age. Percent

	8th grade 13-14 years		9th grade 14-15 years		10th grade 15-16 years		11th grade 16-17 years		12th grade 17-18 years	
	M	F	M	F	M	F	M	F	M	F
Plays videogames	96	77	97	72	95	61	94	53	91	43
Violent behaviour	34	19	41	22	42	21	34	13	34	9

When we asked which games they had played during the last 30 days, the most popular video games among the boys seemed to be racer (71%), first person shooter (65%), and sport game (65%). Fifty three percent of boys had played action game the last month. The most popular videogames among girls seemed to be racer (32%), platform (25%), and sport games (21%). For the violent video games, 17 percent of the girls had played action game, and only 8 percent had played first person shooter game. The most obvious difference between the preferences of girls and boys was therefore found for first person shooter games. This is a strong argument for controlling for gender in investigating a possible effect of first person shooter game on violence. If not, there is an increasing possibility of measuring primarily a gender effect, not a gaming effect. We can though conclude that both violent behaviour and preference for violent games are much higher for the boys.

Table 1 and table 2 show that there is a larger gender difference in prevalence of gaming among high frequent gamers, compare to prevalence of gaming in it self. We also see that younger youths plays more that the elder youths.

Our result presented in table 2 supports the argument for making separate analyses for each age group if we want to study the effect of violent video games on violent behaviour (Kirsh, 2002). When we only study the high frequent video game players, we find for the boys a connection between preference for violent video games and the peak in violent behaviour. First person shooter games was both the most popular, and had its highest prevalence, in 9^{th} and 10^{th} grade, which also were the age groups with highest prevalence of violent behaviour. Action games, the other category of violent video games, has its peak in popularity in 8^{th} grade and 9^{th} grade.

Table 2: Prevalence of different categories of videogames, separate by gender and grade. Percent who played more than 11 days during the last 30 days

Categories of	8th grade		9th grade		10th grade		11th grade		12th grade	
Video games	M	F	M	F	M	F	M	F	M	F
Racer	28	4	23	3	22	3	20	4	16	2
1.person	26	2	29	1	30	2	21	1	19	1
Sport	28	4	27	3	23	2	21	2	18	1
Strategy	19	2	21	3	20	1	15	1	13	1
Action	20	3	18	3	14	2	9	2	10	1
Role-play	10	2	11	1	10	1	12	1	8	1
Platform	6	5	6	2	4	2	3	2	2	2
Adventure	3	3	5	1	4	2	4	1	1	1

Is there a connection?

First we conducted a simple Person correlation between violent video games and violent behaviours. The correlation was r=.23 for action game, and r=.22 for first person shooter games. This is the same size on the correlation as reported by the meta-analyses by Anderson & Bushman (2001). But, the studied included there had not controlled for possible gender effects. Table 3 present the correlations between different videogames, after controlling for possible gender differences in game preference. As can be seen in table 3, after including gender in the analyses, the correlation decrease to .15 for first person shooter games, and to .18 for action games. All game categories correlated statistically significant with violent behaviour, even if the highest effect was reported for the violent games. This to games together explained 4% of the variation in violent behaviour (r^2= .064).

There are significant correlations between most of the different categories of games. Youth who plays videogames often plays more than one category of games. Violent games are also one of the most played games. Therefore, if violent games have a unique effect on violent behaviour, most of the other categories of games will also correlate positive with violent behaviour. Therefore, to capture the unique effect of violent games, we had to include all categories of games in one regression model. The results are presented in table 3. We also conducted separate analyses for the different age groups, since both preferences for violent games, and violent behaviour, have a peak in the same age groups.

Table 3: Predicting violent behaviour from different categories of videogames, separate by grades/ages. Standarized regression coefficients

	Bivariate	Multivariate				
	All	8th grade	9th grade	10th grade	11th grade	12th grade
	n=9887	n=1955	n=1897	n=1954	n=2033	n=2048
Racer	.102 ***	-.044	-.042	-.007	.132 ***	.021
1. person	.152 ***	.108 **	.083	.064	.054	-.027
Sport	.071 ***	.051	-.078	-.036	.000	-.001
Strategy	.081 ***	.012	.019	.047	.023	-.070
Action	.175 ***	.085	.126 ***	.078 **	.121 ***	.133 ***
Role-play	.097 ***	.052	.050	.021	-.001	-.072 **
Platform	.085 ***	.043	.011	-.020	-.054	.022
Adventure	.079 ***	-.010	-.034	.053	.478	.027
R^2		.061	.053	.056	.088	.071

Note. **p<.01 ***p<.001

Note. R^2 is for the videogames, before entering gender in the model

Note: all bivariate coefficients are after controlling for gender

As can be seen in table 3, the association between non-violent games and violent behaviour disappeared, with one exception. There was also significant variation between the different age groups. First person shooter games only had a positive effect on violent behaviour among the youngest youths in 8th grade. In the other grades there was only a positive association between action games and violent behaviour. These results establish that violent games have a unique effect on violent behaviour, also after controlling for the fact that both violent behaviour and preference for violent games has its top in the same age group.

In 11th grade there was also a positive association between violent behaviour and racer games. It is possible that these kinds of game are attractive for aggressive and violent youth, who wants excitement and an arena for aggressive behaviour.

In 12th grade there was also a negative association between role-play games and violent behaviour. Very few of the adolescents in this age group play role-play games, and this are probably a selected no-violent group.

Table 3 also shows that the violent games explained most of the variance in violent behaviour in the oldest age groups with the lowest prevalence of violent videogames, compare to the younger youths. The videogames explained between seven and nine percent of the variance in violent behaviour in the oldest age groups. The reason for this

can be that there is a stronger selection effect in these to age groups. Gaming explained between five and six percent of the variance in violent behaviour in 8th to 10th grade.

Conclusion

The presented results come from a large, representative study, with approximately 2000 youths in each of five age groups. This high number of respondents made analyses possible that had not been done earlier. We included different categories of videogames, gender, and age group in the analysis. This allowed for a more detailed analysis of the possible relationship between exposure to videogames and violent behaviour.

The first question raised in this paper was whether there is a connection between violent videogames and violent behaviour, and if this effect is unique. We found an association between violent behaviour and all categories of games. However, only violent videogames and racer videogames had a unique positive effect on violent behaviour. This means that there is not a strong general effect of gaming on violent behaviour. Our results also show that it is action games, and not first person shooter games, that predict violent behaviour.

One exception is for the youngest adolescents, where only first person shooter predicted violent behaviour. This shows that age is an important factor, and leads us to the next question raised in this paper. Is there a peak in preference for violent videogames and violent behaviour in the same age group? If this is the case, will the association between violent videogames and violent behaviour disappear after having controlled for age? The results show that the effect of first person shooter games disappeared for most of the age group after controlling for age and gender. However, the effect of action videogames remains as a significant predictor in all age groups.

A possible explanation of this unique relationship between action games and violence might be attributed to either causal or selective effect. Either the identification with the perpetrator lead to a reduced inhibition for aggressive acts or violent persons tend to select violent games where they can identify with a perpetrator.

Why do action games have a unique effect on violent behaviour, and not first person shooter games? The simplest explanation is that first person shooter games are more distributed and therefore attract in a less selective way than action games. Or, it can be that there are aspects with first person shooter games that prevent it from having an effect on violent behaviour. This has to be investigated further in later studies.

The present study does not resolve the question of causality. However, we find a significant connection between specific games and violence controlling for gender and age groups. Another important implication of this study is the necessity to consider gender and developmental perspectives in the study of a possible effect.

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