Internet Gaming Disorder and School Attainment: The Moderating Role of Parental Control

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Abstract

Aim: Excessive gaming is negatively related to school attainment. This study aimed to explore whether parental control moderates the relation between internet gaming disorder (IGD) and school attainment, and whether these relationships are further moderated by gender. *Methods:* As part of the Digital Youth Project of the University of Utrecht, a one wave sample of 11- to 18-year-old adolescents ($N = 1327$) was used. The students answered questions to measure the problematic use of gaming, levels of parental control and school attainment. *Results:* The excessive use of games and high levels of parental control were negatively related to school attainment; however, this study did not find a significant interaction between parental control and internet gaming disorder in relation to school attainment. In addition, the interaction was also non-significant regarding gender. *Conclusion:* This study provides further evidence that excessive gaming affects school attainment negatively, and that parental control does not buffer IGD in its relation to school attainment, for both boys and girls.

Keywords: parental control, school attainment, internet gaming disorder, excessing gaming, gender, gaming frequency.

Internet Gaming Disorder and School Attainment: The Moderating Role of Parental Control

Parental control is defined as 'parental intrusiveness, pressure, or domination, with the inverse being parental support of autonomy' (Grolnick and Pomerantz, 2009). According to McLeod et al. (2007), parental control is detrimental to the growth of children and strengthens dependence upon their parents. Parents implement rules and control routines which does not support a child's independence (McLeod et al., 2007). This dependence may suggest that children are not able to develop cognitive skills essential to being independent but instead, constantly seek parental help to solve academic problems. Literature shows that parental control can blunt children's school attainment (Fulton & Turner, 2008; Walker & MacPhee, 2011). However, there are other possible causes for having lower attainment in school, such as spending too much time playing video games.

Video games have become one of the largest entertainment choices among adolescents (Newzoo, 2018). In the Netherlands, a survey showed that playing video games multiple times per week was frequent among youth between 12 and 25 years old (Statista, 2018). This phenomenon can be seen as problematic because gaming can have negative outcomes in young peoples' lives, especially relating to school where the level of attainment decreases (Rehbein et al., 2010). Students who spend more time gaming therefore have lower grades, compared to those who play less frequently. Gómez-Gonzalvo et al. (2020) show that gamers who game more intensively during the week obtain worse grades than occasional gamers. Internet Gaming Disorder (IGD), which has been negatively associated to lower School Attainment (Gentile, 2009), is defined as "uncontrollable, excessive, and compulsive use of online games that causes serious problems such as social and/or emotional problems" (Martynowska, 2018).

It is important that parents play an active role in curbing gaming time so that children can meet school obligations as opposed to playing games. So, even though high levels of parental control have a negative impact on school attainment, it is possible that parental control can be effective in curbing excessive gaming which, in that case, can contribute to better school attainment.

Therefore, this study aims to understand the moderating role of parental control in the relationship between internet gaming disorder and school attainment.

Theoretical Substantiation

Parental Control and School Attainment

Several authors have probed into the mechanisms explaining the negative link between control and school attainment. Baumrind (1991) presented a theoretical model to define different parenting styles. She said that authoritarian parents are highly controlling of their children for their children to achieve certain behaviours. This high-level of control, described as 'hostile' and 'restrictive' by Grolnick and Pomerantz (2009), is harmful to children's development, and therefore their academic achievements.

Furthermore, different authors have theorized (Manassis and Bradley, 1994; Rubin and Mills, 1991) that high levels of parental control in situations where children should act independently (for example, doing their homework) reduces their self-efficacy. Barber (1996) and Steinberg et al. (1989) note that 'parental control involves excessive parental regulation of children's activities and routines, encouragement of children's dependence on parents, and instruction to children on how to think'. This suggests that parental control undermines children's autonomous abilities in completing common school tasks. Rosario et al. (2015) suggests that one such task may be homework; not completing homework would consequently be detrimental to school attainment (Masud, 2014). Thus, the above suggests that too much control from parents inhibits children from being autonomous in academia, such as doing homework, which results in low levels of school attainment.

On the other hand, and according to the self-determination theory (Ryan and Deci, 2000) if adolescents are not capable of fulfilling their needs in a social environment e.g., at home, they might seek other social environments. According to Przybylski et al.'s (2010) review if individuals are not able to meet their basic needs in their family environment, then they may compensate that by engaging in excessive gaming. The author adds that such needs are for example, the lack of authoritarian parenting implying that parental control may help reducing this risky behaviour and decrease the likelihood of developing internet gaming disorder symptoms.

How adolescents arrange their time and prioritize activities is important to understand the relationship between gaming time and school attainment. According to Larson and Verma (1999), large amounts of free time are dedicated to non-productive activities such as playing video games. By spending a lot of time playing video games, or other media related activities, Strasburger and Donnerstein (1999) theorise that time spent on school tasks like homework decreases. Their theory

is called the 'displacement hypothesis'. The 'displacement hypothesis' effects school attainment as the time that students dedicate to playing video games conflicts with time spent on school tasks (Anderson et al., 2001). In support of this argument, this 'displacement' with video gaming happens on weekdays and weekends (Cummings and Vandewater, 2007) thus leaving no time for academic activities. Less time spent on academic activities consequently effects school attainment negatively.

Additionally, Anand (2007) argues that excessive video game playing compromises the quality of school performance. Some theories show that constant contact with video games can decrease students' levels of cognitive control, including lack of attention and working memory (Anguera and Gazzaley, 2015). A study by Chan and Rabinowitz (2006) reported that adolescents who spend more time playing video games may have lower levels of attention. Concentration and focus are important cognitive skills needed to achieve positive levels of school attainment. Therefore, gaming time not only effects time spent on academic work but also on the quality of a students' learning.

Review of Empirical Studies

Parental Control and School Attainment

Empirical research has corroborated the links hypothesized in the theoretical frameworks, showing that an authoritarian parental control style has a negative relation with school attainment (Rogers et al., 2009). In a study of 334 adolescents, Karbach et al. (2013) found that parental control was negatively correlated with school attainment. Parental control was defined in one way as 'the exertion of excessive pressure over children', which is in line with the authoritarian parenting style mentioned above. Furthermore, research by Nunez et al. (2015) comprised of 1,683 Spanish students from 10 to 16 years old, showed that higher levels of parental control on homework was negatively correlated to lower levels of school attainment. A longitudinal study by Kramer (2012) in the United States of America with 6,134 participants examined the relationship between parental control and school attainment and found that controlling and pressuring youth would be detrimental for good academic habits, therefore proving a negative correlation.

Internet Gaming Disorder and School Attainment

Several researchers have found negative relationships in the amount of time that students spend on playing video games and their attainment at school (Hastings et al., 2009; Sharif and

Sargent, 2006). According to a cross-sectional study by Sharif and Sargent (2006) over a sample of 4,508 students, gaming time conflicts with the time that gamers should assign to homework, and as shown above, homework is an important school task. In support of this, Cummings and Vandewater (2007) aimed to examine how playing video games is negatively correlated with doing homework. The sample consisted of 1,941 children aged 10 to 19 years old where 80% were boys and 20% were girls. They concluded that gamers spent 34% less time doing homework compared to non-gamers. Furthermore, Müller et al. (2014) conducted a cross-sectional study across seven European countries with a sample of 12,938 adolescents with ages ranging from 14 and 17 years old. The results showed that adolescents with IGD symptoms had lower levels of school attainment. A two-year longitudinal study by Gentile et al. (2011), aimed at identifying outcomes for adolescents who excessively game. The study analyzed 3034 students in elementary and secondary school and found a negative relation between excessive gaming school attainment.

Evidence then suggests that there is a negative relation between gaming time and school attainment.

Internet Gaming Disorder and Parental Control

Researchers have found that young gamers can become vulnerable and play for more than they should without thinking of consequences (Bassiouni and Hackley, 2016). It is then the parents' responsibility to control the amount of time that their children spend playing video games (Kutner et al., 2008). A longitudinal study by Su et al. (2018) among 1490 adolescents aged 10-15 years aimed at understanding the reciprocal association between parental control and internet gaming disorder. The results showed that high parental control practices result in lower internet gaming disorder.

A study by Lloret Irles et al. (2013) with 610 secondary school participants showed that parents who actively control the time that their children spend playing video games results in less time gaming. The researchers concluded that parental control is effective in controlling gaming time and that without it, more hours are spent gaming which leads to lower academic achievement.

Another study by Malik et al. (2020) with 450 students aged between 11 to 16 years old, aimed to understand the role of parents in preventing excessive gaming time by praising children's self-control. The results showed that this relationship plays a vital role in reducing the likelihood of excessive time playing video games among youth. The researchers conclude that there is a need

for continued research into the ways that parents control this relationship to achieve a more comprehensive theoretical framework. But so far, the most recent studies have shown that parental control is vital in reducing video game time among youth.

The Current Study

Given the theoretical and empirical substantiation above, there is a gap within the research which this study aims to fulfil. As shown, high levels of parental control have been negatively correlated to school attainment. Research also indicates that internet gaming disorder is negatively correlated with school attainment and that parental control can curb internet gaming disorder. In addition, the links between *parental control*, *school attainment* and *internet gaming disorder*, have rarely been studied with gender as a moderator. Therefore, this study also intends to investigate the potential moderating role of gender within these relationships. This study asks:

- *Does parental control moderate the relation between excessive gaming and school attainment?*
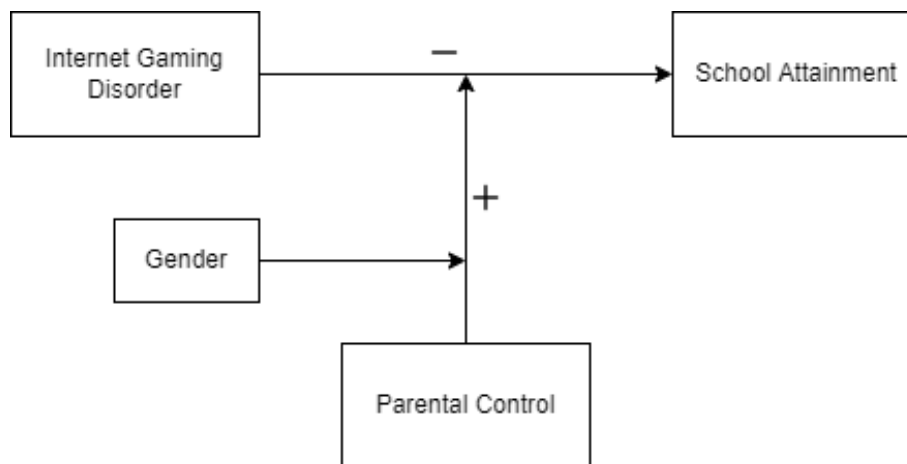- *Are these relationships further moderated by gender?*

figure 1. Research model

Methods

Sample

The data was derived from the Digital Youth Project, an ongoing longitudinal study at Utrecht University. Data was collected through online self-report questionnaires administered in the classroom setting using Qualtrics survey software. For this study, all the students that had not played a game for the past 3 months were excluded. This resulted in a final sample of 1,327 adolescents with ages ranging from 11 to 18 years ($M_{age} = 13.85$, $SD = 1.46$) at T_5. The participants were almost equally distributed by their gender (53.9% girls and 46.1% boys). In terms of education, these students were in the vocational training level (28.6%) and in the pre-academic training level (71.4%).

Measures

Frequency of gaming was measured using two items asking for the number of days playing video games per week (0-7) and how long they would play for (0-9 hours or more each day). These two items were multiplied.

The Internet Gaming Disorder (IGD) symptoms variable was measured using nine dichotomous items (1 = no/2= yes). A sample item is, "During the last 12 months … have you lost interest in hobbies or other activities because you wanted to game?". A sum score of the nine items were calculated. The Cronbach's α value was .73.

Parental control was measured using four items. A sample item is, "How often do your parents (or caregivers) say … that you are not allowed to browse the internet or play games?". Answers were collected using a 5-point response scale [range from 1 (*almost never*) to 5 (*more than 5 times a day)*]. An average score of the four items was calculated. The Cronbach's α value was .84.

Strategy for Analysis

All the analyses performed were using SPSS. The analysis part is divided into two sections: descriptive analysis and regression models. Means and standard deviation of education level, parental control, school attainment and IGD are calculated using all 1,327 observations, for the total group and for boys and girls separately. By performing independent sample t-test with gender as an independent variable, the means of education level, parental control, school attainment success, and IGD for gender groups are compared.

In the second part of the analysis, three hierarchical regression models are performed to predict school attainment.

The first model contains gender, education level and parental control as an independent variable. The independent variables are introduced in two blocks where the first block contains gender and education level, and the second block parental control.

The second model is created by using gender, education level, standardize IGD as independent, and school attainment success as the dependent variable. In this hierarchical regression model, the independent variables are used in two blocks where the first block contains gender and education level, and the second block contains standardize IGD.

The third model is created by using gender, education level, standardize IGD, standardize parental control, interaction between standardize IGD and standardize parental control (standardize IGD x standardize parental control) as independent and school attainment success as the dependent variable. In this hierarchical regression model, the independent variables are used in three blocks where the first block contains gender and education level, the second block contains standardize IGD and standardize parental control, and the third block contains interaction between standardize IGD and standardize parental control and gender.

Ethics

The present study was conducted with the approval by the Ethical Review Board of the Faculty of Social and Behavioral Sciences at Utrecht University. The approval of the Ethical Review Board concerns ethical aspects, as well as data management and privacy issues (including the GDPR). All the participants and respective parents were fully informed about the study and given the right to refuse to participate before the study began.

Results

Descriptive Statistics

Table 1 shows that boys reported lower average education level ($t = -2.76, p < .01$) and school attainment success ($t = -3.12, p < .01$) compared to girls. But boys show a higher level of parental control ($t = 5.54, p < .001$) and IGD scores ($t = 12.28, p < .001$) than girls.

Table 1. Descriptive statistics at each time point for the total group and separately for girls and boys

Variable	Total	M (SD)	
		Girls (53.9%)	Boys (46.1%)
Education Vocational vs Pre-academic	1.7136 (0.45)	1.75 (0.44)	1.68 (0.47)**
Parental Control	1.7564 (0.73)	1.65 (0.68)	1.88 (0.76)***
School Attainment Success	3.5759 (0.99)	3.66 (0.97)	3.48 (1.03)**
IGD Scale	1.8887 (1.30)	1.41 (0.85)	2.31 (1.47)***

Hierarchical Regression

The first model measures the effect of gender and education level on school attainment success. The results in Table 2 show that, gender is significant (β = 0.086, p < .01), implying that girls have better school attainment than boys. Education level (β = 0.049, p > 0.05) is not significantly associated with School Attainment success. When adding parental control to the model, gender (β = 0.680, p < .05) still has a positive significant relation, while parental control (β = -0.119, p < .001) has negative significant relation on school attainment, implying that children reporting that their parent control them more have lower school attainment. Education level (β = 0.047, p > 0.05) has no significant association with school attainment success.

Separately, the same analysis was done by adding internet gaming disorder instead of parental control. Thus, model three shows that gender (β = 0.058, p > 0.05) and education level (β = 0.021, p > 0.05), have no significant relation on school attainment success but internet gaming disorder (β = -0.143, p < .001) has a negative significant relation on school attainment success, implying that adolescents showing symptoms of gaming disorder perform poorer in school.

In the last full multivariate model, both parental control and internet gaming disorder were included in model four. The coefficient table shows that gender (β = 0.050, p > 0.05) and education

level ($\beta = 0.021$, $p > 0.05$) have no significant association with school attainment success but that both internet gaming disorder ($\beta = -0.137$, $p < 0.001$) and parental control ($\beta = -0.121$, $p < 0.001$) have negative significant relation on school attainment success. Lastly, the model five includes the interaction between parental control, internet gaming disorder and gender. This interaction was not significant, implying that the relation between IGD and school attainment was not changed by parental control. In other words, parental control does not buffer internet gaming disorder with school attainment, for both girls and boys.

Table 2. Multiple Linear Regression including Main Effect among Gender, Education, Parental Control, IGD and Two-Way Interaction.

	Model 1			Model 2			Model 3			Model 4			Model 5		
	B	SE B	β	B	SE B	β	B	SE B	β	B	SE B	β	B	SE B	β
Background															
Gender (girls)	0.173	0.058	0.086**	0.137	0.058	0.680*	0.115	0.067	0.058	0.100	0.066	0.050	0.100	0.066	0.050
Education level	0.109	0.064	0.049	-0.118	0.029	-0.119***	0.046	0.069	0.021	0.051	0.069	0.023	0.046	0.069	0.021
IGD and PC															
Parental Control				-0.118	0.029	-0.119***				-0.118	0.034	-0.118**	-0.119	0.032	-0.121***
Internet Gaming Disorder							-0.143	0.033	-0.143***	-0.118	0.034	-0.118**	-0.137	0.036	-0.137***
Interaction IGD * PC													0.049	0.027	0.062
Interaction three-way													0.049	0.077	0.074

Discussion

The present study used data from the fifth wave of an on-going longitudinal study, seeking to contribute to the existing debate on excessive gaming of young adolescents and their school attainment. In general, this study found that internet gaming disorder is negatively related to school attainment success. This implies that young adolescents who have symptoms of internet gaming disorder perform worse in school. In addition, gender was significant in its relation to school attainment, showing that girls report higher levels of school attainment compared to boys. In contrast, boys report higher levels of internet gaming disorder than girls and are more controlled by their parents. This suggests that boys excessively play video games, which implies that they spend less time on their school tasks at home and require more control from their parents. Although the results show that excessive gaming and high levels of parental control are individually negatively related to school attainment, this study did not find a significant interaction between both internet gaming disorder and parental control in relation to school attainment. A three-way interaction was also non-significant regarding gender. This suggests that parental control does not moderate the relationship between internet gaming disorder and school attainment.

As aforementioned, boys report higher levels of parental control than girls and lower levels of school attainment than girls. This result is consistent with Grolnick and Pomerantz's (2009) theory as they theorize that this high level of parental control is harmful to children's development and therefore, their school attainment. Similarly, the 'displacement hypothesis' (Strasburger and Donnerstein, 1999) states that time is displaced by students as they dedicate more time to activities such as playing video games, instead of completing school tasks, which negatively impacts school attainment. The findings are consistent with this theory, as well as Cummings and Vandewater (2007), but only for boys, as they report higher levels of internet gaming disorder compared to girls. This suggests that boys' time might be displaced regarding school tasks in preference for playing video games.

Literature often shows that parental control is negatively related to school attainment, but in this study, it was expected that control could buffer the effects of excessive gaming. This is because the results on parental control are mixed and research has showed that control may be beneficial (Hayek et al., 2022). The authors examined a sample of 345 students between 15 and 18 years old and found that authoritative parenting was positively related with school attainment and better grades.

We used a control measure focussing on the curbing on intent use and gaming. Our results were not what was expected and a reason why may be because we still used a too general

measure of control. The questions used in the database to measure parental control on excessive gaming were not specific enough to address control of internet gaming disorder on a daily basis. For this reason, if a more specific measure of control had been used that closely addressed excessive gaming different effects might have been found. Once adolescents' show internet gaming disorder symptoms then it is more challenging to change their behaviour. To prevent this issue, for example, if parental control is in place from an early stage regarding excessive gaming, it may be possible that control is effective in preventing the development of internet gaming disorder symptoms altogether, and therefore its potential negative effects on school attainment. To support this, van den Eijnden et al. (2009) concluded that parents should start controlling their children's internet use early. The results of the study over 4,483 Dutch students suggest that parental action helps preventing excessive use of the internet.

Strengths and limitations

A strength of this study is that it is a large-scale study with a large sample and that uses measures which have been validated in earlier research (van den Eijnden et al., 2018). Another strength of this study is the inclusion of gender within the model. It allows for a fuller perspective on the differences between adolescent boys and girls regarding internet gaming disorder symptoms, school attainment and parental control levels. This is important because the literature shows that boys play more games excessively than girls, and that girls do better than boys at school (Cummings and Vandewater, 2007).

Given that the findings were non-significant regarding the hypothesis, a limitation of this study may be that the results are based on a single wave of a longitudinal study. If the same research model was duplicated across more school years, the results might well be more clarifying. To further this, it should not be taken as an assumption that different geographical areas might have the same results. This study was limited to the Netherlands and therefore not reflective of any other region that has a higher percentage of adolescent gamers, such as Asia (Statista, 2021)

A second limitation to this study ties in closely with the first in the fact that we had to rely on self-reports of excessive game use and on their individual understanding of their own school attainment success. The data does not include the final grades of the participants which allows for subjective understandings of the participant being 'happy' with their grades. In other words, a low-level student achieving average grades may feel happy, but a high-level student achieving average grades may be unhappy. Therefore, a full model to delineate school attainment success is needed. Equally, the answers given about internet gaming disorder taken

cautiously as there is no tracking measure to depict how accurately they describe their gaming activity.

For future research, there needs to be a more specific measure of parental control on excessive gaming. The design of the study should be adapted to include early parental control efforts and their later effects on school attainment. This will provide more reliable findings given the fact that excessive gaming is studied before it becomes a problem that can lead to lower school attainment. By tackling internet gaming disorder before it is in place, it helps to understand whether parental control can curb excessive gaming and consequently, if it can lead to better school attainment.

Also, further recommendations to overcome the findings being non-significant would be to expand the geographical diversity of the studies and to ensure it is conducted across multiple school years, turning it into a longitudinal study. In relation to the questionnaire, access to final grades would give a better perspective as to how the students are doing at school on an objective scale. Extending the questionnaire to the parents would also provide a deeper insight into their parenting styles regarding the amount of time their children (dis)place on video gaming and school tasks at home. This also adds to the discussion how different parenting styles (parental involvement vs. parental control) contribute to the young adolescents' internet gaming disorder and their school attainment, as research shows that parental involvement can be beneficial (Kramer, 2012).

Conclusion

The study supports research that shows internet gaming disorder is negatively related to school attainment. The importance of these findings indicate that the topic of internet gaming disorder needs to be taken seriously, not only for direct school-related tasks, but as it also affects cognitive skills such concentration and focus (Chan and Rabinowitz, 2006). Therefore, this study contributes to the assumption that excessive gaming is detrimental for mental health and can be considered a behavioral addiction. In addition, parental control as restrictive and hostile (Grolnick and Pomerantz, 2009) negatively affects the development of young adolescents. This adds to the idea that a supportive, involved parenting style, but now focussed on gaming time, may result in more positive outcomes for young adolescents. These outcomes include better school attainment, more independence regarding school tasks at home and perhaps even a better view of internet gaming disorder implications.

References

Anand, V. (2007). A Study of Time Management: The Correlation between Video Game

Usage and Academic Performance Markers. *CyberPsychology & Behavior*, *10*(4),

552–559. https://doi.org/10.1089/cpb.2007.9991

Anderson, D. R., Huston, A. C., Schmitt, K. L., Linebarger, D. L., & Wright, J. C. (2001). I.

Introduction. *Monographs of the Society for Research in Child Development*, *66*(1),

1–9. https://doi.org/10.1111/1540-5834.00121

Anguera, J. A., & Gazzaley, A. (2015). Video games, cognitive exercises, and the

enhancement of cognitive abilities. *Current Opinion in Behavioral Sciences*, *4*, 160–

165. https://doi.org/10.1016/j.cobeha.2015.06.002

Barber, B. K. (1996). Parental Psychological Control: Revisiting a Neglected Construct.

Child Development, *67*(6), 3296–3319. https://doi.org/10.1111/j.1467-

8624.1996.tb01915.x

Bassiouni, D. H., & Hackley, C. (2016). Video games and young children's evolving sense of

identity: a qualitative study. *Young Consumers*, *17*(2), 127–142.

https://doi.org/10.1108/yc-08-2015-00551

Baumrind, D. (1991). The Influence of Parenting Style on Adolescent Competence and

Substance Use. *The Journal of Early Adolescence*, *11*(1), 56–95.

https://doi.org/10.1177/0272431691111004

Chan, P. A., & Rabinowitz, T. (2006). A cross-sectional analysis of video games and

attention deficit hyperactivity disorder symptoms in adolescents. *Annals of General*

Psychiatry, *5*(1). https://doi.org/10.1186/1744-859x-5-16

Cummings, H. M., & Vandewater, E. A. (2007). Relation of Adolescent Video Game Play to

Time Spent in Other Activities. *Archives of Pediatrics & Adolescent Medicine*,

161(7), 684. https://doi.org/10.1001/archpedi.161.7.684

Fulton, E., & Turner, L. A. (2008). Students' academic motivation: relations with parental warmth, autonomy granting, and supervision. *Educational Psychology*, *28*(5), 521–534. https://doi.org/10.1080/01443410701846119

Gentile, D. (2009). Pathological Video-Game Use Among Youth Ages 8 to 18. *Psychological Science*, *20*(5), 594–602. https://doi.org/10.1111/j.1467-9280.2009.02340.x

Gentile, D. A., Choo, H., Liau, A., Sim, T., Li, D., Fung, D., & Khoo, A. (2011). Pathological Video Game Use Among Youths: A Two-Year Longitudinal Study. *Pediatrics*, *127*(2), e319–e329. https://doi.org/10.1542/peds.2010-1353

Gómez-Gonzalvo, F., Devís-Devís, J., & Molina-Alventosa, P. (2020). Video game usage time in adolescents' academic performance. *Comunicar*, *28*(65), 89–99. https://doi.org/10.3916/c65-2020-08

Grolnick, W. S., & Pomerantz, E. M. (2009). Issues and Challenges in Studying Parental Control: Toward a New Conceptualization. *Child Development Perspectives*, *3*(3), 165–170.

Grolnick, W. S., & Pomerantz, E. M. (2009). Issues and Challenges in Studying Parental Control: Toward a New Conceptualization. *Child Development Perspectives*, *3*(3), 165–170. https://doi.org/10.1111/j.1750-8606.2009.00099.x

Hastings, E. C., Karas, T. L., Winsler, A., Way, E., Madigan, A., & Tyler, S. (2009). Young Children's Video/Computer Game Use: Relations with School Performance and Behavior. *Issues in Mental Health Nursing*, *30*(10), 638–649. https://doi.org/10.1080/01612840903050414

Hayek, J., Schneider, F., Lahoud, N., Tueni, M., & de Vries, H. (2022). Authoritative parenting stimulates academic achievement, also partly via self-efficacy and intention towards getting good grades. *PLOS ONE*, *17*(3), e0265595. https://doi.org/10.1371/journal.pone.0265595

Karbach, J., Gottschling, J., Spengler, M., Hegewald, K., & Spinath, F. M. (2013). Parental involvement and general cognitive ability as predictors of domain-specific academic achievement in early adolescence. *Learning and Instruction*, *23*, 43–51. https://doi.org/10.1016/j.learninstruc.2012.09.004

Kramer, K. Z. (2012). Parental Behavioural Control and Academic Achievement: Striking the Balance between Control and Involvement. *Research in Education*, *88*(1), 85–98. https://doi.org/10.7227/rie.88.1.8

Kramer, K. Z. (2012). Parental Behavioural Control and Academic Achievement: Striking the Balance between Control and Involvement. *Research in Education*, *88*(1), 85–98. https://doi.org/10.7227/rie.88.1.8

Larson, R. W., & Verma, S. (1999). How children and adolescents spend time across the world: Work, play, and developmental opportunities. *Psychological Bulletin*, *125*(6), 701–736. https://doi.org/10.1037/0033-2909.125.6.701

Lloret Irles, D., Cabrera Perona, V., & Sanz Baños, Y. (2013). Relationships between video-gaming habits, parental monitoring and school performance. *European Journal of Investigation in Health, Psychology and Education*, *3*(3), 237–248. https://doi.org/10.1989/ejihpe.v3i3.46

Malik, A., Nanda, A. P., & Kumra, R. (2020). Children in the digital world: exploring the role of parental–child attachment features in excessive online gaming. *Young Consumers*, *21*(3), 335–350. https://doi.org/10.1108/yc-01-2020-1090

Manassis, K., & Bradley, S. (1994). The development of childhood anxiety disorders: Toward an integrated model. *Journal of Applied Developmental Psychology*, *15*(3), 345–366. https://doi.org/10.1016/0193-3973(94)90037-x

Martynowska, K. (2018). Kimberly S. Young, Cristiano Nabuco de Abreu, Internet Addiction: A Handbook and Guide to Evaluation and Treatment, New Jersey: Johan

Wiley&Soons 2011. *Roczniki Pedagogiczne*, *10(46)*(3), 154–156.

https://doi.org/10.18290/rped.2018.10.3-11

Masud, H., Thurasamy, R., & Ahmad, M. S. (2014). Parenting styles and academic

achievement of young adolescents: A systematic literature review. *Quality &*

Quantity, *49*(6), 2411–2433. https://doi.org/10.1007/s11135-014-0120-x

McLeod, B. D., Wood, J. J., & Weisz, J. R. (2007). Examining the association between

parenting and childhood anxiety: A meta-analysis. *Clinical Psychology Review*, *27*(2),

155–172. https://doi.org/10.1016/j.cpr.2006.09.002

Müller, K. W., Janikian, M., Dreier, M., Wölfling, K., Beutel, M. E., Tzavara, C.,

Richardson, C., & Tsitsika, A. (2014). Regular gaming behavior and internet gaming

disorder in European adolescents: results from a cross-national representative survey

of prevalence, predictors, and psychopathological correlates. *European Child &*

Adolescent Psychiatry, *24*(5), 565–574. https://doi.org/10.1007/s00787-014-0611-2

Newzoo. (2018). *Global Games Market Report 2018*. https://newzoo.com/insights/trend-

reports/newzoo-global-games-market-report-2018-light-version/

Núñez, J. C., Suárez, N., Rosário, P., Vallejo, G., Valle, A., & Epstein, J. L. (2015).

Relationships between perceived parental involvement in homework, student

homework behaviors, and academic achievement: differences among elementary,

junior high, and high school students. *Metacognition and Learning*, *10*(3), 375–406.

https://doi.org/10.1007/s11409-015-9135-5

Przybylski, A. K., Rigby, C. S., & Ryan, R. M. (2010). A Motivational Model of Video

Game Engagement. *Review of General Psychology*, *14*(2), 154–166.

https://doi.org/10.1037/a0019440

Rehbein, F., Psych, G., Kleimann, M., Mediasci, G., & Mößle, T. (2010). Prevalence and

Risk Factors of Video Game Dependency in Adolescence: Results of a German

Nationwide Survey. *Cyberpsychology, Behavior, and Social Networking*, *13*(3), 269–277. https://doi.org/10.1089/cyber.2009.0227

Rogers, M. A., Theule, J., Ryan, B. A., Adams, G. R., & Keating, L. (2009). Parental Involvement and Children's School Achievement. *Canadian Journal of School Psychology*, *24*(1), 34–57. https://doi.org/10.1177/0829573508328445

Rosário, P., Núñez, J. C., Vallejo, G., Cunha, J., Nunes, T., Suárez, N., Fuentes, S., & Moreira, T. (2015b). The effects of teachers' homework follow-up practices on students' EFL performance: a randomized-group design. *Frontiers in Psychology*, *6*. https://doi.org/10.3389/fpsyg.2015.01528

Rubin, K. H., & Mills, R. S. (1991). Conceptualizing developmental pathways to internalizing disorders in childhood. *Canadian Journal of Behavioural Science/Revue Canadienne Des Sciences Du Comportement*, *23*(3), 300–317. https://doi.org/10.1037/h0079019

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68–78. https://doi.org/10.1037/0003-066x.55.1.68

Sharif, I., & Sargent, J. D. (2006). Association Between Television, Movie, and Video Game Exposure and School Performance. *Pediatrics*, *118*(4), e1061–e1070. https://doi.org/10.1542/peds.2005-2854

Statista. (2018). *Frequency of gaming among youth in the Netherlands*. https://www-statista-com.proxy.library.upenn.edu/statistics/937922/frequency-of-gaming-among-youth-in-the-netherlands/

Steinberg, L., Elmen, J. D., & Mounts, N. S. (1989). Authoritative Parenting, Psychosocial Maturity, and Academic Success among Adolescents. *Child Development*, *60*(6), 1424. https://doi.org/10.2307/1130932

Strasburger, V. C., & Donnerstein, E. (1999). Children, Adolescents, and the Media: Issues and Solutions. *Pediatrics*, *103*(1), 129–139. https://doi.org/10.1542/peds.103.1.129

Su, B., Yu, C., Zhang, W., Su, Q., Zhu, J., & Jiang, Y. (2018). Father–Child Longitudinal Relationship: Parental Monitoring and Internet Gaming Disorder in Chinese Adolescents. *Frontiers in Psychology*, *9*. https://doi.org/10.3389/fpsyg.2018.00095

van den Eijnden, R. J. J. M., Spijkerman, R., Vermulst, A. A., van Rooij, T. J., & Engels, R. C. M. E. (2009). Compulsive Internet Use Among Adolescents: Bidirectional Parent–Child Relationships. *Journal of Abnormal Child Psychology*, *38*(1), 77–89. https://doi.org/10.1007/s10802-009-9347-8

van den Eijnden, R., Koning, I., Doornwaard, S., van Gurp, F., & ter Bogt, T. (2018). The impact of heavy and disordered use of games and social media on adolescents' psychological, social, and school functioning. *Journal of Behavioral Addictions*, *7*(3), 697–706. https://doi.org/10.1556/2006.7.2018.65

Walker, A. K., & MacPhee, D. (2011). How home gets to school: Parental control strategies predict children's school readiness. *Early Childhood Research Quarterly*, *26*(3), 355–364. https://doi.org/10.1016/j.ecresq.2011.02.001

Appendix 1

* Encoding: UTF-8.

DATASET ACTIVATE DataSet1.

*****recoding igd_scale into a different variable IGD_SCALE_V2 to group values

above 5 into *****

RECODE IGD_Scale (1=1) (2=2) (3=3) (4=4) (5 thru Highest=5) INTO IGD_Scale_V2.

VARIABLE LABLES IGD_Scale_V2 'IGD Scale'.

EXECUTE

DESCRIPTIVES VARIABLES=IGD_Scale_V2

  /STATISTICS=MEAN STDDEV MIN MAX.

******A sum score of the nine items for IGD was calculated *****

COMPUTE

     IGD_Scale_V2=SUM(EV47_1,EV47_2,EV47_3,EV47_4,EV47_5,EV47_6,EV47_7,

     EV47_8,EV47_9)-8.

EXECUTE

******A sum score of the four items for Parental Control calculated *****

COMPUTE Parental_Control=SUM(EV51_1,EV51_2,EV51_3,EV51_4)-3.

EXECUTE

**** Standardize Internet Gaming Disorder variable to use in regression analysis ****

COMPUTE z_igd=(IGD_Scale_V2 - 1.8887) / 1.30079.

EXECUTE.

DESCRIPTIVES VARIABLES=Parental_Control

 /STATISTICS=MEAN STDDEV MIN MAX.

****** **Standardize Parental Control variable to use in regression analysis** ******

COMPUTE z_control=(Parental_Control - 1.7564) / 0.72732.

EXECUTE.

COMPUTE INT_IGD_Control_V2=z_igd * z_control.

EXECUTE.

COMPUTE INT_Gender_PC_IGD_3way=Gender * z_igd*z_control.

EXECUTE.

****** **two way interaction regression analysis: z_PC and z_IGD** ******

REGRESSION

 /MISSING LISTWISE

 /STATISTICS COEFF OUTS CI(95) R ANOVA

 /CRITERIA=PIN(.05) POUT(.10)

 /NOORIGIN

 /DEPENDENT School_A_Succes

 /METHOD=ENTER EV3 Ed_Level_2cat

 /METHOD=ENTER z_igd

 /METHOD=ENTER z_control

 /METHOD=ENTER INT_IGD_Control_V2

/SCATTERPLOT=(*ZRESID ,*ZPRED)

/RESIDUALS HISTOGRAM(ZRESID) NORMPROB(ZRESID).

FREQUENCIES VARIABLES=Gender Ed_Level_2cat z_igd z_control

/ORDER=ANALYSIS.

****** Three way interaction regression analysis: gender, z_PC and z_IGD ******

REGRESSION

/MISSING LISTWISE

/STATISTICS COEFF OUTS R ANOVA

/CRITERIA=PIN(.05) POUT(.10)

/NOORIGIN

/DEPENDENT School_A_Succes

/METHOD=ENTER Gender Ed_Level_2cat

/METHOD=ENTER z_igd z_control

/METHOD=ENTER INT_IGD_Control_V2

/METHOD=ENTER INT_Gender_PC_IGD_3way.