An Investigation into the Effects of Excessive Computer Gaming on Levels of Aggression

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Contents

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Abstract

The aim of this present study was to investigate the relationships between levels of aggression and flow experience, absorption, gender, stress and time spent playing games. A quantitative correlation design was used. Aggression was measured with the Buss-Perry Questionnaire, flow experience and absorption was measured with the Game Engagement Questionnaire, stress was measured with the Glazer Stress Control Lifestyle Questionnaire and time spent was measure with the Video Game Questionnaire.103 participants from online game forums participated in the survey (76 male and 27 female). The results indicated that there was a correlation between overall aggression and flow experience as well as absorption. It also found that there was a correlation between age and absorption. With gender it found that there was a correlation with aggression and presence in a game. The presence variable was an unexpected finding in the study.

1. Introduction

History of Gaming

Like everything, things change or become evolved over the years. When we look back over the last thirty years children were more interested in playing football, skipping or hop scotch and the majority of the time they spent outdoors but then technology began to take its place in the world of play, beginning with the *Magnavox Odyssey,* the first gaming console, which was released in 1972 and followed by the Atari 2600 in 1977, the *Sega Mega Drive* in 1989 with also the release of the Atari Lynx, the Atari Jaguar in 1993, then the *Nintendo range*, including the *Game boy*, which shortly followed those consoles (AtariAge, 2014). Today there are numerous of ways to play a game that is no longer involving the outdoors, through the *PlayStation 4, Xbox One, Nintendo Wi*i and of course our daily desktop or laptop computer(D'Silvia, 2014). Each year there are releases of games before Christmas and those games entail full on game engagement with the involvement of violence, such games are Battlefield which is a shooting and survival game influencing gun violence, war and fighting. Other games like this are "Call of Duty" and "Red Dead Redemption" both of which involves murder and violence With such game engagement along with such confinement and isolation one becomes to wonder whether this new era of gaming has an effect on a person's behaviour and personality and in particular their levels of aggression. Whilst a lot of the violent games that we see today are given an age restriction of fifteen years old plus there are still the chances of people of all ages from a child to a grown adult engaging in these games such as the extremely popular and best seller game of 2013 *"Grand Theft Auto V"* which sold 3,670,234 copies in the UK in 2013 (Westfield-Bell, 2014). This game involves guns, violence, theft and hookers causing concern for non-gamers who might believe that these games have an influence on one's behaviour and mentality in the real world but is this just a stereotypical moment and a presumption or does it have an influence on a person's behaviour. Whilst there are many studies on this particular area, it has been evident that there is more research to be conducted and sought.

Aims of study

In the current study, the researcher seeks to look at excessive gaming, gender, flow experience, stress and hours spent playing games with variables that are also connected to gaming such as absorption and immersion within the game and whether they are the influence for a person's level of aggression will be all in relation to levels of aggression.

Griffith et al (2007) looked at excessive computer game playing and evidence for addiction and aggression. In this study they looked at pathological and non-pathological gamers and looked at their behaviours with gaming. They gained their data through online questionnaires in which 7,069 participants were recruited to take the questionnaires. The results discovered that pathological gamers when playing a game would find relief with withdrawal symptoms and had a higher craving for the game due to the reward from the game compared to non-pathological gamers. Whilst this study discovered the addiction aspects of excessive gaming there was very little evidence indicating that excessive gaming had a connection with aggression, both with non-

pathological and pathological gamers leaving it open for further and more in depth study on aggression (Griffith, Grusser & Thalemann, 2007).

Previous Studies

The gaming world involves people of all ages from a child of four plus to a fifty plus adult. A study published by Lemmens and Valkenburg in 2011 looked at the effects of pathological gaming on aggressive behaviour. The sample population were 851 Dutch adolescents, 49% being female and 540 of the participants having only played games. Lemmens and Valkenburg state that adolescent boys tend to be more pathological gamers than adolescent girls. They conducted a two wave panel study using four schools with ages ranging from 11 to 17 years and it was a longitudinal survey study. This study had shown that there was an increase in the time spent playing games with pathological gaming and that time spent specifically playing violent games increased physical aggression but it also predicted a higher level of physical aggression amongst male pathological gamers. (Lemmens & Valkenburg, 2011). Whilst this study has been the tip of the iceberg in relation to the discovery of the connection of levels of aggression and excessive gaming it is still too narrow in terms of age group. In light of the latter study, one of the aims of the current study is to look at the effects of excessive gaming on the levels of aggression on people of all ages from adolescence to adulthood and whether being male or female has an influence on the result.

In America there has been an increasing focus on whether gaming, especially games involving violence, having an influence or factor on some recent behaviours such as school shootings. A study conducted by Craig A. Anderson and Brad J.Bushman from Iowa State University decided to look into gaming and aggression especially after school shootings occurred in Colorado, Arkansas and Kentucky. After these shootings occurred Doug Lowenstein, the president of the *Interactive Digital Software Association*, in 2000 gave the following statement in a CNN interview; *"I think the issue has been vastly overblown and overstated, often by politicians and others who don't fully understand, frankly this industry. There is absolutely no evidence, none that playing violent video games lead to aggressive behaviour."* (Anderson & bushman, 2001, 353) According to Anderson and Bushman there is truth within the industries denial but it cannot be denied that those who were involved in the school shootings were gamers that purportedly played violent games most notably the game "doom". They also provided research that reported time spent each week by participants engaged in game playing. In 1998, they reported that males, age ranged from 8-13 years, spent 7.5 hours per week and college students played 6 hours per week. It was in 1999, in a follow up study, that their findings presented a significant increase by 14.8% and thus providing a breakthrough in the link between aggression and gaming. They found that games with high amounts of violence were associated with heightened aggression, so much so that they compared it to the effects of the use of a condom with the risk of HIV infections. They also discovered through experimental tests that short term exposure to violent games can cause a temporary increase in aggression which means that games involving violence have a correlation with aggression with the real world (Anderson & Bushman, 2001). This study has shown more evidence than previous studies that there is an association with gaming and aggression, taking in the factors of behaviours and events such as school shootings but is this the

only association with gaming and aggression? Therefore, it is the aim of this current research to look at other factors besides the obvious violent outbursts among the population one of which will be *flow experience* along with its components of absorption and immersion.

Whilst studies have specifically looked at excessive gaming with aggression, addiction, pathological and non-pathological gaming, it seems that the term flow experience has only been touched upon and not looked at in depth. Whilst one may be quick to presume that the game itself is the cause of the aggression it may be remiss to leave out the importance surrounding engagement in the game itself. In this current study, it seeks to discover if ones engagement such as flow experience and absorption in the game causes adverse effects such as aggression.

One study that looked into this was done by Craig A.Lindley and Lennart Nacke (2008) on Flow and Immersion in First-Person Shooters: Measuring the player's game play experience. This study looked at different traits of game play experience where participants played three *Half-Life 2* game modifications while they were being measured by various measurements such as electrocardiography, electromyography, electroencephalography, eye tracking and galvanic skin response along with the Game Experience Questionnaire which was handed out after each session. The study found that in the levels that were combat orientated, evidence of flow experience was present which resulted in high-arousal positive affect emotions (Lindley & Nacke, 2008) With looking at this study one can wonder whether the flow experience or engagement in the game can have an effect on a person's levels of aggression depending on the strength of their flow experience within the game and for that reason, this current study seeks to see if there is a correlation with flow experience and levels of aggression along with the correlation of absorption and levels of aggression.

Whilst this current study does not wish to seek nor discuss addiction in connection to gaming, one study in particular Mehwash Mehroof and Mark D. Griffiths (2010) factored in aggression as part of a personality trait that was associated with online gaming in particular, which is a growing world with games such as *World of Warcraft*, *Final Fantasy*, *Ravenshield* and *Battlefield,* all of which contain some form of violence, shooting and murder.A fantasy world that rewards the gamers behaviour and may therefore contribute to, and indeed reinforce, ones level of aggression.   Data was collected through various questionnaires such as the *Buss-Perry Questionnaire* from 200 participants with 123 completing all questionnaires. In the results it showed that 103 out of 203 were averagely aggressive but there was a high variance within the total scores but that it was one of the five personality traits that had a significant association with addiction and online gaming (Griffiths & Mehroof, 2010).

This current study will look at gender as a factor in the results of levels of aggression. In a previous study done by Roland Pfister in 2011, on "*Gender Effects in Gaming Research: A Case for Regression Residuals*", it looked at the difference in the performance between males and females with different games . This allowed for a "powerful statistical approach to video game research whenever gaming experience is a confounding

factor" which of course is one of the aims of this current study (Pfister, 2011, 1) Interesting results surfaced with the study done by Roland Pfister, one of which was when it came to *Tetris*, gender was an important predictor due to the fact that males scored nearly twice as high as females which would open a gap to see the difference in the gaming experience such as flow experience with male and females. The results also found a significant positive correlation using point-biserial correlation analyses between gaming experience and gender. With an ANOVA done with a second data set, a further point-biserial correlation showed that men had a higher amount of "great experience" than women when it came to gaming experience (Pfister, 2011). With the study being focused on gender, it gives an indication that it is a possible factor that gender has an influence on gaming experience and in the case of this study, flow experience. This opens a gap to see whether there is a difference in levels of aggression when gaming between male and female which the study above did not choose to explore. This is a factor that this current study will seek to report if it is the case or not.

Whilst there has been research on aggression and gaming, much of it seems to have been geared towards violence, shootings and addiction. What has not been considered is whether there are more factors or reasons to the events that occurred and whether all aspects are considered. With previous research, there has been evidence of aggression with flow experience, with addiction to online gaming and aggression with engagement of the game but they have failed to report if there are exterior factors to the result of aggression such as a person's work life. Do those with high levels of stress in work find themselves lost in a game to relieve them from their stressful lives and if interrupted, is the action of interruption the core reason for the aggressive behaviour and not the game itself? Studies in the past have looked at the differences in age but due to the increase and development of the gaming world there is an increase of participation from both sexes and could age no longer be a huge factor in it. There is a need for research to see if there are other influences such as a person's personality or their levels of stress that brings out the aggressive behaviour whilst playing a game whether it simply be FIFA 14 or Grand Theft Auto V in which both games involve a lot of engagement yet they cater for both sexes.

Like previous research, data will be sought through several questionnaires which will cater for the different variables involved from stress to game engagement and taking age and gender into consideration. It will seek participants from all walks of life and countries to get a view of the bigger picture and fill the gap of a research that has been conducted only on a small scale.

Hypotheses

In this current study, it is hypothesised that there will be a significant relationship between excessive computer gaming and overall aggression. It is also hypothesised that there will be a relationship between stress and overall aggression. It is also hypothesised that there will be a significant relationship between hours spent playing computer games and levels of aggression. It is also hypothesised that there will be a significant difference between males and females and overall aggression. It is also hypothesised that there will be a

significant relationship between gender and presence in a game. It is also hypothesised that there will be a significant relationship between violent content and gender. It is also hypothesised that there will be a significant relationship between flow experience and levels of aggression. It is also hypothesised that there will be a significant relationship between absorption in the game and levels of aggression.

Gaming has become a huge epidemic in the last few years with technology forever improving and the increase in the interest of the gaming world. With the increase in its popularity and critics, looking into the different aspects, factors and worlds of gaming and pin pointing the facts may take away any stereotypical criticisms that the gaming world faces today and it can create a better awareness for non-gamers of the reasons for its attraction, tranquillity for some and break away from reality for others. In the current study, the researcher is looking to fill some gaps in the research of gaming and aggression to find the core reasons.

2. Methodology

2:1 Participants

The target population for this study were males and females who participated in playing video games. The participants aged between 18 and 61 years. The researcher collected their data from participants who were on online gaming forums. The participants originated from the following countries: Ireland, America, Canada, Sweden, Finland, Australia, Britain and Germany. A sample of 103 participants took part in the study: 76 male (mean age, 28.45, SD=6.0) and 27 female (mean age, 29.56, SD=7.5).

2:2 Design

The current study is a quantitative correlation study. The participants are members of gaming forums. The predictor variables are hours spent playing games, stress, flow experience, absorption in the game and excessive gaming. The criterion variable is the levels of aggression. The demographic variables are male and female.

2:3 Materials

An online survey questionnaire was compiled from various questionnaires. The participants were given a link to allow them access to the questionnaire. These questionnaires are available to view in the appendices section.

Game Engagement Questionnaire

Game engagement, absorption and flow experience was measured using the Game Engagement Questionnaire (Jeanne H.Brockmyer, et al). The Game Engagement Questionnaire is a 19 self-administered questionnaire. The participants were instructed to rate their responses of game engagement on a scale of 1 to 7 with 1-2 being often, 3-5 being occasionally and 6-7 being often. Questions 1-5 were used to indicate absorption in the game, questions 6-14 were used to indicate flow experience, questions15-18 were used to indicate presence in the game and question 19 was used to indicate immersion in the game. The absorption question example is "I feel different". The flow experience question example is "Time seems to kind of standstill or stop". The presence question example is "I really get into the game" and the immersion question example is " I feel like I just can't stop playing". The Chronbach Alpha coefficient for game engagement score is .788.

Buss-Perry Questionnaire

Aggression was measured using the Buss-Perry Questionnaire (Anderson & Dill, 2000). The Buss-Perry Questionnaire is a 29 self-administered questionnaire. The participants were instructed to rate the items given in the questionnaire in terms of how characteristic they are of themselves. The participants rated their responses on a scale of 1 to 7 with 1 being extremely uncharacteristic of me and 7 being extremely characteristic of me. The Buss-Perry questions the participant's and their different feelings and reactions to different situations they may encounter such as "If somebody hits me, I hit back" and "Some of my friends think I am a hothead". Questions 1-5 and 15-21 are reverse rated which is that 7 on the scale becomes extremely uncharacteristic of me rather than extremely characteristic of me and 1 becomes extremely characteristic of me instead of extremely uncharacteristic of me and questions 10-14 and 22-29 remain the same. All subsections are summed up separately and then all sections are summed up together. Questions 1-5 give the indication that the participant is physically aggressive. Questions 10-14 give the indication that the participant is verbally aggressive. Questions 15-21 give the indication that the participant is angry. Questions 22-29 give the indication that the participant is hostile. The Chronbach Alpha coefficient for all case score is .317 indicating a reliable variance with the aggression variables.

Video Game Questionnaire

Time spent and violence was measured using the Video Game Questionnaire (Anderson & Dill, 1999). The Video Game Questionnaire consists of 3 sections with subsections within each section. The participants were asked to think of 5 video games that they have played the most time from a certain period in their lives. They were then ask to rate their most played and second most played game on a scale of 1 to 7. The questions altered in terms of what the scale asked for such as one question asked "In recent months, how often have you played this game?" with 1-2 being rarely, 3-5 being occasionally and 6-7 being often. Another question asked "How violent is the content of this game?" with scale ranging from little or no violence, violent content and extremely violent content. Violent content and violent graphic were summed up separately then they were multiplied by the total of how often. The total scores were then all totalled. The Chronbach alpha coefficient for time spent and violence score is .317.

Glazer Stress Control Lifestyle Questionnaire

Stress was measured using the Glazer Stress Control Lifestyle Questionnaire (Dr.Howard Glazer). The Glazer Stress Control Lifestyle Questionnaire of 40 paired statements such as "Never in a hurry, even when pressured versus always in a hurry" and "Easy going versus Always going at full speed". The participants were instructed to rate on a scale of 1 to 7 with 1 being strongly agree with the statement on the left hand side, 2 being moderately agree with the statement on the left hand side, 3 being slightly agree with the statement on the left hand side, 4 being neither agree nor disagree with either statements, 5 being slightly agree with the

statement on the right, 6 being moderately agree with the statement on the right and 7 being strongly agree with the statement on the right. All answers were summed up. Scores that ranged 0-59 indicated that the participant was a type B personality which is someone who is easy-going, relaxed, not easily irritated and seldom short of time. Scores that ranged 80-140 indicated that the participant was a type A personality which is someone who is aggressive, impatient, competitive and frequently feels under pressure. The Chronbach Alpha coefficient for stress score is .695.

2:4 Data Analysis

All analysis was carried out using IBM SPSS Statistic 22 programme. Pearson's Correlation was used with the computed variables to test the interactions between them. An independent t-test was conducted to compare the demographic variables with the predictor variables. Furthermore, other parametric and non parametric tests were conducted to verify results from the Pearson's correlation and Independent T-Test.

2: 5 Procedure

To participate in the study, the participants were informed that they must be over the age of 18 to participate and take the questionnaire. The participants were approached through online forums with a brief explanation of why the study was being conducted. The participants were given a link to the questionnaire on survey monkey which consisted of the four questionnaires, Buss Perry Questionnaire, Game Engagement Questionnaire, Video Game Questionnaire and Glazer lifestyle Stress Questionnaire. The online survey also consisted of demographic information such as sex, age and country. The participants were made aware that their answers were completely anonymous and private especially with no need for names. The participants were informed that it would take 8-12 minutes to complete the survey. The participants were given contacts in the case that the questions asked in the survey had a negative effect on them. The participants were then thanked for their participation.

3. Results

IBM SPSS version 22 was used to perform all statistical tests. A total of 103 participants completed the online survey. All 103 responses were analysed using Pearson's Correlation, Independent T-Test and Cronbach alpha to confirm findings with only 102 response being analysed for the violent content variable.

3:1 Descriptive statistics

A descriptive statistics test was conducted to obtain the mean and standard deviation for all variables in question. Gender had a mean of 1.26 and SD=.442 and age had a mean of 28.74 and SD=6.45. The Flow experience variable had a mean of 26.59 and SD= 9.27. The absorption variable had a mean of 15.13 and SD=5.11. The presence variable had a mean of 19.85 and SD=4.08. The Immersion variable had a mean of 3.21 and SD=1.70. The time spent playing variable had a mean of 21.82 and a SD=10.58. The violent content variable had a mean of 9.63   and SD= 3.71. The Overall Aggression variable had a mean of 106.52 and SD=13.13. The stress variable had a mean of 78.50 and SD=16.87.

Table 1. Showing descriptive statistics for Absorption, Flow, Presence, Immersion, Time, Violent, Aggression, Stress, Gender and Age.

	N	Minimum	Maximum	Mean	Std.Deviation
Total Absorption	103	5.00	34.00	15.1262	5.11376
Total Flow	103	11.00	63.00	26.5922	9.26668
Total Presence	103	10.00	28.00	19.8544	4.08586
Total Immersion	10	.00	7.00	3.2136	1.70150
Total Time	103	.00	40.00	21.8155	10.58184
Total Violent	102	.00	17.00	9.6275	3.71223
Total Aggression	103	75	157	106.52	13.125
Total Stress	103	0	123	78.50	16.871
Gender	103	1	2	1.26	.442
Age	103	19	61	28.74	6.453

3:2 Inferential Statistics

A Pearson's Correlation was conducted to investigate the relationship between each predictor and criterion variable to accept or reject the hypotheses of the current study. The first Pearson Correlation was the relationship between time and aggression (see 3:2:1). The second Pearson Correlation was the relationship between flow experience and aggression. This was tested with part one and two of the aggression and with the total score of the aggression in which two separate results appeared (see 3:2:2). The third Pearson Correlation was the relationship between absorption and aggression (see 3:2:3). The fourth Pearson Correlation between stress and aggression (see 3:2:4). The fifth Pearson Correlation was age between absorption, flow experience and overall aggression (see 3:2:5). Gender was then correlated with violent content, aggression and presence (see 3:2:6)

3:2:1

A Pearson correlation coefficient found that there was no significant relationship between Aggression (M=17.76, SD = 6.79) and Time (M = 21.82, SD = 10.58) (r (103) = -.032, p = .746). Therefore the hypothesis is rejected. This relationship can account for 00.01% of variation of scores.

3:2:2

A Pearson correlation coefficient found that there was no significant relationship between verbal aggression (M = 17.76, SD = 6.79) and flow experience (M = 26.59, SD = 9.27) (r (103) = .0161, p = .104). Therefore the hypothesis is rejected. This relationship can account for 0.0002% of variation of scores.

A Pearson correlation coefficient found that there was no significant relationship between physical aggression (M = 37.90, SD = 5.466) and flow experience (M = 26.59, SD = 9.27) (r (103) = .058, p = .560). Therefore the hypothesis is rejected. This relationship can account for 0.003% of variation of scores.

A Pearson correlation coefficient found that there was a weak significant relationship between overall aggression (M = 106.52, SD = 13.13) and flow experience (M = 26.59, SD = 9.27) (r (103) = .290, p = .003. Therefore the hypothesis can be accepted. This relationship can account for 00.84% of variation of scores.

3:2:3

A Pearson correlation coefficient found that there was a moderate significant relationship between absorption (M = 15.13, SD=5.11) and overall aggression (M = 106.52, SD = 13.13) (r (103) = .304, p =.002). Therefore the hypothesis can be accepted. This relationship can account for 00.92% of variation of scores.

3:2:4

A Pearson correlation coefficient found that there was no significant relationship between stress (M = 78.50, SD=16.87) and overall aggression (M = 106.52, SD = 13.13) (r (103) = .035, p=.726). Therefore the hypothesis can be rejected. This relationship can account for 00.01% of variation of scores.

3:2:5

A Pearson correlation coefficient found that there was a weak significant relationship between age (M = 28.74, SD=6.45) and absorption (M = 15.13 and SD=5.11) (r (103) = -.208, p = .035). Therefore the hypothesis can be accepted. This relationship can account for 00.43% of variation of scores.

A Pearson correlation coefficient found that there no significant relationship between age (M = 28.74, SD=6.45) and flow experience (M = 26.59, SD = 9.27) (r (103) = -.165 p = .095). Therefore the hypothesis can be accepted. This relationship can account for 00.27% of variation of scores.

A Pearson correlation coefficient found that there was no significant relationship between age (M = 28.74, SD=6.45) and overall aggression (M = 106.52, SD = 13.13) (r (103) = -.100, p= .313). Therefore the hypothesis can be rejected. This relationship can account for 0.01% of variation of scores.

3:2:6

A Pearson correlation coefficient found that there was a weak significant relationship between gender (M = 1.26, SD = .442) and violent content (M = 9.63, SD = 3.71) (r (103) = -.270, p = .006). Therefore the hypothesis can be accepted. This relationship can account for 00.72% of variation of scores.

A Pearson correlation coefficient found that there was no significant relationship between gender (M = 1.26, SD = .442) and overall aggression (M = 106.52, SD = 13.13) (r (103) = -.152, p = .124). Therefore the hypothesis can be rejected. This relationship can account for 00.23% of variation of scores.

A Pearson correlation coefficient found that there was a weak significant relationship between gender (M = 1.26, SD = .442) and presence (M = 19.85, SD=4.08) (r(103) = -.299, p = .002). Therefore the hypotheses can be accepted. This relationship can account for 00.89% of variation of scores.

Table 2. Correlations of aggression, absorption, gender, flow, presence and stress.

		Total Aggression	Total absorption	Gender	Total Flow	Total Presence
Total Aggression	Pearson Correlation	1	.304**	-.152	.290**	.392**
	Sig. (2-tailed)		.002	.124	.003	.000
	N	103	103	103	103	103
Total Absorption	Pearson Correlation	.304**	1	-.115	.632**	.450**
	Sig. (2-tailed)	.002		.249	.000	.000
	N	103	103	103	103	103
Gender	Pearson Correlation	-.152	-.115	1	-.029	-.299**
	Sig. (2-tailed)	.124	.249		.773	.002
	N	103	103	103	103	103
Total Flow	Pearson Correlation	.290**	.632**	-.029	1	.539**
	Sig. (2-tailed)	.003	.000	.773		.000
	N	103	103	103	103	103
Total Presence	Pearson Correlation	.392**	.450**	-.299**	.539**	1
	Sig. (2-tailed)	.000	.000	.002	.000	
	N	103	103	103	103	103

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Figure 1. Scatter Plot showing relationship between aggression and absorption
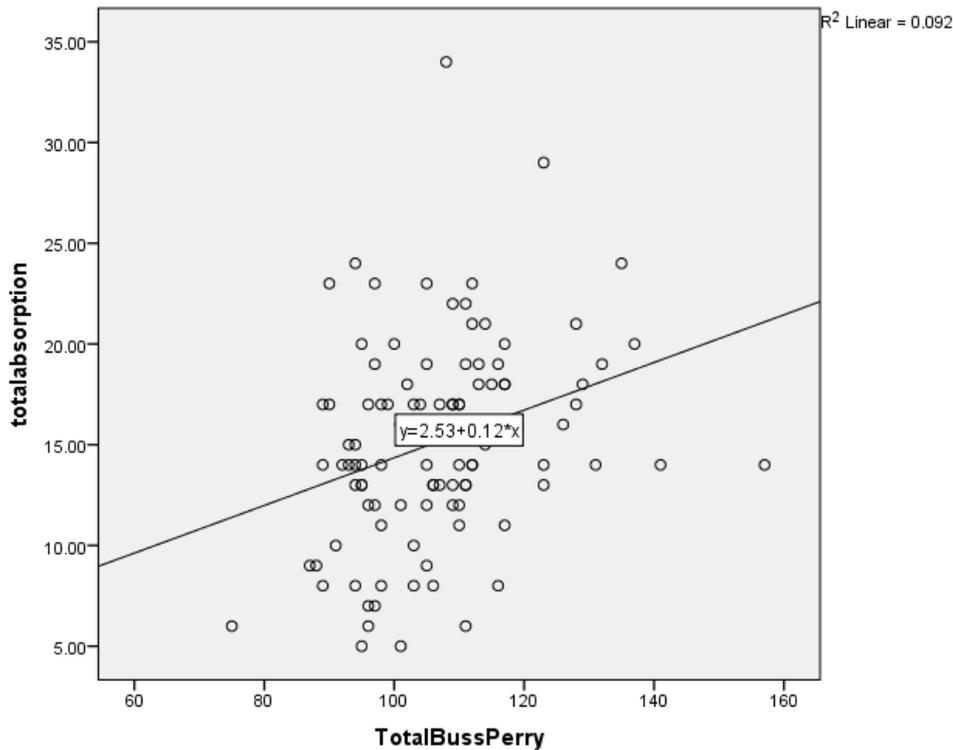
3:3 Demographic statistics

An Independent T-Test was conducted to consider differences between male and female and the factors contributing to aggression while gaming.

Females (M = 77.04, SD = 15.318) were found to have lower levels of stress than males (M = 79.03, SD = 17.456). The 95% confidence limits shows that the population mean difference of the variables lies somewhere between -5.536 and -9.514. An independent samples t-test found that there was no statistical significant difference between stress levels of females and males (t (101) = .524, p = .674). Therefore the hypothesis can be rejected

Females (M = 26.1481, SD = 10.20) were found to have higher levels of flow experience than males (M = 26.75, SD = 8.978). The 95% confidence limits shows that the population mean difference of the variables lies somewhere between -3.53526 and 4.73896. An independent samples t-test found that there was no statistical significant difference between levels of flow experience of females and males (t(101) = .289, p = .636). Therefore the hypothesis can be rejected.

Males (M = 21.92, SD = 10.66) were found to have similar levels of time spent playing games to females (M = 21.52, SD=10.56). The 95% confidence limits show that the population mean difference of the variables lies somewhere between -4.32301 and 5.12808. An independent samples t-test found that there was
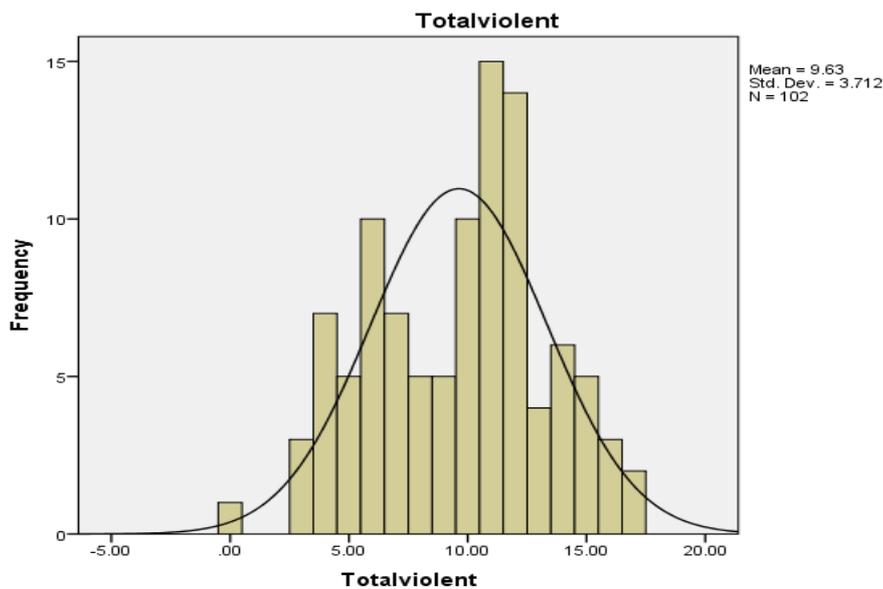
no statistical significant difference between males and females with time spent playing games (t (101) = .169, p = .529). Therefore the hypothesis can be rejected.

Females (M = 7.96, SD = 3.75) were found to have higher levels of violent content than males (M = 10.23, SD = 3.54). The 95% confidence limits show that the population mean difference of the variable lies somewhere between .66438 and 3.86303. An independent samples t-test found that there was a statistical significant difference between males and female with the levels of violent content (t (100) = 2.808, p = .006). Therefore the hypothesis can be accepted.

Figure 2. Histogram showing normal distribution with Aggression.

TotalBussPerry

Mean = 106.52
Std. Dev. = 13.125
N = 103
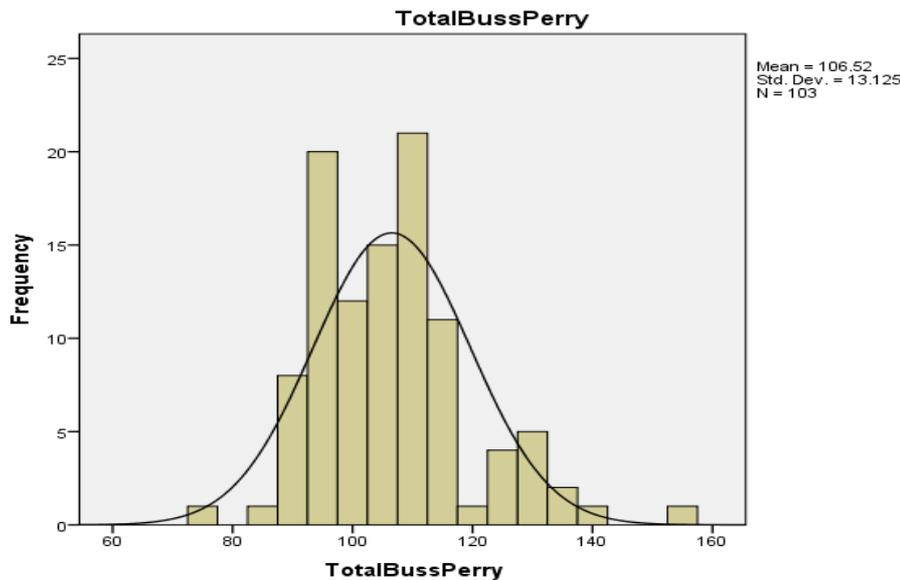
Figure 3. Histogram showing normal distrubtion with violent content.

Totalviolent

Mean = 9.63
Std. Dev. = 3.712
N = 102

4. Discussion

The aims of the current study were shown through the hypotheses in the introduction. It was hypothesised that there would be a significant relationship between excessive computer gaming and overall aggression. It was also hypothesised that there would be a relationship between stress and overall aggression. It was also hypothesised that there would be a significant relationship between hours spent playing computer games and levels of aggression. It was also hypothesised that there would be a significant difference between males and females and overall aggression. It was also hypothesised that there would be a significant relationship between gender and presence in a game. It was also hypothesised that there would be a significant relationship between violent content and gender. It was also hypothesised that there would be a significant relationship between flow experience and levels of aggression. It was also hypothesised that there would be a significant relationship between absorption in the game and levels of aggression.

The hypotheses above went through statistical testing using the Pearson correlation and independent samples t-test to support the hypotheses. The results of this study supported only some of the hypotheses in question. Building upon previous research, conducted by Craig A.Lindley and Lennart Nacke (2008) on Flow and Immersion in First-Person Shooters: Measuring the player's game play experience, the researcher conducted analyses on flow experience within the game using the Game Engagement Questionnaire which looks at not only flow experience but also absorption, immersion and presence within the game (Lindley & Nacke, 2008). Interestingly while it was predicted that flow experience would have a correlation with levels of aggression in which the result had shown this, there was a stronger correlation with absorption and levels aggression. Absorption was as said previous a variable that was part of the game engagement aspect of the study. While both represent the level of engagement within the game it can be interpreted that absorbing oneself in a game rather than being in the flow of the game can cause one to have higher levels of aggression.

The Buss-Perry Questionnaire was split in four parts for analyses. Part one was to indicate whether a person was physically aggressive. Part two was to indicate whether a person was verbally aggressive. Part three was to indicate whether a person was angry. Part four was to indicate whether a person was hostile. All four parts were analysed individually and correlated with the predictor and criterion variables as well as analysed as a whole and correlated with the predictor and criterion variables. Whilst there were no significant correlations with physical and verbal aggression and flow experience, it was evident that there was a correlation between overall aggression and flow experience. Interestingly while it was predicted that gender would have a correlation or relationship with aggression, the results of the Pearson correlation coefficient indicates that there was no significant relationship between the two variables which in turn caused for the hypotheses to be rejected.

The researcher was seeking to see if time spent playing a game would be an influencing factor on a person's level of aggression. Through analyses the results had show that there was no correlation between time spent

playing a game and levels of aggression. This result informs us that regardless of how long one spends playing a game it is not evident that it can increase or cause any level of aggression in which other factors have to be taken into account instead.

The variable violent content was analysed with gender to see if gender had a relationship with the level of violence content one would play. Whilst it was not predicted as a hypothesis, it was an interesting discovery that females had a higher correlation with violent content than males. This result would indicate an opening gap for further research.

Furthermore whilst it would be stereotypical for one to think that the male participants considering there was more male than female that participated in the survey, would have spent more time playing but the results show that both males and females had similar scores for time spent playing games with males having a mean of 21.92 and SD of 10.66 and females having a mean of 21.2 and SD of 10.56.

Whilst the researcher wanted to look at factors that would influence ones levels of aggression, the criterion variables of male and female was in particular a keen interest to the researcher and not touched upon that often in previous research. The researcher looked at stress levels and flow experience with males and females to see if there was a significant difference between the two. In terms of flow experience, females were seen to have higher levels of flow experience than males but there was no significant difference between males and females. With the levels of stress, it was seen in the results that females had less stress levels than males but again there was no significant difference between them. This interpretation of whether being female or male has an influence on ones flow experience and stress levels when it comes to gaming has not been without its limitations such as the fact that there were more males than females who participated in the survey and being unable to control their day in which they took the survey which could have had an influence on their response set about limitations to the study.

Whilst the researcher did not seek to find the following correlation, the researcher came past it in the stage of analyse. The factor of presence within a game which was discovered through the analyses of the game engagement questionnaire appeared to be an interesting find. In the results of this analyse, there was a significant relationship between gender and presence. This discovery although the significance of it was weak, with a more controlled and evenly spread group of females and males, this variable could be analysed further and may result with a stronger significance.

Whilst previous research conducted by Lemmens and Valkenburg in 2011 found that there was an increase on time spent gaming specifically violent games which in turn increased physical aggression specifically amongst male participants, in particular pathological male gamers, the current study could only partially support this (Lemmens & Valkenburg, 2011). The part of this current study that did not support the previous study above was the time spent. The results had shown in this current study that there was no significant correlation with

time spent gaming and levels of aggression. The part that supported the previous study was the violent variable. This approach is similar to the theory proposed by Lemmens and Valkenburg in that violent games can be a contributing factor but conflicting evidence in this current study suggests that is is more common in females than in males whereas the study done by Lemmens and Valkenburg suggested that it was more common in males.

Violence was a significant factor in this study and with the results of this study indicating that violent content of the game was a contributing factor to the levels of aggression, this result supports previous research done on violence and gaming such as the study conducted by Anderson and Bushman which was conducted after a number of high school shootings that had evidence that all those involved in the shooting aspect of the events were playing a game called "Doom". Their findings of violent games and their effect on the increase of one's level of aggression was so strong that the compared those to the statistics of condom use and AIDS. (Anderson & Bushman, 2001) While this study did not get a strong significance, it got a significance to support previous research and their findings.

With the acceptance and rejection of the different hypotheses, the researcher questions whether the quantity of participants and location via online forums of retrieval was enough to support the hypotheses that got rejected and would it be a different case if it was in a more controlled environment with a higher and more even amount of participants.

Throughout the study not many problems arose. There were some criticisms on the online forums of how the questions were worded and that in itself could be seen as a potential weakness to the study.

Furthermore, whilst there is that weakness, there are still some strengths of the study. One of the strengths of the study was the discovery of the significance of the variables that the researcher originally did not intend to analyse such as the presence variable with game engagement. With this discovery, it opens up a new gap for further researchers to build upon. Another strength of the study was the highlight that a lot of the judgement towards gaming and aggression that stereotypically would be geared and pointed towards males was in fact proven to not be the case as females had higher levels than males in some of the variables such as flow experience which in most cases, to most people would have never been seen as a possibility.

One clear weakness that could have an impact on the results was the fact that although there was a high amount of participants that being 103, not all sections were answered by all 103 participants some sections were only answered by 100,101 or 102 participants and whilst on the subject of participants, there was not an even distribution of participants with there being significantly more males than females that participated in the survey. For further research, the researcher would suggest that whilst trying to get a high and good quantity of participants to partake in the study, future research should allow for more control on even amounts of females

and males to allow for a more significant and even result that may accept the hypotheses that were initially rejected in this study.

The implications of this study provide a better understanding of the gaming world and whilst it may be thought that those who partake in a high amount of hours playing a game has a huge impact on a person's aggression, it does not indicate that their levels of aggression would increase or be present at that. This study promotes that games and their content are not necessarily a contributing factor to a person's aggressive behaviour that it is the experience of the game that can cause one's aggression levels to rise.

Further research in the area of presence within a game should be considered for future research with the consideration that it was not initially sought by the researcher of this study and that its discovery has opened up the opportunity to study it in a more in-depth approach with gaming and levels of aggression.

Furthermore, another variable that was not involved in this study but thought of throughout the process of analyses and results is a person's personality and personality traits. The researcher would suggest looking at these factors in future research on aggression and gaming.

For future research, the researcher would suggest a possible longitudinal experiment that could possibility entail an even amount of male and female participants along with different levels of intensity of games such as test one being FIFA a game that is all about engagement and competiveness, then test two being a fighting game such as wrestling for example UFC which has less limits on how far a person can hurt the other and test three being a shooting or war/survival game that will test patience which could possibly be a contributing factor to a person's aggression. With doing this experiment the researcher would also suggest implementing a questionnaire at the end of each test in order to get not only an observational result but a result of the participants own responses after each test. With this future research, other researchers may find stronger grounds to support the hypotheses that this study intended to support.

In conclusion, the researcher set out to support a number of hypotheses and the majority of them were successful in their analyses. A new discovery of the effects of presence in a game with levels of aggression is a topic the researcher would like to look into in the future or suggest for future research with other researchers.

References

Anderson, C.A & Bushman, B.J. (2001). Effects of Violent Video Games on Aggressive Behaviour, Aggressive Cognition, Aggressive Affect, Physiological Arousal, and Prosocial Behaviour: A Meta-Analytic Review of the Scientific Literature. American Psychological Society. Issue, 12(5)

Anderson, C.A & Dill, K. (1999) Video Game Questionnaire. Retrieved from http://www.psychology.iastate.edu/faculty/caa/Scales/VGquest.pdf

AtariAge. (2014). Atari 2600 History. Retrieved from http://atariage.com/2600/

AtariAge. (2014). Atari Jaguar History. Retrieved from http://atariage.com/Jaguar/history.html

AtariAge. (2014). Atari Lynx History. Retrieved from https://atariage.com/Lynx/history.html

Buss, A.H & Perry, M.P. (1992). The aggression questionnaire, Journal of personality and social psychology, 63, 452-459.

Brockmyer, J.H, Burkhart, K.M, Curtis, K.A, Fox, C.M, McBroom, E, & Pidruzny, J.N. (2009). The development of the Game Engagement Questionnaire: A measure of engagement in video game-playing, Journal of Experimental Social Psychology, 45, 624-634

Brookfield Chiro. (2013) Glazer Stress Control Questionnaire. Retrieved from http://www.brookfieldchiro.com/id12.html

D' Silvia, R. (2014). History of Home Video Game Consoles. Retrieved from http://www.ibuzzle.com/articles/history-home-video-game-consoles.html

Griffiths, M.D, Grusser, S.M & Thalemann, R. (2007). Excessive Computer Game Playing: Evidence for Addiction and Aggression? 10(2) 290-292, DOI: 10.1089/cpb.2006.9956.

Griffiths, M.D,. & Mehroof, M. (2010) Online Gaming Addiction: The Role of Sensation Seeking, Self-Control, Neuroticism, Aggression, State Anxiety and Trait Anxiety.13(3). Doi: 10.1089=cyber.2009.0229.

Pfister, R. (2011). Gender Effects in Gaming Research: A Case for Regression Residuals?. 14 (10), DOI: 10.1089/cyber.2010.0547.

Westfield-Bell, H. (2014). Top Selling Video Games of 2013 (UK). Retrieved from http://www.n3rdabl3.co.uk/2014/01/top-selling-video-games-2013-uk/

5.Appendices

Buss-Perry Questionnaire and score sheet

Buss-Perry Scale

Please rate each of the following items in terms of how characteristic they are of you. Use
the following scale for answering these items.

1	2	3	4	5	6	7
extremely uncharacteristic of me						extremely characteristic of me

1) Once in a while I can't control the urge to strike another person.
2) Given enough provocation, I may hit another person.
3) If somebody hits me, I hit back.
4) I get into fights a little more than the average person.
5) If I have to resort to violence to protect my rights, I will.
6) There are people who pushed me so far that we came to blows.
7) I can think of no good reason for ever hitting a person.
8) I have threatened people I know.
9) I have become so mad that I have broken things.
10) I tell my friends openly when I disagree with them.
11) I often find myself disagreeing with people.
12) When people annoy me, I may tell them what I think of them.
13) I can't help getting into arguments when people disagree with me.
14) My friends say that I'm somewhat argumentative.
15) I flare up quickly but get over it quickly.
16) When frustrated, I let my irritation show.
17) I sometimes feel like a powder keg ready to explode.
18) I am an even-tempered person.
19) Some of my friends think I'm a hothead.
20) Sometimes I fly off the handle for no good reason.
21) I have trouble controlling my temper.
22) I am sometimes eaten up with jealousy.
23) At times I feel I have gotten a raw deal out of life.
24) Other people always seem to get the breaks.
25) I wonder why sometimes I feel so bitter about things.
26) I know that "friends" talk about me behind my back.
27) I am suspicious of overly friendly strangers.
28) I sometimes feel that people are laughing at me behind me back.
29) When people are especially nice, I wonder what they want.

5:2

Game Engagement Questionnaire

Game Engagement Questionnaire (GEQ) items.

	NEVER		OCCASSIONALLY		OFTEN	
1	2	3	4	5	6	7

. 1   I lose track of time

. 2   Things seem to happen automatically

. 3   I feel different

. 4   I feel scared

. 5   The game feels real

. 6   If someone talks to me, I don't hear them

. 7   I get wound up

. 8   Time seems to kind of standstill or stop

. 9   I feel spaced out

. 10   I don't answer when someone talks to me

. 11   I can't tell that I'm getting tired

. 12   Playing seems automatic

. 13   My thoughts go fast

. 14   I lose track of where I am

. 15   I play without thinking about how to play

. 16   Playing makes me feel calm

. 17   I play longer than I meant to

. 18   I really get into the game

. 19   I feel like I just can't stop playing

5:3

Video Game Questionnaire

Video Game Questionnaire

Instructions: Pease think of the five video games that you have played for the greatest amount of time from when you were in 7th grade until the present. Include computer, console/TV, and arcade games. Please write down the titles of these games on the blank lines below. If you have never played a video game in your life, please check here and go on to the next questionnaire ___.

1) Title of your "most played" game: _____.
PLEASE PRINT CLEARLY

2) Title of your "2nd most played" game: _____.
PLEASE PRINT CLEARLY

3) Title of your "3rd most played" game: _____.
PLEASE PRINT CLEARLY

4) Title of your "4th most played" game: _____.
PLEASE PRINT CLEARLY

5) Title of your "5th most played" game: _____.
PLEASE PRINT CLEARLY

Now, please rate each game by answering the questions that follow.

1). For the following items, rate the game you listed as your "most played" game:

a) In recent months, how often have you played this game? 1234567 Rarely Occasionally Often

b) During 11th & 12th grades, how often did you play this game? 1234567 Rarely Occasionally Often

c) During 9th & 10th grades, how often did you play this game? 1234567 Rarely Occasionally Often

d) During 7th & 8th grades, how often did you play this game? 1234567 Rarely Occasionally Often

e) How violent is the content of this game? 1234567 Little or No Extremely Violent Content Violent Content

f) How bloody/gory are the graphics of this game? 1234567 Little or No Extremely Blood & Gore Bloody & Gory

d) Which of the following categories best describes this game? Check all that apply. __ Education __Sports __ Fantasy __ Fighting with hands/feet __ Fighting with Weapons __ Skill

_____

2). For the following items, rate the game you listed as your "2nd most played" game:

a) In recent months, how often have you played this game? 1234567 Rarely Occasionally Often

b) During 11th & 12th grades, how often did you play this game? 1234567 Rarely Occasionally Often

c) During 9th & 10th grades, how often did you play this game? 1234567 Rarely Occasionally Often

d) During 7th & 8th grades, how often did you play this game? 1234567 Rarely Occasionally Often

e) How violent is the content of this game? 1234567 Little or No Extremely Violent Content Violent Content

f) How bloody/gory are the graphics of this game? 1234567 Little or No Extremely Blood & Gore Bloody & Gory

d) Which of the following categories best describes this game? Check all that apply. __ Education __Sports __ Fantasy __ Fighting with hands/feet __ Fighting with Weapons __ Skill

Score by adding violent content and violent graphic questions and multiplying by the total of how often questions and average the scores.

5:4

Glazer Stress Control Lifestyle Questionnaire

1 = strongly agree with the statement on the LEFT hand side. 2 = moderately agree with the statement on the LEFT hand side. 3 = slightly agree with the statement on the LEFT hand side. 4 = neither agree nor disagree with EITHER statement.		5 = slightly agree with the statement on the RIGHT hand side. 6 = moderately agree with the statement on the RIGHT hand side. 7 = strongly agree with the statement on the RIGHT hand side.

Statement	Score	Statement
Don't mind leaving things temporarily unfinished	1 2 3 4 5 6 7	Must get things finished once started
Calm and unhurried about appointments	1 2 3 4 5 6 7	Never late for appointments
Not competitive	1 2 3 4 5 6 7	Highly competitive
Listen well, let others finish speaking first	1 2 3 4 5 6 7	Anticipate others in conversations, interrupt finishing their sentences
Never in a Hurry, even when pressured	1 2 3 4 5 6 7	Always in a Hurry
Able to wait calmly	1 2 3 4 5 6 7	Uneasy when waiting
Easy Going	1 2 3 4 5 6 7	Always going at full speed
Take one thing at a time	1 2 3 4 5 6 7	Try to do more than one thing at a time. What's next?
Slow and deliberate in speech	1 2 3 4 5 6 7	Vigorous and forceful in speech, use a lot of gestures
Concerned with satisfying yourself not others	1 2 3 4 5 6 7	Want recognition from others for a job well done
Slow doing things	1 2 3 4 5 6 7	Fast at doing things
Relaxed	1 2 3 4 5 6 7	Hard driving
Express feelings openly	1 2 3 4 5 6 7	Hold feeling in
Have a large number of interests	1 2 3 4 5 6 7	Few interests
Satisfied with life	1 2 3 4 5 6 7	Ambitious
Never set own deadlines	1 2 3 4 5 6 7	Often set own deadlines
Feel limited responsibility	1 2 3 4 5 6 7	Always feel responsible
Never judge things in terms of	1 2 3 4 5 6 7	Quantity is more important

quantity, just quality		
Casual about work	1 2 3 4 5 6 7	Take work very serious
Not very precise	1 2 3 4 5 6 7	Very precise, careful about detail

Total your scores from above: _____

Below is how to interpret the result.

Scores in the range of 0 - 29 indicates a TYPE B PERSONALITY; you are relaxed and cope well with stress - you are unlikely to develop any stress related illness.

Scores in the range of 30 - 59 indicates a TYPE B PERSONALITY; you are generally relaxed and cope adequately with stress.

Scores in the range of 60 - 79 indicates a TYPE A/B PERSONALITY; you are a mixture of both types, which is healthy. YOU CAN HOWEVER FALL INTO TYPE A BEHAVIOUR AT TIMES, YOU SHOULD BE AWARE OF WHEN OR IF THAT HAPPENS.

Scores in the range of 80 - 109 indicates a TYPE A PERSONALITY. You DO NOT cope well with stress and are prone to developing stress related illnesses such as cardiac problems. Stress management training is something you should consider, as well as a medical checkup.

Scores between 110 - 140 indicates a TYPE A PERSONALITY; If you are over 40, and smoke, you are EXTREMELY likely to develop a stress related illness. You are in the high-risk group. Please seek a medical consultation along with a stress management consultant / trainer.

PLEASE REMEMBER; These results may change/alter over time, so it is often wise to revisit and test yourself again, especially if you have had a rough time.

Personality traits related to a type A and a type B personality have been listed below. How much do these match your personality?

PERSONALITY TYPE
A typical type A personality may have some of the following characteristics:

Competitive.
Achiever.
Fast worker.
Aggressive.
Impatient.
Restless.
Hyper-alert.
Explosive Speech.
Frequently feels under pressure.

A typical type B personalities have the following characteristics (again these are examples and do not include all traits).

Relaxed.
Easy-going.
Seldom impatient.
Takes time to enjoy pursuits outside the job.
Works steadily.
Not easily irritated.
Seldom short of time.

<div align="center">
Moves and speaks more slowly.
Not preoccupied with achievement.
</div>

Then there is the mixture of the two types A/B; this is where you have some of the different characteristics from both type A and type B personality.

Type A people tend to have 'time urgency', in that they cannot be late, have to meet deadlines, have problems if they are kept waiting, they often set themselves deadlines, for example even if a task has been given with a week to finish they will have it completed much earlier. This often means they do a number of tasks at once, or have a number of tasks ongoing at the same time. They are very competitive and strive toward goals, but they do not have a sense of achievement or joy in their efforts. They can also be quite hostile and aggressive which may or may not be expressed overtly. Some believe type A are insecure and have low self esteem, highly prone to illness and stress. A number of research papers show they have a higher probability of heart problems. Type A people tend to respond to stressors far more quickly than Type B, often resulting in seeing events as a threat to their control. Some researchers have suggested that because of this they are more likely to experience more stress and have more accidents. In today's western society Type A people are considered excellent employees because they work hard and meet deadlines, which translates to being highly productive, all excellent qualities for the commercial culture we live in, but not so good for general life.

Type B persons are less driven and place fewer pressures on themselves. They have lower levels of competitiveness, time urgency, and hostility; they tend to be easy going. They can be just as ambitious as Type A's and are often more successful because they are less likely to be ill. They are also clever in the respect in getting Type A people to work for them so the work is being done in a productive manner, eg they are very good at delegating work, something that Type A people MAY find more difficult as they then loose control. Type B's can relax and work without feeling guilty when they are not working. They enjoy a challenge of meeting and accomplishing a goal and seeing the result of their work. They receive satisfaction from their own work without the need to seek external approval. They can express themselves openly and freely without the aggression and hostility of Type A's. Type B's tend to work at a pace that gets the job done on time without feeling any added burden.

Type A/B's individuals tend to be a mixture of the two extremes, all with different traits. It is worth mentioning that when our personality type is known and understood, one can start to work on any elements that they would like to change to allow for an easier life with less stress. This however, does take time and patience is needed.

5:5

Questionnaire given to participants.

Excessive Gaming on Levels of Aggression

Excessive gaming on the levels of aggression.

My name is Anne-Marie Knowles and I am a final year student at Dublin Business School of Arts Ireland. I am conducting research on excessive gaming and its affects on levels of aggression. This research is being conducted as part of my studies and will be submitted for examination.

You are invited to take part in this study and participation involves completing this online survey.

To participate you must be over 18 years of age.Participation is completely voluntary and so you are not obliged to take part.

The Survey will take you approximately 10 -12 minutes.

Participation is anonymous and confidential. Thus responses cannot be attributed to any one participant. For this reason, it will not be possible to withdraw from participation after the questionnaire has been collected.

The questionnaires will be securely stored and data from the questionnaires will be transferred from survey monkey to a password protected usb and computer.

It is important that you understand that by completing and submitting the questionnaire that you are consenting to participate in the study and that you are over the age of 18.

If any questions cause you any concern please contact the following support contacts:

Samaritans: 08457 90 90 90 * (UK)
1850 60 90 90 * (ROI)

Beyond Blue: 1300 22 4636

Inspire: https://www.inspire.com/groups/mental-health-america/

Thank you for taking the time to complete this survey.

1. Demographic information - All participants must be over the age of 18 to complete the survey

Age:

Sex:

Country:

2. Gaming Engagement Questionnaire

Please rate each of the following items in terms of how you feel when you are playing a game. Use

the following scale for answering these items

	1 Never	2	3	4 Occassionally	5	6	7 Often
I lose track of time	○	○	○	○	○	○	○
Things seem to happen automatically	○	○	○	○	○	○	○
I feel different	○	○	○	○	○	○	○
I feel scared	○	○	○	○	○	○	○
The game feels real	○	○	○	○	○	○	○
If someone talks to me, I don't hear them	○	○	○	○	○	○	○
I get wound up	○	○	○	○	○	○	○
Time seems to kind of stand still or stop	○	○	○	○	○	○	○
I feel spaced out	○	○	○	○	○	○	○
I don't answer when someone talks to me	○	○	○	○	○	○	○
I can't tell that I'm getting tired	○	○	○	○	○	○	○
Playing seems automatic	○	○	○	○	○	○	○
My thoughts go fast	○	○	○	○	○	○	○
I lose track of where I am	○	○	○	○	○	○	○
I play without thinking about how to play	○	○	○	○	○	○	○
Playing makes me feel calm	○	○	○	○	○	○	○
I play longer than I meant to	○	○	○	○	○	○	○
I really get into the game	○	○	○	○	○	○	○
I feel like I just can't stop playing	○	○	○	○	○	○	○

3. Buss-Perry Scale

Please rate each of the following items in terms of how characteristic they are of you. Use

the following scale for answering these items

	1 Extremely Uncharacteristic of me	2	3	4	5	6	7 Extremely Characteristic of me
1) Once in a while I can't control the urge to strike another person.							
2) Given enough provocation, I may hit another person.							
3) If somebody hits me, I hit back.							
4) I get into fights a little more than the average person.							
5) If I have to resort to violence to protect my rights, I will.							
6) There are people who pushed me so far that we came to blows.							
7) I can think of no good reason for ever hitting a person.							
8) I have threatened people I know.							
9) I have become so mad that I have broken things.							
10) I tell my friends openly when I disagree with them.							
11) I often find myself disagreeing with people.							
12) When people annoy me, I may tell them what I think of them.							
13) I can't help getting into arguments when people disagree with me.							
14) My friends say that I'm somewhat argumentative.							
15) I flare up quickly but get over it quickly.							
16) When frustrated, I let my irritation show.							
17) I sometimes feel like a powder keg ready to							

Excessive Gaming on Levels of Aggression

18) I am even tempered

19) Some of my friends think I'm a hothead.

20) Sometimes I fly off the handle for no good reason.

21) I have trouble controlling my temper.

22) I am sometimes eaten up with jealousy.

23) At times I feel I have gotten a raw deal out of life.

24) Other people always seem to get the breaks.

25) I wonder why sometimes I feel so bitter about things.

26) I know that "friends" talk about me behind my back.

27) I am suspicious of overly friendly strangers.

28) I sometimes feel that people are laughing at me behind me back.

29) When people are especially nice, I wonder what they want

4. Video Game Questionnaire

Instructions:

Please think of 5 video games that you have played for the greatest amount of time. Include computer, console/TV and arcade games.

Please type in the text boxes provided, the title's of those games on the blank line provided. If you have never played a game please move onto the next questionnaire.

Title of your "most played" game

Title of your 2nd "most played" game

Title of your 3rd "most played" game

Title of your 4th "most played" game

Title of your 5th "most played game

For the following items, rate the game you listed as your "most played" game:

	Rarely			Occassionally			Often
In recent months, how often have you played this game?	○	○	○	○	○	○	○
During the last month, how often did you play this game?	○	○	○	○	○	○	○
During last 6 months, how often did you play this game?	○	○	○	○	○	○	○
During the last year, how often did you play this game?	○	○	○	○	○	○	○

5. For the following items, rate the game you listed as your "most played" game:

	Little			Violent Content			Extremely Violent Content
How violent is the content of this game?	○	○	○	○	○	○	○

6. For the following items, rate the game you listed as your "most played" game:

	Education	Sports	Fantasy	Fighting with hands/feet	Fighting with weapons	Skill
Which of the following categories best describes this game? Check all that apply	⊜	⊜	⊜	⊜	⊜	⊜

7. For the following items, rate the game you listed as your " 2nd most played" game:

	Rarely	Occassionally	Often
In recent months, how often have you played this game?			
During the last month, how often did you play this game?			
During last 6 months, how often did you play this game?			
During the last year, how often did you play this game?			

8. For the following items, rate the game you listed as your " 2nd most played" game:

	Rarely	Occasionally	Often
In recent months, how often have you played this game?	☐	☐	☐
During the last month, how often did you play this game?	☐	☐	☐
During last 6 months, how often did you play this game?	☐	☐	☐
	☐		☐ ☐
		☐	☐

During the last year, how often did you play this game?

9. For the following items, rate the game you listed as your " 2nd most played" game:

How violent is the content of this game?

Which of the following categories best describes this game?

Check all that apply.

- Little
- Violent Content
- Extremely Violent Content
- Education
- Sports
- Fantasy
- Fighting with hands/feet
- Fighting with weapons
- Skill

10. Below are a list of contrasting behaviours. Please rate yourself for each set of statements/behaviours from 1 being strongly agree with the statement on the LEFT hand side, 2 being moderately agree with the statement to the LEFT hand side, 3 being slightly agree with the statement on the LEFT hand side, 4 being neither agree nor disagree with EITHER statement, 5 being slightly agree with the statement on the RIGHT hand side, 6 being moderately agree with the statement on the RIGHT hand side & 7 being strongly agree with the statement on the RIGHT.

1 " Don't mind leaving things temporarily unfinished" to 7 "Must get things finished once started"

1 "Calm and unhurried about appointments" to 7 "Never late for appointments"

1 "Not Competitive" to 7 " Highly competitive"

1 "Listen well, let others finish speaking first" to 7 "Anticipate others in conversations, interrupt finishing their sentences"

1 " Never in a Hurry, even when pressured" to 7 " Always in a hurry"

1 " Able to wait calmly" to 7 " Uneasy when waiting"

1 " Easy going" to 7 " Always going at full speed"

1 " Take one thing at a time" to 7 " Try to do more than one thing at a time. What's next?"

1 " Slow and deliberate in speech" to 7 " vigorous and forceful in speech, use a lot of gestures"

1 " Concerned with satisfying yourself not others" to 7 " Want recognition from others for a job well done"

1 " Slow doing things" to 7 " Fast at doing things"

1 " Relaxed" to 7 " Hard driving"

1 " Express feelings openly" to 7 " Hold feeling in"

1 " Have a large number of interests" to 7 " Few interests"

1 " Satisfied with life" to 7 " Ambitious"

1 " Never set own deadlines" to 7 " Often set own deadlines"

1 " Feel limited responsibility" to 7 " Always feel responsible"

1 " Never judge things in terms of quantity, just quality" to 7 " Quantity is more important"

1 " Casual about work" to 7 " Take work very serious"

1 " Not very precise" to 7 "Very precise, careful about detail"