Video Gaming as a Factor that Affects Academic Performance in Grade Nine

2018

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Abstract

In an attempt to investigate concerns expressed by high school counselors, the researchers developed a quantitative Likert-scale survey to assess the relationship between recreational video gaming and academic performance (defined as school attendance and final grades) in grade 9. Questions about video gaming appeared with other questions about social relations, extra-curricular activities, and leisure-time activities. Complete data sets resulted for 82 of the 96 grade nine students in three mid-western Canadian high schools who volunteered for the study with their parents' permission. The students answered the survey questions in their school libraries during release time from their English Language Arts classes. This article reports gender-separated correlations between video gaming and academic performance, based on the students' questionnaire responses, attendance records, and the arithmetic means of their final marks in English, mathematics, science, and social studies. Pearson product-moment correlations were determined for linear data and Spearman rho correlations were determined for nonlinear data – both with calculations of two-tailed probability of error. In this report, the results are collated into 8 overall categories created by correlating 42 pairs of variables related to the following factors: attendance, final marks, time spent playing video games, positive and negative school experiences, and positive and negative video game experiences. In consideration of their findings, the researchers recommend that school professionals advise parents and students of the potentially harmful effects of playing video games. The article contains 8 tables with two sections each (for male and female participants), and 47 cited entries in the list references.

Keywords: video games, adolescence, teenagers, academic performance, school performance, school grades, school attendance

Our study responds to school counselors' concerns over increases in the problematic effects of recreational video gaming on their students' school attendance and grades. These counselors wanted to make data-driven decisions to advise parents to monitor their children's video gaming activities. At the same time, we chose to study the correlations between school performance and other factors, primarily as a means to embed our video gaming questions into these other categories. We were afraid that our grade 9 research participants would otherwise construe our focus on video gaming and therefore might not be as honest in their answers.

Our research purpose was therefore to study the correlations between a variety of factors and academic performance in grade 9. The factors included social relations (e.g., friends), extra-curricular activities (e.g., work), and leisure-time activities (e.g., playing video games). We operationally defined academic performance as school attendance and final marks.

Because we collected the data by means of a Likert-scale questionnaire, and because we developed our own survey instrument, we did not anticipate collecting statistically significant findings. We were essentially testing the waters to see whether any correlations would arise.

Our results show correlations that warrant further investigation and confirm our school counselors' concerns over the relationship between recreational video gaming and academic performance. Interested readers are invited to contact the primary author of this article for copies of the survey instrument and our aggregate data. We also welcome inquiries about the other correlations that we discovered, related to the other factors that were included in our survey.

Overview of Related Literature

We began our research as an investigation of the relationships between adolescent video gaming and two aspects of school performance: attendance and school marks. Therefore, although we later expanded our inquiry to include other factors that affect academic performance in grade 9, the following overview is limited to the literature on video gaming. Because we separated our own data by gender, our literature overview includes gender-related observations whenever relevant.

The potential of video gaming to influence students' lives is undisputed. Whether recreational or educational (Brockmyer et al, 2009; Chuang & Chen, 2009; Lee & LaRose, 2007), violent or nonviolent (Ferguson & Kilburn, 2010; Fleming & Rickwood, 2001; Huesmann, 2010), video gaming has become an integral part of North American children's lives outside of school. Over 90% of all youth in the United States play video games (Hagedorn & Young, 2011, "Gaming Addiction," para. 1).

The literature on the relationship between video gaming and school attendance is sparse. We found only one report of research that specified gaming as a predictor of truancy (Rehbein, Kleimann, & Moble, 2010). In their study of 15,168 German 9th graders, Rehbein et al. (2010) identified increased truancy as directly related to video game dependency (VGD), which they clearly differentiated from extensive gaming. Austin and Totaro (2011) included video gaming as one of many internet activities that could affect school attendance, but they reported no correlation between gaming per se and attendance. The girls in their study tended to skip school to socialize on the internet. The boys were more prone to video gaming, but during out-of-school hours. These findings are important, because other researchers (such as Lin & Chen, 2006; and Yakovlev & Kinney, 2008) have found clear relationships between attendance and school marks. Yakovlev and Kinney, for example, reported an overall course grade decrease of 0.9 points for every class missed.

Much more research has been done to investigate the connection between video gaming and school performance. Most researchers have reported negative correlations, based on time spent gaming, game content, and levels of player dependency. Clear and negative correlations have been found between the amount of time that a student spends playing video games and his/her school marks (Gentile, Lynch, Linder, & Walsh, 2004; Hastings et al., 2009; Sharif & Sargent, 2006). In their study of 1,492 high school students in Thailand, Jaruratanasirikul, Wongwaitaweewong, & Sangsupawanich (2009) found that 2 hours of gaming per day correlated with an overall GPA of below 3.00. Violent video game content, which is characteristic of massive multiplayer online role-playing games (Oggins & Sammis, 2012; Sublette & Mullan, 2012; Young, 2009), also negatively correlates with academic performance (Alsaleh, 2005; Lynch, Gentile, Olson, & van Brederode, 2001; Sharif & Sargent, 2007). Most damaging of all is video game dependency (VGD, Rehbein et al., 2010), which has also been described as pathological gaming (Gentile, 2009) and addiction (Charlton & Danforth, 2007;

Shao-I, Jie-Zhi, & Der-Hsiang, 2004; Van Rooij, Schoenmakers, Vermulst, Van Den Eijnden, & Van De Mheen, 2011).

The negative correlations that have been found between video gaming and overall school performance are augmented by reports of other school-related skills and behaviors. Monke (2009) purported that the increased distances of time and space afforded by worldwide online games would interfere with students' developing normal perceptions of time and space. Anand (2007) found that video game addicts tended to fall asleep in class and fall behind in their assignments. Gentile (2009) reported correlations between pathological gaming and attention deficits in class. Griffiths (2010a) and Sharif and Sargent (2006) found that video gaming creates time conflicts that reduce the amount of time that gamers devote to homework. The 425 (10-19-year-old) boy gamers in Cummings and Vandewater's (2007) study spent an average of 30% less time reading for every hour that they played video games on weekdays, and the 109 girls spent an average of 34% less time doing homework for every hour that they played video games on weekdays. Clearly, there is evidence in the literature that video gaming correlates with diminished school performance.

Classroom behaviors are affected by the relationship between adolescent video gaming and aggression (Barenthin & Van Puymbroeck, 2006; Ferguson & Kilburn, 2010; Hastings et al., 2009). This aggression makes players more apt to argue with teachers and fight with classmates (Alsaleh, 2005; Gentile et al., 2004; Lynch et al. 2001). The level of aggression correlates with the degree of violence in the games (Anderson, Gentile, & Buckley, 2007; Anderson, Shibuya, & Ihori, 2010; Huesmann, 2010). Players of violent games are rewarded for becoming increasingly engaged in the violence (Bartlett & Rodeheffer, 2009; Ledwis et al., 2008, Fleming & Rickwood, 2001). Outside of the gaming environment, this aggression manifests as emotions that range from irritability (Alsaleh, 2005, Hagedorn & Young, 2011) to outright hostility (Gentile et al., 2004, Lynch et al., 2001; Shao-I et al., 2004) and loss of control (Duven, Muller, & Wolfling, 2011; Hagedorn & Young, 2011).

In other research, video gaming has been found to benefit school marks, skills, and behaviors (Barber, Eccles, & Stone, 2001; Blum-Dimaya, Reeve, Reeve, & Hoch, 2010; Sutherland, Facer, Furlong, & Furlong, 2000). While Ferguson (2011) conservatively concluded that gaming does not necessarily jeopardize school performance, other researchers have found positive correlations between gaming and educational development, including reading and math (Bowers & Berland, 2013; Wittwer & Senkbeil, 2008), cognitive processing (Abrams, 2009; Ferguson, 2007); imagination and creativity (Durkin & Barber, 2002; Steinkuehler & Duncan, 2008), nonverbal intelligence (Subrahmanyam, Greenfield, Kraut, & Gross, 2001), and general literacy and learning skills (Gee, 2004; Jenkins, 2006). Bowers & Berland (2013) found positive correlations between 1-2 hours of daily gaming and mathematics and reading skills in 13,960 US high school students. In their study of 4,660 German 15 year-olds, Wittwer and Senkbeil (2008) also found positive correlations between "smart" gaming and mathematics skills (but no other school subjects). Abrams (2009) reported that struggling high school students can use gaming to develop cognitive schema that can be applied to academic material as well, and De Aguilera and Mendiz (2003) and Ferguson (2007) reported positive correlations between gaming and spatial cognition. In their interactions with artificial intelligence (Durkin & Barber, 2002), gamers develop complex thought processes and problem-solving skills (De Aguilera & Mendiz, 2003) that can serve them well in school settings.

Overall, the literature includes evidence of both positive and negative correlations between video gaming and academic performance. Addiction and violent game content feature

prominently in the reports of negative correlations, but most of the research reviewed here did not separate addiction from non-dependent use, or violent from nonviolent content. Griffiths (2010b) cautioned against assuming that excessive gaming equates addiction, even if the individual plays 14 hours a day, because addiction has its own set of deleterious consequences that do not always characterize heavy gaming. It seems reasonable to assume that the average adolescent is not a pathological gamer. Cummings and Vandewater (2007) found that only 534 (36%) of their 1491 (10-19-year-old) US students were video gamers, and that the gamers played an average of only 1 hour per weekday and 1.5 hours per weekend day. Hunley et al. (2005) found a higher proportion (50%) of gamers in their much smaller study of 101 US adolescents, who played an average of 4.43 hours per week. If these figures are representative, most adolescents spend three times as many hours watching television as they do playing video games (Cummings & Vandewater, 2007). The type of game content is more worrisome, and may not have been adequately teased out in this review of the literature.

Methodology

We conducted the research in a mid-western Canadian school division, with ethics approval from the school division, Brandon University, and University College of the North. The school division superintendent and a high school principal helped us to refine our research plan and survey instrument. A substitute teacher conducted the surveys, and an administrative secretary collected the academic performance data.

Access and Sampling

We used nonprobability convenience sampling to recruit research subjects who were taking grade 9 English Language Arts in three high schools during the year of data collection. Of the 541 students who were invited to participate, 96 volunteered (with their parents'/guardians' consent) – a response rate of 18%. In the end, we analyzed the data for 82 questionnaires (15%), which is the number for which we obtained complete sets of performance data from the school division. Of these 82 research participants, 29 were male and 53 were female.

The Survey Instrument

We developed a quantitative questionnaire to use as the survey instrument. The first set of questions asked primarily for demographic information: gender, parents' education, residency, age, and spoken language(s). The other sections of the questionnaire used Likert-scale questions to ask about students' relationships with peers, extracurricular activities, school experiences, self-concept, self-esteem, self-advocacy, and video games. To "lighten" the questionnaire, we added questions about students' music, actor, and career preferences. These questions were not intended for inclusion in the data analysis.

Some of the questions either reinforced or countered each other, so that we could check the students' answers for consistency. For example, a student who chose #4 or #5 to answer "There should be a video game club in school" would be expected to choose #4 or #5 to answer "Video games make me feel good" and "Video games are important in my life."

Data Collection

Each high school set its own date and time for data collection during an English language arts class. At the appointed time, a substitute teacher met the students in the library to complete the

survey. The questionnaires took approximately 20 minutes to complete, so the total release time from class was approximately 40 minutes.
The following summer, an administrative secretary created an Excel spreadsheet of the students' attendance (recorded as number of class times absent, identified as either excused or unexcused) and school marks (recorded as overall final percentages, with individual marks for English, mathematics, science, and social studies), coded with student numbers.

Data Analysis

We converted the Excel spreadsheet's attendance data into numerical scores that reflected the percentage of total classes that each student had attended (instead of missed) during the school year. For the students' final marks, we used the means (i.e. arithmetic averages) that were already recorded on the spreadsheet.

Then we separated the respondents by gender, and we calculated separate correlations for males (29 M) and females (53 F). Pearson product-moment calculations determined correlations between the linear sets of data (i.e., between the school performance scores for attendance and school marks). Spearman rho calculations determined correlations between the school performance scores and the students' answers to our nonlinear survey questions.

We chose the following classifications to assess the relative strength of our correlations:

- coefficients of (+ or -) .100 to .199 = "slight" correlation, no predictability
- coefficients of (+ or -) .200 to .299 = "mild" correlation, no predictability
- coefficients of (+ or -) .300 to .399 = "moderate" correlation, limited predictability
- coefficients of (+ or -) .400 to .499 = "fair" correlation, fair predictability

We also assessed the degree to which correlations were made more meaningful by statistically significant two-tailed low probability of error: $p < .01$ or $p < .05$.

Limitations of the Research Design

We anticipated a higher return on our invitations to participate. Of the letters that were sent home with students from the three high schools, we experienced return rates of 5%, 35%, and 23%. Our sample was therefore far from representative of the grade 9 student population in our own school division, and our findings cannot be generalized even to this small target population, let alone grade 9 students in other parts of Canada or the United States.

It would also have been better to have more equal participation by boys and girls. Of the 82 students included in our data analysis 29 (35%) were male and 53 (65%) were female.

We should have added a "please print" signature line to the consent form, so that all names would be readable by the administrative secretary who collected the school performance data and coded our questionnaires with student numbers.

Our survey instrument was homemade. Although we would like to think that the questions we used for data analysis had face validity, we cannot be sure.

Given the literature's focus on differentiating between violent and nonviolent video game content, we would also add the following question to our survey, with five choices for response

that would accommodate non-gamers as well as gamers who play games with varying degrees of violence: “How would you rate the content of the video games that you normally play?”
We used a correlational design to calculate the relationships between our various variables, two at a time. We did not have enough research participants – or a strong enough survey instrument – to conduct a multi-factor analysis.

We collected data at one point in time only. We therefore had no longitudinal data for tracking students’ academic performance, etc., over time in relation to continued (or escalated) video game usage – or any other identified factors that could change over time.

We did not anticipate finding startling revelations in our data – and we didn’t. What we hoped was that the data would reveal sufficient tendencies toward correlation that would justify further research into the problem of video game usage by adolescent students.

Results

For this report of our research, we decided to share the following correlations related specifically to video game usage and academic performance.

Attendance and Time Spent Playing Video Games (see Table 1)

Males. We found a moderate negative correlation between the number of classes that our 29 male students attended and the number of hours that they spent playing video games each day (-.317).

Females. We found a slight negative correlation between the number of classes that our 53 female students attended and the number of hours that they spent playing video games each day (-.192).

Table 1. Attendance and Time Spent Playing Video Games

MALES (N = 29)		Number of hours played per day
Attendance	Spearman rho coefficient significance (2-tailed)	-.317 .088
FEMALES (N = 53)		Number of hours played per day
Attendance	Spearman rho coefficient significance (2-tailed)	-.192 .169

Final Marks and Time Spent Playing Video Games (see Table 2)

Males. We found a mild negative correlation between our 29 male students’ final marks and the number of hours that they spent playing video games each day (-.268).

Females. We found a mild negative correlation between our 53 female students’ final marks and the number of hours that they spent playing video games each day (-.213).

Table 2. Final Marks and Time Spent Playing Video Games

MALES (N= 29)		Number of hours played per day
Final Marks	Spearman rho coefficient significance (2-tailed)	-.268 .153
FEMALES (N = 53)		Number of hours played per day
Final Marks	Spearman rho coefficient significance (2-tailed)	-.213 .125

Time Spent Playing Video Games and Positive School Experiences (see Table 3)

Positive school experiences were operationally defined by the students' answers to the following Likert-scale questions:

- "I feel good being in a classroom . . ."
- "I like most of my teachers . . ."
- "Teachers say I have a good attitude . . ."

Males. We found negative correlations between the number of hours that our 29 male students spent playing video games each day and their answers to all three positive school experience questions. The correlations were mild for the "I feel good" question (-.257), moderate and statistically significant for the "like my teachers" question (-.387, $p < .05$), and slight for the "good attitude" question (-.105).

Females. We found a slight positive correlation between the number of hours that our 53 female students spent playing video games each day and their answers to the first positive school experience question: "I feel good" (.118). We also found a mild negative correlation for the second school experiences question: "like my teachers" (-.218). There was no discernible correlation for the third question: "good attitude" (.118).

Table 3. Time Spent Playing Video Games and Positive School Experiences

MALES (N = 29)		I feel good being in a classroom.	I like most of my teachers.	Teachers say I have a good attitude.
Number of hours played per day	Spearman rho coefficient significance	-.257 .179	-.387* .038	-.105 .588
FEMALES (N = 53)		I feel good being in a classroom.	I mess up everything I do.	I feel really hurt when I am criticized.
Number of hours played per day	Spearman rho coefficient significance	.118 .400	-.218 .116	.058 .679

* Correlation is significant at the 0.05 level (2-tailed).

Time Spent Playing Video Games and Negative School Experiences (see Table 4)

Negative school experiences were operationally defined by the students' answers to the following Likert-scale questions:

- "I feel sleepy during classes . . ."
- "I do not keep up with my assignments . . ."

Males. We found positive correlations between the number of hours that our 29 male students spent playing video games each day and their answers to the two negative school experiences questions. The correlations were moderate for the "sleepy" question (.316), and mild for the "do not keep up" question (.220).

Females. We found no discernible correlation between the number of hours that our 53 female students spent playing video games each day and their answers to the first negative school experiences question: "sleepy" (-.049). However, we found a statistically significant moderate positive correlation for the second school experiences question: "do not keep up" (.355, p = .01).

Table 4. Time Spent Playing Video Games and Negative School Experiences

MALES (N = 29)		I feel sleepy during classes.	I do not keep up with my assignments.
Number of hours played per day	Spearman rho coefficient significance (2-tailed)	.316 .095	.220 .251
FEMALES (N = 53)		I feel sleepy during classes.	I do not keep up with my assignments.
Number of hours played per day	Spearman rho coefficient significance (2-tailed)	-.049 .729	.355** .009

** Correlation is significant at the 0.01 level.

Attendance and Positive Video Game Experiences (see Table 5)

Positive video game experiences were operationally defined by the students' answers to the following Likert-scale questions:

- "There should be a video game club in school . . ."
- "Playing video games makes me feel good . . ."
- "Video games are important in my life . . .

Males. We found negative correlations between the number of classes that our 29 male students attended and their answers to the three positive video game experiences questions. The correlations were mild for the "video game club" question (-.200), slight for the "playing makes me feel good" question (-.146), and mild for the "games are important" question (-.208).

Females. We found slight negative correlations between the number of classes that our 53 female students attended and their answers to the three positive video game experiences questions: "video game club" (-.147), "playing makes me feel good" (-.185), and "games are important" (-.161).

Table 5. Attendance and Positive School Experiences

MALES (N = 29)		Attendance
I feel good being in a classroom.	Spearman rho coefficient significance (2-tailed)	-.203 .291
I like most of my teachers.	Spearman rho coefficient significance (2-tailed)	-.061 .755
Teachers say I have a good attitude.	Spearman rho coefficient significance (2-tailed)	-.226 .239
FEMALES (N = 53)		Attendance
I feel good being in a classroom.	Spearman rho coefficient significance (2-tailed)	-.085 .547
I like most of my teachers.	Spearman rho coefficient significance (2-tailed)	-.174 .213
Teachers say I have a good attitude.	Spearman rho coefficient significance (2-tailed)	-.101 .471

Attendance and Negative Video Game Experiences (see Table 6)

Negative video game experiences were operationally defined by the students' answers to the following Likert-scale questions:

- "I have been told that I play video games too much . . ."
- "I have missed school because I played video games . . ."
- "I lie about how much I play video games . . ."
- "I have been told that I play video games too much . . ."

Males. We found no discernible correlations between the number of classes that our 29 male students attended and their answers to the first and second negative video game experiences questions: "play too much" (.048), and "missed school" (.003). However, we found negative correlations for the third and fourth video game questions. The correlations were mild for the "lie" question (-.294), and slight for the "told I play too much" question (-. 193).

Females. We found no discernible correlations between the number of classes that our 53 female students attended and their answers to the first negative video game experiences question: "play too much" (-.084). However, we found negative correlations for the second, third, and fourth questions. The correlations were slight for the "missed school" question (-.192), mild for the "lie" question (-.206), and slight for the "told I play too much" question (-.123).

Table 6. Attendance and Negative Video Game Experiences

MALES (N = 29)		Attendance
I think I play video games too much.	Spearman rho coefficient significance (2-tailed)	.048 .800
I have missed school because I played video games.	Spearman rho coefficient significance (2-tailed)	.003 .988
I lie about how much I play video games.	Spearman rho coefficient significance (2-tailed)	-.294 .115
I have been told that I play video games too much.	Spearman rho coefficient significance (2-tailed)	-.193 .307
FEMALES (N = 53)		Attendance
I think I play video games too much.	Spearman rho coefficient significance (2-tailed)	-.084 .550
I have missed school because I played video games.	Spearman rho coefficient significance (2-tailed)	-.192 .169
I lie about how much I play video games.	Spearman rho coefficient significance (2-tailed)	-.206 .140

Final Marks and Positive Video Game Experiences (see Table 7)

Males. We found negative correlations between our 29 male students' final marks and their answers to the three positive video game experiences questions. The correlations were mild for the "video game club" question (-.233), slight for the "playing makes me feel good" question (-.153), and mild for the "games are important" question (-.213).

Females. We found negative correlations between our 53 female students' final marks and their answers to the three positive video game experiences questions. The correlations were slight for the "video game club" question (-.142), mild and statistically significant for the "playing makes me feel good" question (-.295, $p < .05$), and mild for the "games are important" question (-.223).

Table 7. Final Marks and Positive Video Game Experiences

MALES (N = 29)		Final Marks
There should be a video game club in school.	Spearman rho coefficient significance (2-tailed)	-.233 .216
Playing video games makes me feel good.	Spearman rho coefficient significance (2-tailed)	-.153 .420
Video games are important in my life.	Spearman rho coefficient significance (2-tailed)	-.213 .260

* Correlation is significant at the 0.05 level.

Table 7. Final Marks and Positive Video Game Experiences (continued)

FEMALES (N = 53)		Final Marks
There should be a video game club in school.	Spearman rho coefficient significance (2-tailed)	-.142 .310
Playing video games makes me feel good.	Spearman rho coefficient significance (2-tailed)	-.295* .032
Video games are important in my life.	Spearman rho coefficient significance (2-tailed)	-.223 .108

* Correlation is significant at the 0.05 level.

Final Marks and Negative Video Game Experiences (see Table 8)

Males. We found a slight positive correlation between our 29 male students' final marks and their answers to the first negative video game experiences question: "play too much" (.153). There were no discernible correlations for the second, third, and fourth video game questions: "missed school" (.074), "lie" (-.025), and "told I play too much" (.099).

Females. We found negative correlations between our 53 female students' final marks and their answers to the first, second, and fourth negative video game experiences questions. The correlations were mild for the "play too much" question (-.214), mild for the "missed school" question (-.213), and moderate and statistically significant for the "told I play too much" question (-.329, $p < .05$). There was no discernible correlation for the third video game question: "lie" (.032).

Table 8. Final Marks and Negative Video Game Experiences

MALES (N = 29)		Final Marks
I think play video games too much.	Spearman rho coefficient significance (2-tailed)	.153 .418
I have missed school because I played video games.	Spearman rho coefficient significance (2-tailed)	.074 .698
I lie about how much I play video games.	Spearman rho coefficient significance (2-tailed)	-.025 .894
I have been told that I play video games too much.	Spearman rho coefficient significance (2-tailed)	.099 .601

* Correlation is significant at the 0.05 level.

Table 8. Final Marks and Negative Video Game Experiences (continued)

I think I play video games too much.	Spearman rho coefficient significance (2-tailed)	-.214 .123
I have missed school because I played video games.	Spearman rho coefficient significance (2-tailed)	-.213 .125
I lie about how much I play video games.	Spearman rho coefficient significance (2-tailed)	-.032 .821
I have been told that I play video games too much.	Spearman rho coefficient significance (2-tailed)	-.329* .016

* Correlation is significant at the 0.05 level.

Discussion

Any tendencies toward correlation are important, because we need to address potential problems before our grade 9 students get into real trouble and jeopardize their school marks or, worse yet, drop out before completing high school. In fact, we chose grade 9 for our study because we wanted to recruit research participants before they were likely to drop out due to the effects of playing video games.

Attendance and Time Spent Playing Video Games

For males, our moderate negative correlation has limited predictability for the relationship between attendance and time spent playing video games (-.317). The more hours that adolescent boys play video games each day, the fewer school classes they attend. This finding supports Rehbein et al.'s (2010) finding that video-game-dependent students in grade 9 have higher levels of truancy.

Final Marks and Time Spent Playing Video Games

Our correlations have no predictive value for the relationship between final marks and time spent playing video games. This finding reflects the apparent contradictions in the literature, wherein some researchers correlate video gaming with lower school marks (Gentile et al, 2004; Hastings et al, 2009; Sharif & Sargent, 2006), and others correlate it with higher school marks (Bowers & Berland, 2013; Sutherland et al., 2000; Wittwer & Senkbeil, 2008).

Time Spent Playing Video Games and Positive School Experiences

For males, our statistically significant moderate negative correlation has limited predictability for the relationship between time spent playing video games and positive school experiences as defined by the "like my teachers" question (-.387, $p < .05$). The more hours that boys play video games each day, the less they like their teachers.

This finding is consistent with the literature's focus on increased aggression in adolescent video game players (Barenthin & Van Puymbroeck, 2006; Ferguson & Kilburn, 2010; Hastings et al., 2009), which makes them more likely to argue with their teachers (Alsaleh, 2005; Gentile et al., 2004; Lynch et al., 2001).

Time Spent Playing Video Games and Negative School Experiences

For males, our moderate positive correlation has limited predictability for the relationship between time spent playing video games and negative school experiences as defined by the "sleepy" question (.316). The more hours that boys play video games each day, the more likely they are to feel sleepy in school.

For females, our statistically significant moderate positive correlation has limited predictability for the relationship between time spent playing video games and negative school experiences as defined by the "do not keep up" question (.355, $p < .01$). The more hours that girls play video games each day, the more likely they are to fall behind in their assignments.

These findings are consistent with Anand's (2007) report that video game addicts tend to fall asleep in class and fall behind in their assignments. They also support Gentile et al.'s (2004) and Sharif and Sargent's (2006) findings that video gaming creates time conflicts that reduce the amount of time that gamers devote to homework (thus compromising the timely completion of assignments).

Attendance and Positive Video Game Experiences

Our correlations have no predictive value for the relationship between attendance and positive video game experiences. This finding is inconsistent with Rehbein et al.'s (2010) negative correlation between attendance and video-game dependency (which we assume would mean assigning a greater value to video games in one's life).

Attendance and Negative Video Game Experiences

Our correlations have no predictive value for the relationship between attendance and negative video game experiences. This finding is consistent with Rehbein et al.'s (2010) negative correlation between attendance and video-game dependency – which other researchers have correlated with lying about usage (Anand, 2007; Young, 2009).

Final Marks and Positive Video Game Experiences

Our correlations have no predictive value for the relationship between final marks and positive video game experiences. If we assume that the time students spend playing video games is proportional to how positive their video game experiences are, then our findings contradict other researchers who found negative correlations between video gaming and school marks (Gentile et al., 2004; Hastings et al., 2009; Sharif & Sargent, 2006).

Final Marks and Negative Video Game Experiences

For females, our statistically significant moderate negative correlation has limited predictability for the relationship between final marks and negative video game experiences as defined by the "told I play too much" question (-.329, $p < .05$). The more adolescent girls are told that they play video games too much, the less likely they are to have high marks in school. This finding is consistent with other researchers who found negative correlations between video gaming and school marks (Gentile et al., 2004; Hastings et al., 2009; Sharif & Sargent, 2006).

Recommendations

For Practice

School counselors need to include the problematic consequences of video gaming in their conversations with grade 9 students and their parents. Logically, any activity that draws students away from their schoolwork will eventually affect their academic performance.

For Further Research

This research is worth repeating, with the following changes:

- There should be a larger sample from a broader target population. Teachers, counselors, administrators, and parents have told us that the research should be repeated, but by targeting texting in addition to playing video games. The general consensus seems to be “Boys play video games, but girls text.”
- There should be a standardized instrument for collecting data on this subject. We wish that we had access to a questionnaire that is statistically valid and reliable.
- The research should be repeated using a longitudinal research design. Someone needs to track the academic progress of students who continue to play video games, or who increase their time playing, in comparison to other students who do not.

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