Factors That Affect Academic Performance in Grade Nine: Focus on Video Games

Marion Terry, Ph.D.
Faculty of Education
Brandon University
270-18th Street
Brandon, Manitoba
Canada R7A6A9

Amjad Malik, Ph.D.
Faculty of Education
University College of the North
504 Princeton Drive
Thompson, Manitoba
Canada R8N 085

David Sinclair
Goose Lake High School
P.O. Box 759
Roblin, Manitoba
Canada R0L1P0

Cheryl Fines
Crocus Plains High School
1930 First Street
Brandon, Manitoba
Canada R7A6Y6

Sara Terry
25 Westcott Bay
Brandon Manitoba
Canada R7B2V5

Abstract

In response to concerns expressed by high school counsellors, the researchers developed a Likert-scale survey to examine the relationship between video gaming and academic performance (defined as school attendance and final grades) in grade 9. Questions about video gaming were included with other questions about school experiences, self-concept, peer relationships, parental support, and nonacademic activities other than video games. The data analysis revealed correlations between non-educational video gaming, academic performance, and other school experiences. Other interesting correlations involved self-concept, peer relationships, parental support, and nonacademic activities other than video games. The researchers recommend that school professionals advise parents and students of the potentially deleterious effects of playing video games.

Keywords: students-at-risk**,** video games**,** school experiences**,** interpersonal relationships**,** extracurricular activities

1. Introduction

We initiated the research because school counsellors told us that they needed data to address the damaging effects of non-educational video gaming on students' attendance and grades.

At the same time, we investigated correlations between grade 9 academic performance and the following other factors: video gaming, school experiences, self-concept, peer relationships, parental support, and nonacademic activities other than video games. Our results warrant further investigation of these relationships.

2. Review of the Literature

Our research began as a study of the relationship between video gaming and school performance. Thus, although we later broadened our investigation to include other factors, the following review includes only the literature on video gaming.

2.1. Introduction

Video gaming has become entrenched in the lives of many youth, especially boys (Charlton & Danforth, 2009). Over 90% of US children play video games (Hagedorn & Young, 2011). Researchers have found relationships between video gaming and school performance, self-concept, interpersonal relationships, and other nonacademic activities.

2.2. School Performance

We found only one research report that identified gaming as a predictor of truancy: Rehbein, Kleimann, &Moble (2010) found a direct correlation between increased truancy and video game dependency in their study of 15,168 German 9th graders. This finding is important, because researchers such as Yakovlev and Kinney (2008) have found correlations between attendance and school marks. Yakovlev and Kinney reported an overall course grade reduction of 0.9 points for every class missed.

More literature exists on the relationship between video gaming and final marks. Jaruratanasirikul, Wongwaitaweewong, and Sangsupawanich (2009) found that two hours of gaming per day correlated with a GPA of below 3.00 in 1,492 high school students in Thailand. The violent content that characterizes massive multiplayer online role-playing games (MMOs) also negatively correlates with final marks (Alsaleh, 2005). Most harmful of all is video game dependency (Rehbein et al., 2010), also called pathological gaming (Gentile, 2009) and addiction (Shao-I, Jie-Zhi, & Der-Hsiang, 2004).

Researchers have also found negative correlations between video gaming and other types of school-related behaviours. Anand (2007) reported that video game addicts are laggard in school assignments and fall asleep in class. Gentile, Lynch, Linder, & Walsh (2004) found that gaming creates time conflicts that lessen the hours that gamers devote to homework. Of 534 (10-19-year-old) gamers in Cummings and Vandewater's (2007) study, 425 boys spent an average of 30% less time reading for every hour that they played video games on weekdays, and 109 girls spent an average of 34% less time doing homework for every hour that they played video games on weekdays.

There is a clear relationship between adolescent video gaming and aggression (Anderson, Shibuya, & Ihori, 2010), which makes the players more prone to argue with teachers and fight with peers (Gentile, 2009). Bartlett & Rodeheffer (2009) found that the graphic realism of modern video games positions players to become more engaged in the violence. Fleming and Rickwood (2001) described players who assume the role of a violent hero who is rewarded for aggressive acts. Outside the gaming environment, this aggression manifests as emotions that range from irritability (Alsaleh, 2005) to hostility (Shao-I et al., 2004) and loss of control (Duven, Muller, & Wolfling). Lynch, Gentile, Olson, & van Brederode (2001) found that 8th and 9th graders who played violent video games perceived the world as hostile and reacted with hostility. Gentile et al. (2004) also discovered that 8th and 9th graders who were naturally hostile were more likely to play violent video games, resulting in escalated hostility and aggressive behaviours.

Elsewhere in the literature, video gaming is reported to enhance school behaviours (Barber, Eccles, & Stone, 2001; Blum-Dimaya, Reeve, Reeve, & Hoch, 2010) such as reading and math (Wittwer & Senkbeil, 2008), creativity and imagination (Durkin & Barber, 2002), nonverbal intelligence (Subrahmanyam, Greenfield, Kraut, & Gross, 2001), and general literacy and learning skills (Gee, 2004). In their study of 13,960 US high school students, Bowers and Berland (2013) found positive correlations between 1-2 hours of daily gaming and mathematics and reading skills. Wittwer and Senkbeil (2008) also found positive correlations between "smart" gaming and mathematics skills in their study of 4,660 German 15-year-olds. Gamers develop problem-solving skills and complex thought processes (De Aguilera & Mendiz, 2003) that apply to academic work.

2.3. Self-Concept

Researchers have found conflicting relationships between adolescents' video gaming and psychic well-being. Jin and Park (2009) found that players with a strong sense of self do not become as immersed in the computer-generated world of video games. Durkin and Barber (2002) found positive correlations between non-addictive gaming and self-esteem, self-concept, and self-identity affirmation. However, other researchers have correlated video gaming with decreased self-esteem (Padilla-Walker, Nelson, Carroll, & Jensen, 2010), and pathological gaming with intrapsychic conflict (Griffiths, 2010a), depression (Hagedorn & Young, 2011), and suicidal thoughts (Rehbein et al., 2010).

2.4. Peer Relationships

Addiction appears in the literature as a catalyst for declining socialization (Oggins & Sammis, 2012) and peer relationships (Griffiths, 2010a), especially when connected to MMOs (Van Rooij, Meerkerk, Schoenmakers, Griffiths, & Van de Mheen, 2010). Video game dependency is characterized by an inability to stop playing (Duven et al., 2011) despite seriously negative consequences in the player's life (Griffiths, 2010). In addition to escalated hostility (Lynch et al., 2001) and aggression (Durkin & Barber, 2002), addicted gamers lie about their playing time (Young, 2009), and they experience mood swings (Lemmens, Valkenburg, & Peter, 2009) and problems with impulse control (Hagedorn & Young, 2011). Their physical health also deteriorates, including problems related to sleep loss (Rehbein et al., 2010) and withdrawal symptoms when they are not playing (Charlton & Danforth, 2009). These consequences affect their relationships with peers, especially because of the time that they spend playing video games instead of socializing with real-life friends (Anand, 2007; Smyth, 2007; Van Rooij et al., 2010).

When addiction is removed from the correlations, there is less consensus that gaming jeopardizes peer relationships. Negative correlations have been found between gaming and social development (Padilla-Walker et al., 2010), real-life friendships (Porter, Starcevic, Berle, & Fenech, 2010), and sports and leisure activities that would cultivate peer relations (Cummins & Vandewater, 2007). The 425 boy gamers in Cummings and Vandewater's (2007) study spent an average of 12% less time in recreational activities for every hour that they played video games on weekends. They and the 109 girl gamers spent less nongaming time with friends if they played video games alone, and more nongaming time with friends if they played video games with friends. Other researchers have reported that players find recreational video games socially rewarding (Hoffman & Nadelson, 2010) because they nurture friendships (Wallenius, Rimpela, Punamaki, & Lintonen, 2008) and create anticipatory socialization (Barber et al., 2001). Even violent video games can prompt friendships if the players are not addicted to MMOs (Oggins & Sammis, 2012). In their US study, Durkin and Barber (2002) found that moderate 16-year-old users had more academic friends, low and high users participated more in clubs, and non-users engaged in more risky behaviours such as substance abuse with friends.

2.5. Family Relationships

Video gaming affects the adolescent gamers' relationships with family members. Addicted players are so preoccupied with gaming that they withdraw from their families (Young, 2009). In their study of 1,491 US children (10-19 years old), Cummings and Vandewater (2007) found that female adolescents who play video games with their parents are more likely to engage in other activities with their parents, and male adolescents who play video games alone or with friends are less likely to engage in other activities with their parents. However, in their study of 1,304 US high school students, Durkin and Barber (2002) found that family relationships were closer for both high-use and moderate-use gamers than for non-gamers. Furthermore, in their study of 687 US students in grades 8 and 9, Gentile et al. (2004) found that parental controls on video-game content resulted in less aggression, manifested as fewer arguments and fights.

2.6. Other Nonacademic Activities

Most of the evidence in the literature is that adolescents' anticipation that video gaming will relieve boredom (Shao-I et al., 2004) and jumpstart socialization (Barber et al., 2001) is unfounded. In their efforts to escape everyday life by gaming (Wallenius et al., 2008), adolescents tend to lose interest in other activities (Griffiths, 2010; Rehbein et al., 2010; Young, 2009). The time that addicted players devote to gaming obstructs their participation in clubs (Anand, 2007), work (Oggins & Sammis, 2012), sports (Anand, 2007), and general socialization (Duven et al., 2011), especially when MMOs are involved (Van Rooij et al., 2010).

Even non-addicted gamers are less likely to engage in activities such as sports (Cummings & Vandewater, 2007), and more likely to engage in risky behaviours such as alcohol consumption (Padilla-Walker et al., 2010).

2.7. Conclusion

The literature reveals both negative and positive correlations between video gaming and school performance, self-concept, interpersonal relationships, and other nonacademic activities. Addiction and violent content appear in the reports of negative correlations, but most of the research reviewed here did not separate addictive from non-addictive playing, or violent from nonviolent content. Most adolescent gamers are not addicted. In their study of 1491 (10-19-year-old) US students, Cummings and Vandewater (2007) found that only 534 (36%) played video games, and that these individuals played an average of only 1 hour per weekday and 1.5 hours per weekend day. They concluded that most adolescents spend three times as many hours watching television as they do playing video games. The type of game content is more troubling, as indicated in the literature.

3. Methodology

We conducted the research in partnership with an urban Manitoba school division and Brandon University's Centre for Aboriginal and Rural Education Studies (BU CARES). The school division provided a substitute teacher to conduct the surveys and a secretary to collect the academic performance data. BU CARES paid for these services.

3.1. Access and Sampling

We started the research process by negotiating our research plans with the school division superintendent and the principals of the three high school sites for data collection. Then we sent letters of introduction to the parents/guardians of the 541 students who were taking grade 9 English language arts in winter term. Attached to each letter was a copy of the consent form for the parent/guardian and child to sign.

Of the 541 students who were invited to participate, 96 (18%) volunteered (with their parents'/guardians' consent). In the end, we analysed the data for the 82 questionnaires (15%) for which we obtained complete sets of performance data.

3.2. The Survey Instrument

We developed a Likert-scale survey that included questions about the students' video gaming, school experiences, self-concept, peer relationships, parental support, and nonacademic activities other than video games.

3.3. Data Collection

Each high school set its own date for data collection. A substitute teacher met the students in the library to complete the survey during English language arts class time. The total release time was approximately 40 minutes. The following summer, a school division secretary created an Excel spreadsheet of the students' attendance (recorded as number of class times absent) and school marks (recorded as overall final percentages, with individual marks for English, mathematics, science, and social studies).

3.4. Data Analysis

First, we used the demographic data from our questionnaires to divide our 82 student participants by gender: 29 males and 53 females. All of the respondents met our criteria of being fluent English language speakers who were 14-15 years old and had lived in the school division's city for 5+ years. We assumed that these criteria would ensure that most of the students would have had similar opportunities to engage in school activities, peer relationships, and extracurricular activities such as playing video games.

Then we converted the attendance data into numerical scores that reflected the percentage of total classes attended (instead of missed) during the school year. We also converted the final marks into the arithmetic means of individual students' percentages for the four core subjects in grade 9 (English, mathematics, science, and social studies). We used Pearson product-moment calculations to determine male and female correlations (2) between these linear sets of school performance data.

Finally, we chose 24 questions to analyse from our questionnaires. We used Spearman rho calculations to determine male and female correlations (518) based on the students' school performance data and their answers to the nonlinear Likert-scale questions devoted to video gaming, video gaming, school experiences, self-concept, peer relationships, parental support, and nonacademic activities other than video games.

3.5. Research Limitations

We had the following limitations to our research sample, instrument, and design:

1. Because of our low survey return rate, our results have limited generalizability.
2. We would like to think that the questions we used for data analysis had face validity, but our survey instrument was by no means standardized.
3. We did not control for confounding variables such as emotionally traumatic events that may have happened to individual students during the school year.
4. 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 their video game usage – or any other identified factors that could change over time.

4. Results

The following classifications identify the relative strength of our correlations:

(+ or -) .300 to .399 = moderate correlation, limited predictability
(+ or -) .400 to .499 = fair correlation, moderate predictability
(+ or -) .500 to .599 = good correlation, fair predictability
(+ or -) .600 to .699 = very good correlation, good predictability
(+ or -) .700 to .799 = excellent correlation, very good predictability
(+ or -) .800 to .899 = superior correlation, excellent predictability
(+ or -) .900 to .999 = almost perfect correlation, superior predictability
(+ or -) 1.000 = perfect correlation, absolute predictability

The following relationships have correlations ranging from moderate to perfect (i.e., coefficients from 3.00 to 1.000). Individual correlations are made more meaningful by statistically significant two-tailed low probability of error: $p < .01$ or $p < .05$.

4.1. Males

4.1.1. Attendance(see Table 1)

The more school classes that adolescent boys attend, the more likely they are to have high marks (.357).

4.1.2. Time Spent Playing Video Games (see Table 2)

The more hours that adolescent boys play video games, the fewer school classes they attend (-.317), the less they like their teachers (-.387, $p < .05$), the more likely they are to feel sleepy in school (.316), and the more likely they are to have friends who have dropped out of school (.482, $p < .01$).

4.1.3. Positive Video Game Experiences (see Table 3)

The more adolescent boys want to have a video game club in school, the more likely they are to fall behind in their school assignments (.366).

The more adolescent boys feel good about playing video games, the more likely they are to have friends who have dropped out of school (.440, $p < .05$).

The more importance that adolescent boys attach to playing video games, the more likely they are to feel sleepy in school (.313).

4.1.4. Negative Video Game Experiences (see Table 4)

The more adolescent boys feel that they play video games too much, the less likely they are to be told by teachers that they have a good attitude (-.326), and the more likely they are to feel sleepy during classes (.365).

The more adolescent boys miss school because of playing video games, the less likely they are to be told by teachers that they have a good attitude (-.337), and the more likely they are to feel sleepy during classes (.349).

The more adolescent boys lie about how much they play video games, the less likely they are to like their teachers (-.329), and the more likely they are to fall behind in their school assignments (.312).

4.1.5. Positive School Experiences (see Table 5)

The more adolescent boys are told by teachers that they have a good attitude, the more likely they are to have high marks (.301), and the less likely they are to fear being rejected by their friends (-.451, p<.05).

4.1.6 Negative School Experiences (see Table 6)

The more adolescent boys fall behind in their assignments, the less likely they are to have high marks (-.439, p<.05).

4.1.7. Negative Self-Concept (see Table 7)

The more adolescent boys feel that other people are happier than they are, the more likely they are to fear being rejected by their friends (.460, p<.05).

The more adolescent boys feel that they "mess up everything," the more likely they are to fear being rejected by their friends (.366).

The more adolescent boys feel hurt when they are criticized, the more likely they are to fear being rejected by their friends (.466, p<.05).

4.1.8. Positive Peer Relationships (see Table 8)

The better adolescent boys get along with their peers, the more likely they are to feel good in school (.461, p<.05), and the more they like their teachers (.471, p<.01).

4.1.9. Negative Peer Relationships (see Table 9)

The more adolescent boys have friends who have dropped out of school, the fewer school classes they attend (-.462, p<.01), the less likely they are to have high marks (-.318), and the more likely they are to fall behind in their school assignments (.440, p<.05)

The more adolescent boys fear being rejected by their friends, the less likely they are to have high marks in school (-.319), and the more likely they are to report feeling sleepy in school (.520, p<.01).

4.1.10. Parental Support (see Table 10)

The more parents encourage their adolescent sons to do well in school, the more school classes these boys attend (.416, p<.05), the fewer hours they play video games (-.351), the less likely they are to lie about how much they play video games (-.315), and the less likely they are to report being told that they play video games too much (-.352).

4.1.11. Nonacademic Activities Other Than Video Games (see Table 11)

The busier adolescent boys are outside of school, the fewer school classes they attend (-.354), the less likely they are to credit video games for making them feel good (-.307), the less importance they attach to playing video games (-.469, p<.01), and the less likely they are to report being told that they play video games too much (-.435, p<.01).

The more adolescent boys enjoy other activities more than school classes, the less likely they are to report being told that they play video games too much (-.375, p<.01), the less they like their teachers (-.318), and the more they are to report having friends who have dropped out of school (.303).

The more frequently adolescent boys play sports, the more likely they are to have teachers tell them that they have a good attitude (.340), and the less likely they are to fear being rejected by their friends (-.412, p<.05).

The more hours that adolescent boys work during the week, the more likely they are to have teachers tell them that they have a good attitude (.319).

4.2. Females

4.2.1. Attendance (see Table 1)

The more school classes that adolescent girls attend, the more likely they are to have high marks (.373, p<.01).

4.2.2. Time Spent Playing Video Games (see Table 2)

The more hours that adolescent girls play video games, the more likely they are to fall behind in their school assignments (.355, p<.01).

4.2.3. Positive Video Game Experiences (see Table 3)

The more adolescent girls feel good about playing video games, the more likely they are to report feeling good in school (.666, p<.01), and the less likely they are to have teachers tell them that they have a good attitude (-.317, p<.05).

The more importance that adolescent girls attach to playing video games, the more likely they are to report feeling good in school (1.000, p<.01).

4.2.4. Negative Video Game Experiences (see Table 4)

The more adolescent girls miss school because of playing video games, the more likely they are to have friends who have dropped out of school (.485, p<.01).

The more adolescent girls are told that they play video games too much, the less likely they are to have high marks in school (-.329, p<.05).

4.2.5. Positive School Experiences

We found no .300+ coefficients for adolescent girls' positive school experiences.

4.2.6Negative School Experiences (see Table 6)

The more adolescent girls fall behind in their assignments, the less likely they are to have high marks (-.312, p<.05).

4.2.7. Negative Self-Concept (see Table 7)

The more adolescent girls feel that they "mess up everything," the more likely they are to fear being rejected by their friends (.426, p<.01).

The more adolescent girls feel hurt when they are criticized, the more likely they are to fear being rejected by their friends (.561, p<.01).

4.2.8. Positive Peer Relationships (see Table 8)

The more adolescent girls get along with their peers, the more likely they are to report being told by teachers that they have a good attitude (.583, p<.01).

4.2.9. Negative Peer Relationships

We found no .300+ coefficients for adolescent girls' negative peer relationships.

4.2.10. Parental Support (see Table 10)

The more parents encourage their adolescent daughters to do well in school, the fewer hours these girls play video games (-.322, p<.05), the less likely they are to want a video game club in school (-.317, p<.05), the less likely they are to miss school because of playing video games (-.379, p<.01), the more they like their teachers (.300, p<.05), the less likely they are to report feeling really hurt when they are criticized (-.354, p<.01), the more likely they are to be busy outside of school (.453, p<.01) , and the more likely they are to play sports frequently (.396, p<.01).

4.2.11. Nonacademic Activities Other Than Video Games (see Table 11)

The busier adolescent girls are outside of school, the more school classes they attend (1.000, p<.01), and the more likely they are to report playing video games too much (1.000, p<.01).

The more adolescent girls enjoy other activities more than school classes, the less likely they are to have high marks (-.329, p<.05), and the more likely they are to miss school because of playing video games (1.000, p<.01).

The more frequently adolescent girls play sports, the more school classes they attend (.386, p<.01), the more likely they are to report playing video games too much (.386), and the more likely they are to miss school because of playing video games (.352, p<.01).

The more hours that adolescent girls work during the week, the more likely they are to report having friends who have dropped out of school (.458, p<.01).

5. Discussion

Any tendencies toward correlation are important, because it is essential that we 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. That said, we limited our discussion to the 26 correlations with predictability levels ranging from moderate to absolute (i.e., coefficients between 4.00 and 1.000), categorized by gender (15 male correlations and 11 female correlations). These correlations also have statistically significant two-tailed low probability of error: p<.01 or p<.05. Connections to the literature reflect our literature review's emphasis on adolescent video gaming.

5.1. Males

We found 14 fair and 1 good correlation (with moderate and fair levels of predictability) related to our 29 male students' video game habits, school experiences, self-concept, peer relationships, parental support, and nonacademic activities other than video games.

5.1.1. Video Game Habits (see Tables 2, 3, 4)

There was a fair positive correlation, with moderate predictability, between the time that adolescent boys spend playing video games and their feeling sleepy in school (.482, p<.01). This finding is consistent with Anand's (2007) report that video game addicts tend to fall asleep in class.

There was also a fair positive correlation, with moderate predictability, between adolescent boys' feeling good about playing video games and having friends who have dropped out of school (.440, p<.05). Our finding is consistent with other researchers who have found negative correlations between video gaming and rewarding peer relationships (Cummings & Vandewater, 2007; Padilla-Walker et al, 2010; Porter et al., 2010).

5.1.2. School Experiences (see Tables 5,6)

There was a fair negative correlation, with moderate predictability, between adolescent boys' being told by teachers that they have a good attitude and being afraid of rejection by their friends (-.451, p<.05). There was also a fair negative correlation, with moderate predictability, between adolescent boys' falling behind in their assignments and their school marks (-.439, p<.05).

5.1.3. Self-Concept (see Table 7)

There was a fair positive correlation, with moderate predictability, between adolescent boys' feeling that other people are happier than they are and fearing that their friends will reject them (.460, p<.05). There was also a fair positive correlation between adolescent boys' feeling hurt when they are criticized and fearing rejection by their friends (.466, p<.05).

5.1.4. Peer Relationships (see Tables 8, 9)

There was a fair positive correlation, with moderate predictability, between adolescent boys' getting along with their peers and feeling good in school (.461, p<.05). There was also a fair positive correlation, with moderate predictability, between adolescent boys' getting along with their peers and liking their teachers (.471, p<.01).

There was a fair negative correlation, with moderate predictability, between adolescent boys' having friends who have dropped out of school and attending school classes (-.462, p<.01). There was a fair positive correlation, with moderate predictability, between adolescent boys' having friends who have dropped out of school and falling behind in their school assignments (.440, p<.05).

There was a good positive correlation, with fair predictability, between adolescent boys' fearing rejection by their friends and feeling sleepy in school (.520, p<.01).

5.1.5. Parental Support (see Table 10)

There was a fair positive correlation, with moderate predictability, between parents' encouraging their adolescent sons to do well in school and these boys' attending school classes (.416, p<.05).

5.1.6. Nonacademic Activities Other Than Video Games (see Table 11)

There was a fair negative correlation, with moderate predictability, between adolescent boys' being busy outside of school and feeling that video games are important in their lives (-.469, p<.01).

There was also a fair negative correlation, with moderate predictability, between adolescent boys' being busy outside of school and being told that they play video games too much (-.435, p<.01). These findings support the literature on video gaming, wherein negative correlations have been identified between gaming and other leisure-time activities (Griffiths, 2010; Rehbein et al., 2010; Young, 2009).

There was a fair negative correlation, with moderate predictability, between adolescent boys' playing sports frequently and fearing rejection by their friends (-.412, p<.05).

5.2. Females

We found 4 fair, 2 good, 1 very good, and 4 perfect correlations (with moderate, fair, good, and absolute levels of predictability) related to our 53 female students' video game habits, self-concept, peer relationships, parental support, and nonacademic activities other than video games.

5.2.1. Video Game Habits (see Tables 3, 4)

There was a very good positive correlation, with good predictability, between adolescent girls' feeling good about playing video games and feeling good in school (.666, p<.01). There was also a perfect positive correlation, with absolute predictability, between adolescent girls' feeling that video games are important in their lives and feeling good in school (1.000, p<.01). As a positive school experience, feeling good in school supports the literature's evidence that video gaming benefits school marks, skills, and behaviours (Barber et al., 2001; Blum-Dimaya et al., 2010).

There was a fair positive correlation, with moderate predictability, between adolescent girls' missing school because of playing video games and having friends who have dropped out of school (.485, p<.01). Our finding parallels the literature's negative correlations between video gaming and rewarding peer relationships (Cummings &Vandewater, 2007; Padilla-Walker et al, 2010; Porter et al., 2010). It is also consistent with the literature's emphasis on the negative correlations between pathological video gaming and real-life friendships (Anand, 2007; Smyth, 2007; Van Rooij et al., 2010).

5.2.2. Self-Concept (see Table 7)

There was a fair positive correlation, with moderate predictability, between adolescent girls' feeling that they "mess up everything" and fearing that their friends will reject them (.426, p<.01).There was a good positive correlation, with moderate predictability, between adolescent girls' feeling hurt when they are criticized and fearing rejection by their friends (.561, p<.01).

5.2.3. Peer Relationships (see Table 8)

There was a good positive correlation, with fair predictability, between adolescent girls' getting along with their peers and being told by teachers that they have a good attitude (.583, p<.01).

5.2.4. Parental Support (see Table 10)

There was a fair positive correlation, with moderate predictability, between parents' encouraging their adolescent daughters to do well in school and these girls' being busy outside of school (.453, p<.01).

5.2.5. Nonacademic Activities Other Than Video Games (see Table 11)

There was a perfect positive correlation, with absolute predictability, between adolescent girls' being busy outside of school and attending school classes (1.000, p<.01).

There was also a perfect positive correlation, with absolute predictability, between adolescent girls' being busy outside of school and playing video games too much (1.000, p<.01). This finding contradicts the literature on video gaming, wherein negative correlations have been identified between gaming and other leisure-time activities (Griffiths, 2010; Rehbein et al., 2010; Young, 2009) such as sports (Anand, 2007).

There was a perfect positive correlation, with absolute predictability, between adolescent girls' enjoying other activities more than school classes and missing school because of playing video games (1.000, p<.01). This finding contradicts the negative correlations that have been found between gaming and other leisure-time activities (Griffiths, 2010; Rehbeinet al., 2010; Young, 2009) such as sports (Anand, 2007).

There was also a fair positive correlation, with moderate predictability, between the hours that adolescent girls work during the week and their having friends who have dropped out of school (.458, p<.01).

6. Conclusion

Most of our findings support the conclusion that playing video games has detrimental effects on adolescents' school experiences, peer relationships, and leisure-time activities. Our correlations warrant further investigation and confirm the school counsellors' concerns over the relationships between non-educational video gaming, academic performance, and other school experiences – especially for adolescent boys. Of the other factors, self-concept, peer relationships, parental support, and nonacademic activities other than video games produced the most interesting correlations.

7. Recommendations

7.1. Recommendations for Practice

School counsellors need to include the potential dangers of video gaming at the forefront in dealing with grade 9 students and their parents. Any activity that lures students away from their schoolwork will eventually impede academic performance.

7.2. Recommendations for Further Research

The research is worth repeating, but with a larger sample. The feedback that we have received so far from teachers, counsellors, administrators, and parents is 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."

The research should be repeated with a longitudinal 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. A longitudinal design would facilitate both types of comparison, in essence "self" and "other."

8. References

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Correlation Tables

Table 1: Attendance

Attendance	Coefficient	Strength of Correlation	Strength of Prediction
Males Attendance + Final Marks	.357	moderate	limited
Females Attendance + Final Marks	.373 **	moderate	limited

** Correlation is significant at the 0.01 level.

Table 2: Time Spent Playing Video Games

Time Spent Playing Video Games	Coefficient	Strength of Correlation	Strength of Prediction
Males Time spent playing video games + Attendance	-.317	moderate	limited
Time spent playing video games: . . . I like most of my teachers.	-.387*	moderate	limited
. . . I feel sleepy during classes	.316	moderate	limited
. . . Several of my friends quit school.	.482**	fair	moderate
Females Time spent playing video games: . . . I do not keep up with my assignments.	.355**	moderate	limited

* Correlation is significant at the 0.05 level.

** Correlation is significant at the 0.01 level.

Table 3: Positive Video Game Experiences

Positive Video Game Experiences	Coefficient	Strength of Correlation	Strength of Prediction
Males Our school should have a video game club: . . . I do not keep up with my assignments.	.366	moderate	limited
Playing video games makes me feel good: . . . Several of my friends quit school.	.440*	fair	moderate
Video games are important in my life: . . . I feel sleepy during classes.	.313	moderate	limited
Females Playing video games makes me feel good: . . . I feel good being in a classroom.	.666**	very good	good
. . . Teachers say I have a good attitude.	-.317*	moderate	limited
Video games are important in my life: . . . I feel good being in a classroom.	1.000**	perfect	absolute

* Correlation is significant at the 0.05 level.

** Correlation is significant at the 0.01 level.

Table 4: Negative Video Game Experiences

Negative Video Game Experiences	Coefficient	Strength of Correlation	Strength of Prediction
Males I think I play video games too much: . . . Teachers say I have a good attitude. . . . I feel sleepy during classes. I miss school because I play video games: . . . Teachers say I have a good attitude. . . . I feel sleepy during classes. I lie about how much I play video games: . . . I like most of my teachers. . . . I do not keep up with my assignments.	 -.325 .365 -.337 .349 -.329 .312	 moderate moderate moderate moderate moderate moderate	 limited limited limited limited limited limited
Females I miss school because I play video games: . . . Several of my friends quit school. I've been told I play video games too much: . . . Final Marks	 .485** -.329*	 fair moderate	 moderate limited

* Correlation is significant at the 0.05 level.
** Correlation is significant at the 0.01 level.

Table 5: Positive School Experiences

Positive School Experiences	Coefficient	Strength of Correlation	Strength of Prediction
Males Teachers say I have a good attitude: . . . Final Marks . . . I am afraid of being rejected by my friends.	 .301 -.451*	 moderate fair	 limited moderate

* Correlation is significant at the 0.05 level.

Table 6: Negative School Experiences

Negative School Experiences	Coefficient	Strength of Correlation	Strength of Prediction
Males I do not keep up with my assignments: . . . Final Marks	 -.439*	 fair	 moderate
Females I do not keep up with my assignments: . . . Final Marks	 -.312*	 moderate	 limited

* Correlation is significant at the 0.05 level.

Table 7: Negative Self-Concept

Negative Self-Concept	Coefficient	Strength of Correlation	Strength of Prediction
Males People around me seem happier than me: . . . I am afraid of being rejected by my friends. I mess up everything I do: . . . I am afraid of being rejected by my friends. I feel really hurt when I am criticized: . . . I am afraid of being rejected by my friends.	.460* .366 .466*	moderate moderate fair	limited limited moderate
Females I mess up everything I do: . . . I am afraid of being rejected by my friends. I feel really hurt when I am criticized: . . . I am afraid of being rejected by my friends.	.426** .561**	fair good	moderate fair

* Correlation is significant at the 0.05 level.

** Correlation is significant at the 0.01 level.

Table 8: Positive Peer Relationships

Positive Peer Relationships	Coefficient	Strength of Correlation	Strength of Prediction
Males I am easy to get along with: . . . I feel good being in a classroom. . . . I like most of my teachers.	.461* .471**	fair fair	moderate moderate
Females I am easy to get along with: . . . Teachers say I have a good attitude.	.583**	good	fair

* Correlation is significant at the 0.05 level.

** Correlation is significant at the 0.01 level.

Table 9: Negative Peer Relationships

Negative Peer Relationships	Coefficient	Strength of Correlation	Strength of Prediction
Males Several of my friends quit school: . . . Attendance . . . Final Marks . . . I do not keep up with my assignments. I am afraid of being rejected by my friends: . . . Final Marks . . . I feel sleepy during classes.	-.462** -.318 .440* -.319 .520**	fair moderate fair moderate good	moderate limited moderate limited fair

* Correlation is significant at the 0.05 level

** Correlation is significant at the 0.01 level.

Table 10: Parental Support

Parental Support	Coefficient	Strength of Correlation	Strength of Prediction
Males My parents encourage me to do well in school:			
. . . Attendance	.416*	fair	moderate
. . . Time spent playing video games	-.351	moderate	limited
. . . I lie about how much I play video games.	-.315	moderate	limited
. . . I've been told I play video games too much.	-.352	moderate	limited
Females My parents encourage me to do well in school:			
. . . Time spent playing video games	-.322*	moderate	limited
. . . Our school should have a video game club.	-.317*	moderate	limited
. . . I miss school because I play video games.	-.379**	moderate	limited
. . . I like most of my teachers.	.300*	moderate	limited
. . . I feel really hurt when I am criticized.	-.354**	moderate	limited
. . . I have a busy life outside of school.	.453**	fair	moderate
. . . I play sports frequently.	.396**	moderate	limited

* Correlation is significant at the 0.05 level.
** Correlation is significant at the 0.01 level.

Table 11: Nonacademic Activities Other Than Video Games

Nonacademic Activities Other Than Video Games	Coefficient	Strength of Correlation	Strength of Prediction
Males I have a busy life outside of school:			
. . . Attendance	-.354	moderate	limited
. . . Playing video games makes me feel good.	-.307	moderate	limited
. . . Video games are important in my life.	-.469**	fair	moderate
. . . I've been told I play video games too much.	-.435**	fair	moderate
I like other activities more than school classes:			
. . . I've been told I play video games too much.	-.375**	moderate	limited
. . . I like most of my teachers.	-.318	moderate	limited
. . . Several of my friends quit school.	.303	moderate	limited
I play sports frequently:			
. . . Teachers say I have a good attitude.	.340	moderate	limited
. . . I am afraid of being rejected by my friends.	-.412*	fair	moderate
Number of hours worked during the week:			
. . . Teachers say I have a good attitude.	.319	moderate	limited
Females I have a busy life outside of school:			
. . . Attendance	1.000**	perfect	absolute
. . . I play video games too much.	1.000**	perfect	absolute
I like other activities more than school classes:			
. . . Final Marks	-.329*	moderate	limited
. . . I miss school because I play video games.	1.000**	perfect	absolute
I play sports frequently:			
. . . Attendance	.386**	moderate	limited
. . . I play video games too much.	.386	moderate	limited
. . . I miss school because I play video games.	.352**	moderate	limited
Number of hours worked during the week:			
. . . Several of my friends quit school.	.458**	fair	moderate

 * Correlation is significant at the 0.01 level.
** Correlation is significant at the 0.01 level.