

The influence of game genre and life satisfaction on Internet Gaming Disorder among Dutch adolescents: A three-year longitudinal study

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Abstract

Internet Gaming Disorder (IGD) is a relatively new construct which measures addiction to online games. Because there is little longitudinal research done on IGD and its predictors, this study investigated whether game genre and life satisfaction influences the development of IGD-symptoms and if so, to what extent time spent gaming mediates this relationship. This was investigated in a longitudinal sample of 385 adolescents in secondary education ($M_{age}=14.8$, $SD_{age}=.75$; 49% male), in the Netherlands. Data was collected through a digital survey in classrooms. Results show that the genre Browser/Cell phone protects adolescents against the development of IGD-symptoms (both cross-sectional and longitudinal) and it also leads to a decrease in time spent gaming (longitudinal). In addition, time spent gaming mediates the relationship between the genre Browser/Cell phone and IGD-symptoms (longitudinally). Furthermore, a lower life satisfaction leads to more IGD-symptoms (both cross-sectional and longitudinal) while it also leads to more time spent gaming (cross-sectional). Lastly, time spent gaming does not mediate the relationship between life satisfaction and IGD-symptoms (cross-sectional). These results show that more attention should be given to the predictors of IGD.

Key words: adolescents, Internet Gaming Disorder, game genre, life satisfaction, time spent gaming.

Samenvatting

Internet Gaming Disorder (IGD) is een relatief nieuw concept dat verslaving aan online games meet. Helaas is er weinig longitudinaal onderzoek naar de voorspellers van IGD. Om deze reden is de volgende vraag behandeld: ‘In welke mate beïnvloedt speltype en tevredenheid met het leven de ontwikkeling van IGD symptomen en speelt tijd gependend aan games hier een mediërende rol in?’. Dit is onderzocht aan de hand van een longitudinale steekproef van 385 adolescenten op middelbare scholen in Nederland ($M_{leeftijd}=14.8$, $SD_{leeftijd}=.75$; 49% jongen). De data zijn verzameld door middel van een online vragenlijst. Resultaten laten zien dat het speltype Browser/Cell phone een beschermende invloed heeft op het ontwikkelen van IGD symptomen (zowel cross-sectioneel als longitudinaal), en op speeltijd (longitudinaal). Bovendien medieert speeltijd de relatie tussen speltype en IGD symptomen (longitudinaal). Daarnaast leidt een lage tevredenheid met leven tot meer IGD symptomen (zowel cross-sectioneel als

longitudinaal) en tot meer speeltijd (cross-sectioneel). Tenslotte medieert speeltijd niet de relatie tussen tevredenheid met het leven en de ontwikkeling van IGD symptomen (cross-sectioneel). Deze resultaten laten zien dat er meer aandacht besteed moet worden aan de voorspellers van IGD.

Sleutelwoorden: adolescenten, type game, Internet Gaming Disorder, tevredenheid met het leven, speeltijd.

Introduction

About 97% of all adolescents in the United States play online games at least one hour per day (Granic, Lobel & Engels, 2014). Considerable attention has been given to this online gaming behaviour in scientific studies, because researchers have shown that online gaming may, for example, negatively influence academic achievements (Brunborg, Mentzoni & Frøyland, 2014) or increase social anxiety (Lo, Wang & Fang, 2005; Gentile et al., 2011), loneliness (Lemmens, Valkenburg & Peter, 2011), and depression (Gentile et al., 2011).

One of the most troubling consequences of online gaming is Internet Gaming Disorder (IGD). Around 1% to 10% of adolescents is regarded to be addicted to online games (Petry, Rehbein, Gentile, Lemmens, Rumpf, Mößle & Auriacombe, 2014). However, it has been difficult to examine the prevalence of adolescents addicted to online games because, until recently, there was no standard definition of IGD (Griffiths & Meredith, 2009). Since 2013, the DSM-V has coined the term Internet Gaming Disorder to describe pathological use of specific Internet games and non-computerized games (Lemmens et al., 2015), such as games played on consoles. According to the DSM-V, adolescents are diagnosed with IGD if they experience at least five of the following nine criteria: preoccupation, tolerance, withdrawal, persistence, escape, problems, deception, displacement, and conflict (Petry et al., 2014).

Despite the history of conceptual difficulties, several researchers have addressed factors that influence the onset of IGD. The aim of this study is to add to the body of knowledge regarding predictors of IGD among adolescents. Because adolescents are considered to be more vulnerable to develop IGD (Griffiths & Wood, 2000; Mentzoni et al., 2011; Rehbein, Mößle, Arnaud & Rumpf, 2013) and spend more time gaming than any other age group (Holtz & Appel, 2011), the focus of this study will be on adolescents in the age of 12 to 16 years old.

An important game factor and an important person factor will be investigated in relation to IGD, respectively game genre and life satisfaction. The relationship between these two variables and IGD lack strong, longitudinal evidence. Therefore, we will look into the role of these variables on the development of IGD over time. We will also investigate the role of time spent gaming in the relationship between the two factors and IGD. Hypotheses about these factors will be discussed in the paragraphs below.

The role of game genres

The prevalence of online games - and attention to IGD - has increased over the last few decades. Online games can be easily accessed through computers, laptops, tablets and even mobile phones and adolescents do so in increasingly larger numbers (Marketingfacts, 2015).

A key factor that can influence the development of IGD - and one which is often overlooked - is the specific attractions and benefits offered by game genres (King, Delfabbro & Griffiths, 2010). For example, online games such as massive multiplayer online role-playing games (MMORPGs) offer the opportunity to meet new friends and to belong to a certain group (King et al., 2010). This is especially relevant, because human beings are social creatures who have an intrinsic need to belong (Baumeister & Leary, 1995). Therefore, it can be said that game genres are built in such a way that people's psychological needs can be fulfilled by playing these games (Wu, Wang & Tsai, 2010). This is in line with the Uses and Gratification theory, which proposes that people use media, like online games, to satisfy their interests and their psychological needs (Ruggiero, 2000).

However, while all genres are designed to entice their players, some genres are more enticing than others due to their different structural characteristics. For example, the genre MMORPG differs enormously from plain strategic games in the way that the player can interact with other people and with the game mechanics. These differences in structural characteristics of game genres may differently affect the chance of developing IGD-symptoms. Cross-sectional research has suggested that Role-Playing Games (RPGs) (Elliot, Ream, McGinsky & Dunlap, 2012; Lee, Ko, Song, Kwon, Lee, Nam & Jung, 2007; Lemmens & Hendriks, 2016), MMORPGs (Elliot et al., 2012; Subramaniam et al., 2016), First-Person Shooter (FPS) games (Elliot et al., 2012; Lemmens & Hendriks, 2016; Müller, Janikian, Dreier, Wölfling, Beutel, Tzavara & Tsitsika, 2015), action-adventure games (Lemmens & Hendriks, 2016; Männikkö, Billieux, Nordström, Koivisto & Kääriäinen, 2016), strategy games (Männikkö et al., 2016), simulation games (Lee et al., 2007; Lee & Kim, 2017), and gambling games (Elliot et al., 2012) yield high risk of developing IGD-symptoms, regardless of the time spent gaming. This is caused by the enticing structural characteristics such as the possibility to immerse yourself in a game or a captivating storyline (Männikkö et al., 2016). In contrast, cell phone games and browser games may yield lower risk of developing IGD-symptoms, because it has structural characteristics that do not appeal to its users for longer periods of time (Techopedia, 2017), such as lower levels of

complexity in the games. However, the influence of these genres on IGD-symptoms have never been investigated in a longitudinal manner. Therefore, we hypothesize that genres like RPG (e.g. Assassins Creed), MMORPGs (e.g. World of Warcraft), FPS (e.g. Call of Duty), Strategy (e.g. League of Legends), Simulation (e.g. Sims), Gambling (e.g. Online Poker), and Action-Adventure (e.g. Mario) will generate a higher prevalence of IGD in comparison to the genre Cell phone (e.g. Clash of Clans) and Browser (e.g. Agar.io; Hypothesis 1).

Game genre can also be expected to influence time spent gaming. Cross-sectional studies found that time spent gaming was the highest among the genres RPG (Männikkö et al., 2016), MMORPG (Elliot et al., 2012; Männikkö et al., 2016; Smyth, 2007; Stetina et al., 2011), Action-Adventure (Elliot et al., 2012; Männikkö et al., 2016), FPS (Elliot et al., 2012) Gambling (Elliot et al., 2012) and Strategy (Männikkö et al., 2016). These genres and the genre Simulation may influence time spent gaming, because these games are designed to go on endlessly and entice their audience through realistic images and exciting storylines (Elliot et al., 2012; Johnson et al., 2016; King et al., 2010). This may lead to high amounts of time spent gaming. In contrast, cell phone games and browser games do not have these realistic images and exciting storylines which can hold the audience's interest for a longer period of time. Therefore, cell phone and browser games may be less interesting to play for a longer amount of time (Johnson et al., 2016) and thus will be played less often. Based on these cross-sectional results, we hypothesize that genres like RPG (e.g. Assassins Creed), MMORPGs (e.g. World of Warcraft), FPS (e.g. Call of Duty), Strategy (e.g. League of Legends), Simulation (e.g. Sims), Gambling (e.g. Online Poker), and Action-Adventure (e.g. Mario) will lead to more time spent gaming, in comparison to the genre Cell phone (e.g. Clash of Clans) and Browser (e.g. Agar.io; Hypothesis 2).

As mentioned above, certain game genres may lead to more time spent on games and may directly lead to the development of IGD-symptoms. It is also possible that game genre has an indirect influence on IGD-symptoms, namely via time spent gaming. Some genres may lead to more time spent gaming due to their structural characteristics, which in turn may lead to the development of IGD-symptoms. Therefore, we hypothesize that time spent gaming will mediate the relationship between game genres like RPG (e.g. Assassins Creed), MMORPGs (e.g. World of Warcraft), FPS (e.g. Call of Duty), Strategy (e.g. League of Legends), Simulation (e.g. Sims), Gambling (e.g.

Online Poker), and Action-Adventure (e.g. Mario) and IGD, in comparison to the genre Cell phone (e.g. Clash of Clans) and Browser (e.g. Agar.io; Hypothesis 3).

The role of life satisfaction

Life satisfaction is another factor that may influence the risk of developing IGD-symptoms. Cross-sectional studies have investigated this relationship and concluded that there is a correlation between life satisfaction and IGD (Lemmens, Valkenburg & Peter, 2009; Pawlikowski et al., 2014; Männikkö et al., 2016), because adolescents use online games to escape from their unsatisfying life (Ko, Yen, Chen, Chen & Yen, 2005; Kuss, Louws, & Wiers, 2012; Hagström & Kaldø, 2014). Playing games may therefore be a mechanism for adolescents with a lower life satisfaction to avoid or distract themselves from their real-life problems.

In contrast, a longitudinal study concluded that a lower daily life satisfaction does not lead to a higher prevalence of IGD over time (Lemmens et al., 2011). The authors did find that a lower life satisfaction was correlated to higher scores on IGD. However, in this study life satisfaction was tested in a multivariate model. Possibly, life satisfaction does have a unique influence on IGD-symptoms but the longitudinal study was not able to capture this, because of the strong intercorrelations with other psychosocial predictors in the model. Therefore, we hypothesize that a lower life satisfaction will lead to higher prevalence of IGD in comparison to a higher life satisfaction (Hypothesis 4). With this hypothesis, the unique influence of life satisfaction on IGD can be tested.

Furthermore, life satisfaction may also have an influence on time spent gaming. This can be explained by the escapism hypothesis. This concept is based on the notion of negative reinforcement (Hagström & Kaldø, 2014). Adolescents experience less negative emotions when playing online games (Hussain & Griffiths, 2009), and this removal causes an increase in the tendency to play online games. Therefore, we hypothesize that adolescents with a lower life satisfaction will spend more time gaming in comparison to adolescents with a higher life satisfaction (Hypothesis 5), because they can escape their real-life problems through gaming.

As mentioned above, life satisfaction may lead to more time spent gaming and may lead directly to a higher prevalence of IGD. It is also possible that life satisfaction may indirectly influence IGD, via time spent gaming. Adolescents may end up in a negative spiral where they spend much time on online games to escape their problems, while their problems are not solved adequately, and thus become addicted to these

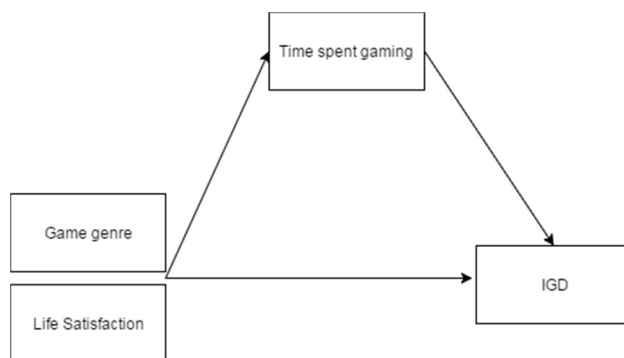
games. However, this model has never been tested in a longitudinal manner. Therefore, we hypothesize that time spent gaming will mediate the relationship between a lower life satisfaction and IGD, in comparison to a higher life satisfaction (Hypothesis 6).

Current study

As mentioned before, in this study we will investigate the predictive role of game genre and life satisfaction on Internet Gaming Disorder, including the mediating role of time spent gaming (see Figure 1). To date, this model has never been investigated in a longitudinal manner before. This has caused uncertainty about the causal influence of game genre and life satisfaction on IGD-symptoms. This study will provide much-needed insight into the role of these factors in the development of IGD-symptoms, both cross-sectional and longitudinal, and it will strengthen the small base of evidence available.

Furthermore, this study will investigate the factors game genre and life satisfaction in a longitudinal manner among adolescents between the ages of 12 to 16 years old. Despite the fact that adolescents are more vulnerable to IGD (Griffiths & Wood, 2000; Mentzoni et al., 2011; Rehbein, Mößle, Arnaud & Rumpf, 2013) and spend more time gaming than any other age group (Holtz & Appel, 2011), not many studies have looked at the role of the abovementioned factors on IGD-symptoms, particularly among young adolescents. Therefore, this study will add to the much-needed body of knowledge about IGD predictors among adolescents and the results may be used to tailor interventions more effectively.

Figure 1. Research model



Method

Respondents

The data for this study have been collected as part of the Digital Youth Project, which is a longitudinal project on the digital behaviours of Dutch adolescents. Adolescents in their first and second year of secondary education were asked to fill in a digital survey, with a one-year interval between each wave. The first measurement (T1) was held in February 2015, the second measurement (T2) in February 2016 and the third measurement (T3) in February 2017.

At T1, the sample consisted of 696 respondents between the age of 11 and 15 years old ($M_{age}=12.93$, $SD_{age}=.74$). Of these 696 respondents, 48.1% was male, 38.4% had a low educational level, 24.3% had an average educational level and 37.4% had a high educational level. At T2, 432 respondents (62.1% response) who participated at T1 also participated at T2. The sample consisted of adolescents between the age of 12 to 16 years old ($M_{age}=13.82$, $SD_{age}=.77$). Of these 432 respondents, 49.4% was male, 35.6% had a low educational level, 18.2% had an average educational level and 46.2% had a high educational level. Finally, 401 respondents (92.8% response) who participated in T1 and T2 also participated at T3. The sample consisted of adolescents between the age of 13 to 17 years old ($M_{age}=14.8$, $SD_{age}=.75$). Of these 401 respondents, 49% was male, 41.1% had a low educational level, 1.2% had an average educational level, and 57.8% had a high educational level. Dropout was mainly due to the dropout of whole classes resulting from the school's inability to schedule all the classes at both T2 and T3. There were also individual dropouts, mainly adolescents who were sick, declined further participation or who left the school.

Before analyses could be performed, we removed respondents that did not play any games the past three months in all three waves ($N= 16$). A total of 385 respondents remained in the sample on which the analyses were performed.

Procedure

Adolescents were recruited from two secondary schools in the Netherlands. Before the adolescents could participate, their parents received a letter containing information about the study including the goals of the study and what their children were supposed to do. The parents were asked for their passive informed consent before the adolescents could participate in the study. This study was approved by the Ethical Commission of University Utrecht.

At all measurements, computers in the participating schools were used to complete the digital survey. Research assistants were present to answer any questions, to ensure that the adolescents filled in their survey in private and to supervise the data

collection in general. The digital survey itself took about 30 to 40 minutes to complete.

Measures

Game genre. The variable game genre was not directly measured in the survey. Rather, the following open-ended question was asked: ‘Which games did you play the most in the past three months?’. This was done to get an exact image of all the games played by the respondents. Next, these different games were categorized in one of thirteen genres, namely: Sports, Browser/Cell phone, Shooters, Puzzle, Racing/Driving, Simulation, Rhythm, Strategy, Massive multiplayer online-role playing/Role-playing, Sandbox, Action-adventure, Wii, and Survival. This categorization was done by two independent researchers who had sufficient personal experience in the gaming world. Only the genres which had 15 or more respondents at wave 1 and 3 were included in the analyses. These genres are: Sports, Browser/Cell phone, Shooter, Simulation and Action-Adventure. These genres were converted to dummy variables where 0 stood for a specific genre and 1 stood for all the other genres. See Appendix 1 for the definitions of each genre.

Internet Gaming Disorder. The variable IGD was measured with the Internet Gaming Disorder scale (Lemmens et al., 2015), which contained nine dichotomous (yes or no) items. An example of an item is: ‘Did you feel bad these past six months because you were not able to play games?’. These items were combined into a continuous scale by calculating the sum score. Cronbach’s alpha of the scale at T1 was .73, .76 at T2, and .83 at T3.

Life satisfaction. The variable life satisfaction was measured by the Satisfaction with Life Scale (Diener, Emmons, Larsen & Griffin, 1985), which contains seven items on a 6-point Likert scale (ranging from one ‘totally agree’ to six ‘totally disagree’). An example of an item is: ‘My life is running smoothly’. These items were combined into a continuous scale by calculating the mean score. Cronbach’s alpha of the scale at T1 was .84, .79 at T2, and .81 at T3.

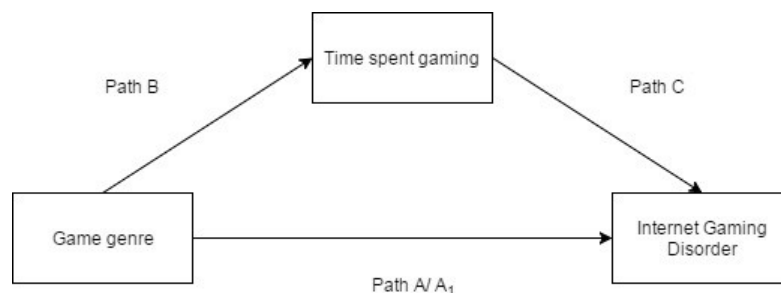
Hours spent gaming per week. The variable hours spent gaming per week was measured by two items. The first item measured the average days spent gaming per week (ranging from ‘less than a day per week’ to ‘7 days a week’) and the second item measured the average hours spent gaming per day (ranging from ‘never’ to ‘9 hours or more’). These two items were multiplied with each other, resulting in hours spent gaming per week (ranging from ‘never’ to ‘56 hours’).

Strategy of analysis

First, descriptive analyses were performed for the variables game genre, hours spent gaming per week, IGD and life satisfaction, and correlations for these variables and the control variables gender, educational level and age were investigated.

Second, the first mediation model (see Figure 2) was tested with the Baron and Kenny method (Baron & Kenny, 1986). There are four steps to be completed according to this method. First, the dependent variable should be correlated with the independent variable (Path A). Second, the independent variable should be correlated with the mediator (Path B). Third, the mediator should be correlated with the dependent variable, even after controlling for the independent variable (Path C). Fourth, the effect of Path A should decrease significantly when the entire model is tested (Path A₁). This means that Path B and Path C in Figure 2 needed to be significant. Path A, B and C were tested with a Poisson Regression analysis, because the assumption of normality was violated for IGD (zero-inflated). Path A₁ was calculated with the Sobel test (Field, 2013).

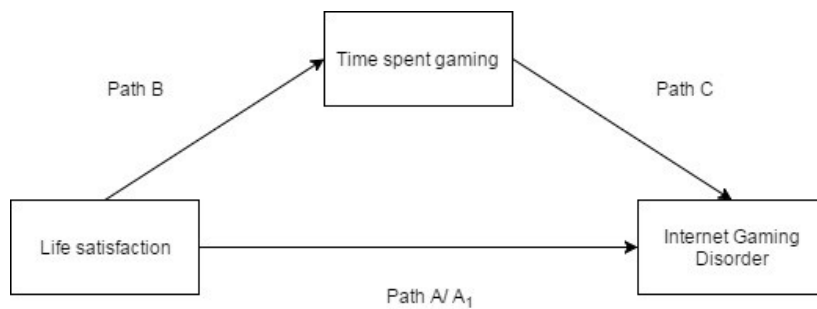
Figure 2. Mediation model with game genre



Third, the second mediation model (see Figure 3) was also tested with the Baron and Kenny method (Baron & Kenny, 1986). Path A, B and C were tested with a Poisson Regression analysis, because the assumption of normality was violated for IGD (zero-inflated). Path A₁ was calculated with the Sobel test (Field, 2013).

All the analyses were done in a cross-sectional manner (for T3) and in a longitudinal manner. The results reported below are based on the univariate relationship between each variable, meaning that the unique influence of the predictor on the outcome is reported.

Figure 3. Mediation model with life satisfaction



Results

Descriptive

The mean, standard deviation, and reach of the used variables are shown in Table 1. Overall, most respondents are relatively satisfied with their lives and they play for 7 to 8 hours per week on average, although there is much variation in time spent gaming. At T1, 14 respondents (3.9%) report 5 or more symptoms of IGD and can thus be classified as being addicted to online games. Another 109 (30.2%) respondents report 1-4 symptoms and 238 (65.9%) report no symptoms of IGD. At T3, 14 (5.2%) respondents report 5 or more symptoms. Another 56 (21%) report 1-4 symptoms and 197 (73.8%) report no symptoms of IGD. Furthermore, the most popular game genres at T1 are: Sport (N=106), Browser/Cell phone (N=102), Shooter (N=86), Action-Adventure (N=74) and Sandbox (N=44). At T3, the most popular games are: Sport (N=75), Browser/Cell phone (N=69), Action-Adventure (N=57), and Shooter (N=56).

Table 1. Descriptive relevant variables

	N	Mean	Standard deviation	Minimum	Maximum
Life satisfaction T1	376	4.80	.79	2.29	6
Life satisfaction T3	319	4.60	.81	1.86	6
IGD T1	361	.75	1.39	0	8
IGD T3	267	.71	1.58	9	9
Hours gaming per week T1	356	7.34	8.40	0	49
Hours gaming per week T2	298	7.71	9.80	0	56
Hours gaming per week T3	265	8.43	10.92	0	56

*Note: N stands for number.

Correlations

First, the cross-sectional correlations of the important variables at T3 are shown in Table 2. The genre Browser/ cell phone was negatively correlated with IGD, but the other four genres were not correlated with IGD. However, regression analyses were performed for all five genres to make sure there are no suppressor effects influencing

the results. In addition, the genres Sports and Shooter were positively correlated with hours gaming per week while the genre Browser/ Cell phone was negatively related to hours gaming per week. The genres Simulation and Action-Adventure were not related to hours spent gaming. Also, hours gaming per week was strongly correlated with IGD.

Furthermore, life satisfaction is correlated negatively with IGD, but it is not correlated with hours spent gaming. However, regression analyses were performed for life satisfaction to make sure there are no suppressor effects influencing the results.

In Table 3, the longitudinal correlations between the main variables are shown. First, none of the genres at T1 were correlated with IGD T3. However, regression analyses were performed with all five game genres to make sure there are no suppressor effects influencing the results. Second, the genre Shooter T1 had a positive correlation with hours gaming per week T2, while the genre Browser/Cell phone T1 had a negative correlation with hours gaming per week T2. The genres Sports, Simulation, and Action-Adventure did not have any influence on hours spent gaming. Lastly, hours spent gaming T2 was correlated with IGD T3.

Furthermore, life satisfaction T1 was negatively correlated with IGD T3. However, life satisfaction T1 was not correlated with hours spent gaming T2. Nevertheless, regression analyses were performed with life satisfaction as a predictor to make sure there are no suppressor effects or previous behaviour influencing the results.

Table 2. Correlation matrix variables on T3

	1	2	3	4	5	6	7	8	9	10	11
1. Gender T3	-										
2. Age T3	-.156*	-									
3. Educational level T3	.179**	-.246**	-								
4. Genre Sports T3	1.332**	.124*	-.019	-							
5. Genre Shooter T3	-.315**	.095	-.024	-.165**	-						
6. Genre Browser/Cell phone T3	.324**	-.068	.087	.186**	-.157**	-					
7. Genre Simulations T3	-.076	-.031	-.014	-.036	-.030	-.034	-				
8. Genre Action-adventure T3	-.029	-.013	.016	-.063	-.053	-.059	-.011	-			
9. Hours gaming per week T3	-.640**	-.042	-.173**	.152*	.210**	-.313**	.080	.032	-		
10. Life satisfaction T3	-.057	-.090	.115*	.037	-.032	.079	.009	.014	.026	-	
11. IGD T3	-.314**	.076	-.219**	.112	.063	-.230**	.070	.031	.463**	-.252**	-

Note: * = $p < .05$, ** = $p < .01$ (two-tailed). Pearson correlation was used for continuous variables, Spearman Rho was used for dichotomous or skewed variables.

Table 3. Longitudinal correlation matrix

	IGD T3	Hours gaming per week T2
1. Gender T1	-.262**	-
2. Age T1	.059	-
3. Educational level T1	-.134*	-
4. Life satisfaction T1	-.176**	.028
5. IGD T1	.491**	-
6. Genre Sports T1	.053	.115
7. Genre Shooter T1	.070	.233**
8. Genre Browser/ Cell phone T1	-.116	-.289**
9. Genre Simulation T1	.013	-.054
10. Genre Action-Adventure T1	-.082	-.060
11. Hours gaming per week T2	.338**	-

Note: * = $p < .05$, ** = $p < .01$ (two-tailed). Spearman Rho was used due to skewed variables.

Analyses for the mediating role of time spent gaming on the relationship between game genre and IGD-symptoms

First, the relationship between the genres and IGD were tested (see Table 4). Cross-sectional results (T3) show that the genre Browser/Cell phone negatively predicted IGD. Longitudinally, this result was also confirmed. This means that respondents who play Browser/Cell phone games have a lower chance of becoming addicted to online games.

Table 4. Effects of game genre on IGD T3, after controlling for gender, age, and educational level

Cross-sectional T3	B	P	95% CI lower	95% CI upper
<i>Step 1</i>				
Gender (male)	1.298	.000	.896	1.700
Age	-.008	.930	-.192	.176
Educational level (low)	.758	.000	.453	1.062
<i>Step 2</i>				
Sports*	-.272	.114	-.608	.065
Browser/Cell phone*	-1.252	.001	-1.992	-.513
Shooter*	.182	.302	-.163	.527
Simulation*	.528	.115	-.128	1.184
Action-Adventure*	-.007	.971	-.394	.380
Longitudinal	B	P	95% CI lower	95% CI upper
<i>Step 1</i>				
Gender (male) T1	.800	.000	.436	1.165
Age T1	.241	.014	.050	.433
Educational level (low) T1	.254	.191	-.126	.633
IGD T1	.383	.000	.319	.447
<i>Step 2</i>				
Sports T1*	-.066	.714	-.415	.284
Browser/Cell phone T1*	-.587	.036	-1.135	-.038
Shooter T1*	.301	.087	-.044	.646
Simulation T1*	.016	.971	-.815	.846
Action-Adventure T1*	-.065	.779	-.515	.386

Note: CI stands for Confidence Interval. P stands for significant (two-tailed).

* These genres were put into the model separately, but they are presented together in this table for convenience sake.

Second, the relationship between the game genres and hours spent gaming was investigated (see Table 5). Cross-sectional results (T3) show that playing the genre Sports predicted a decrease in hours spent gaming, while playing the genres Shooter and Simulation predicted an increase in hours spent gaming. The genres Browser/Cell phone and Action-Adventure did not have a significant effect on hours spent gaming. Longitudinal results show that the genre Browser/Cell phone predicted a decrease in hours spent gaming (T2), while the genre Action-Adventure

predicted an increase in hours spent gaming (T2). The genres Sports, Shooter and Simulation did not have any significant effects.

Table 5. Effects of game genre on hours spent gaming per week, after controlling for gender, age, and educational level

Cross-sectional T3	B	P	95% CI lower	95% CI upper
<i>Step 1</i>				
Gender (male)	1.250	.000	1.102	1.397
Age	-.196	.000	-.252	-.140
Educational level (low)	.429	.000	.339	.518
<i>Step 2</i>				
Sports*	-.445	.000	-.543	-.347
Browser/Cell phone*	-.043	.645	-.228	.141
Shooter*	.179	.001	.076	.283
Simulation*	.356	.005	.107	.605
Action-Adventure*	-.066	.244	-.178	.045
Longitudinal	B	P	95% CI lower	95% CI upper
<i>Step 1</i>				
Gender (male) T1	.443	.000	.326	.560
Age T1	-.023	.467	-.084	.038
Educational level (low) T1	-.279	.000	-.417	-.140
Hours spent gaming T1	.035	.000	.030	.039
<i>Step 2</i>				
Sports T1*	-.091	.091	-.198	.015
Browser/Cell phone T1*	-.275	.001	-.439	-.111
Shooter T1*	-.061	.261	-.167	1.265
Simulation T1*	.059	.620	-.174	.291
Action-Adventure T1*	.209	.001	.090	.328

*Note: CI stands for Confidence Interval. P stands for significant (two-tailed). For the longitudinal analyses, hours spent gaming on T2 was used. The genres with a * were put into the model separately, but they are presented together in this table for convenience sake.

Third, the mediating role of hours spent gaming per week on the relationship between game genre and IGD was tested (see Table 6). Cross-sectional results show that time spent gaming did not mediate the relationship between the genre Browser/Cell phone and IGD, according to the Sobel test ($t=.045$, $p=.652$). Longitudinally, results show that time spent gaming completely mediated the relationship between the genre Browser/Cell phone and IGD; although there was a direct effect of this genre on IGD-symptoms, this effect completely disappeared when running the mediation model: in this model, the genre Browser/Cell phone was no longer a significant predictor.

Table 6. Mediation model; the effects of game genre and hours spent gaming per week on IGD T3, after controlling for gender, age, and educational level

Cross-sectional T3	B	P	95% CI lower	95% CI upper
<i>Step 1</i>				
Gender (male)	1.250	.000	1.102	1.397
Age	-.196	.000	-.252	-.140
Educational level (low)	.429	.000	.339	.518
<i>Step 2</i>				
Sports	-.028	.906	-.487	.432
Browser/Cell phone	-1.150	.004	-1.933	-.367
Shooter	.041	.863	-.428	.510
Simulation	.404	.275	-.322	1.130
Action-Adventure	-.142	.576	-.642	.357
Hours gaming per week	.041	.000	.031	.052
Longitudinal	B	P	95% CI lower	95% CI upper
<i>Step 1</i>				
Gender (male) T1	.755	.000	.384	1.126
Age T1	.158	.133	-.048	.363
Educational level (low) T1	.081	.691	-.318	.480
IGD T1	.366	.000	.295	.437
<i>Step 2</i>				
Sports T1	.346	.209	-.194	.886
Browser/Cell phone T1	-.252	.489	-.965	.462
Shooter T1	.350	.192	-.176	.876
Simulation T1	.023	.960	-.865	.910
Action-Adventure T1	.192	.520	-.392	.775
Hours spent gaming T2	.025	.002	.009	.041

Note: CI stands for Confidence Interval. P stands for significant (two-tailed).

Analyses for the relationship between life satisfaction and IGD.

First, the relationship between the life satisfaction and IGD was tested (see Table 7). Cross-sectional results show that life satisfaction negatively predicted IGD. This result was also supported longitudinally. This means that respondents who have a higher life satisfaction, have a lower chance of becoming addicted to online games.

Table 7. Effects of life satisfaction on IGD T3, after controlling for gender, age, and educational level

Cross-sectional T3	B	P	95% CI lower	95% CI upper
<i>Step 1</i>				
Gender (male)	.652	.004	.213	1.090
Age	.192	.046	.003	.381
Educational level (low)	.406	.012	.090	.722
<i>Step 2</i>				
Life satisfaction	-.537	.000	-.686	-.387
Longitudinal	B	P	95% CI lower	95% CI upper
<i>Step 1</i>				
Gender (male) T1	.811	.000	.437	1.186
Age T1	.137	.205	-.074	.348
Educational level (low) T1	.143	.495	-.268	.555
IGD T1	.392	.000	.305	.478
<i>Step 2</i>				
Life satisfaction T1	-.201	.034	-.386	-.015

Note: CI stands for Confidence Interval. P stands for significant (two-tailed).

Second, the relationship between life satisfaction and hours spent gaming per week was investigated (see Table 8). Cross-sectional results show that life satisfaction negatively predicted hours spent gaming per week, meaning that a lower life satisfaction is associated with more time spent gaming per week. However, these results were not found longitudinally. Therefore, the mediation model could not be performed in a longitudinal manner, because path B (see Figure 3) was not significant.

Table 8. Effects of life satisfaction on hours spent gaming, after controlling for gender, age and, educational level

Cross-sectional T3	B	P	95% CI lower	95% CI upper
<i>Step 1</i>				
Gender (male)	1.250	.000	1.102	1.397
Age	-.196	.000	-.252	-.140
Educational level (low)	.429	.000	.339	.518
<i>Step 2</i>				
Life satisfaction	-.131	.000	-.180	-.083
Longitudinal	B	P	95% CI lower	95% CI upper
<i>Step 1</i>				
Gender (male) T1	.443	.000	.326	.560
Age T1	-.023	.467	-.084	.038
Educational level (low) T1	-.279	.000	-.417	-.140
Hours spent gaming T1	.035	.000	.030	.039
<i>Step 2</i>				
Life satisfaction T1	.022	.430	-.032	.075

Note: CI stands for Confidence Interval. P stands for significant (two-tailed). For the longitudinal analyses, hours spent gaming on T2 was used.

Third, the mediating role of hours spent gaming on the cross-sectional relationship between life satisfaction and IGD was tested for T3 (see Table 9). Results show that hours spent gaming did not mediate the relationship between life satisfaction and IGD; the effect of life satisfaction seemed to grow stronger when controlling for hours spent gaming and this was supported by the Sobel test ($t=-4.36, p< .000$).

Table 9. The mediation model; the influence of life satisfaction and hours spent gaming per week on IGD T3, after controlling for gender, age, and educational level

Cross-sectional T3	B	P	95% CI lower	95% CI upper
<i>Step 1</i>				
Gender (male)	.652	.004	.213	1.090
Age	.192	.046	.003	.381
Educational level (low)	.406	.012	.090	.722
<i>Step 2</i>				
Life satisfaction	-.466	.000	-.624	-.308
Hours spent gaming	.038	.000	.028	.048

Note: CI stands for Confidence Interval. P stands for significant (two-tailed).

Discussion

This longitudinal study aimed to extend the knowledge base about predictors of Internet Gaming Disorder, by studying the impact of game genre and life satisfaction. More specifically, this study investigated whether game genre and life satisfaction have an influence on Internet Gaming Disorder symptoms (both cross-sectional as longitudinal) among 11 to 17 year olds, and if so, to what extent time spent gaming mediates those relationships.

This study shows that between 3.9% (T1) and 5.2% (T3) of the adolescents aged 11 to 17 years old are addicted to online games, while another 21% to 30.2% are at risk of becoming addicted to online games. Although the percentages of adolescents who are addicted to online games are in line with other studies (Lemmens, Valkenberg & Gentile, 2015; Petry et al., 2014), it can be regarded as worrying that almost one third of the adolescents suffer from at least one symptom of IGD.

This study also shows that the genre Browser/Cell phone can work as a protective factor against developing IGD-symptoms, both cross-sectional as longitudinal. Surprisingly, no other genres seem to have any influence on IGD-symptoms. With regards to the relationship between game genre and time spent gaming, the findings show very inconsistent results. The genres Sport, Shooter, and Simulation are related to time spent gaming (cross-sectional), whereas the genre Browser/Cell phone seems to be a protective factor, and the genre Action-Adventure seems to promote time spent gaming (longitudinal). With regards to the entire mediation model, the longitudinal relation between game genre and IGD runs completely through time spent gaming. Lastly, a lower life satisfaction seems to predict the development of IGD-symptoms (both cross-sectional and longitudinal), although there is no mediation effect via time spent gaming (cross-sectional).

The mediating role of time spent gaming on the relationship between game genre and IGD-symptoms

The first hypothesis proposed that genres like RPG (e.g. Assassins Creed), MMORPGs (e.g. World of Warcraft), First-Person Shooter (e.g. Call of Duty), Strategy (e.g. League of Legends), Simulation (e.g. Sims), Gambling (e.g. Online Poker), and Action-Adventure (e.g. Mario) will generate a higher prevalence of IGD, in comparison with Cell phone (e.g. Clash of Clans) and Browser (e.g. Agar.io). We were not able to study certain genres, like MMORPGs, in our study, because almost no one played these types of games. This may be a result of the age

range in this sample. Research has shown that genres like MMORPGs and RPGs are often played by older adolescents (Elliot et al., 2012). In the end, we were able to investigate five genres, namely: Sports, Browser/Cell phone, Shooter, Simulation and Action-Adventure. Results show that only the genre Browser/Cell phone had an influence on IGD-symptoms. In line with the hypothesis, adolescents who play the genre Browser/Cell phone had a lower chance of developing symptoms of IGD. This is most likely the case because this genre does not have the kind of appealing structural characteristics that encourages adolescents to play often or very long. This result was found both cross-sectional and longitudinal. However, no other genre had any influence on IGD-symptoms. This may in part be explained by the fact that adolescents in this study showed rapidly changing interests in the type of games that they played: at T1, the genres Sport, Browser/Cell phone, Shooter and Action-Adventure were preferred above the other genres. However, at T3, this distinction was blurred; no genres stood out in preference. The absence of a specific preference for a game genre may have influenced the results, because the amount of people playing a specific genre at T3 was lower than it was at T1. This may have influenced the power of the results.

The second hypothesis proposed that genres like RPG (e.g. Assassins Creed), MMORPGs (e.g. World of Warcraft), First-Person Shooter (e.g. Call of Duty), Strategy (e.g. League of Legends), Simulation (e.g. Sims), Gambling (e.g. Online Poker), and Action-Adventure (e.g. Mario) would lead to more time spent gaming, in comparison to Cell phone (e.g. Clash of Clans) and Browser (e.g. Agar.io). Results are very inconsistent; the genres which influence time spent gaming differ enormously from each other, both cross-sectional and longitudinal. Cross-sectional results show that adolescents who play the genre Sports may spent less time gaming, while adolescents who play the genres Shooter and Simulation may spent more time gaming. These results may be explained by the nature of the genres. Sport games are often fixed games with a limited amount of time per game. In contrast, Shooter and Simulation games often do not have a fixed end point which can cause adolescents to continue playing because they lose track of time. However, longitudinal results show that adolescents who play the genre Browser/Cell phone spent less time gaming, while adolescents who play the genre Action-Adventure spent more time gaming. Again, this can be explained by the structural characteristics of the genres. Browser/Cell phone games are less enticing due to a lack of, for example, exciting storylines, which may lead to adolescents playing these games less often. Action-Adventure games on the other hand, have

more of a storyline and they do not have a fixed end point, which may cause adolescents to play longer than intended. It is also possible that these inconsistent findings are related to the preferences of the adolescents in this sample. As mentioned earlier, there is less of a preference for a specific game genre at the T3, which may influence the different outcomes for this hypothesis.

The third hypothesis proposed that time spent gaming will mediate the relationship between game genres like RPG (e.g. Assassins Creed), MMORPGs (e.g. World of Warcraft), First-Person Shooter (e.g. Call of Duty), Strategy (e.g. League of Legends), Simulation (e.g. Sims), Gambling (e.g. Online Poker), and Action-Adventure (e.g. Mario) and IGD, in comparison to Cell phone (e.g. Clash of Clans) and Browser (e.g. Agar.io). Cross-sectional results show that time spent gaming does not mediate the relationship between the genre Browser/Cell phone and IGD-symptoms. This means that the genre Browser/Cell phone and time spent gaming has a unique influence on the development of IGD-symptoms. However, this direct effect of the genre Browser/Cell phone disappears completely when we look at the mediating role of time spent gaming longitudinally. These results show that game genre does have an important influence on the development of IGD-symptoms, but it is necessary to keep other factors such as time spent gaming into account when looking at IGD.

The mediating role of time spent gaming on life satisfaction and IGD-symptoms

The fourth hypothesis proposed that a lower life satisfaction will lead to a higher risk of developing IGD symptoms, which was confirmed in this study. This finding is in line with previous cross-sectional studies (Lemmens, Valkenburg & Peter, 2009; Pawlikowski et al., 2014; Männikkö et al., 2016), which showed that a lower life satisfaction was associated with higher risk of IGD-symptoms. The fact that this result was also found longitudinally is in contrast with the longitudinal study by Lemmens et al. (2011), who found a cross-sectional association, but not a longitudinal one. This contradiction may be explained by the models used in both studies. In the study by Lemmens et al. (2011), life satisfaction was tested in a multivariate model together with related concepts such as loneliness, self-esteem and social competence, while in this study, the unique influence of life satisfaction was tested. This study shows that life satisfaction is an important person factor to take into account when looking at the development of IGD-symptoms.

The fifth hypothesis proposed that adolescents with lower life satisfaction will spend more time gaming, in comparison to adolescents with a higher life satisfaction. In line with this hypothesis, cross-sectional results indeed show that adolescents with a lower life satisfaction will

spent more time gaming. This is in line with the escapism hypothesis (Hagström & Kaldø, 2014), which states that adolescents with a lower life satisfaction will play more online games, because they experience less negative emotions when playing online games (Hussain & Griffiths, 2009). This result, however, was not supported over time. It is possible that adolescents with a lower life satisfaction are more prone to developing symptoms of IGD over time, without necessarily spending more time on games, because they are more sensitive to developing this disorder.

The sixth hypothesis stated that time spent gaming will mediate the relationship between a lower life satisfaction and IGD, in comparison to a higher life satisfaction. Only cross-sectional analyses could be performed. These analyses show that time spent gaming does not mediate the relationship between life satisfaction and IGD-symptoms. This means that both life satisfaction and time spent gaming has a unique influence on the development of IGD-symptoms. This is in line with the vulnerability argument mentioned above; adolescents with a lower life satisfaction seem to be more sensitive for IGD-symptoms in general, without necessarily playing more games. This reaffirms the notion that life satisfaction is an important person factor that needs to be taken into account when studying IGD, because these adolescents are more at risk of becoming addicted to online games.

Limitations

This longitudinal study gives a much-needed deeper insight into the predictors of IGD, by studying the impact of game genre and life satisfaction on IGD-symptoms. To our knowledge, no longitudinal research has been done on the influence of game genres on IGD-symptoms, while cross-sectional studies have shown differences in prevalence of IGD among different genres. This is important to investigate, because with this knowledge you can tailor prevention programs more effectively. This study also strengthens the small knowledge base about the influence of life satisfaction on IGD-symptoms, which may help to target the adolescents who are more vulnerable to IGD at a particular moment in time. Moreover, this study focuses exclusively on 11 to 17 year old adolescents. It is important to focus on this group, because research has suggested that this group plays more online games (Holtz & Appel, 2011) and is more prone to IGD (Griffiths & Wood, 2000; Mentzoni et al., 2011; Rehbein, Mößle, Arnaud & Rumpf, 2013).

Although this study contributes to the body of knowledge about IGD predictors, it has several limitations that need to be discussed. First, the longitudinal sample size is rather small, namely 385 respondents, which resulted in a low number of adolescents who reported symptoms

of IGD. However, the percentage of adolescents who suffered from IGD was within the range reported by previous studies. Therefore, we recommend that future research should investigate the role of game genre, time spent gaming and life satisfaction on IGD-symptoms in a larger and international sample to see if the results of this study can be replicated in a more diverse sample. We also recommend to conduct research to see if these results hold true for the late adolescents and adults, because IGD is also present in adults, albeit to a lesser extent (Mentzoni et al., 2011). Second, self-report was used to measure the different constructs, which may result in inaccurate measurement. However, almost all investigations into the role of game genre, time spent gaming, life satisfaction and IGD are measured by self-reports. Still, we recommend the use of experiments to strengthen the validity of the results that were found (see for an example of an experiment on IGD the article of Smyth, 2007). Third, the process of matching games with a specific genre was done by the main researcher. Although a second researcher and gamer checked the process, the assigned genres may differ from the choices other researchers would make. This is an important point, because there is a lot of discussion and disagreement about which game corroborate to which genre. However, the game genres were based on available literature. We recommend that future research should focus on a unified definition of the available game genres in corroboration with gamers and game experts, to increase the comparability between studies.

Conclusion and implications

As expected, the genre Browser/Cell phone has a protective influence on IGD-symptoms, although none of the other genres had an influence on IGD-symptoms. It is important to investigate solely the role of game genres on IGD-symptoms, because it enables practitioners to tailor their prevention programmes more specifically and it may take away some of the concerns of parents about the seemingly addictive (but incorrect) nature of the game genre Browser/Cell phone.

In addition, life satisfaction seems to be a very important person factor to take into account when investigating predictors of IGD. It seems that vulnerable adolescents are more prone to IGD than normal adolescents and it is important to take this into account in this increasingly digitalised world.

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Appendix 1. Definitions game genres

1. Sport
2. Browser/ Cell phone
3. Shooter
4. Simulation
5. Action-adventure
999. Missing

1. Sport: This genre encompasses all games in which you have the control of or are manager for a real of fictional sport (Elliot, Ream, McGinsky & Dunlap, 2012; Mobygames, 2017) (e.g. FIFA).
2. Browser/ Cell phone: This genre contains all games that are played on the cell phone, e.g. Candy Crush and/or games that are played on the internet through a browser. These games can be played in single-player or multi-player worlds (Techopedia, 2017).
3. Shooter: This genre is three-dimensional and is mostly played from the viewpoint of the character (Schneider, 2004). Games in this genre can be played in single-player or multi-player worlds. The goal is to fight against enemies, usually with weapons (Elliot, Ream, McGinsky & Dunlap, 2012; Techopedia, 2017). An example is Call of Duty.
4. Simulation: This genre entails all games that are based on realistic situations in real-life e.g. Sims (Mobygames, 2017).
5. Action-adventure: This genre is a mixture between action and adventure genres (Rollins & Morris, 2000). The genre contains elements of the action genre (precision, movement, quick decision-making, reflexes and timing) but they also contain a story line and dialogues (Rollings & Adams, 2006). An example of this genre is Grand Theft Auto.
999. This category contains all the cases where people did not fill in anything.

Literature list

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Appendix 2: Overview articles, search systems, and search words used

H1: To what extent does game genre influence Internet Gaming Disorder?

#	Author & year	Participants and settings	Country	Sample Size	Design of Study	Measures	Main Findings	Theoretical explanation	Limitations
1	Elliot, Golub, Ream & Dunlap, 2012	Online survey, age ranging between 18 to 60 years old	United States of America	3380 (59% male)	Cross-sectional	-15 game genres -Problem use of video games	-Game type influences problematic videogame play (FPS, action-adventure, MMORPGs, Gambling)	-Game design -Operant conditioning -Stimulation dopamine neurotransmission	-Cross-sectional
	Lemmens & Hendriks, 2016	Online survey, age ranging between 13-40 years old	The Netherlands	2442 (67% female)	Cross-sectional	-Internet gaming disorder (both polytomous and dichotomous) -Game genre (action-adventure, sports, FPS, strategy, simulation, puzzle, racing, and fighting)	-RPG, Shooter, action and simulation predicted IGD (on both scales)	-Structural game characteristics -Socialising component	/
	Lee & Kim, 2017	Survey	South Korea	1566 (51% male)	Cross-sectional	-Problematic game use scale -Genres RG, simulation, shooting game, action, serious, causal, and sports/racing	-Game genre RPG, simulation and causal games predicted game addiction	-Social interaction	-Cross-sectional design -Correlational nature -Did not take into account genre MOBA -Generalization issues

King, Delfabbro & Griffiths, 2010	Online survey, age ranging between 14 to 57 years old	Australia	421 (87.2% male)	Cross-sectional	-Problematic video game playing test -Video game structural characteristics survey	-Structural characteristics influence problematic video game play	-Structural game characteristics	-Self-report -Self-selected players -Use of the measure -problematic video game playing test -Uncertain clinical status -game addiction
Subramaniam et al., 2016	Survey, mean age of 23.6 (SD=5)	Singapore	972 (36.8% female)	Cross-sectional	-Game genre (MMORPGs, real-time strategy, FPS, other) -9-item IGD scale	-Playing MMORPGs was a significant predictor of IGD	-Bio-psychosocial processes -Internet penetration and social acceptance -Escapism -Structural game characteristics -Social, multiplayer nature of the game (possibly combined with peer pressure)	-Self-selected sample -Use of self-report
Lee, Ko, Song, Kwon, Lee, Nam & Jung, 2007	Classroom survey, average age is 15.9	South-Korea	627 (77% male)	Cross-sectional	-The Korean internet addiction test	-RPGs are most addictive	-Game characteristics	-Cross-sectional
Thomas & Martin, 2010	Survey, age ranging between 12 to 54 years old	Tasmania (Australia)	2035 (no gender ratio)	Cross-sectional	-Addiction (DSM-4)	-5% addicted to computer games -4.2% addicted to video-arcade games -4.6% addicted to the internet	Not presented in the article	-Cross-sectional -Need for assessment non-gamers too -Self-report

	Männikkö, Billieux, Nordström, Koivisto & Kääriäinen, 2016	Online survey, age ranging between 13-24 years old (M=18.7)	Finland	271	Cross-sectional	-Seven item version of the gaming addiction scale for adolescents (GAS) -17 genres divided into 4 variables	-The genres MMORPG, RPG, action-adventure, strategy, FPS, and adventure were predictive of GAS	-Socialising and reinforcing features (in a permanent world); structural characteristics -Motive to play	-Cross-sectional design -Use of self-report -Low response rate
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H2: To what extent does game genre influence time spent gaming?

#	Author & year	Participants and settings	Country	Sample Size	Design of Study	Measures	Main Findings	Theoretical explanation	Limitations
1	Smyth, 2007	Experiment, age ranging between 18-20 years (M=19.2)	/	100 (73% male)	Experiment (1-month period)	-Four types of games: arcade, console, Sole play on computer, and MMORPG -Time spent gaming	-The MMORPG group reported playing more hours than the other groups (arcade, console, solo play on computer)	No theoretical explanations	/
2	Männikkö, Billieux, Nordström, Koivisto & Kääriäinen, 2016	Online survey, age ranging between 13-24 years old (M=18.7)	Finland	271	Cross-sectional	-Seven item version of the gaming addiction scale for adolescents (GAS) -17 genres divided into 4 variables	- Highest frequency weekly and daily gaming for the genres MMORPG, RPG, action-adventure, strategy, mobile, puzzle, and action-adventure	-Coping	-Cross-sectional design -Use of self-report -Low response rate
3	Stetina, Kothgassner, Lehenbauer & Kryspin-Exner, 2011	Survey, age ranging from 11-67 years (M=23)	Germany, Austria and Switzerland	468 (87% male)	Cross-sectional	-MMORGP, RTS and OES user -time spent playing continuously	-Users playing MMORPGs had higher play time than the other two	-Socialising nature -Escapism	-Very few females -Self-selected group

H3: To what extent does time spent gaming mediate the relationship between game genre and Internet Gaming Disorder?

The support for the mediation model will be built on the articles found in the search for support for H1 and 2.

H4: To what extent does life satisfaction influence Internet Gaming Disorder?

#	Author & year	Participants and settings	Country	Sample Size	Design of Study	Measures	Main Findings	Theoretical explanation	Limitations
1	Peeters, Koning & Van den Eijnden, in press	Classroom survey, age ranged between 11 to 15 years old	The Netherlands	T1: 544 (48.9% male) T2: 354	Longitudinal	-Internet gaming disorder (IGD) -Satisfaction with life scale	-No main effect life satisfaction on IGD-symptoms -Correlation between life satisfaction and IGD	-Social vulnerability model -Coping model -Attention model	-Higher educational level was overrepresented -High dropout
2	Lemmens, Valkenburg & Peter, 2011	Paper survey, age ranged between 11 to 17 years old	The Netherlands	T1: 1024 (51% male) T2: 851 (51% male)	Longitudinal	-Pathological gaming (PG) -Satisfaction with life scale	-Correlation between life satisfaction and PG -No relationship life satisfaction and PG over time	-Channeling dissatisfaction through games	No limitations were reported
3	Lemmens, Valkenburg & Peter, 2009	Paper survey, age ranged between 12 to 28 years old	The Netherlands	Sample 1: 644 (48% male) Sample 2: 573 (49% -male)	Cross-sectional	-Game addiction scale -Satisfaction with life scale	-Life satisfaction negatively correlated with game addiction	-Escapism	-Cross-sectional design

4	Mannikko, Billieux & Kaariainen, 2015	Survey, age ranged between 13 to 24 years old	Finland	293	Cross-sectional	-Problematic gaming behavior -Satisfaction with life scale	-High level of problematic gaming behavior linked to lower levels of life satisfaction	-Coping	-Cross-sectional design -Low response rate -Self-report
5	Ko, Yen, Chen, Chen & Yen, 2005	Survey, age ranged between 13 to 15 years old	Taiwan	221 (55.9% male)	Cross-sectional	-Chinese addiction scale -Daily life satisfaction	-Lower life satisfaction leads to addiction online games	-Escapism	-Cross-sectional

H5: To what extent does life satisfaction influence time spent gaming?

#	Author & year	Participants and settings	Country	Sample Size	Design of Study	Measures	Main Findings	Theoretical explanation	Limitations
1	Kuss, Louws &	Online survey, mean age of 21	Germany, The Netherlands and Belgium	265, 189 males	Cross-sectional	-Game motivation (escapism) -Problem video game playing questionnaire	-Escapism is associated with problematic gaming	-Escaping from reality	/

H6: To what extent does time spent gaming mediate the relationship between life satisfaction and Internet Gaming Addiction?

The support for the mediation model will be built on the articles found in the search for support for H4 and 5.

Appendix 3. Syntax

* Encoding: UTF-8.

*Filtering out the people who were not present during all three waves.

```
SELECT IF (T1 = 1 AND T2 = 1 AND T3 = 1).  
EXECUTE.
```

*Removing all participants who did not play any games in the past 3 months.

USE ALL.

```
COMPUTE filter_$(AV42 = 1 OR BV42= 1 OR CV42 = 1).
```

```
VARIABLE LABELS filter_$(AV42 = 1 OR BV42= 1 OR CV42 = 1 (FILTER)).
```

```
VALUE LABELS filter_$(0 'Not Selected' 1 'Selected').
```

```
FORMATS filter_$(f1.0).
```

```
FILTER BY filter_$(.
```

```
EXECUTE.
```

```
*****  
*****
```

*Preparation before analyses.

```
*****  
*****
```

*Recode item life satisfaction T1.

```
RECODE AV38_3 (1=6) (2=5) (3=4) (4=3) (5=2) (6=1) (99=99) INTO T1_Q38_3recoded.
```

```
VARIABLE LABELS T1_Q38_3recoded 'recoded item'.
```

```
EXECUTE.
```

*Recode item life satisfaction T1.

```
RECODE AV38_4 (1=6) (2=5) (3=4) (4=3) (5=2) (6=1) (99=99) INTO T1_Q38_4recoded.
```

```
VARIABLE LABELS T1_Q38_4recoded 'recoded item'.
```

EXECUTE.

*Recode item life satisfaction T2.

RECODE BV38_3 (1=6) (2=5) (3=4) (4=3) (5=2) (6=1) (99=99) INTO T2_Q38_3recoded.

VARIABLE LABELS T2_Q38_3recoded 'recoded item'.

EXECUTE.

*Recode item life satisfaction T2.

RECODE BV38_4 (1=6) (2=5) (3=4) (4=3) (5=2) (6=1) (99=99) INTO T2_Q38_4recoded.

VARIABLE LABELS T2_Q38_4recoded 'recoded item'.

EXECUTE.

*Recode item life satisfaction T3.

RECODE CV38_3 (1=6) (2=5) (3=4) (4=3) (5=2) (6=1) (99=99) INTO T3_Q38_3recoded.

VARIABLE LABELS T3_Q38_3recoded 'recoded item'.

EXECUTE.

*Recode item life satisfaction T3.

RECODE CV38_4 (1=6) (2=5) (3=4) (4=3) (5=2) (6=1) (99=99) INTO T3_Q38_4recoded.

VARIABLE LABELS T3_Q38_4recoded 'recoded item'.

EXECUTE.

*Recode T1 items IGD from 1 and 2 to 0 and 1.

RECODE AV47_1 AV47_2 AV47_3 AV47_4 AV47_5 AV47_6 AV47_7 AV47_8 AV47_9
(1=0) (2=1) INTO AV47_1rec AV47_2rec AV47_3rec

AV47_4rec AV47_5rec AV47_6rec AV47_7rec AV47_8rec AV47_9rec.

VARIABLE LABELS AV47_1rec 'T1 hercoded' /AV47_2rec 'T1 hercoded' /AV47_3rec 'T1
Hercoded'

/AV47_4rec 'T1 Hercoded' /AV47_5rec 'T1 Hercoded' /AV47_6rec 'T1 Hercoded'
/AV47_7rec 'T1 Hercoded'

/AV47_8rec 'T1 Hercoded' /AV47_9rec 'T1 Hercoded'.

EXECUTE.

*Recode T2 items IGD from 1 and 2 to 0 and 1.

```
RECODE BV47_1 BV47_2 BV47_3 BV47_4 BV47_5 BV47_6 BV47_7 BV47_8 BV47_9  
(1=0) (2=1)
```

```
INTO BV47_1rec BV47_2rec BV47_3rec BV47_4rec BV47_5rec BV47_6rec BV47_7rec  
BV47_8rec BV47_9rec.
```

```
VARIABLE LABELS BV47_1rec 'T2 Recoded' /BV47_2rec 'T2 Recoded' /BV47_3rec 'T2  
Recoded'
```

```
/BV47_4rec 'T2 Recoded' /BV47_5rec 'T2 Recoded' /BV47_6rec 'T2 Recoded' /BV47_7rec  
'T2 Recoded' /BV47_8rec 'T2 Recoded' /BV47_9rec 'T2 Recoded'.
```

```
EXECUTE.
```

*Recode T3 items IGD from 1 and 2 to 0 and 1.

```
RECODE CV47_1 CV47_2 CV47_3 CV47_4 CV47_5 CV47_6 CV47_7 CV47_8 CV47_9  
(1=0) (2=1)
```

```
INTO CV47_1rec CV47_2rec CV47_3rec CV47_4rec CV47_5rec CV47_6rec CV47_7rec  
CV47_8rec CV47_9rec.
```

```
VARIABLE LABELS CV47_1rec 'T3 Recoded' /CV47_2rec 'T3 Recoded' /CV47_3rec 'T3  
Recoded'
```

```
/CV47_4rec 'T3 Recoded' /CV47_5rec 'T3 Recoded' /CV47_6rec 'T3 Recoded' /CV47_7rec  
'T3 Recoded' /CV47_8rec 'T3 Recoded' /CV47_9rec 'T3 Recoded'.
```

```
EXECUTE.
```

*Scale life satisfaction T1.

```
COMPUTE T1_Lifesatisfaction=(AV38_1 + AV38_2 + T1_Q38_3recoded +  
T1_Q38_4recoded + AV38_5 + AV38_6 +
```

```
AV38_7) / 7.
```

```
EXECUTE.
```

*Scale life satisfaction T2.

```
COMPUTE T2_Lifesatisfaction=(BV38_1 + BV38_2 + T2_Q38_3recoded +  
T2_Q38_4recoded + BV38_5 + BV38_6 +
```

```
BV38_7) / 7.
```

EXECUTE.

*Scale life satisfaction T3.

```
COMPUTE T3_Lifesatisfaction=(CV38_1 + CV38_2 + T3_Q38_3recoded +  
T3_Q38_4recoded + CV38_5 + CV38_6 +  
CV38_7) / 7.
```

EXECUTE.

*Sumscore IGD T1.

```
COMPUTE  
T1_IGD=SUM(AV47_1rec,AV47_2rec,AV47_3rec,AV47_4rec,AV47_5rec,AV47_6rec,AV  
47_7rec,AV47_8rec,  
AV47_9rec).
```

EXECUTE.

*Sumscore IGD T2.

```
COMPUTE  
T2_IGD=SUM(BV47_1rec,BV47_2rec,BV47_3rec,BV47_4rec,BV47_5rec,BV47_6rec,BV4  
7_7rec,BV47_8rec,  
BV47_9rec).
```

EXECUTE.

*Sumscore IGD T3.

```
COMPUTE  
T3_IGD=SUM(CV47_1rec,CV47_2rec,CV47_3rec,CV47_4rec,CV47_5rec,CV47_6rec,CV4  
7_7rec,CV47_8rec,  
CV47_9rec).
```

EXECUTE.

*Recode gaming per week due to calculations T1.

```
RECODE AV43(1=0.25) (2=1) (3=2) (4=3) (5=4) (6=5) (7=6) (8=7) INTO  
T1_Daysperweek_rec.
```

EXECUTE.

*Recode gaming per week due to calculations T2.

```
RECODE BV43(1=0.25) (2=1) (3=2) (4=3) (5=4) (6=5) (7=6) (8=7) INTO  
T2_Daysperweek_rec.
```

EXECUTE.

*Recode gaming per week due to calculations T3.

```
RECODE CV43(1=0.25) (2=1) (3=2) (4=3) (5=4) (6=5) (7=6) (8=7) INTO  
T3_Daysperweek_rec.
```

EXECUTE.

*Recode hours gaming per day due to calculations T1.

```
RECODE AV44 (1=0) (2=0.5) (3=2) (4=3) (5=4) (6=5) (7=6) (8=7) (9=8) (99=99) INTO  
T1_Hoursgamingperday_rec.
```

EXECUTE.

*Recode hours gaming per day due to calculations T2.

```
RECODE BV44 (1=0) (2=0.5) (3=2) (4=3) (5=4) (6=5) (7=6) (8=7) (9=8) (99=99) INTO  
T2_Hoursgamingperday_rec.
```

EXECUTE.

*Recode hours gaming per day due to calculations T3.

```
RECODE CV44 (1=0) (2=0.5) (3=2) (4=3) (5=4) (6=5) (7=6) (8=7) (9=8) (99=99) INTO  
T3_Hoursgamingperday_rec.
```

EXECUTE.

*Compute hours gaming per week T1.

```
COMPUTE T1_Hoursgamingperweek=T1_Daysperweek_rec * T1_Hoursgamingperday_rec.
```

EXECUTE.

*Compute hours gaming per week T2.

```
COMPUTE T2_Hoursgamingperweek=T2_Daysperweek_rec * T2_Hoursgamingperday_rec.  
EXECUTE.
```

*Compute hours gaming per week T3.

```
COMPUTE T3_Hoursgamingperweek=T3_Daysperweek_rec * T3_Hoursgamingperday_rec.  
EXECUTE.
```

*Recode educational level to low, middle and high T1.

```
RECODE AV_opleiding (1=1) (2=2) (3=2) (4=3) (5=3).  
EXECUTE.
```

*Recode educational level to low, middle and high T2.

```
RECODE BV_opleiding (1=1) (2=2) (3=2) (4=3) (5=3).  
EXECUTE.
```

*Recode educational level to low, middle and high.

```
RECODE CV_opleiding (1=1) (2=2) (3=2) (4=3) (5=3).  
EXECUTE.
```

*Recode genre Sports T1.

```
RECODE AV_Gamegenre (1=0) (2=1) (3=1) (4=1) (5=1) (6=1) (7=1) (8=1) (9=1) (10=1)  
(11=1) (12=1)
```

```
(13=1) (14=1) (999=1) INTO AV_Sports.
```

```
EXECUTE.
```

```
VALUE LABELS AV_Sports
```

```
0= Sports
```

```
1= Different.
```

```
EXECUTE.
```

*Recode genre Browser/cell phone T1.

RECODE AV_Gamegenre (1=1) (2=0) (3=1) (4=1) (5=1) (6=1) (7=1) (8=1) (9=1) (10=1)
(11=1) (12=1)

(13=1) (14=1) (999=1) INTO AV_BrowserANDCellphone.

EXECUTE.

VALUE LABELS AV_BrowserANDCellphone

0= Browser and Cell phone

1= Different.

EXECUTE.

*Recode genre Shooter T1.

RECODE AV_Gamegenre (1=1) (2=1) (3=0) (4=1) (5=1) (6=1) (7=1) (8=1) (9=1) (10=1)
(11=1) (12=1)

(13=1) (14=1) (999=1) INTO AV_Shooter.

EXECUTE.

VALUE LABELS AV_Shooter

0= Shooter

1= Different.

EXECUTE.

*Recode genre Simulation T1.

RECODE AV_Gamegenre (1=1) (2=1) (3=1) (4=1) (5=1) (6=0) (7=1) (8=1) (9=1) (10=1)
(11=1) (12=1)

(13=1) (14=1) (999=1) INTO AV_Simulation.

EXECUTE.

VALUE LABELS AV_Simulation

0= Simulation

1= Different.

EXECUTE.

*Recode genre Action-adventure T1.

RECODE AV_Gamegenre (1=1) (2=1) (3=1) (4=1) (5=1) (6=1) (7=1) (8=1) (9=1) (10=1)
(11=1) (12=0)

(13=1) (14=1) (999=1) INTO AV_ActionAdventure.

EXECUTE.

VALUE LABELS AV_ActionAdventure

0= Action-Adventure

1= Different.

EXECUTE.

*Recode genre Sports T3.

RECODE CV_Gamegenre (1=0) (2=1) (3=1) (4=1) (5=1) (6=1) (7=1) (8=1) (9=1) (10=1)
(11=1) (12=1)

(13=1) (14=1) (999=1) INTO CV_Sports.

EXECUTE.

VALUE LABELS CV_Sports

0= Sports

1= Different.

EXECUTE.

*Recode genre Browser/cell phone T3.

RECODE CV_Gamegenre (1=1) (2=0) (3=1) (4=1) (5=1) (6=1) (7=1) (8=1) (9=1) (10=1)
(11=1) (12=1)

(13=1) (14=1) (999=1) INTO CV_BrowserANDCellphone.

EXECUTE.

VALUE LABELS CV_BrowserANDCellphone

0= Browser and Cell phone

1= Different.

EXECUTE.

*Recode genre Shooter T3.

RECODE CV_Gamegenre (1=1) (2=1) (3=0) (4=1) (5=1) (6=1) (7=1) (8=1) (9=1) (10=1)
(11=1) (12=1)

(13=1) (14=1) (999=1) INTO CV_Shooter.

EXECUTE.

VALUE LABELS CV_Shooter

0= Shooter

1= Different.

EXECUTE.

*Recode genre Simulation T3.

RECODE CV_Gamegenre (1=1) (2=1) (3=1) (4=1) (5=1) (6=0) (7=1) (8=1) (9=1) (10=1)
(11=1) (12=1)

(13=1) (14=1) (999=1) INTO CV_Simulation.

EXECUTE.

VALUE LABELS CV_Simulation

0= Simulation

1= Different.

EXECUTE.

*Recode genre Action-adventure T3.

RECODE CV_Gamegenre (1=1) (2=1) (3=1) (4=1) (5=1) (6=1) (7=1) (8=1) (9=1) (10=1)
(11=1) (12=0)

(13=1) (14=1) (999=1) INTO CV_ActionAdventure.

EXECUTE.

VALUE LABELS CV_ActionAdventure

0= Action-Adventure

1= Different.

EXECUTE.

*For correlation analyses, the following genres were used.

*Recode genre Sports T1.

RECODE AV_Gamegenre (1=1) (2=0) (3=0) (4=0) (5=0) (6=0) (7=0) (8=0) (9=0) (10=0)
(11=0) (12=0)

(13=0) (14=0) (999=0) INTO AV_Sports2.

EXECUTE.

VALUE LABELS AV_Sports2

0= Different

1= Sports.

EXECUTE.

*Recode genre Browser/cell phone T1.

RECODE AV_Gamegenre (1=0) (2=1) (3=0) (4=0) (5=0) (6=0) (7=0) (8=0) (9=0) (10=0)
(11=0) (12=0)

(13=0) (14=0) (999=0) INTO AV_BrowserANDCellphone2.

EXECUTE.

VALUE LABELS AV_BrowserANDCellphone2

0= Different

1= Browser and Cell phone.

EXECUTE.

*Recode genre Shooter T1.

RECODE AV_Gamegenre (1=0) (2=0) (3=1) (4=0) (5=0) (6=0) (7=0) (8=0) (9=0) (10=0)
(11=0) (12=0)

(13=0) (14=0) (999=0) INTO AV_Shooter2.

EXECUTE.

VALUE LABELS AV_Shooter2

0= Different

1= Shooter.

EXECUTE.

*Recode genre Simulation T1.

RECODE AV_Gamegenre (1=0) (2=0) (3=0) (4=0) (5=0) (6=1) (7=0) (8=0) (9=0) (10=0)
(11=0) (12=0)

(13=0) (14=0) (999=0) (999=1) INTO AV_Simulation2.

EXECUTE.

VALUE LABELS AV_Simulation2

0= Different

1= Simulation.

EXECUTE.

*Recode genre Action-adventure T1.

RECODE AV_Gamegenre (1=0) (2=0) (3=0) (4=0) (5=1) (6=0) (7=0) (8=0) (9=0) (10=0)
(11=0) (12=0)

(13=0) (14=0) (999=0) INTO AV_ActionAdventure2.

EXECUTE.

VALUE LABELS AV_ActionAdventure2

0= Different

1= Action-Adventure.

EXECUTE.

*Recode genre Sports T3.

RECODE CV_Gamegenre (1=1) (2=0) (3=0) (4=0) (5=0) (6=0) (7=0) (8=0) (9=0) (10=0)
(11=0) (12=0)

(13=0) (14=0) (999=0) INTO CV_Sports2.

EXECUTE.

VALUE LABELS CV_Sports2

0= Different

1= Sports.

EXECUTE.

*Recode genre Browser/cell phone T3.

RECODE CV_Gamegenre (1=0) (2=1) (3=0) (4=0) (5=0) (6=0) (7=0) (8=0) (9=0) (10=0)
(11=0) (12=0)

(13=0) (14=0) (999=0) INTO CV_BrowserANDCellphone2.

EXECUTE.

VALUE LABELS CV_BrowserANDCellphone2

0= Different

1= Browser and Cell phone.

EXECUTE.

*Recode genre Shooter T3.

RECODE CV_Gamegenre (1=0) (2=0) (3=1) (4=0) (5=0) (6=0) (7=0) (8=0) (9=0) (10=0)
(11=0) (12=0)

(13=0) (14=0) (999=0) INTO CV_Shooter2.

EXECUTE.

VALUE LABELS CV_Shooter2

0= Different

1= Shooter.

EXECUTE.

*Recode genre Simulation T3.

RECODE CV_Gamegenre (1=0) (2=0) (3=0) (4=1) (5=0) (6=0) (7=0) (8=0) (9=0) (10=0)
(11=0) (12=0)

(13=0) (14=0) (999=0) (999=1) INTO CV_Simulation2.
EXECUTE.

VALUE LABELS CV_Simulation2

0= Different

1= Simulation.

EXECUTE.

*Recode genre Action-adventure T3.

RECODE CV_Gamegenre (1=0) (2=0) (3=0) (4=0) (5=1) (6=0) (7=0) (8=0) (9=0) (10=0)
(11=0) (12=0)

(13=0) (14=0) (999=0) INTO CV_ActionAdventure2.

EXECUTE.

VALUE LABELS CV_ActionAdventure2

0= Different

1= Action-Adventure.

EXECUTE.

*Preparation before analyses.

*Reliability analyses for life satisfaction T1.

RELIABILITY

/VARIABLES=AV38_1 AV38_2 T1_Q38_3recoded T1_Q38_4recoded AV38_5 AV38_6
AV38_7

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE SCALE

/SUMMARY=TOTAL MEANS.

*Reliability analyses for life satisfaction T2.

RELIABILITY

/VARIABLES=BV38_1 BV38_2 T2_Q38_3recoded T2_Q38_4recoded BV38_5 BV38_6
BV38_7

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE SCALE

/SUMMARY=TOTAL MEANS.

*Reliability analyses for life satisfaction T3.

RELIABILITY

/VARIABLES=CV38_1 CV38_2 T3_Q38_3recoded T3_Q38_4recoded CV38_5 CV38_6
CV38_7

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE SCALE

/SUMMARY=TOTAL MEANS.

*Reliability analyses for IGD T1.

RELIABILITY

/VARIABLES=AV47_1rec AV47_2rec AV47_3rec AV47_4rec AV47_5rec AV47_6rec
AV47_7rec AV47_8rec

AV47_9rec

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE SCALE

/SUMMARY=TOTAL MEANS.

*Reliability analyses for IGD T2.

RELIABILITY


```
/VARIABLES=BV47_1rec BV47_2rec BV47_3rec BV47_4rec BV47_5rec BV47_6rec  
BV47_7rec BV47_8rec
```

```
BV47_9rec
```

```
/SCALE('ALL VARIABLES') ALL
```

```
/MODEL=ALPHA
```

```
/STATISTICS=DESCRIPTIVE SCALE
```

```
/SUMMARY=TOTAL MEANS.
```

*Reliability analyses for IGD T3.

RELIABILITY

```
/VARIABLES=CV47_1rec CV47_2rec CV47_3rec CV47_4rec CV47_5rec CV47_6rec  
CV47_7rec CV47_8rec
```

```
CV47_9rec
```

```
/SCALE('ALL VARIABLES') ALL
```

```
/MODEL=ALPHA
```

```
/STATISTICS=DESCRIPTIVE SCALE
```

```
/SUMMARY=TOTAL MEANS.
```

```
*****  
*****.
```

*Preparation before analyses- CHECKING ASSUMPTIONS

```
*****  
*****.
```

*Checking for outliers life satisfaction T1.

REGRESSION

```
/MISSING LISTWISE
```

```
/STATISTICS COEFF OUTS R ANOVA
```

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

```
/NOORIGIN
```

```
/DEPENDENT AV3
```

```
/METHOD=ENTER T1_Lifesatisfaction
```

```
/SAVE MAHAL COOK LEVER.
```

*Checking for outliers life satisfaction T2.

REGRESSION

```
/MISSING LISTWISE  
/STATISTICS COEFF OUTS R ANOVA  
/CRITERIA=PIN(.05) POUT(.10)  
/NOORIGIN  
/DEPENDENT AV3  
/METHOD=ENTER T2_Lifesatisfaction  
/SAVE MAHAL COOK LEVER.
```

*Checking for outliers life satisfaction T3.

REGRESSION

```
/MISSING LISTWISE  
/STATISTICS COEFF OUTS R ANOVA  
/CRITERIA=PIN(.05) POUT(.10)  
/NOORIGIN  
/DEPENDENT AV3  
/METHOD=ENTER T3_Lifesatisfaction  
/SAVE MAHAL COOK LEVER.
```

*Checking for outliers life satisfaction T3.

REGRESSION

```
/MISSING LISTWISE  
/STATISTICS COEFF OUTS R ANOVA  
/CRITERIA=PIN(.05) POUT(.10)  
/NOORIGIN  
/DEPENDENT AV3  
/METHOD=ENTER T3_Lifesatisfaction  
/SAVE MAHAL COOK LEVER.
```

*Checking for outliers IGD T1.

REGRESSION

```
/MISSING LISTWISE  
/STATISTICS COEFF OUTS R ANOVA  
/CRITERIA=PIN(.05) POUT(.10)  
/NOORIGIN  
/DEPENDENT AV3  
/METHOD=ENTER T1_IGD  
/SAVE MAHAL COOK LEVER.
```

*Checking for outliers IGD T2.

REGRESSION

```
/MISSING LISTWISE  
/STATISTICS COEFF OUTS R ANOVA  
/CRITERIA=PIN(.05) POUT(.10)  
/NOORIGIN  
/DEPENDENT AV3  
/METHOD=ENTER T2_IGD  
/SAVE MAHAL COOK LEVER.
```

*Checking for outliers IGD T3.

REGRESSION

```
/MISSING LISTWISE  
/STATISTICS COEFF OUTS R ANOVA  
/CRITERIA=PIN(.05) POUT(.10)  
/NOORIGIN  
/DEPENDENT AV3  
/METHOD=ENTER T3_IGD  
/SAVE MAHAL COOK LEVER.
```

*Checking for normality and homoscedasticity between T1 life satisfaction and T1 IGD.

REGRESSION

```
/MISSING LISTWISE  
/STATISTICS COEFF OUTS CI(95) R ANOVA TOL ZPP  
/CRITERIA=PIN(.05) POUT(.10)  
/NOORIGIN  
/DEPENDENT T1_IGD  
/METHOD=ENTER T1_Lifesatisfaction  
/SCATTERPLOT=(*ZRESID ,*ZPRED)  
/RESIDUALS NORMPROB(ZRESID).
```

*Checking for normality and homoscedasticity between T2 life satisfaction and T2 IGD.

REGRESSION

```
/MISSING LISTWISE  
/STATISTICS COEFF OUTS CI(95) R ANOVA TOL ZPP  
/CRITERIA=PIN(.05) POUT(.10)  
/NOORIGIN  
/DEPENDENT T2_IGD  
/METHOD=ENTER T2_Lifesatisfaction  
/SCATTERPLOT=(*ZRESID ,*ZPRED)  
/RESIDUALS NORMPROB(ZRESID).
```

*Checking for normality and homoscedasticity between T3 life satisfaction and T3 IGD.

REGRESSION

```
/MISSING LISTWISE  
/STATISTICS COEFF OUTS CI(95) R ANOVA TOL ZPP  
/CRITERIA=PIN(.05) POUT(.10)  
/NOORIGIN  
/DEPENDENT T3_IGD
```

```
/METHOD=ENTER T3_Lifesatisfaction
/SCATTERPLOT=(*ZRESID ,*ZPRED)
/RESIDUALS NORMPROB(ZRESID).
```

```
*****
*****
```

```
*Analyses- DESCRIPTIVES
```

```
*****
*****
```

```
*Descriptive relevant variables.
```

```
FREQUENCIES VARIABLES=T1_Lifesatisfaction T3_Lifesatisfaction T1_IGD T3_IGD
T1_Hoursgamingperweek
```

```
    T2_Hoursgamingperweek T3_Hoursgamingperweek
```

```
/STATISTICS=STDDEV RANGE MINIMUM MAXIMUM MEAN
```

```
/ORDER=ANALYSIS.
```

```
*****
*****
```

```
*Analyses- CORRELATIONS T3
```

```
*****
*****
```

```
*Pearson correlations (continous) T3.
```

```
CORRELATIONS
```

```
/VARIABLES=T3_IGD T3_Hoursgamingperweek CV4 T3_Lifesatisfaction
```

```
/PRINT=TWOTAIL NOSIG
```

```
/MISSING=PAIRWISE.
```

```
*Spearman correlations T3.
```

```
NONPAR CORR
```

```
/VARIABLES=CV3 CV4 CV_opleiding CV_Sports2 CV_Shooter2
CV_BrowserANDCellphone2
```

CV_Simulation2 CV_ActionAdventure2 T3_Hoursgamingperweek T3_Lifesatisfaction
T3_IGD

/PRINT=SPEARMAN TWOTAIL NOSIG

/MISSING=PAIRWISE.

*Analyses- CROSS-SECTIONAL ANALYSES T3

Model 1

*Control variables gender, age, educational level and time spent gaming (T3) on IGD T3.

* Generalized Linear Models.

GENLIN T3_IGD BY CV3 CV_opleiding (ORDER=ASCENDING) WITH CV4
T3_Hoursgamingperweek

/MODEL CV3 CV_opleiding CV4 T3_Hoursgamingperweek INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Sports -> IGD, controlled for age, educational level and gender.

* Generalized Linear Models.

GENLIN T3_IGD BY CV_Sports CV3 CV_opleiding (ORDER=ASCENDING) WITH CV4

/MODEL CV_Sports CV3 CV_opleiding CV4 INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Shooter -> IGD, controlled for age, educational level and gender.

* Generalized Linear Models.

GENLIN T3_IGD BY CV3 CV_opleiding CV_Shooter (ORDER=ASCENDING) WITH
CV4

/MODEL CV3 CV_opleiding CV4 CV_Shooter INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Browser/Cell phone -> IGD, controlled for age, educational level and gender.

* Generalized Linear Models.

GENLIN T3_IGD BY CV3 CV_opleiding CV_BrowserANDCellphone
(ORDER=ASCENDING) WITH CV4

/MODEL CV3 CV_opleiding CV4 CV_BrowserANDCellphone INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Simulation -> IGD, controlled for age, educational level and gender.

* Generalized Linear Models.

GENLIN T3_IGD BY CV3 CV_opleiding CV_Simulation (ORDER=ASCENDING) WITH CV4

/MODEL CV3 CV_opleiding CV4 CV_Simulation INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Action-Adventure -> IGD, controlled for age, educational level and gender.

* Generalized Linear Models.

GENLIN T3_IGD BY CV3 CV_opleiding CV_ActionAdventure (ORDER=ASCENDING)
WITH CV4

/MODEL CV3 CV_opleiding CV4 CV_ActionAdventure INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

Genre -> hours spent gaming (T3).

*Sports -> hours spent gaming, controlled for gender, age, and educational level.

* Generalized Linear Models.

```
GENLIN T3_Hoursgamingperweek BY CV_Sports CV3 CV_opleiding  
(ORDER=ASCENDING) WITH CV4
```

```
/MODEL CV_Sports CV3 CV_opleiding CV4 INTERCEPT=YES
```

```
DISTRIBUTION=POISSON LINK=LOG
```

```
/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100  
MAXSTEPHALVING=5
```

```
PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)  
CILEVEL=95 CITYPE=WALD
```

```
LIKELIHOOD=FULL
```

```
/MISSING CLASSMISSING=EXCLUDE
```

```
/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.
```

*Browser -> hours spent gaming, controlled for gender, age, and educational level.

* Generalized Linear Models.

```
GENLIN T3_Hoursgamingperweek BY CV3 CV_opleiding CV_BrowserANDCellphone  
(ORDER=ASCENDING) WITH CV4
```

```
/MODEL CV3 CV_opleiding CV4 CV_BrowserANDCellphone INTERCEPT=YES
```

```
DISTRIBUTION=POISSON LINK=LOG
```

```
/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100  
MAXSTEPHALVING=5
```

```
PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)  
CILEVEL=95 CITYPE=WALD
```

```
LIKELIHOOD=FULL
```

```
/MISSING CLASSMISSING=EXCLUDE
```

```
/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.
```

*Shooter -> hours spent gaming, controlled for gender, age, and educational level.

* Generalized Linear Models.

```
GENLIN T3_Hoursgamingperweek BY CV3 CV_opleiding CV_Shooter  
(ORDER=ASCENDING) WITH CV4
```

```
/MODEL CV3 CV_opleiding CV4 CV_Shooter INTERCEPT=YES
```

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Simulation -> hours spent gaming, controlled for gender, age, and educational level.

* Generalized Linear Models.

GENLIN T3_Hoursgamingperweek BY CV3 CV_opleiding CV_Simulation
(ORDER=ASCENDING) WITH CV4

/MODEL CV3 CV_opleiding CV4 CV_Simulation INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Action-Adventure -> hours spent gaming, controlled for gender, age, and educational level.

* Generalized Linear Models.

GENLIN T3_Hoursgamingperweek BY CV3 CV_opleiding CV_ActionAdventure
(ORDER=ASCENDING) WITH CV4

/MODEL CV3 CV_opleiding CV4 CV_ActionAdventure INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

```

    LIKELIHOOD=FULL
/MISSING CLASSMISSING=EXCLUDE
/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Mediation model (T3).
* Generalized Linear Models.
GENLIN T3_IGD BY CV_opleiding CV3 CV_Sports CV_Shooter
CV_BrowserANDCellphone CV_Simulation
    CV_ActionAdventure (ORDER=ASCENDING) WITH CV4 T3_Hoursgamingperweek
/MODEL CV_opleiding CV3 CV_Sports CV_Shooter CV_BrowserANDCellphone
CV_Simulation
    CV_ActionAdventure CV4 T3_Hoursgamingperweek INTERCEPT=YES
DISTRIBUTION=POISSON LINK=LOG
/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5
    PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD
    LIKELIHOOD=FULL
/MISSING CLASSMISSING=EXCLUDE
/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

```

Model 2

*Life satisfaction -> IGD, controlled for age, gender and educational level.

* Generalized Linear Models.

```

GENLIN T3_IGD BY CV3 CV_opleiding (ORDER=ASCENDING) WITH
T3_Lifesatisfaction CV4
/MODEL CV3 CV_opleiding T3_Lifesatisfaction CV4 INTERCEPT=YES
DISTRIBUTION=POISSON LINK=LOG
/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

```

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Life satisfaction -> hours spent gaming (T3), controlled for age, gender and educational level.

* Generalized Linear Models.

GENLIN T3_Hoursgamingperweek BY CV3 CV_opleiding (ORDER=ASCENDING) WITH
T3_Lifesatisfaction CV4

/MODEL CV3 CV_opleiding T3_Lifesatisfaction CV4 INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Mediation model (T3) with life satisfaction, -> IGD, controlled for age, gender and educational level.

* Generalized Linear Models.

GENLIN T3_IGD BY CV3 CV_opleiding (ORDER=ASCENDING) WITH
T3_Lifesatisfaction CV4

T3_Hoursgamingperweek

/MODEL CV3 CV_opleiding T3_Lifesatisfaction CV4 T3_Hoursgamingperweek
INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Analyses- CORRELATIONS LONGITUDINAL

*Longitudinal correlations.

NONPAR CORR

/VARIABLES=AV3 AV4 AV_opleiding T1_Lifesatisfaction T1_IGD
T2_Hoursgamingperweek AV_Sports2

AV_BrowserANDCellphone2 AV_Shooter2 AV_Simulation2 AV_ActionAdventure2
T3_IGD

/PRINT=SPEARMAN TWOTAIL NOSIG

/MISSING=PAIRWISE.

*Analyses- LONGITUDINAL ANALYSES

Model 1

Control variables -> IGD (longitudinal).

*Age -> IGD.

* Generalized Linear Models.

GENLIN T3_IGD WITH T1_IGD AV4

/MODEL T1_IGD AV4 INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Educational level -> IGD.

* Generalized Linear Models.

GENLIN T3_IGD BY AV_opleiding (ORDER=ASCENDING) WITH T1_IGD

/MODEL T1_IGD AV_opleiding INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Gender -> IGD.

* Generalized Linear Models.

GENLIN T3_IGD BY AV3 (ORDER=ASCENDING) WITH T1_IGD

/MODEL AV3 T1_IGD INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*IGD -> IGD.

* Generalized Linear Models.

GENLIN T3_IGD WITH T1_IGD

/MODEL T1_IGD INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Genre -> IGD (longitudinal).

*Sports -> IGD, controlled for age, educational level and gender.

* Generalized Linear Models.

GENLIN T3_IGD BY AV3 AV_opleiding AV_Sports (ORDER=ASCENDING) WITH
T1_IGD AV4

/MODEL AV3 AV_opleiding AV_Sports T1_IGD AV4 INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Browser/Cell phone -> IGD, controlled for age, educational level and gender.

* Generalized Linear Models.

GENLIN T3_IGD BY AV3 AV_opleiding AV_BrowserANDCellphone
(ORDER=ASCENDING) WITH T1_IGD AV4

/MODEL AV3 AV_opleiding T1_IGD AV4 AV_BrowserANDCellphone
INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Shooter -> IGD, controlled for age, educational level and gender.

* Generalized Linear Models.

GENLIN T3_IGD BY AV3 AV_opleiding AV_Shooter (ORDER=ASCENDING) WITH
T1_IGD AV4

/MODEL AV3 AV_opleiding T1_IGD AV4 AV_Shooter INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Simulation -> IGD, controlled for age, educational level and gender.

* Generalized Linear Models.

GENLIN T3_IGD BY AV3 AV_opleiding AV_Simulation (ORDER=ASCENDING) WITH
T1_IGD AV4

/MODEL AV3 AV_opleiding T1_IGD AV4 AV_Simulation INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG


```
/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100  
MAXSTEPHALVING=5
```

```
PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)  
CILEVEL=95 CITYPE=WALD
```

```
LIKELIHOOD=FULL
```

```
/MISSING CLASSMISSING=EXCLUDE
```

```
/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.
```

*Action-Adventure -> IGD, controlled for age, educational level and gender.

* Generalized Linear Models.

```
GENLIN T3_IGD BY AV3 AV_opleiding AV_ActionAdventure (ORDER=ASCENDING)  
WITH T1_IGD AV4
```

```
/MODEL AV3 AV_opleiding T1_IGD AV4 AV_ActionAdventure INTERCEPT=YES
```

```
DISTRIBUTION=POISSON LINK=LOG
```

```
/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100  
MAXSTEPHALVING=5
```

```
PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)  
CILEVEL=95 CITYPE=WALD
```

```
LIKELIHOOD=FULL
```

```
/MISSING CLASSMISSING=EXCLUDE
```

```
/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.
```

*Control variables T1 on time spent gaming T2

* Generalized Linear Models.

```
GENLIN T2_Hoursgamingperweek BY AV3 AV_opleiding (ORDER=ASCENDING) WITH  
AV4 T1_Hoursgamingperweek
```

```
/MODEL AV3 AV_opleiding AV4 T1_Hoursgamingperweek INTERCEPT=YES
```

```
DISTRIBUTION=POISSON LINK=LOG
```

```
/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100  
MAXSTEPHALVING=5
```

```
PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)  
CILEVEL=95 CITYPE=WALD
```

```
LIKELIHOOD=FULL
```

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Genre -> time spent gaming (longitudinal).

*Sports -> hours spent gaming, controlled for gender, age, educational level.and time spent gaming T1.

* Generalized Linear Models.

GENLIN T2_Hoursgamingperweek BY AV3 AV_opleiding AV_Sports
(ORDER=ASCENDING) WITH

T1_Hoursgamingperweek AV4

/MODEL AV3 AV_opleiding AV_Sports T1_Hoursgamingperweek AV4
INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Browser/ Cell phone -> hours spent gaming, controlled for gender, age, educational level.and time spent gaming T1.

* Generalized Linear Models.

GENLIN T2_Hoursgamingperweek BY AV3 AV_opleiding AV_BrowserANDCellphone
(ORDER=ASCENDING) WITH

T1_Hoursgamingperweek AV4

/MODEL AV3 AV_opleiding T1_Hoursgamingperweek AV4 AV_BrowserANDCellphone
INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Shooter -> hours spent gaming, controlled for gender, age, educational level.and time spent gaming T1.

* Generalized Linear Models.

GENLIN T2_Hoursgamingperweek BY AV3 AV_opleiding AV_Shooter
(ORDER=ASCENDING) WITH

T1_Hoursgamingperweek AV4

/MODEL AV3 AV_opleiding T1_Hoursgamingperweek AV4 AV_Shooter
INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Simulation -> hours spent gaming, controlled for gender, age, educational level.and time spent gaming T1.

* Generalized Linear Models.

GENLIN T2_Hoursgamingperweek BY AV3 AV_opleiding AV_Simulation
(ORDER=ASCENDING) WITH

T1_Hoursgamingperweek AV4

/MODEL AV3 AV_opleiding T1_Hoursgamingperweek AV4 AV_Simulation
INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Action-Adventure -> hours spent gaming, controlled for gender, age, educational level and time spent gaming T1.

* Generalized Linear Models.

GENLIN T2_Hoursgamingperweek BY AV3 AV_opleiding AV_ActionAdventure
(ORDER=ASCENDING) WITH

T1_Hoursgamingperweek AV4

/MODEL AV3 AV_opleiding T1_Hoursgamingperweek AV4 AV_ActionAdventure
INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Mediation model (longitudinal) with game genre, controlled for age, gender, educational level and IGD T1.

* Generalized Linear Models.

GENLIN T3_IGD BY AV_opleiding AV3 AV_Sports AV_BrowserANDCellphone
AV_Shooter AV_Simulation

AV_ActionAdventure (ORDER=ASCENDING) WITH AV4 T1_IGD
T2_Hoursgamingperweek

/MODEL AV_opleiding AV3 AV_Sports AV_BrowserANDCellphone AV_Shooter
AV_Simulation

AV_ActionAdventure AV4 T1_IGD T2_Hoursgamingperweek INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

Model 2

*Life satisfaction (longitudinal)-> IGD, controlled for age, gender and educational level, IGD.

* Generalized Linear Models.

GENLIN T3_IGD BY AV_opleiding AV3 (ORDER=ASCENDING) WITH AV4
T1_Lifesatisfaction T1_IGD

/MODEL AV_opleiding AV3 AV4 T1_Lifesatisfaction T1_IGD INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

*Life satisfaction (longitudinal) -> time spent gaming, controlled for age, gender, educational level and time spent gaming T1

* Generalized Linear Models.

GENLIN T2_Hoursgamingperweek BY AV_opleiding AV3 (ORDER=ASCENDING) WITH
T1_Hoursgamingperweek

T1_Lifesatisfaction AV4

/MODEL AV_opleiding AV3 T1_Hoursgamingperweek T1_Lifesatisfaction AV4
INTERCEPT=YES

DISTRIBUTION=POISSON LINK=LOG

/CRITERIA METHOD=FISHER(1) SCALE=1 COVB=MODEL MAXITERATIONS=100
MAXSTEPHALVING=5

PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD)
CILEVEL=95 CITYPE=WALD

LIKELIHOOD=FULL

/MISSING CLASSMISSING=EXCLUDE

/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.