

# Cyberbullying or Normal Game Play? Impact of age, gender, and experience on cyberbullying in multi-player online gaming environments: Perceptions from one gaming forum

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## **Abstract**

This paper includes preliminary findings from a research study to investigate perceptions among adolescents and adults regarding prevalence, seriousness, and psychological impact of cyberbullying in multi-player online gaming environments. A survey was administered including questions regarding what gamers believe constitutes cyberbullying in online gaming environments, whether they have experienced cyberbullying in this space (i.e. witness, victim, or bully), and what, if any, psychological effects those experiences have had on them. The survey was posted to the Animal Crossing Community gaming forum and was completed by 1,033 respondents who report playing a variety of

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online games, in a variety of content levels (i.e. "early childhood" to "adult content"). Analyzing data from adolescent and adult respondents (ages 12-70) indicate that cyberbullying does occur in the online game space and can have negative psychological effects. In addition, an emergent theme from this research is that age, gender, and experience play an important role in perceptions regarding the frequency, seriousness, and impact of cyberbullying in online gaming environments.

**Keywords:** cyberbullying, online gaming, gender, MMORPG, cyber abuse, electronic bullying

## 1. INTRODUCTION

Research in the area of cyberbullying, especially in problem spaces such as social networking and texting has had a great deal of attention due to the increased number of tragic events resulting from cyberbullying using social media. Cyberbullying research began in the late 1990s and was largely in response to the growing use of technology among adolescents, as well as increased instances of cyber abuse among teenagers (Patchin & Hinduja, 2006; Yardi & Bruckman, 2011). These seminal studies primarily focused on the establishment of baseline information on prevalence of cyberbullying, as well as the various methods used by cyberbullies to harass their victims such as cell phone texting, YouTube videos, email, chat rooms, and online gaming.

The prevalence of the cyberbullying phenomenon has been researched among adolescents (Lenhart, 2010; Yardi & Bruckman, 2011). These studies have indicated that the burgeoning ownership of technology (e.g. smartphones, tablets, etc.) as well as the sharp increase in Internet and social networking site use has led to widespread cyberbullying victimization (Beran & Li, 2005; Kowalski & Limber, 2007; Mesch, 2009; Ortega, Elipe, Mora-Merchan, Calmaestra, & Vega, 2009; Patchin & Hinduja, 2006; Raskauskas & Stoltz, 2007; Ybarra, 2004). While much of the research has been focused on young adolescents, more recent work has investigated cyberbullying among older adolescents in college (Aricak, 2009; Dilmac, 2009; Molluzzo, Lawler, & Manneh, 2012; G. Rivituso, 2012; J. Rivituso, 2014; Smith & Yoon, 2012) as well as adults in the workplace (Keashly & Neuman, 2010; McKay, Arnold, Fratzl, & Thomas, 2008; Privitera & Campbell, 2009).

## 2. PSYCHOLOGICAL IMPACT OF CYBERBULLYING

Research has identified that cyberbullying causes severe psychological, emotional, and

social problems among many of its victims (Blair, 2003; Juvonen & Gross, 2008; Patchin & Hinduja, 2006; G. Rivituso, 2012; J. Rivituso, 2014). Cyberbullying can have a long-lasting psychological impact on individuals; the result of which can include changes in self-efficacy, self-esteem and behavior. Researchers have offered varied theories as to the cause of these problems (Anderson & Sturm, 2007; Bandura, 1989, 1990; Diamanduros, Downs, & Jenkins, 2008). Additionally, research supports that such bullying has larger societal issues both inside and outside the cyber environments. In response to the negative stimuli of being cyberbullied, middle and high school student victims have been found to become cyberbullies themselves. (Berthold & Hoover, 2000; Fryling & Rivituso, 2013; Katzer, 2009; Wong & Xio, 2012; Ybarra & Mitchell, 2004). Berthold and Hoover (2000) reported that middle school student victims were more than three times as likely to bully others when compared to non-victims.

The psychological impact of cyberbullying may be more profound than that of traditional bullying because negative comments, threats, and accusations are often visible to a wide audience and are long-lasting. This content may be viewed repeatedly by the victim and their peers causing repeated victimization (Campbell, 2005; G. Rivituso, 2012; J. Rivituso, 2014; Strom & Strom, 2005). These factors generate a great deal of anxiety among victims and negatively impact their psychological state (Beale & Hall, 2007; DeHue, Bolman, & Vollink, 2008; Spear, Slee, Owens, & Johnson, 2009; Strom & Strom, 2005). The negative impact of cyberbullying leads to feelings of frustration, anger, and sadness that are detrimental to the victim's psychological well-being (Patchin & Hinduja, 2006). Victims of cyberbullying experience depressive symptoms, behavior problems, drug use, and negative attitudes toward school (Ybarra & Mitchell, 2004; Ybarra, 2004). Adolescent cyberbullying victims are likely to report behavioral issues, drinking alcohol, smoking, and depressive symptoms

(Juvonen & Gross, 2008; Mason, 2008). Victims of cyberbullying quite often experience embarrassment, lowered self-esteem, and negative impacts on their academic, professional, personal and social life (Mesch, 2009) as well as an increased rate of suicidal thoughts (Kim, Koh, & Leventhal, 2005; Klomek, Sourander, & Gould, 2010; Patchin & Hinduja, 2007).

While elementary, middle, and high school students are the most researched groups regarding cyberbullying, researchers have found that older adolescents and adults can be victims of cyberbullying in college and the workplace (Bond, Tuckey, & Dollard, 2010; Chapell et al., 2004; Cowie, Naylor, Smith, Rivers, & Pereira, 2002; De Cuyper, Baillien, & De Witte, 2009; Keashly & Neuman, 2010; Lester, 2009; Privitera & Campbell, 2009). However, scientific research on bullying and cyberbullying among older adolescents and adults within both college and the workplace is in its infancy with less than significant literature on the topic (Lester, 2009).

### **3. CYBERBULLYING IN ONLINE GAMING ENVIRONMENTS**

More recently researchers have begun to investigate cyberbullying in online gaming environments. Yang (2012) examined 1,069 adolescent online game players in a quantitative study to explore the relationships between their gender, preference for video games, hostility, aggressive behavior, experiences of cyberbullying, and victimization. Participants were recruited from 16 elementary, middle, and high schools in three cities in Taiwan. Significant findings from this study indicate an association between male respondents and a preference for violent games, increased hostility, and aggressive behavior. Violent and bullying behavior in the online world does have significance outside of that environment as bullying behavior can cross-over between the online world (cyberbullying) and the physical world (traditional bullying). Yang (2012) found that male victims who had experienced repeated cyberbullying instances in online gaming, had a greater likelihood of observable aggressive behavior in his daily life.

A study conducted by Li (2006) involved 264 junior high school students from three Canadian schools. Findings from this study indicate that while boys and girls spend similar amounts of

time online, there are distinct differences in behavior related to cyberbullying. The differences identified that boys were more likely to be involved in cyberbullying, but they were less likely to tell an adult if cyberbullying behavior was taking place. Leung and McBride-Chang (2013) conducted a study among 626 Hong Kong Chinese fifth and sixth grade students of both genders with the focus examining friendship and bullying experiences, both at school and in online computer gaming. Their findings indicate that while instances of cyberbullying are present in the online gaming environment, a positive development related to the social functioning of children was found, that being the development of friendships attributed to participation in online gaming.

Contemporary cyberbullying research has primarily focused on elementary, middle, and high school adolescents. As the phenomenon has grown, the research lens has changed from prevalence type studies to psychological type studies. Cyberbullying studies have begun to focus on the identification of the physical, emotional, and social problems associated with cyberbullying among adolescents. Findings have identified that victims of cyber abuse often suffer from a myriad of harmful stressors affecting the general well-being of the victim. There is still a need to further study the negative effects of cyberbullying victimization since research in this area still has a variety of gaps (Tokunaga, 2010). While some researchers have begun to examine this phenomenon among post-secondary students and adults, this work is somewhat limited. Most recently cyberbullying research has extended to the online gaming environment but these studies are also limited and have focused on elementary, middle, and high school students.

Additional research is warranted because of the limited amounts of empirical research on cyberbullying in gaming environments. In addition, an overlooked area in the existing research is the investigation of cyberbullying among older adolescents and adults (i.e. adult bullies and victims). A recent study conducted by Ipsos MediaCT for The Entertainment Software Association (2013) reported that 68% of gamers are adults (18 years or older). Therefore, it is important to not overlook this population in online gaming cyberbullying research.

As with traditional bullying, cyberbullying can have a long-lasting psychological impact on individuals; the result of which can include changes in self-efficacy, self-esteem and behavior. Therefore, strategies are needed to detect and mitigate cyberbullying wherever it may occur, including online gaming environments, and to whomever it may involve, including adult populations.

#### 4. METHODOLOGY

This exploratory research investigates perceptions regarding cyberbullying prevalence and seriousness in gaming environments, with three primary research questions:

- Is there a perception that cyberbullying a problem in the online gaming environment among adolescents and/or adult populations?
- Have adolescent and/or adult gamers experienced cyberbullying in the game space, as a witness, victim, or bully?
- What, if any, psychological problems are resulting from cyberbullying in online gaming environments?

A survey instrument developed by the investigators of this study, including two undergraduate student researchers at a small liberal arts college, was used to address the research questions. This instrument incorporated questions from prior cyberbullying research studies (Molluzzo et al., 2012; Smith & Yoon, 2012) as well as a variety of new questions developed by the researchers to specifically address the study questions. The survey included questions spanning the participants belief of what constitutes cyberbullying in online gaming environments, whether they have experienced cyberbullying in this space (i.e. witness, victim, or bully), and what, if any, psychological effects those experiences have evoked. An expert online gamer was part of the team involved in developing the questions to ensure proper gaming "lingo" was followed (i.e. terms such as "aggroing" to refer to baiting monsters into attacking unprepared players and "griefing" to refer to deliberately irritating or harassing other players in the game).

Prior to releasing the final survey, it was pilot tested with a small group of online gamers. Minor modifications were made and the final survey, consisting of 42 questions, was posted to online games/forums and available to

everyone in these environments. The questions broke down cyberbullying into specific behaviors that allowed participants to define cyberbullying and to identify specific behaviors they experienced as a witness, victim, and/or bully. Participants were asked specific questions addressing whether they believe cyberbullying is a problem in this environment and, for those who were victims or bullies, what psychological effect cyberbullying had on them. The survey also asked background information including age, gender, amount of time they spent playing, and their experience level.

#### Population and Sample

The surveys were initially distributed through a variety of online gaming discussion forums. In addition, a snowball sampling approach was attempted using social media. To encourage participation, respondents were offered the chance to win a \$50 Amazon gift card upon completion of the survey. Email addresses of those interested in entering the drawing were collected and stored separately to ensure confidentiality of responses. The most significant number of responses came from the Animal Crossing Community online gaming forum (<http://www.animalcrossingcommunity.com/>) and is the focus of this paper. The survey was posted in such a way that members were asked to participate upon login to the forum. We believe this, in addition to the gift card drawing, contributed greatly to the high response rate.

As of June 2014, the Animal Crossing Community gaming forum hosted 564,166 total members. The gender distribution of those completing the survey is similar (i.e. less than 1% difference) to that of forum members, for those that reported their gender (approximately 62% female and 38% male). Sixty-five percent of the individuals that report their age to the forum are over the age of 19. There was no response bias or known characteristic that predicted whether a participant responded to the survey.

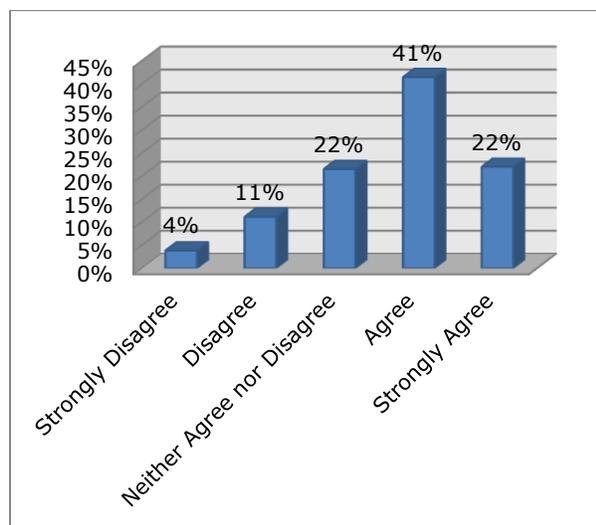
One thousand four hundred and eighty-five participants started and 1033 (70%) completed the survey. One thousand twenty-five surveys were used in the analysis presented in this paper. Six responses under the age of 12 and two responses with an age of 116 were eliminated from the sample due to validity concerns. The population age range is 12 to 70 with an average age of 22.04, median age of 19 and mode age of 18. When asked to select a

category that best describes the use of online gaming, 46% of the sample indicated that they most often participate as an Explorer (see Figure A1 in Appendix A).

Respondents may play games from multiple content types and were asked to select all categories that applied. Participants of the survey most often played games classified as **Everyone** (76%), **Everyone 10+** (58%), **Teen** (74%), and **Mature** (58%). Respondents play games from a variety of content levels, from content suitable for all ages to mature content. (see Table A1 in Appendix A). A majority (66%) of the participants self-reported an experience level of advanced player and 14% classified themselves as an expert player.

**Results**

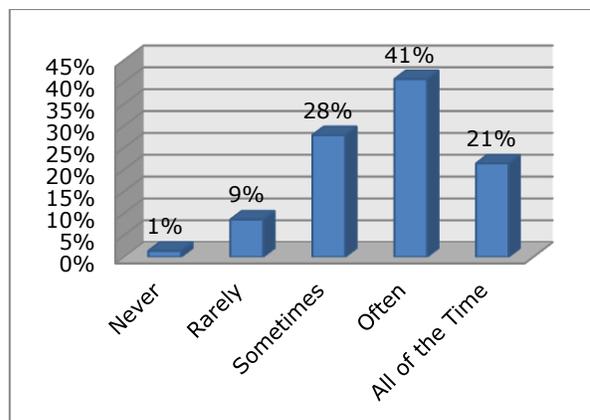
Before describing the data analysis, a brief overview of distributions of perceptions will be presented. 38% of respondents (43% of females and 28% of males) have avoided a multi-player video game because they were concerned about cyberbullying behavior. 54% (57% of females and 49% of males) have left a multi-player video game because someone was exhibiting cyberbullying behavior. 63.51% of the participants either agreed or strongly agreed that cyberbullying is a serious problem in the online gaming environment (see Figure 1), with females reporting higher at 68% than males at 55%.



**Figure 1: Cyberbullying is a serious issue within multi-player video games.**

62.12% of the participants reported that cyberbullying occurs often to all of the time in

online gaming environments. Again, female respondents reporting higher at 67% than male respondents at 53%.



**Figure 2: What degree does cyberbullying occur within multi-player video games?**

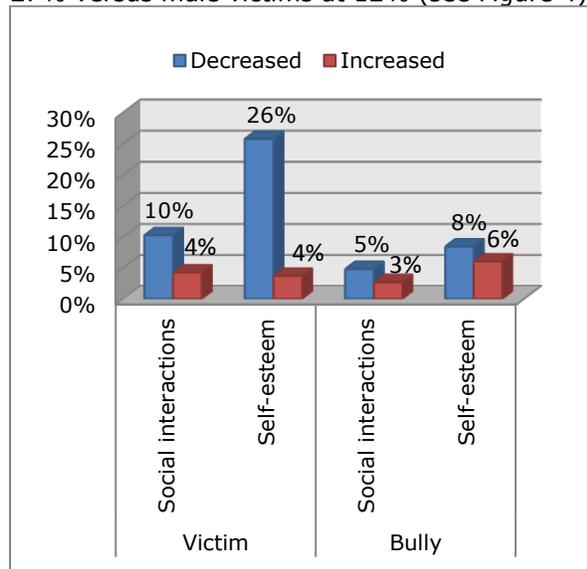
We further broke down cyberbullying into categories of being a victim and witness of the bully. 78% of respondents have been a victim of cyberbullying (79% of females and 73% of males) in multi-player online gaming environments, 91% (same for both males and females) have witnessed cyberbullying, and 35% (29% of females and 42% of males) admit to exhibiting cyberbullying behavior (see Figure A2 in Appendix A). Female respondents were slightly more inclined to report cyberbullying in the gaming environment (49%) versus male respondents (45%).

There is also a perception that females are more likely to be the victim of cyberbullying and less likely to be the perpetrator of cyberbullying than males. 26% of respondents reported that females are more likely to be cyberbullied, 10% think males are more likely to be cyberbullied, and 64% think both are equally likely to be cyberbullied. 58% believe males are more likely to be a cyberbully, 1% believe females are more likely to be a cyberbully, and 41% think both are equally likely to be cyberbully.

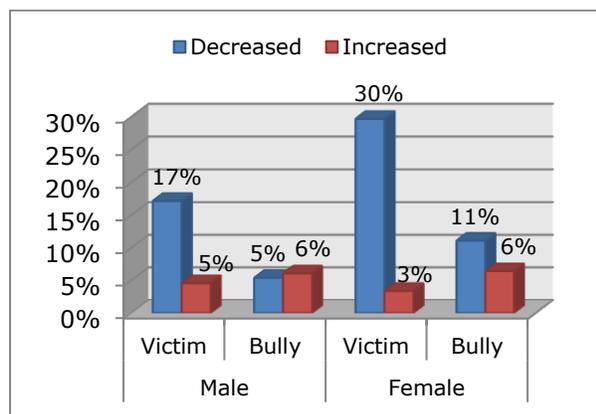
**Psychological impact (victim and bully)**

When bullying behavior occurs both the victim and bully are negatively impacted psychologically. Both groups report a net decrease in both social interactions and self-esteem (see Figure 3). Female respondents experienced a greater negative psychological impact. For example, the net decrease in the

self-esteem of female cyberbullying victims is 27% versus male victims at 12% (see Figure 4).



**Figure 3: Comparison of psychological impact between victim and bully**



**Figure 4: Comparison of impact on self-esteem between victim versus bully and male versus female**

Additional negative factors such as aggressiveness, stress, anxiety, anger, and depression have a net increase for both the victim and bully (see Figure A3 in Appendix A). Male and female respondents had similar negative impacts on these factors as the victim of cyberbullying. However, female respondents have notably greater negative consequences when acting as the bully (see Figures A4 and A5 in Appendix A).

**Data Mining**

Further analysis was conducted using the Waikato Environment for Knowledge Analysis

(WEKA). WEKA is a free data mining tool consisting of a collection of machine learning algorithms that can applied directly to a dataset (see <http://www.cs.waikato.ac.nz/ml/weka/>). The WEKA workbench allows for automatic analysis of large datasets to identify which data are most relevant. WEKA contains tools for data pre-processing, classification, regression, clustering, association rules, and visualization. We used WEKA to perform both supervised (linear regression) and unsupervised (clustering) data-mining techniques.

**Linear Regression**

Linear regression was used as a form of supervised data mining to test hypotheses that emerged from the initial data analysis, described in the previous section. For example, based on a given age and experience level, how likely will the person feel cyberbullying is serious?

WEKA develops a regression model by only using the independent variables that statistically (measured in R-squared) contribute to the accuracy of the model. The following independent variables were provided to WEKA for consideration in the regression model: age, gender, and gaming experience level (see Table 1)

Independent Variable	Values
Age	Coded as actual age
Gender	1=Male 2=Female
Experience	1=None 2=Beginner 3=Intermediate 4=Advanced 5=Expert

**Table 1: Independent Variable Coding**

Using WEKA’s linear regressions allowed us to analyze the data by predicting a dependent numerical value for the given set of independent variables. The dependent variables that were analyzed corresponded to the three questions below.

- Is cyberbullying a serious problem?
- How often is cyberbullying occurring in online gaming?
- How often have you experienced, witnessed or participated in cyberbullying?

Several regressions were run and the most significant ones are reported here. The results of the following questions served as a dependent variable.

**Question 1:** Based on your definition of cyberbullying, select the degree to which you agree with the following statement:

Cyberbullying is a serious issue within multi-player video games. (1=Strongly Disagree to 5=Strongly Agree)

WEKA produced the following regression formula:

$$\begin{aligned} \text{Serious Issue} = & \\ & 0.0109 * \text{Age} + \\ & 0.3578 * \text{Gender} + \\ & -0.0905 * \text{Experience} + \\ & 3.19 \end{aligned}$$

To summarize the results, older females (ages 63 – 70) with little experience are more likely to strongly agree that cyberbullying a serious problem. Young males (12 – 37), who are more experienced gamers, are more likely to neither agree or disagree that cyberbullying is a serious problem.

**Question 2:** Based on your definition of cyberbullying, to what degree would you say cyberbullying occurs within multi-player video games? (1=Never to 5=All of the Time)

WEKA produced the following regression formula:

$$\begin{aligned} \text{Degree Occurs} = & \\ & 0.2426 * \text{Gender} + \\ & 3.3209 \end{aligned}$$

This formula reveals that both genders perceive cyberbullying occurring *sometimes* to *often*, with more females stating cyberbullying happens *often*. Age and experience were not determinate factors.

**Question 3:** Based on your definition of cyberbullying, please estimate how often you have experienced cyberbullying (as a victim) within multi-player video games. (1=Never to 5=All the time)

WEKA produced the following regression formula:

$$\begin{aligned} \text{Victim Frequency} = & \\ & -0.0063 * \text{Age} + \\ & 0.2254 * \text{Gender} + \\ & 0.1587 * \text{Experience} + \\ & 1.4405 \end{aligned}$$

This formula predicts that young females with high gaming experience are the most likely to be a cyberbullying victim in the online gaming environment. As age increases the likelihood of being a victim decreases.

**Question 4:** Based on your definition of cyberbullying, please estimate how often you have experienced cyberbullying (as a witness) within multi-player video games. (1=Never to 5=All the time)

WEKA produced the following regression formula:

$$\begin{aligned} \text{Witness Frequency} = & \\ & -0.0099 * \text{Age} + \\ & 0.1988 * \text{Gender} + \\ & 0.1622 * \text{Experience} + \\ & 2.3523 \end{aligned}$$

This model predicts that all respondents are likely to witness some cyberbullying in the online gaming environment. Similarly to the victim frequency regression model, young females with high gaming experience are the most likely to witness cyberbullying.

**Question 5:** Based on your definition of cyberbullying, please estimate how often you have experienced cyberbullying (as individual exhibiting bullying behavior) within multi-player video games. (1=Never to 5=All the time)

WEKA produced the following regression formula:

$$\begin{aligned} \text{Exhibit Cyberbullying behavior Frequency} = & \\ & -0.0081 * \text{Age} + \\ & -0.1289 * \text{Gender} + \\ & 1.8599 \end{aligned}$$

This formula reveals that experience is not a factor in determining whether or not an individual will exhibit cyberbullying behavior. The model predicts that older females are least likely to exhibit cyberbullying behavior and young males are most likely.

Overall, using a supervised method of data mining for the regression analysis provided an opportunity to further answer the research questions and offered a deeper understanding of some of emergent themes central to age, gender and experience.

**Clustering**

In addition to answering the initial research questions, running unsupervised data mining techniques helps develop future research questions and hypotheses. Clustering is an unsupervised form of data-mining that does not test a hypothesis but rather it lets patterns emerge from the data. In clustering every attribute is used to analyze the data. For example, what age groups or genders are most likely to perceive cyberbullying as a serious problem?

Considering the psychological effects of cyberbullying on both the victim and bully, learning more about the bully may offer a scaffold for future inquiry. A cluster analysis provides the framework to create behavioral models. Table 2 below highlights the groups as they emerge as a bully or non-bully. The characteristics are identical with the exception of age. For both male and females the younger counterpart, with all other characteristics equal, emerges as the bully. While the age difference is only a few years, it is worth further investigation in future research.

Cluster 0 (187 – 18%) Age 21 Female Intermediate player Plays 10–39 hrs/week <b>Bully? Yes</b>	Cluster 1 (467 – 46%) Age 23 Female Intermediate player Plays 10–39 hrs/wk <b>Bully? No</b>
Cluster 2 (219 – 21%) Age 22 Male Intermediate player Plays 10–39 hrs/week <b>Bully? No</b>	Cluster 3 (152 – 15%) Age 20 Male Intermediate player Plays 10–39 hrs/wk <b>Bully? Yes</b>

**Table 2: Cluster Analysis (Bully)**

Building on the cluster analysis above, frequency of being a victim or witnessing cyberbullying behaviors was added. By adding the additional dependent variables of victim and witness, behavior models displaying the characteristics of the cyberbully may become apparent. The objective of using these variables is to have a

better understanding of the behaviors that may cause cyberbullying behaviors. For example, if a person is a victim do they become a cyberbully? Or if a gamer is a witness does this also contribute to cyberbullying behaviors?

Cluster 0 (341 – 33%) Age 23 Female Advanced Player Plays 40-69 hrs/wk Rarely a victim Rarely a witness <b>Never a bully</b>	Cluster 1 (313 – 31%) Age 23 Female Advanced Player Plays 10–39 hrs/wk Sometimes a victim Often a witness <b>Rarely a bully</b>
Cluster 2 (197 – 19%) Age 21 Male Advanced Player Plays 0 – 9 hrs/wk Rarely a victim Rarely a witness <b>Never a bully</b>	Cluster 3 (174 – 17%) Age 21 Male Advanced Player Plays 10–39 hrs/wk Sometimes a victim Often a witness <b>Rarely a bully</b>

**Table 3: Cluster Analysis (Victim, Witness, & Bully)**

The cluster analysis above (Table 3) shows that for both males and females if they have minimal exposure to being a victim or witness they are likely to not engage in bullying behaviors. In contrast, if a gamer is more exposed to being a victim and witness they are more likely to exhibit cyberbullying behaviors themselves.

**5. DISCUSSION**

**Limitations**

While the survey had over 1000 respondents it is important to note that the entire sample used for this paper were all members of the Animal Crossing Community gaming forum. While individuals in this community report playing a variety of online games, in a variety of content levels (i.e. “early childhood” to “adult content”), further research is needed to determine whether or not our findings can be generalized to the online gaming community at large.

While the age and gender distributions of respondents were reflective of the Animal Crossing Community forum members, they were not with the total population of the online gaming community. 62% of the respondents indicated that they are female, while ESA reports that only 45% of gamers are female. The average age of our respondents was 22,

while the ESA reports that the average age of gamers is 30 (Ipsos MediaCT, 2013).

Future research will include distributing the survey through other channels to increase the diversity of respondents, decrease any unknown bias towards members of the Animal Crossing Community gaming forum, and augment the findings outlined in this paper. Additional investigation will contain further data mining to look for more patterns, other predictors of bullying behavior, factors contributing to negative psychological impacts, and dynamics that may contribute to the mitigation of cyberbullying.

### Conclusions

The objective of this study was to investigate perceptions among adolescents and adults regarding prevalence, seriousness, and psychological impact of cyberbullying in multi-player online gaming environment. Preliminary analysis of the data supports prior research that suggests that there are instances of cyberbullying in online gaming environments (e.g. Leung and McBride-Chang, 2013; Li, 2006; Yang, 2012) and extends that work by including adult populations.

This study also supports the hypothesis that there are negative psychological consequences of cyberbullying in online gaming. Similar to the findings by Li (2006) our male respondents were slightly more likely to exhibit bullying behavior and slightly less likely to report cyberbullying incidents than female respondents.

Yang (2012) found that male victims who had experienced repeated cyberbullying instances in online gaming, had a greater likelihood of observable aggressive behavior in his daily life. Our study did not find a notable difference between male and female victims in regard to increased aggressive behavior but both showed a net increase.

Cluster analysis revealed that cyberbully victims and witnesses may be more likely to exhibit cyberbullying behavior. This finding supports prior research (e.g. Fryling & Rivituso, 2013; Shu Ching Yang, 2012) that suggests cyberbullying victimization increases the likelihood of exhibiting cyberbullying behavior.

Overall our male respondents were slightly less negatively impacted psychologically by being bullied than female respondents. However,

female respondents reported a notable greater net increase over male respondents in aggressiveness, stress, anxiety, anger, and depression after exhibiting cyberbullying behavior.

While individuals of all genders, age groups, and experience levels may be impacted by cyberbullying in online gaming environments, perceptions regarding the seriousness of such activities varied among these groups. Older females with less gaming experience reported the highest perception of cyberbullying occurrence, seriousness, and victimization. Conversely, younger male respondents with more gaming experience report the lowest perception of cyberbullying occurrence, seriousness, and victimization. Females are more likely to be negatively impacted psychologically, particularly when exhibiting cyberbullying behavior, and are more likely to avoid or leave a game due to cyberbullying behavior.

This research serves to enhance the understanding of the general public by identifying that cyberbullying activities transcend the social networks, cell phones, email, and chat rooms. The study aims to identify that computer gaming, often sought by users of all ages as a means of entertainment and even relaxation, has as an inherent risk and participates are vulnerable to cyberbullying activities. The work sought to begin to understand the social norms of bullying behavior in gaming environments by investigating perceptions regarding cyberbullying prevalence, seriousness, and psychological impact.

The findings from this research add to the academic and scientific understanding of cyberbullying in the problem space of gaming. Findings add to the growing database of empirical knowledge on this construct for both adolescents and adults. Future research will explore triggers of cyberbullying behavior in the online gaming environment and mitigation strategies, including technological enhancements to monitor and to mitigate cyberbullying. Our ultimate objective in future research is to better understand under what conditions cyberbullying occurs and to provide some best practices in prevention with possible human-computer interaction interventions.

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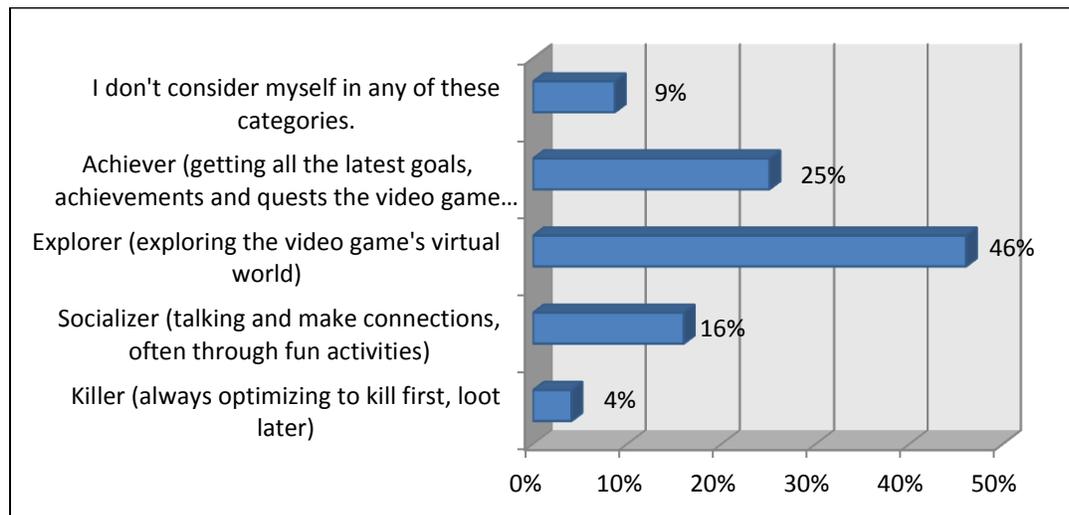
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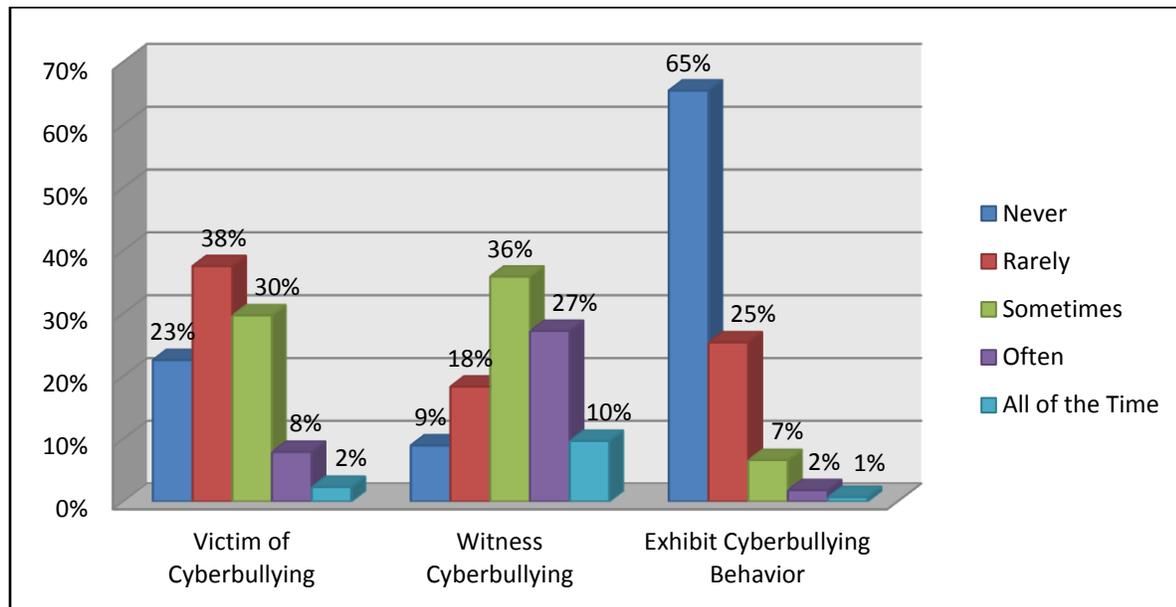
**Appendix A – Figures and Tables**



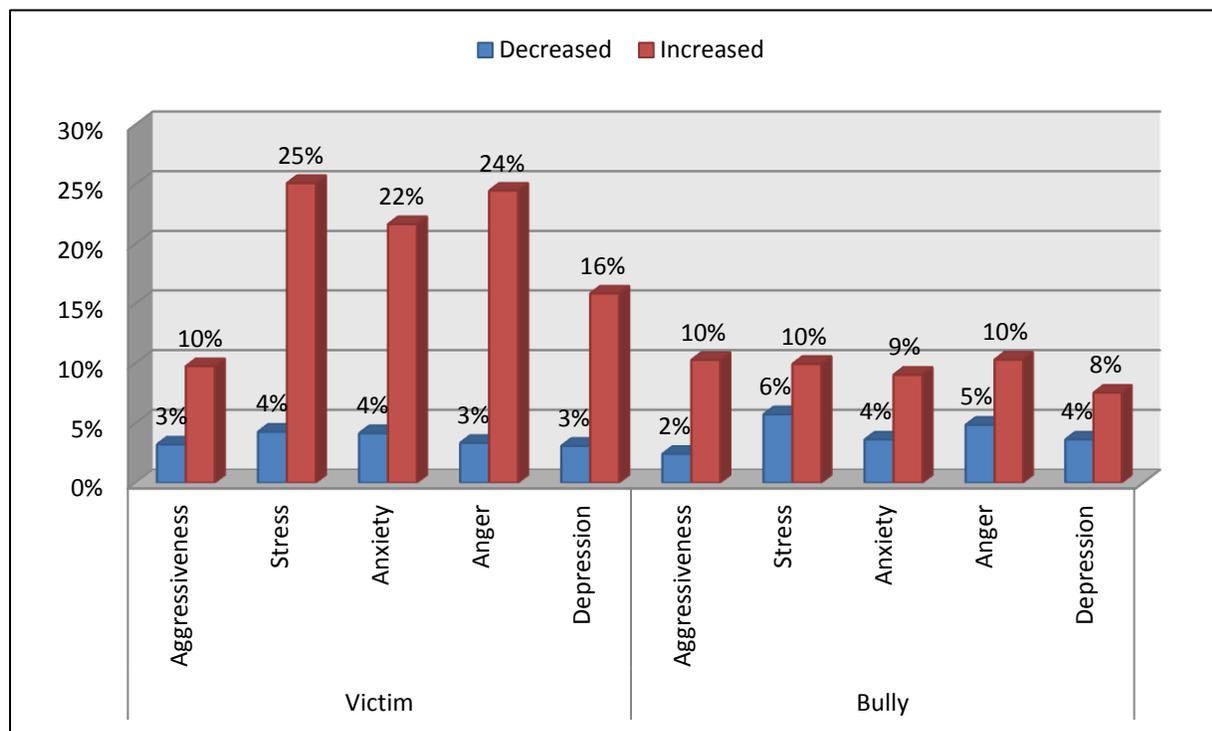
**Figure A1: Which of the following categories best describes you?**

Entertainment Software Rating Board (ESRB) rating	Percent Play
<b>Early Childhood:</b> Content is intended for young children.	3%
<b>Everyone:</b> Content is generally suitable for all ages. May contain minimal cartoon, fantasy or mild violence and/or infrequent use of mild language.	76%
<b>Everyone 10+:</b> Content is generally suitable for ages 10 and up. May contain more cartoon, fantasy or mild violence, mild language and/or minimal suggestive themes.	58%
<b>Teen:</b> Content is generally suitable for ages 13 and up. May contain violence, suggestive themes, crude humor, minimal blood, simulated gambling and/or infrequent use of strong language.	74%
<b>Mature:</b> Content is generally suitable for ages 17 and up. May contain intense violence, blood and gore, sexual content and/or strong language.	58%
<b>Adults Only:</b> Content suitable only for adults ages 18 and up. May include prolonged scenes of intense violence, graphic sexual content and/or gambling with real currency.	8%

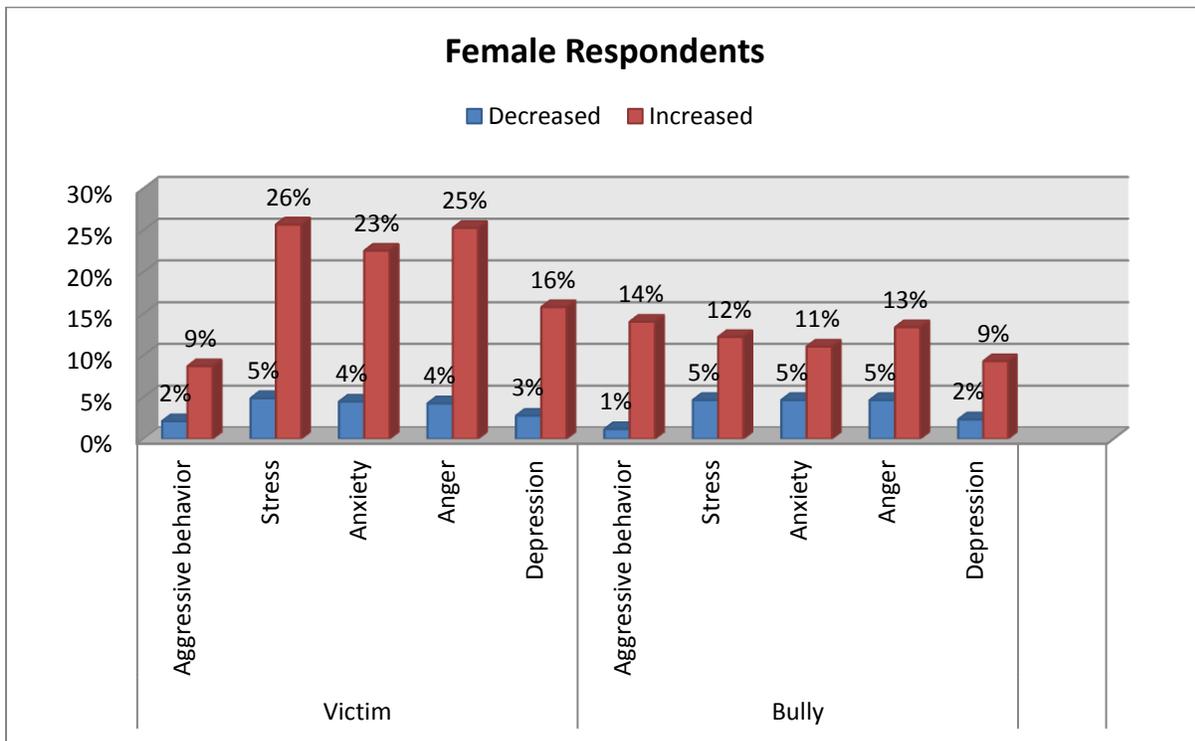
**Table A1: Game Content Types Played**



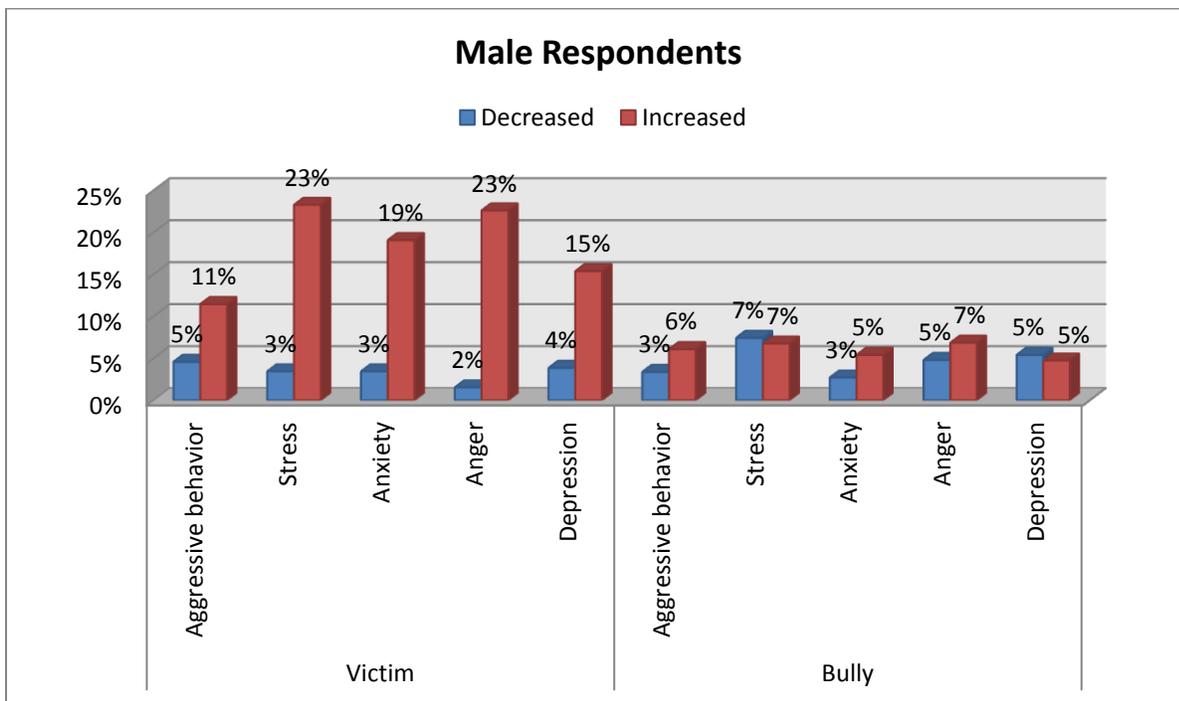
**Figure A2: Comparisons of perceptions of frequency of being a victim, witness and/or a bully**



**Figure A3: Comparison of psychological impact between victim and bully (All Respondents)**



**Figure A4: Comparison of psychological impact between victim and bully (Females only)**



**Figure A5: Comparison of psychological impact between victim and bully (Males only)**