1-10-2017

# Internet Gaming and Aggression in Adolescent Males

Michael Forsythe
*Winona State University*

The Effects of Violent Internet Gaming Content on Aggression in Adolescent Males

A Capstone Project submitted in partial fulfillment of the requirements for the Master of Science

Degree in Community Counseling at Winona State University

Michael Forsythe

College of Education

Counselor Education Department

Spring, 2017

CERTIFICATE OF APPROVAL

_____

INTERNET GAMING AND AGGRESSION IN ADOLESCENT MALES

This is to certify that the Capstone Project of

Michael Forsythe

Has been approved by the faculty advisor and the CE 695 – Capstone Project

Course Instructor in partial fulfillment of the requirements for the

Master of Science Degree in Community Counseling

Capstone Project Supervisor: Eric Baltrinic, Ph.D.

Approval Date: 1/10/17

Abstract

Internet Gaming (IG) has become a subject of interest to the counseling profession, to the extent that addiction to IG is included as an item worthy of further consideration in the DSM-5. IG has been the subject of considerable research, resulting in two opposing views of the negative effects versus the positive effects of playing games online. One viewpoint is that involvement in IG featuring violent content increases hostility levels in the gamers. Other researchers hold that IG can be a valuable educational tool, and that gamers benefit by socializing with other gamers. This review of literature will summarize the findings of researchers who have examined the effects of violent IG on levels of aggression in adolescent male gamers, and report on current and proposed assessments and treatment interventions.

*Key words:* internet gaming, adolescents, aggression, IGD assessment, IGD treatment

The Effects of Violent Internet Gaming Content on Aggression in Adolescent Males

**Table of Contents**

For purposes of this review, it is important to draw a distinction between internet addiction disorder (IAD) and internet gaming (IG). While IAD is not a disorder recognized by the American Psychiatric Association, many scholarly journals include articles on the subject. Tao, et al (2010) proposed a set of criteria for IAD that closely resemble the criteria for substance use disorder (SUD) in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). Though they identified three subsets of IAD, internet gaming, sexual preoccupation, and messaging/emailing, they did not address the issue of increased aggression in internet gamers.

As opposed to IAD, which deals with activity on the internet in general, internet gaming disorder (IGD) refers to playing on-line games involving fantasy and role-play (Anderson & Bushman, 2001). The DSM-5 includes IGD as a condition for further study, also with proposed criteria very similar to those used to diagnose SUD (APA, 2013). However, the proposed criteria do not include increased aggressive feelings or behaviors. There is some evidence to suggest that gamers with IGD will also have co-occurring disorders such as substance use disorder, depressive disorders, and panic disorders. They may exhibit some of the symptoms of those disorders as well, without meeting the full criteria for diagnosis (Yau & Potenza, 2014).

The potential for IA and IGD is not limited to the United States. Ružic-Baf, Strnak, and Debeljuh (2016) reported the existence of clinics to treat video game addiction in China, the Netherlands and Korea. The authors are located in Croatia, where they conducted a study of 123 seventh and eighth grade students to learn their online gaming habits and the impact of gaming on their lives. Other researchers cited in this paper are from Turkey, Japan, Belgium, Sweden, Italy and Australia, to name a few diverse locations.

As of 2015, there were 155 million people in the United States who play video games. Of these, 56% were male and 26% percent were under the age of eighteen. 29% of frequent gamers played online (Entertainment Software Association, 2015). One year later, those numbers had changed to 59% of players being male, 27% being under the age of eighteen (Entertainment Software Association, 2017). Therefore, a significant number of adolescent males play video games online and the number is growing. Socio-economic status is not a significant barrier to those who wish to play online. Multi-player on-line games may be played on a variety of hardware ranging from relatively inexpensive hand-held devices to elaborate desktop computers, (Carnagey, Anderson, & Bushman, 2006). Beyond that, online gaming on any device requires only adequate internet access. Since all five of the most-played online video games have an age appropriateness rating that shows they contain some violence or graphic violence (Entertainment Software Ratings Board, 2015), indications are that a significant number of adolescent male gamers play games that include violence. As Holtz and Appel (2011) point out, "adolescence has been described as a time of high arousability and of increased vulnerability to problems in the regulation of affect and behavior" (p.49). It is therefore appropriate to examine the gaming habits of the adolescent male cohort and the effects of violent gaming on it.

## Literature Review

### Benefits of gaming

It should be noted that some researchers report positive effects of video gaming, notably when games are used for educational purposes. King (2015) points out that students can develop valuable workplace skills by playing Massively Multiplayer Online Games (MMOG's). However, she does not view the game itself as a teacher, but rather sees the human teacher as a co-player in the game. While acknowledging the possible effects on aggressive behavior caused

by playing MMOGs, Willoughby (2008) also states that IG can be a positive factor in the development of cognition, social skills, and visual intelligence. Similarly, Mengel (2014) agrees that there is a link between violent IG and aggression, but also points out a link between increased prosocial behavior and playing games that are designed to reward cooperation between players. Uz & Cagiltay (2015) report the results of a study involving gamers who play MMOGs. The researchers studied 114 university students (mostly male) and found that many played video games in part to avoid social interaction in real life. From another point of view, Peters and Malesky Jr.(2008) studied 196 players of the MMOG World of Warcraft. The game is notble because players are required to spend 20 hours a week playing it in order to reach the highest level. The researchers found that gamers sought social interaction and friendship in the cyber-world because they lack social skill in face-to-face situations. Thus, though there are social interaction and friendships invlolved in playing MMOG's, it is questionable whether they transfer outside of the gaming environment.

Eichenbaum, Bavelier, and Green (2014) cite research showing that playing video games causes the brain to release dopamine in levels similar to those released when an individual takes receational drugs, thus reinforcing the similarities between IAD, IGD, and substance use disorder. However, the authors also believe that the release of reward chemicals like dopamine signals other parts of the brain that an event has occurred and conditions the brain to reorganize so that it will recognize and reward future events (game playing). A positive effect is that reward chemicals are also essential to learning. In rewarding game playing, the brain is also preparing itself to process and store new information.

Hess and Gunter (2013) found that students who participated in serious game-based classes exhibited improved motivation and better performance. Students also learned problem-

solving and social skills. The authors compared two groups of students who were studying

American History online. One group studied material included in a serious video game, the other

took a traditional online course. The students who played the video game took longer to

complete the course material, but reported higher satisfaction with the experience than students

in the non-game group. The gaming group also had an A average grade compared to a B average

for the non-gamers.

Schrader and McCreery (2008) propose that video games be viewed not just as delivery

systems for information, but as unique environments in which players not only develop

technological expertise, but also improve social skills such as collaboration and accomplishing

goals. After studying gamers involved in the MMOG World of Warcraft, they found that

younger players reached the expert level more quickly than older players. It is possible younger

gamers master games quickly because they have a higher level of technological competence. If

so, technological competence developed in MMOG's designed for entertainment might be an

asset for students learning in a virtual environment.

**Gaming and aggression**

The rise of violence in video gaming has been traced back as far as the 1980's (Fischer,

Kastenmüller, & Greitemeyer, 2009). The question of whether there is a connection between

violent online gaming and increased aggression in players has been raised by many researchers.

Anderson and Bushman (2001, p.354) provide the following definitions:

Aggression is behavior intended to harm another individual who is motivated to avoid

that harm. It is not an affect, emotion, or aggressive thought, plan, or wish. This

definition excludes accidental acts that lead to harm, such as losing control of an auto and

accidentally killing a pedestrian, but includes behaviors intended to harm even if the

attempt fails, such as when a bullet fired from a gun misses its human target.

Violence refers to extreme forms of aggression, such as physical assault and murder. All

violence is aggression, but not all aggression is violence (p. 354).

They examined the issue and concluded that violent video gaming not only increases

aggressive feelings and behavior in players; it also decreases pro social behavior.  Lemmens,

Valkenburg and Jochen (2011) found that time spent playing violent video games not only

increased  physical aggression in adolescent males, but that pathological gaming predicted an

increase in violence by players regardless of the games' content.  More adolescents than adults

say that violence attracts them to IG, and they play more hours per week than do their adult

counterparts. In addition, adolescents who play violent video games are overwhelmingly male

(Griffiths, Davies, & Chappell, 2004), and adolescent males (Lemmens et al, 2011).

One recent development in the universe of MMOGs is that players have the ability to

create their own characters. Given a choice, they tend to create characters armed with weapons

and capable of initiating and reacting to acts of violence. A study has shown not only that players

of violent games show increased aggression levels compared to players of non-violent games,

but also players who design their own character have increased levels of hostility compared

gamers who play with a randomly assigned character (Fischer et al, 2009). Increased aggression

in adolescent IG players manifests itself in a number of ways, including aggressive behavior,

aggressive cognition, aggressive affect, and physiological arousal (Anderson & Bushman, 2001).

They also report a decrease in prosocial skills due to playing violent games. In reporting the

results of a study of Dutch adolescent gamers, Lemmens et al  (2011) identify increased physical

aggression and the likelihood of developing IGD as effects on violent online gamers. Yang

(2012) found the inherent conflict in violent gaming can lead to bullying online and bullying behavior can be transferred into real world settings such as schools. Reasearch indicates that gamers who play violent video games can become desensitized to violence, with the result they become numb to the physiological effects of real-life violence. Due to wide spread violence in popular online games, interventions to address the desensitization have been called for (Carnagey, Anderson, & Bushman, 2006).

Bennersted, Ivarsson, and Linderoth (2011) point out that those who focus on the negative effects of violent gaming and those who emphasize the positive effects are in agreement that "both these positions furnish arguments on the basis of a shared logic: that engagement in gaming activities fosters the development of (negative or positive) behaviors that are manifested in situations beyond games themselves" (p 44),. Those focusing on the negatives may have been influenced by a combination of hyperbole and flawed research. While addressing what they call a debate between those who identify positive effects of video gaming and those who identify negative effects, question whether behavior by players of violent games transfers into real life settings. The authors also point out that players of the game Lord of the Ring Online (competing as six-person teams) learn to manage aggression through collaboration, planning and assigning appropriate characters to attack and defend foes. Others argue that aggression and violent behavior found in on-line gaming does transfer to real life situations. In addition to the sources cited above linking bullying and online gaming, Ybarra, Rowell, Korchmaros, and Reisner, (2014) identify violent video gaming as a causative factor for children carrying weapons to school. Holtz and Appel (2011) found that playing violent online games led to increased externalized problem behaviors i.e. aggressive behavior and deliquency in adolescents. Citing the social learning theory of Bandura, authors Gabbiadini, Andrighetto, and Volpato (2012)

hypothesized that playing the video game Grand Theft Auto (GTA) resulted in moral

disengagement; the players' moral boundaries shifted so that the immoral behavior of the virtual

gaming universe became morally acceptable. Moral disengagement was caused by the rewards

for immoral and violent behavior inherent to GTA. Gamers earn higher status by committing

more violent virtual acts. The authors called for further research to examine whether moral

disengagement tranfers to immoral behaviors in real-life settings. Specifically, more longitudinal

studies are called for.

While there  are ample studies to suggest a correlation between violent internet gaming

and increased levels of aggression in gamers, there is a lack of inquiry into whether the increase

in aggression is sustained over time (Willoughby, Adachi, & Good, 2012). Sestir and Bartholow

(2010) examined that question in a study of  184 college sudents. They found that while levels of

aggression in the subjects were higher immediately after playing games with violent content, the

increase in aggression declined after a delay of just 15 minutes. It should be noted that the

majority of subjects were female; the authors were unable to say if the results could be

generalized across genders.

### Discussion

Researchers are divided on the effects of video gaming. One camp holds that there are

undeniable benefits in education and the development of prosocial skills, even in some games

with violent content. Others point to evidence showing a correlation between violent content in

online gaming and increased levels of aggression in gamers.  Previously noted statistics from the

electronic gaming industry indicate that the number of online gamers, and the number of

adolesecent males playing online games, is growing.There is ample evidence to suggest that,

despite the positive benefits, playing online video games with violent content can lead not only

to addiction to playing the game (IGD), but also to an increase in aggressive behavior in the

gamer. Though more research into the nature of IGD and appropriate interventions are called for,

the scope and volume of available literature indicate that awareness in the counseling community

is also growing. As any mental disorder, clinicians will have the reponsibility to assess and

diagnose clients with suspected IGD, and to employ appropriate interventions when called for.

**Assessment**

Because of the effects of IA on developmental task achievement in teenagers, it is

important to identify early-stage IGD in teenagers so that they can receive treatment (Cho, et al.,

2014). Using proposed criteria from the DSM-5 and existing screens for IA, the authors studied

the internet habits of  1082 students ages thirteen and fourteen. Based on the data, they

developed a seven-factor, forty-one point screen for IGD. While they are satisfied with the

validity of the scale, they call for more research and development in this area. As of 2017, there

are at least 20 instruments available to screen and assess clients for IGD. However, not many

have been properly validated. A more recent instrument, the Ten-Item Internet Gaming Disorder

Test (IGDT-10) is based on the proposed DCM-5 criteria. In a study of over four thousand

internet gamers, researchers found the IGDT-10 and the proposed criteria to be valid instrument

(Király, et al., 2017). It is likely that other instruments for screening and assessment for IGD will

be developed as research into IGD continues.

**Diagnosis**

According to Yau and Potenza (2014), IGD is often overlooked and can be difficult to diagnose

because the symptoms can be masked as ordinary internet usage.They list the proposed crieteria

for IGD as:

1. Preoccupation with Internet games. 2. Psychological withdrawal symptoms (eg,

anxiety). 3. Tolerance (the need to spend an increasing amount of time playing Internet

games). 4. Unsuccessful attempts to control or limit Internet game participation. 5. Loss

of interest in previous hobbies. 6. Continued use despite knowledge of a problem. 7.

Deceiving family members and/or therapists. 8. Use of Internet games to escape a

negative mood. 9. Jeopardizing or losing a relationship, job, or educational opportunity

due to Internet gaming (p.381).

Severity ratings of mild, moderate or severe may also be assigned according to the number of

criteria met (APA, 2013).

Clinicans should also be aware of the possibility of co-occurring disorders, typically

substance use disorder and ganbling disorder, but also other disorders such as generalized

anxiety disorder, panic disorder, depression, and social phobia (Yau & Potenza, 2014). The

authors call for more research into whether depression leads to IGD, IGD leads to depression, or

factors such as environment and genetics contribute to the development of both.

**Treatment**

IGD is a relatively new disorder. There are already clinics for the treatment of IGD, using

a variety of techniques (Ružic-Bafet al, 2016).  King and Delfabbro (2014b) conducted a review

of literature reporting on the efficacy of then-current interventions for the treatment of IGD.

Though they stated that many individuals diagnosed with IGD were receiving treatment, they

reported a lack of uniformity in diagnostic criteria. Admittedly, many clinical trials were

conducted before the proposed criteria for IGD were published in the DSM-5. Though some

studies reported a decrease in symptomology, there was a lack of post-treatment measures to

indicate the long-term efficacy of treatment. The authors stated that they were unable to ascertain which interventions might be effective and called for more research on the subject.

As with many mental disorders, it is likely that a two-fold approach consisting of medication (at least in the short term) and therapy will be effective in treating IGD. Yau and Potenza (2014) report on two studies directed at developing  psychopharmacoligical interventions to deal with IGD. In one trial, the medication methylphenidate reduced playing time and symptoms of IGD in children diagnosed with both attention deficit hyperactivity disorder (ADHD) and IGD. In another trial sustained-release bupropion, administered over a period of  six weeks, not only reduced playing time and symptoms, but also resulted in a reduction of cravings to play online video games. The authors also mention studies to examine the efficacy of cognitive behavioral interventions in the treatment of IGD, though they did not mention the results of said studies.

Some researchers propose a cognitive model of IGD. King and Delfabbro (2014a) identified four cognitive factors contributing to IGD: beliefs about game reward value and tangibility, maladaptive and inflexible rules about gaming behaviour, over-reliance on gaming to meet self-esteem needs, and gaming as a method of gaining social acceptance. They believe that research must look beyond simple preoccupation in addressing IGD and examine the possibility of negative thoughts about self and the world in gamers. They report on the results of seven treatments for IGD that employed Cognitive Behavioral Therapy (CBT) as a therapy and call for further research into its use. Dong and Potenza (2014) point to reward seeking and lack of executive control as factors contibutig to IGD. Because of similarities between IGD and substance use disorder, in which CBT has been shown to be an effective treatment strategy, they also advocate for further study into its use in treating IGD.

Sakuma, et al. (2017) report on the success of a Self-Discovery Camp (SDiC) in Japan. Modeled after a similar approach developed in Korea, it involves different therapies including psychotherapy, psychoeducational therapy, and cognitive behavioral therapy. Ten campers (average age sixteen) spent 8 nights and 9 days at a camp where they were treated using the various methods. Patients had no access to the internet or video games.Thus, similar to inpatient treatment for substance use disorder, they were not exposed to the stimulus. The results showed a decrease in internet gaming time and an increase in self-efficacy not only immediately after the camp,but also three months later. Thought the authors caution that the SDiC approach may not be effective in all counties, they were able to transfer it from Korea to Japan.

While the therapies discussed above address the addictive component of IGD, they may not deal directly with the increase in aggression related to violent online gaming. However, there are evidence-based strategies for managing aggression in adolescents. A relatively recently developed intervention is Mode Deactivation Therapy (MDT), a manualized therapy based on elements of  CBT, Acceptance and Commitment Therapy (ACT), Dialectical Behavior Therapy (DBT) and Functional Analytic Therapy (FAP). MDT has been shown to reduce aggression not only in adolescent males, but in families as well. A meta-analysis shows that results achieved by MDT surpass those produced by CBT, DBT and Social Skills Training (SST) (Apsche, Bass, & DiMeo, 2011). It should be noted that one of the authors of the meta-analysis, Jack Apsche, is also credited with the development of MDT. However, independent research supports the efficacy of MDT for both individuals and families (Thoder & Cautilii, 2011).

The Anger Control Program (ACP) is a cognitive-behavioral intervention that has been developed over twenty years. Used in school settings and oupatient clinics, it consists of eighteen semi-structured group sessions that adress social cognitive distortions that lead to disruptive and

aggressive behavior. Though it was developed to be used in treating fourth through sixth grade students, it can easily be adapted for adolescents (Smith, Lochman, & Daunic, 2005). More treatment options will emerge as research into IGD continues.

### Author's note

This project began as a partial fulfillment of the requirement for a class in research design. I proposed a study examining whether playing online video games with violent content had a correlation with increased levels of aggression in adolescent male gamers. The proposed study was similar in design to a number of completed studies, the results of which are readily available. I proposed that it could be used as a model for groups to use at the systemic (school) or community level as a way to assess the incidence of IGD. At the time, I had some concern that the internal validity of the study could be affected by an uncontrolled variable: Increased levels of the hormone testosterone that are a part of going through puberty in males. van Bokhoven, et al. (2006) conducted a longitudinal study of males aged twelve to twenty-one to investigate the possibility of a correlation between higher testoterone levels and increases in aggressive, antisocial and delinquent behaviors. Their results were mixed. They found no direct link between increased testosterone levels and aggresion in males going throuh puberty. However, there was a correlation between delinquent and aggressive behavior in males age sixteen who had higher levels of testosterone. The authors admit that their results may have been skewed by the fact they drew subjects from families of low socio-economic status. The inclusion of a control group made up of adolescent males who either play non-violent online games or do not play online games at all should allow for the possible effects of increased testosterone levels on aggression in all adolescent males. King and Delfabbro (2014b) call for the inclusion of a control group in future studies about IGD.

In conducting the necessary research and writing this paper, I found myself enmeshed in the myriad details of defining the problem, assessing, diagnosing and treating IGD. It was only as the project neared completion that I was able to pull back my focus and reflect on the increase in aggressive behaviors in our society as a whole. While driving a city bus for three years, I observed countless incidents of disourteous driving. People would do the darndest things to avoid gettig stuck behind a bus; run red lights, proceed out of turn at a four way stop, or just plain cut me off in traffic. Driver discourtesy has spawned road rage. It is appalling to think that people have died as a result of something so trival as a disagreement over right-of-way procedures. Social media sites are rampant with examples of aggressive thoughts and behaviors. Insults lead to buling and threats, and in some cases to physical violence and even death.

As a counselor, I have begun to integrate mindulness techniques into sessions with clients. The object is not only to encourage clients to figuratuuvely stop and smell the roses, but also to become aware of everything that is happening in the moment. Becoming aware before acting is a good practice for all (myself included).

References

Anderson, C., & Bushman, B. (2001). Effects of violent video games on aggressive behavior, aggressive cognition, aggressive affect, physiological arousal, and prosocial behavior: A meta-analytical review of the scientific literature. *Psychological Science 12(5)*, 353-359.

APA. (2013). Internet gaming disorders. In *Diagnostic and statistical manual of mental disorders (5th edition)* (pp. 795-798). Arlington, VA: American Psychiatric Association.

Apsche, J. A., Bass, C. K., & DiMeo, L. (2011). Mode Deactivation Therapy (MDT) comprehensive meta-analysis. *The International Journal of Behavioral Consultation and Therapy 7(1)*, 46-53.

Apsche, J. A., Bass, C. K., & Houston, M.-A. (2006). A one year study of adolescent males with aggression and problems of conduct and personality: A comparison of MDT and DBT. *International Journal of Behavioral Consultation and Therapy 2(4)*, 544-552.

Bennersted, U., Ivarsson, J., & Linderoth, J. (2011). How gamers manage aggression: Situating skills in collaborative computer games. *Computer-Supported Collaborative Learning 7*, 43-61.

Carnagey, N. L., Anderson, C. A., & Bushman, B. A. (2006). The effects of video game violence on physiological desensitization to real life violence. *Journal of Experimental Social Psychology 43*, 489-496.

Cho, H., Kwon, M., Choi, J.-H., Lee, S.-K., Choi, J. S., Choi, S.-W., & Kim, D.-J. (2014). Development of the Internet Addiction scale based on the Internet Gaming Disorder criteria suggested in DSM-5. *Addictive Behaviors 39*, 1361-1366.

Dong, G., & Potenza, M. N. (2014). A cognitive-behavioral model of internet gaming disorder: Theoretical underpinnings and clinical implications. *Journal of Psychiatric Research 58*, 7-11.

Eichenbaum, A., Bavelier, D., & Green, C. S. (2014). Play that can do serious good. *American Journal of Play 7(1)*, 50-72.

Entertainment Software Association. (2015). *Essential facts about the computer and video game industry.* Retrieved from www.theesa.com

Entertainment Software Association. (2017, April 1). *2016 essential facts about the computer and video game industry.* Retrieved from http://www.theesa.com/about-esa/industry-facts/

Entertainment Software Ratings Board. (2015). *ESRB Ratings.* Retrieved from www.esrb,org

Fischer, P., Kastenmüller, A., & Greitemeyer, T. (2009). Media violence and the self: The impact of personalized gaming characters in aggressive video games on aggressive behavior. *Journal of Experimental Social Psychology 137(3)*, 367-390.

Gabbiadini, A., Andrighetto, L., & Volpato, C. (2012). Brief report: Does exposure to violent video games increase moral disengagement among adolescents. *Journal of Adolescence 33(5)*, 1403-1406.

Griffiths, M. D., Davies, M., & Chappell, D. (2004). Online computer gaming: a comparison of adolescent and adult gamers. *Journal of Adolesecence 27*, 87-96.

Hess, T., & Gunter, G. (2013). Serious game-based and nongame-based online courses: Learning experiences and outcomes. *British Journal of Educational Technology 44 (3)*, 372-385.

Holtz, P., & Appel, M. (2011). Internet use and video gaming predict problem behavior in early adolescence. *Journal of Adolescence 34*, 49-58.

King, D., & Delfabbro, P. (2014a). The cognitive psychology of Internet gaming disorder. *Clinical Psychology Review 34*, 298-308.

King, D., & Delfabbro, P. H. (2014b). Internet Gaming Disorder treatment: A review of definitions of diagnosis and treatment outcome. *JournaL of Clinical Psychology 70(10)*, 942-955.

King, E. (2015). Designing after-school learning using the massively multiplayer online role-playing game. *Theory into Practice 54*, 128-135.

Király, O., Sleczka, P., M., H., Urbán, R., Griffiths, M. D., & Demetrovics, Z. (2017). Validation of the Ten-Item Internet Gaming Disorder Test (IGDT-10) andevaluation of the nine DSM-5 Internet Gaming Disorder criteria . *Addictive Behaviors 64* , 253-260.

Lemmens, J. S., Valkenburg, P., & Jochen, P. (2011). The effects of pathological gaming on aggressive behavior. *Journal of Youth Adolescence 40*, 38-47.

Mengel, F. (2014). Computer games and prosocial behaviour. *PLoS ONE 9(4)*.

Ružic-Baf, M., Strnak, H., & Debeljuh, A. (2016). Online video games and young people. *International Journal of Research in Education and Science 2(1)*, 94-103.

Sakuma, H., Mihara, S., Nakayama, H., Miura, K., Kitayuguchi, T., i Maezono, M., . . . Higuchi, S. (2017). Treatment with the self-discovery camp (SDiC) improves internet gaming disorder. *Addictive Behaviors 64* , 357-362.

Schrader, P., & McCreery, M. (2008). The acquisition of skill and expertise in massively multiplayer online games. *Education Tech Research Develpment 56*, 557-574.

Smith, S. W., Lochman, J. E., & Daunic, A. P. (2005). Managing aggression using cognitive-behavioral Interventions: State of the practice and future directions . *Behavioral Disorders 30(3)*, 227-240.

Tao, R., Huang, X., Wang, J., Zhang, H., Zhang, Y., & Li, M. (2010). Proposed diagnostic criteria for internet addictionaddiction. *Addiction 105*, 556-564.

Thoder, V. J., & Cautilii, J. D. (2011). An independent evaluation of mode deactivation therapy for juvenile offenders. *The International Journal of Behavioral Consultation and Therapy 7(1)*, 41-46.

Uz, C., & Cagiltay, K. (2015). Social interaction and games. *Digital Education Review 27*, 1-9.

van Bokhoven, I., van Goozen, S. H., van Engeland, H., Schaal, B., Arseneault, L., Séguine, J. R., . . . Tremblay, R. (2006). Salivary testosterone and aggression, delinquency, and social dominance in a population-based longitudinal study of adolescent males. *Hormones and Behavior 50 (1)*, 118-125.

Willoughby, T. (2008). A short-term longitudinal study of internet and computer game use by adolescent boys and girls: Prevalence, frequency of use, and psychosocial predictors . *Developmental Psychology 44(1)*, 195-204.

Willoughby, T., Adachi, P. J., & Good, M. (2012). A longitudinal study of the association between violent video game play and aggression among adolescents. *Developmental Psychology 48(4)*, 1044-1057.

Yang, S. C. (2012). Paths to bullying in online gaming: The effects of gender, preference for playing violent games, hostility, and aggressive behavior on bullying. *Journal of Educational Computing Research*, 235-249.

Yau, Y., & Potenza, M. (2014). Internet gaming disorder. *Psychiatric Annals 44(8}*, 379-383.

Ybarra, M. L., Rowell, H. L., Korchmaros, J. D., & Reisner, S. (2014). Cross-Sectional associations between violent video and computer game playing and weapon carrying in a national cohort of children. *Agressive Behavior 48*, 345-358.