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The Interaction of Cyberaggression and Self-Efficacy within the Virtual World and the Real World

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Abstract

The present study seeks to analyze the impact of cyberaggression and positive feedback from an anonymous videogame player on one's self-efficacy and performance both inside and outside of the videogame. The internet provides a unique way for individuals to interact, and the online disinhibition effect can lead users to engage in out of character behaviors once online. This shift in behavior can be an influencing factor for cyberbullying or isolated instances of cyberaggression. Negative feedback can lower one's self-efficacy, and a lower self-efficacy can lead to a worse performance on the activity. It was hypothesized that mean comments from an anonymous competitor would lower self-efficacy both in the game and for an unrelated memory task, and similarly diminish the performance in both activities. It was also hypothesized that a positive comment after the first competition would both increase self-efficacy inside and outside the game and also improve performance on both activities. Participants in the present study took a memory test, played an online racing game, received predetermined feedback after losing the race, then played the videogame and took the memory test one final time, after rating their self-efficacy before every activity. It was discovered that the type of message received did not play a role on self-efficacy and performance both inside and outside of the videogame.

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A Review of the Literature

During the 2016 North American League of Legends semi-finals, Team Solo Mid (TSM) was facing off against Team Immortals, the number one ranked team in the region. In one of the interviews before the matches, the two star players for TSM were asked how they would win the game. Bjergsen and Doublelift, the two main carries responded that they would tilt the other team in order to win. In videogames, the term tilt refers to when one player is not in a great state of mind to play at the high level he can normally achieve. This tilt is often characterized by making poor decisions without logical explanation. One reason for tilt is a player doubting his ability to achieve victory. This doubt can arise as a result of either failed prior attempts or harsh words from another player. This paper seeks to explore the origins and effects of tilt by looking at the impact that verbal attacks in the virtual world have in both the game and real world.

Positive Uses for Videogames

Having come a very long way from the simple games from the 1970's, videogames today serve multiple purposes and take a variety of forms. The most obvious reason to play videogames is enjoyment. A study by Griffiths and Wood (2000) revealed that children today typically begin playing videogames around the age of seven or eight. At this age, children typically do not spend a lot of time playing videogames and solely use them for entertainment. One reason that videogames bring fun for the players is because they can serve as an escape (Bertozzi, 2012). In the world that the videogame creates, players have a space where they can behave differently than they ever would in

the real world. This new world can offer different experiences and adventures that would never be achievable outside of the game.

Although first designed for pleasure, videogames have been given a new purpose because of their interactive nature. Moreover, videogames can serve as a valuable asset within educational settings. Because of the enjoyment that many people have found in videogames, they have been brought to educational settings because of the positive views that students already hold. Videogames are different than standard teaching methods because of the merging of entertainment and education. By being a part of the videogame, controlling the environment, and virtually interacting with the lesson, students had higher levels of motivation and grasping of the educational topics (Vogel, Vogel, Cannon-Bowers, Muse, & Wright, 2006).

Because of their uniqueness and utilization of new technology, videogames are able to present new ideas of difficult concepts that were once difficult for students to grasp. One of the areas where videogames shine is in the field of science (Cheng, She, & Annetta, 2015). Many scientific concepts need to be understood in three dimensions, something which can be very hard to achieve with paper that is only two dimensions. Also, many experiments have to take place under very specific conditions, and the controlled nature of videogames can recreate what would be unobtainable in a standard classroom setting. Videogames serve as a niche tool allowing students to grasp topics that were once foreign.

Videogames also achieve success because of the way that they can simulate situations that occur in the real world. As a result of all of the engagement that arises from the interaction that videogames offer, players are able to form cognitive maps of the

information that is being taught, further increasing retention (Andrews, 2011). This engagement helps videogames to efficiently teach both behavioral and cognitive skills.

An advantage that videogames have over other forms of education is the ability to convey ideas through pictures rather than words from a textbook. In 2013, 876 middle school students who had videogames incorporated into the science curriculum participated in a study looking at motivation (Marino et al.). Videogames were most appealing to students with learning disabilities. Students who could not read at or above grade level or were in an individualized educational program preferred videogames because of the ease of access to the content. Videogames simplify and bring to life difficult lessons that were once out of reach for struggling scholars.

While highly preferred by populations that struggle with reading, the preference to choose videogames over more standard teaching methods also carries over to most students. Videogames are associated with fun and enjoyment, while some classes can be thought of as dull. Because of these preconceived notions, students showed more interest in videogames than typical lesson plans (Dempsey, Rasmussen, & Lucassen, 1994). Videogames serve the purpose of more than just enjoyment and can successfully be used for tutoring, practicing new skills, and changing students' ideas of a subject.

The versatility of videogames impact the teaching methods of students and teachers alike. While the videogames can increase students' excitement to learn, educators find benefits within videogames from the reduced course load and time required for teaching (Ricci, 1994). The usefulness of videogames for practice are best for teachers because of the time that students can spend learning from the videogames, rather than the teacher. Students found increased retention from the videogames

compared to standard teaching because of the individual interaction that is available through technology, rather than just one instructor. This unique teaching opportunity can serve as an independent method to fully cover and reinforce what was initially taught by the teacher.

Because of all of the benefits that videogames have brought to the classroom, they have been carried to other instructional settings and are crucial to many different training programs. The results that are accomplished within videogames are applicable to real life outside of the virtual world (Garris, Ahlers, & Driskell, 2002). In addition to the increased level of interaction within videogames, immediate feedback in tasks and stimulation of multiple senses add to the benefits of videogames. The targeted areas that videogames aim to improve are technical and mechanical skills, and videogames can seek to improve actual movements and actions or the mental processes of a related activity.

For complex tasks where practicing is difficult or not easily available, the virtual reality component of videogames allow for in-depth practice that would not be able to be obtained otherwise. The military has started using videogames and other similar situation tools in order effectively train new recruits. In a study by Gopher, Well, and Bareket (1994), a group of pilots practiced flight for 10 hours on an aviation computer game and performed significantly better than those who did not have the opportunity. Videogames have been found to improve hand-eye coordination, and other benefits have been found in surgery (Gotterbarn, 2010). When flying a plane that costs millions of dollars or performing a surgery, there is very little room for error. Videogames can help relieve the stress from these highly complicated tasks and grant practice that could not be achieved in the physical world.

In addition to just skills focused training, videogames can also improve different types of knowledge. As lined out by Garris, Ahlers, and Driskell (2002), videogames focus on three different types of knowledge: declarative, procedural, and strategic. Declarative knowledge is familiarity with the specific data and facts surrounding a task or theory and is tested through the ability to recall or recognize certain pieces of information. This knowledge is foundational and purely theoretical. In 1984, White looked at a videogame that focused on Newtonian principles. The students who played the videogame understood the ideas much better than the students who did not and scored higher on the questions dealing with Newton's principles.

Going one step further, procedural knowledge is understanding and being able to perform a certain task. After having the knowledge of the facts around an idea or task, procedural knowledge is characterized through taking the background understanding and transferring it to be able to perform the necessary skill. One needs to be successful in the desired task, rather than just understanding what should be performed and how. Looking at the role that videogames play in affecting this type of knowledge, Whitehall and McDonald (1993) found improved performance in electronic troubleshooting among the students who practiced with a variable-payoff videogame than those who received the standard training. The replacement of the typical training with a videogame better helped students to picture and fully grasp the required task more effectively than standard training without models and interactive examples.

The deepest level of knowledge, strategic knowledge, looks at the ability to think critically and apply prior learned knowledge. After the basics have been mastered, strategic knowledge looks to transfer the information to new situations or expand upon

what is already known from different ideas. Rather than simply going through the basics, cognitive strategies must be applied to new situations building from previously learned ideas. This type of knowledge deals with full understanding and application of more complex ideas. A videogame that aimed to improve the practical reasoning abilities in students was found to better their ability to think critically (Wood & Stewart, 1987). Videogames have been found to improve all levels of knowledge, both practically and theoretically, and can serve as useful instructional tools in a variety of scenarios.

Videogames have the ability to teach skills outside of the classroom that can aid in standard day-to-day situations. Because of the unpredictable nature of action videogames and the requirement to react quickly within the game, many gamers experience heightened reflexes. A study by Green, Pouget, and Bavelier found that gamers have faster reactions to multiple types of sensual stimuli: auditory and visual (2010). The benefits are not limited to reaction time but also a variety of unrelated tasks including contrast detection, visual search, multiple object tracking, and decision making. Gamers are not only faster at these tasks but also more precise. This study offers the explanation that because sequences and exact decisions and actions are almost never repeated, gamers must be able to quickly adapt and take in stimuli at a rapid pace. Videogames have the ability to teach people, even when people are not aware that they improving skills or expanding their knowledge.

In addition to adapting to rapidly changing environments, videogames help players adapt to life outside of the virtual world. With schools and education switching to technology as an aid for teaching, turning in assignments, and many other tasks, students with a background knowledge of how to work a computer adjust to the

technology focused society (Greenfield, Camaioni, Ercolani, Weiss, Lauber, & Perucchini, 1994). Videogames not only grant students a degree of comfort with technology but can also teach more complex skills troubleshooting when dealing with computers, giving gamers an edge over the rest of the population that rarely deals with technology other than when necessary.

Although videogames have been found to greatly assist inside the classroom and other educational settings, the benefits of videogames are not solely related to education and learning. One of the biggest reasons that students prefer video games as a form of education is because of the enjoyment found within videogames. A study in 2006 found six main reasons for people to find enjoyment within videogames: arousal, challenge, competition, diversion, fantasy, and social interaction (Sherry, Lucas, Greenberg, & Lachlan). A large group of middle schoolers, high schoolers, and university students were surveyed for average time played and reasons for playing videogames.

The top reason that people played videogames was because of the challenge that videogames presented. Challenge exists within videogames in a variety of forms, and many people enjoy videogames because of the ability to push their skills to the highest level possible and bettering past scores and levels of play. Challenge can also be manifested in a puzzle or difficult level that must be beaten in order to move onto the next stage or part of the game. Players seek to beat the videogame and personal bests with challenges.

Another large factor influencing why people game is competition, which should not be confused with challenge. While challenge is mostly located within the videogame and oneself, competition is the drive that players have to best others, seeing who the

better player is and who has mastered the difficult skills. Overall, challenge was the second highest reason to play videogames but the highest amongst college students and eleventh graders. Part of the appeal with competition is the ability to give groups a hierarchy of skill levels and the pride that one feels when being recognized as a top player.

One aspect of videogames that adds to the uniqueness is the ability to play within a virtual environment that is different and separate from the real world. The two draws that videogames have to players with the new reality is diversion and reality. Gamers will choose videogames because of diversion when they would like to get away from the real world. Reasons to escape include the desire to be away from stresses and responsibilities, filling time, or stopping boredom. Within the students, videogames were often used as a way to take a break from studying (Sherry et al., 2006).

Fantasy, while similar to diversion, was the second lowest reason players gave in the survey. While diversion focuses on getting into the virtual world in order to get away from the real world, fantasy is when players actively want to be in the game to do things that are not achievable in real life. Videogames can put players in a countless number of worlds and realities, anything from fighting in a futuristic war with lasers, to flying cars.

Typically thought of as a reason to play videogames, arousal was often mentioned as a reason, but scored in the middle of all of the scores. Arousal is any effect that a game can have on emotions, either from fast-paced action, beautiful graphics, or a moving musical score. This motive can be viewed as the outward expression of joy and fun that a player experiences while playing a videogame (Sherry et al., 2006).

The final reason to game, social interaction, was rated as the lowest reason the respondents currently play videogames, even though the chance to play with others was the reason that the majority of people got into videogames. There was an idea within the survey that videogames can be used as a way to stay "cool," and that one needed to stay up-to-date on the current popular games. One reason that social interaction has an appeal to players as a reason to game was because videogames can be used as a tool to learn more about the personalities of friends. One reason that social interaction may have dropped as a reason to play as players age is because of the types of videogames available. Not all videogames can be played in a group setting, and some games are only playable by one player. All of the above characteristics add to the enjoyment that players can find within videogames, and the diversity of videogames allow for a diverse population to enjoy all different kinds of videogames, seeking different gratifications (Sherry et al., 2006).

An important note to make about videogames within the educational environment is the need for them to remain as play, rather than be used strictly for education. Because enjoyment of the game is part of the large appeal that videogames have to students, monotony will lead to boredom and hinder the educational benefits that videogames can provide. In 1981, a study by Dekkers and Donatti looked into the benefits of early simulation videogames. There was a negative relationship between duration of training and training effectiveness. The longer that the simulation videogames were used in training, the less effective they became because of the boredom.

Diversion, one of the main reasons to play a videogame, is an explanation for the lack of effectiveness when videogames are used over a long period of time. Because

videogames are often used as a way to escape the problems and boredom in the real world, adding learning and other problems to this escape takes away part of what makes videogames so special. In the book *Man, Play, and Games*, Caillois states that when one is forced to play a game, it can no longer be classified as play (1961). Using videogames within an educational setting can increase performances, but the games should be used in moderation in order to protect the enjoyment that brings part of the success that videogames can have.

Negative Effects of Videogames

Although videogames can bring a lot of joy and benefits to a variety of settings, videogames have received a poor reputation and have been known to cause harm. Since videogames have become more prevalent and influential in popular culture, they have received blame for multiple problems within society including school shootings, and obesity. While it is difficult to directly blame videogames for each individual instance, the influence of videogames is not always positive on players.

One area where videogames have mixed results in affecting one's health is concentration. Rather than just negatively hindering the ability to focus, concentration is helped in one aspect but harmed in another. The negative effects are most apparent in children, who can have difficulties completed goal-focused tasks where concentration must be used for long periods of time (Gentile, Swing, Lim, & Khoo, 2012). Although long term concentration can be detrimentally impacted, short-term concentration is greatly strengthened. Experienced gamers are able to process information from their environment at a faster rate. Very successful gamers have been observed making and acting on up to six decisions per second, a rate four times faster than the average person.

Additionally, high level players are able to focus on six things at a time efficiently, with the average person only being able to keep track of four without becoming confused (Green, Pouget, & Bavelier, 2010). Elite players of the game StarCraft II typically average 180 actions per minute, and can get above 300 when focusing very intently. Concentration is both positively and negatively impacted by videogames because of the rate at which new things constantly appear and the need for an environment to be continually scanned in most games.

Because of the nature of videogames and the typical requirement for players to be stuck inside staring at a screen, videogames have negatively impacted the health of players who game out of moderation. A variety of negative health side effects can happen while one engages in videogames for a prolonged period of time, including eyestrain, headaches, fatigue, and mood swings (Tazawa, Soukalo, Okada, & Takada, 1997). Some of these side effects can arise as a result of staring at a screen for prolonged periods of time without resting one's eyes, poor posture, or small repetitive movements without proper support. Other common physical ailments that can be caused by videogames are tendonitis, repetitive strain injury, seizures, and increased heartrate (Emes, 1997). Although these problems can have any number of origins, the large majority of negative health effects of videogames can be easily be prevented by playing in moderation, or using proper posture with breaks in between gaming sessions.

Looking at children, videogames can have strong, negative effects when not played a safe amount. In 2001, a study by Tazawa and Okada looked at the effect that videogames and television have on sleep. The survey collected the responses of 1172 parents of elementary schoolers and found that boys typically play more videogames and

watch more television than girls. Although the amount of time watching television did not play a role in black rings under the eyes or muscle stiffness, videogames did. Because videogames are a lot more involved than television and players must focus intently on the screen, the videogames negatively impacted eye health. Similarly, when videogames are played, eyes are glued to a television while the head is held upright and the body attempts to make rapid movements of extremities. All of this gaming can overwork one's body, leading to a state of exhaustion in one's head and shoulders or cause stiffness in the back. When parents intervene on the amount of videogames that they allow their children to play, there are fewer negative side effects, and the children were able to sleep more.

When videogames are played to an excessive extent, a large number of abnormal physical effects can arise. As identified by Griffiths and Wood in 2000, doctors have discovered the following negative side effects in people who spent an abnormal amount of time playing videogames: auditory hallucinations (Spence, 1993), enuresis, which is an inability to hold one's bladder (Schink 1991), tenosynovitis (Brasington 1990), and peripheral neuropathy, damage to nerves that can negatively impact sensation and movement (Friedland & St. John, 1984). While videogames can impact many different parts of one's physical body, many of these side effects are extremely rare and were cured when videogames were cut from one's routine.

The excessive play of videogames has been linked to many physical ailments, but simply spending too much time playing videogames can be a problem in itself. When one spends an excessive amount of time playing videogames, one can develop an addiction to videogames. Anderson and Ford believe that the most dangerous part of

dedicating a lot of one's time to videogames is not the risk of the abnormal physical ailments, but rather the development of videogame addiction (1986).

Similar to many other types of addiction, videogame addiction has symptoms and detrimental behaviors negatively impacting one's life. In 1983, Soper and Miller listed videogame addiction equal to other behavioral addictions because of the cumpulisive behavior, a loss of interest in outside activities, minimal association with other who are not addicts, and symptoms of withdrawal when attempting to stop, such as physically shaking. Because of these symptoms and sufficient research, internet use gaming disorder has been included in the newest edition of the *Diagnostic and Statistical Manual of Mental Disorders*, the manual that lists all universally accepted disorders in the United States (APA, 2013).

Although one of the characteristics of a disorder is the need to cause distress in a life, a longitudinal study by Shotton in 1989 looked at the impact that videogames have on the lives of a large number of people. This study looked at 127 people who reported themselves as being "hooked" on videogames for at least five years. Surprisingly, this study found that this population was highly intelligent, motivated, and achievement oriented. Five years after the study, the younger group in the study found a lot of success academically, attended university, and held positions at high ranking jobs. Many of the individuals led high functioning lives, but felt they were often misunderstood. The balance between a large amount of time spent between the virtual world and real world was probably a factor in this feeling.

When looking through reviews for new videogames, typically a game is viewed in a positive manner when the reviews label the game as "addicting." When a game is

addicting, the videogame can easily keep the players' attention and allows the player to log a large amount of hours in the videogame without growing bored. In 2005, the videogame Stardew Valley, a roleplay farming simulator, was released with fantastic reviews. Many players reported an "addiction" to this game, with some playing 10 hours or more daily. Looking into what makes some games more addicting than others, Griffiths and Dancaster (1995) concluded that the greater a game's effect on one's arousal level, the greater the level of addiction will be.

The idea of an "addicting" videogame is enjoyable and a selling point to some people, but those who are dealing with a videogame addiction struggle to quit the detrimental videogame habits. In Amsterdam, Netherlands, and addiction treatment center has recently started detoxing and treating adolescents and young adults who believe they no longer have control over their addiction to videogames. This addiction has the same compulsions to perform an activity, similar to gambling, and has taken over and ruined lives (Rathee, Rathee, Bhardwaj, 2014).

On a broader scale, internet addiction can include the need to play videogames online. In order to diagnose internet addiction, the amount of time one spends online is not a direct factor, but addicts will typically spend anywhere from 40 to 80 hours online every week, with individual sessions that can last 20 hours or longer (Young, 2004). As a result of this extreme amount of gaming or being online, sleep schedules are disturbed because addicts will play through the night. This loss in sleep can harm the immune system's ability to respond to diseases, and cause extreme fatigue. When away from the internet, addicts will suffer from reoccurring thoughts like "I must have the internet," or "I cannot go without the internet." Typically once the internet is used to this extent, the

purpose shifts away from being an information tool or sense of pleasure and becomes more about a coping mechanism or way to escape from one's problems (Young, 2004).

A unique problem that internet addiction can lead to is a cyberaffair, which is a romantic and/or sexual relationship that is started online. Because of the unique origin of this relationship, the majority, if not all, of the interaction occurs online. This new form of an affair has the same destructive abilities of standard affairs and can break up former stable, long-term relationships and marriages. Internet addicts reported serious relationship problems that lead to marital discord, separation, and divorce (Young, 1998). These cyberaffairs can be more dangerous than standard affairs because of the ability to instantly meet at any hour of the day online or inside of a virtual world. Another issue is the ease of hiding an affair online. If a spouse already spends a large amount of time online, the partner may have no idea that an affair is occurring. Cyberaffairs are a quickly growing way that an addiction to videogames can cause great harm to one's life.

Another way that videogames have the ability to ruin lives is the unhealthy amount of time that one spends playing them, thus losing time spent for other activities. When looking at gamers achievements in school, players have negative views towards school. Similarly, unsuccessful students typically spent much more time playing videogames than high achieving peers, including gaming sessions three hours or longer at a time (Colwell et. al, 1995). Roe and Mujis (1998) suggested that one reason people who play a lot of videogames score lower in school is because of the smaller amount of time they are able to focus on studying and homework. The direct impact of videogames on academics is unclear. While videogames could hinder one's ability to focus on school, students could also turn to videogames as an escape from a learning environment

that they already do not like. Regardless, videogames played excessively have been associated with poorer scores in school.

An addiction to videogames is not the only negative psychological effect that can develop from an abundance of gaming. Looking into the changes in behaviors in avid gamers, Bosoth (1994) did not find an increased rate in risk-taking behaviors like alcohol and drug use. However, one large change in gamers was a higher risk for depression. The more important players viewed the games in their personal life, whether for social interaction, enjoyment, or a sense of confidence, the more likely they were to report depression. Videogames do not provide enough gratification to sustain players who find their worth within the game and not outside achievements or relationships.

Cyberbullying and Cyberaggression

Perhaps the most detrimental aspect of videogames is the possibility of cyberbullying online. Cyberbullying is any form of bullying or harassment that takes place over the internet, cell phones, videogames, or other electronic devices. Examples can include sending insulting or harsh messages, aggressive comments, or threatening harm (Kowalski & Limber, 2007). When comparing cyberbullying to traditional bullying methods, Barlett, Gentile, and Chew (2016) discovered three key differences: the ability for more repetition of the bullying online; cyberbullying does not cause any physical harm; and when online, one has the ability to bully and remain anonymous.

One important distinction to be made is the difference between cyberbullying and "cyberaggression." The term "cyberaggression" was first used by Schnurr, Mahatmya, and Basche (2013) in order to discuss one time conflicts versus continual interactions. This study held that cyberbullying needs the element of repetition, and without this factor

the behavior cannot be classified cyberbullying. When looking at the labels given by adolescents, repetition is typically viewed to be required for cyberbullying. A survey from 2010 in Canada asked over 2000 students whether they had engaged in cyberbullying, and only 14% reported being a victim or perpetrator of bullying, even though 50% had experienced aggression online and 33% were aggressive towards others online (Mishna, Cook, Gadalla, Daciuk, & Solomon). Sugarman and Willoughby (2013) found similar results with adolescents waiting until aggressive behaviors had been repeated for the action to be labeled as "bullying." While a large amount of the harassment that takes place online takes the form of individual interactions, games with a smaller player base can have a higher chance of cyberbullying because of the increased probability of continually running into the same players.

Although cyberbullying takes place entirely online, the effects can be lasting and carry far outside of the virtual environment. Continual cyberbullying can have negative impacts on the victim's mental state, increasing the likelihood of psychological distress and depression (Ybarra, Mitchell, Wolak, & Finkelhor, 2006; Chang, Lee, Chiu, Hsi, Huang, & Pan, 2013). Both victims and perpetrators have reported higher levels of social anxiety as a result of cyberbullying (Pabian & Vandebosch, 2016).

A large number of factors play into who is likely to be the perpetrator or victim of cyberbullying. Looking at the prevalence of bullying in America, it is estimated that 30% of youth are impacted by bullying, either as the victim or bully (Nansel, Overpeck, Pilla, Ruan, Simons-Morton, & Scheidt, 2001). Those who both engage in bullying and are bullied by another report the lowest level of psychosocial functioning, and this phenomenon holds true in cyberbullying as well (Haynie et al., 2001; Ybarra & Mitchel,

2004). Risk factors that can impact the emergence of cyberbullying in high school are online game use, exposure to violence in media, high risk behaviors on the internet, and previous experiences with cyberbullying (Chang, Chiu, Miao, Chen, Lee, Huang, & Pan, 2015).

In regards to who is likely to be on the receiving end of cyberbullying, many of the characteristics that bullies look for in the real world are also searched for when engaging in bullying online. Some of the features are so similar that Ybarra and Mitchel (2004) reported in their survey on youth internet use that about half of the victims of traditional bullying are also bullied online. This can result in the internet failing to provide the haven that some people search for online and can be one more tool to which the bullies have access. However, the population of victims is distinct because half of the victims are only bullied online and are not the victims of traditional bullying.

When determining a possible victim to cyberbully, the type of videogame can play a role in who is chosen. Videogames have been shown to have the ability to negatively impact the affect, thoughts, and actions of players. In 2013, Saleem and Anderson looked at the attitudes of players after playing videogames that contained aspects of terrorism and had stereotypical depictions of different ethnic groups. Compared to games without these aspects, gamers were more aggressive, and had more negative attitudes towards the particular group. Bullies do not always look for certain characteristics within possible victims, but can also be impacted by the influence of the game.

One key difference between traditional bullying and cyberbullying is the role that social anxiety plays. Social anxiety typically develops as a long-term result of bullying

(Pabian & Vandebosch, 2016). In contrast to traditional bullying, where social anxiety is developed with time, this study also found that perpetrators seek out victims who already have high levels of social anxiety. La Greca and Stone (1993) suggest socially anxious victims are selected because of the diminished ability to defend themselves and worse social skills. Although one might assume that socially anxious people are more likely to use the internet because of the separation from face-to-face contact, socially anxious individuals are no more likely to use the internet than peers (Madell & Muncer, 2006).

Perpetrators of cyberbullying have multiple characteristics in common. Social anxiety impacts the bullies online as well as the victims because this form of bullying is more anonymous and less confrontational than standard types of aggression (Kowalski & Limber, 2007). One of the most important characteristics of cyberbullying is that a bully not only spends a large amount of time online but also has a high understanding of and proficiency with technology and the internet (Walrave & Heirman, 2011; Vanderbosch & Van Cleemput, 2009). Risky internet use is also a factor when identifying risks towards leading to cyberbullying (Erdur-Baker, 2010). In regards to age, adolescents between the ages of 12-15 are most likely to cyberbully, in addition to teenage to early adult males (Erdur-Baker, 2010).

An interesting phenomenon that has begun to take place in regards to perpetrators of cyberbullying is the "revenge of the nerds hypothesis." When asked for the reason people will cyberbully, studies have shown that revenge is a commonly cited reason (Hinduja & Patchin, 2009; Sanders, 2009). The stereotypical idea of a victim of bullying is a small person, typically a nerd, without the ability to protect himself from a larger, more menacing bully. With the advancement of technology and ability to cyberbully

with the possibility to remain anonymous, those who have long been bullied have the ability to seek revenge. In looking at who current cyberbullies choose to attack, the last victim of 41% of bullies was someone who had previously cyberbullied them. Additionally, over half of the victims of traditional bullying who turned to cyberbullying stated that at least a quarter of people they cyberbully had previously bullied them within the past six months (König, Gollwitzer, & Steffgen, 2010). Although physically weaker than the original perpetrators of bullying, these new cyberbullies are able to feel a sense of power and assert dominance over those they previously were not able to. Traditional bullying can take away the power and control that victims feel over certain situations, and cyberbullying can grant the previous victim a new sense of control from the safety behind a screen, removed from the danger of directly standing up to the original aggressor.

Similarly, cyberbullying can be a way for victims to release their feelings from being bullied. Cyberbullies are more likely to choose victims who have a lower socioeconomic status (Wegge et al., 2014). Perpetrators of cyberbullying can find power not only in their higher social class, but also advanced skills with technology, allowing them to cause harm to a prior bully, returning their power. One interesting thing to note is that the more one engages in cyberbullying, the higher his belief in his social standing and popularity, although cyberbullying does not enhance his level of popularity.

Cyberbullying has been growing in popularity because of numerous advantages that can happen while online. With all of the new inventions of different devices, people are able to access the internet from virtually anywhere, whether on computers or cellphones, and the internet can provide the bully a certain level of protection. Actions performed online can be performed anonymously because of the disconnect from the real

world and safety that the screen can provide (Slonje, Smith, & Frisen, 2013). As previously mentioned, the internet can become an extension from school, preventing the bullying from ending just because the individuals are apart. Because of the anonymity and separation from adult supervision, cyberbullies prefer this method over traditional methods with the lower chance of getting caught or receiving a punishment (Smith et al., 2008).

While cyberbullying is not limited to messages over the internet in videogames, there are ample opportunities to cyberbully within an online game. Oftentimes, aggression from one's outside life can be transferred into the videogames reality. Not all victims of cyberbullying seek revenge on bullies. Some victims will turn to aggression against a random third party online. In order to regain control that was lost by cyberbullying, one can release anger and frustration onto someone completely different online (Konig, Gollwitzer, & Steffgen, 2010).

Online disinhibition effect. Because of the separation that the online world can provide, people can act differently online than they would in the real world. As previously stated, victims of bullying who would never want to be aggressive directly to someone can use the internet as a way to seek revenge. This phenomena is known as the online disinhibition effect. Internet users become a lot more open online, self-disclosing close secrets that they never would share off the internet, while others might be aggressive more often or in harsher ways once they enter the online world. The online disinhibition effect is limited into two main categories. Benign disinhibition is where people are more likely to reveal personal information, sharing secrets, fears, emotions, and wishes. This change can even include individuals being uncharacteristically kind,

putting others first in an attempt to help. The motives for behaving differently online can include searching for one's true identity, resolve problems affecting one outside of the online world or internally, and develop oneself. One can use the new world online in a search for self-actualization, with the drives behind the change being for positive growth (Suler, 2004).

Sadly the internet does not always result in individuals trying to evolve into a better form of oneself. The other form of online disinhibition is toxic disinhibition, where people use harsh and rude language, criticize, become angry, are filled with hate, and threaten others. An additional shift can be individuals exploring sections of the internet that are avoided offline, such as violence, crime, and pornography. One who goes through this shift is not actively trying to grow, but rather could simply be blindly following a darker motive or desire.

The study by Suler in 2004 listed six main reasons why people can experience this drastic change in character online: dissociative anonymity, invisibility, asynchronicity, solipsistic introjection, dissociative imagination, and minimization of status and authority. Many of these reasons are unique to the internet and can serve as an appealing reason for people to cyberbully.

An advantage that the internet can offer in social situations is the ability to remain anonymous. Within many online gaming worlds, the only information that is given to other players is the online name that is chosen. A player's appearance, gender, thoughts, and personal life can all be completely hidden. Some websites can even allow people to avoid choosing a name and interact online with complete anonymity. As a result of this ability to hide one's true self, dissociative anonymity plays a large role in why

individuals will behave differently online. Because internet users can act in a manner that is separate from their normal identity, users can feel less vulnerable online and have a better opportunity to act out. While disassociating from the real world self, behaviors performed online do not have to be owned. The dissociation can result in some individuals completely avoiding all ownership of behaviors that happen online. With the ability to create a new self, individuals can also aim to behave in a manner that is nicer and more outgoing than they typically behave offline. This new identity can sometimes be viewed as an entirely separate being (Suler, 2004).

Although one of the drawbacks to written communication can be not being aware of how a message is received, this factor can play a role in why people behave differently online. The invisibility that is given to participants online can encourage people to behave in abnormal ways, granting them courage to visit websites or say things that would not be said under normal circumstances. When someone is ready to share a deep thought, feeling, emotion, or dream, perceived judgement from others, either in the form of shaking a head, a frown or sigh, or another negative form of nonverbal communication, can discourage one from continuing. Without the possibility of eye-contact, or social anxiety from speaking in front of someone, the internet can allow people to behave in different ways because of the ability to hide behind the screen (Suler, 2004).

Compared to more standard forms of communication, there is not a proper time frame in which someone needs to respond online. Conversations online can occur between people in two completely different time zones, and responses can be delayed not just for seconds, but up to days and even weeks later. Because interactions do not take

place in real time, people feel free to act in a different way since the user will not have to deal with another's immediate reaction to a message. During a conversation, the reactions from others heavily influence future remarks. People usually choose to obey social norms as they respond to the reactions from others. Without the input from the other part of the conversation, people are more likely to follow their own deeper desires, allowing them to avoid these norms. The lack of time can also allow people to post a message and then leave the comment. Posters can separate themselves from their message, feeling safety in revealing a deep thought without experiencing the reactions of others (Suler, 2004).

Solipsistic introjection, the fourth reason for online disinhibition, occurs when feelings of one's mind merging with a companion's mind takes place and that person's psychological presence and influence have impacted the original user's psyche. This experience happens because a voice can be assigned to a stranger online, either consciously or unconsciously. In addition to a voice, the different user can develop into a visual image and be assigned a character within the intrapsychic world of the internet user. This image and character can be shaped by how the other user behaves and is presented online within the text communication, and also one's internal ideas for representation that can be shaped by personal expectations, wishes, and needs. After the initial development of the character, the image can be shifted as a result of the new persona having resemblances to people known offline. Factors influencing the more precise details can be close friends, significant others, past relationships, books, and films. As a result from these imaginary characters, one's reality is based upon the imagination where the characters reside, and the role play required to interact in the

fantasy with the other user can produce disinhibition and a change in behavior online (Suler, 2004).

Because the internet can be used as a way to escape one's problems and the real world, the combination of the fantasy and created characters and the escape online results in dissociative imagination. Instead of creating a new character from another user, this cause of online disinhibition arises when the internet user creates a new character for himself. This new persona is viewed to live in a separate world, away from the stresses, either responsibilities and demands or social norms, that the user experiences offline. These users believe that there is a distinction between the online and offline worlds, and the laws and rules that govern one area are not always applicable to the other. Dissociative imagination is most heavily seen in fantasy games, such as massive multiplayer online role playing games, MMO RPG, where gamers create an imaginary character, and then interact with many other users in a fictional, online world (Suler, 2004).

The final reason for people to behave differently online arises as a result of the equality that takes place on the internet. Because many people view the others that they interact with as peers, a minimization of status and authority exists. While one's personal beliefs, opinions, and standings can play a large role in the real world, an equality is present online, where nothing is immediately changed based on one's gender, status, wealth, or race because of the ability to hide these characteristics. Offline, people can demonstrate social standings and power in dress and body language. The large shift in behavior occurs because of possible fears of speaking true thoughts in front of authority figures because of disapproval or punishment. The idea of an authority is heavily

minimized online, resulting in people sharing true thoughts and even misbehaving (Suler, 2004).

With all of these possible ways to impact one's behavior, the change in behavior can also vary. Similar to how one's behavior can either become much more beneficial than normal or seek to cause harm, the level of influence can vary greatly. While some individuals may see only minor shifts in behavior, others might appear to be completely different and unrecognizable online. It is very important to remember that one does not become a different person online, but that a different side of the self is exposed. The self is not independent of the environment, and the self is able to take a variety of forms. If one is passive in face-to-face encounters but becomes very aggressive online, one form is not more real than the other. The dimensions both equally belong to the person and simply arise in different environments.

One part of Suler's theory that has been shown to greatly impact the behavior of bullies online is the ability to remain anonymous. Anonymity has had such a large influence on cyberbullying that some researchers believe that withholding one's identity is an important part of cyberbullying (Vanderbosch & Van Cleemput, 2009). One study found much higher rates of harsh comments when one was anonymous on an online message board. Fifty-three percent of anonymous comments were uncivil, while only 29% of comments were rude when the identity of the poster was accessible (Santana, 2014). This study not only shows the influence of anonymity, but also a high likelihood of uncivil comments online, regardless of the availability of an identity.

When looking at online forums, a 2012 study found the majority of cyberbullying attacks were anonymous. This study looked at 5,230 online forums for commenters who

chose to post as "anonymous" rather than have the comment attached to a name or username. Instances were also ruled out when the two individuals were found to have multiple interactions. Bullies preferred to hide behind the ability to remain anonymous, rather than openly take responsibility for comments (Moore, Nakano, Enomoto, & Suda).

Anonymity plays such a large role on bullying that the more one feels anonymous online, the more likely one is to act aggressive. Barlett, Gentile, and Chew (2016) found that the higher level of anonymity that a person feels online is significantly related to cyberbullying behavior. This study also found that anonymity was associated with positive views of cyberbullying. Over time, one's behaviors become more stable, and when one does not receive any negative consequences from negative comments online, their actions appear to be acceptable and eventually positive. The ability to remain anonymous online supports positive beliefs about cyberbullying.

Videogames allow for cyberaggression to transfer away from a specific target towards a random third party. Cyberbullying can be directed to another player in a videogame through displaced anger. This type of cyberbullying has no relation to revenge. This transference of anger is not always successful when revenge is a motive for the cyberaggression because justice can only be realized when one harms the original cyberbully. When there is no desire for any revenge, one can choose to cyberbully others online because of the perceived power that one can feel over others online when attacking them, or the online environment can provide one an avenue to release built-up anger (Konig, Gollwitzer, & Steffgen, 2010).

Cyberbullying effects on different populations. While many of the previously discussed influences and effects of cyberbullying can be applied to a large variety of

different populations, many large group differences play a role in the impact videogames can have. Age, gender, and even race all influence cyberbullying and the effects.

In addition to cyberbullying being able to erase the power that one might have from age, the age of technology users affects the type of technology that is used and how one reacts. By the time one reaches adolescence, technology is used on a regular basis as a form of communication, and many youths even believe that computers and other electronic forms of communication are crucial and necessary tools for their social lives (Kowalski, Limber, & Agatston, 2008). Because of this need to be near electronic devices, adolescents have easy access to the means to bully others.

Videogames are able to serve as an outlet for some younger children. Before younger populations are fully able to deal with complicated emotions and feelings, videogames can be used as an outlet to release frustration and build-up aggression. Similar to how some children find a positive outlet for aggression within sports, one can vent and work through frustration while playing a videogame, allowing for lower stress levels. In order for this outlet to remain positive, the videogame must have very low violence levels and only be played for a set amount of time (Rathee, Rathee, & Bhardwaj, 2014). Although videogames can serve this positive use at a young age, it is possible that this outlet for aggression that is used in a positive manner can develop into a much more detrimental form of expression over time.

Younger children can also be influenced negatively by videogames. Before children can properly regulate time and their own schedules, kids can spend large amounts of time playing videogames and sacrifice sleep as a result. When the amount of time playing videogames was not monitored by authority, Tazawa and Okada (2001)

found that children spent more time on videogames than school work or other recreational activities, reducing the amount of sleep they would get on a nightly basis.

Another important factor that can influence videogame play and cyberbullying is race. In 2013, Low and Espelage found that Blacks had higher bullying perpetration rates than other races. This finding has been reproduced nationally, and this study reported higher risks within this population. Blacks on average reported higher instances of family violence, alcohol and other drug use, and hostility, and lower levels of possible protections such as empathy and parental monitoring. Compared to the white population, Blacks had more depressive symptoms while bullying, rather than hostility. While race does appear to influence bullying levels, the environment also has a large impact.

In addition to some populations being more prone to bullying and cyberbullying, the races within a videogame can influence thoughts and actions of the players. Looking at the role that stereotypes play, violent videogames have the ability to influence racial attitudes and aggression depending on which races were used in the game. Yang, Gibson, Lueke, Huesmann, and Bushman (2014) investigated the effect of the link between black characters in videogames and violence. This study performed two experiments, where white college-aged students played a violent videogame either as a white or black avatar. Both characters were designed within the game based on cultural stereotypes for each group. When the participants played as the black avatar, there were higher levels of implicit and explicit negative attitudes towards Blacks. Similarly, the participants had higher scores on a symbolic racism test, and had more and stronger associations between Blacks and negative words, phrases, and ideas. The results were

significantly different when participants used the white and black avatars, showing that small cultural biases that are portrayed in society can be carried into the virtual world.

The second experiment from the study by Yang et al. (2014) found an increased level in violence in the white participants. After playing as the stereotypical black avatar, the attitudes towards this community affected the gamers so strongly that attitudes and behaviors carried into the real world, even after the game ended. Participants were also more likely to view Blacks in a negative way and associate them at higher levels with weapons. The same effect did not occur when the gamers performed the same violent acts with a white avatar. The reason that simply playing as another race can have such a large impact on the player is because of the preexisting negative stereotypes that appear in the media and that the game enforces.

> Exposure to a violent stimulus related to an avatar's Black race should increase the accessibility of aggressive cognitions in memory stereotypical of that race (e.g., "Black men are violent," "Black men are dangerous"). Such increased accessibility of negative beliefs about Black people may also activate other semantically related thoughts, feelings, and behavioral tendencies (Berkowitz, 1990), leading to more negative attitudes toward Blacks (pp. 1-2).

Because of the deep rooted cultural biases that our society holds, simply performing acts with different avatars can not only influence thoughts, but lead to more aggressive behaviors. When interacting online, if one is dealing with common stereotypical views, their interactions with others could possibly be affected.

As seen in the prior study, avatars are able to have a very strong influence over a videogame. The avatar can influence videogames in a variety of ways, such as how

much a player identifies with the avatar, and aggression levels. With the advancement of technology, avatars are able to appear extremely realistic, and some games allow for seemingly endless possibilities to customize an avatar. When players are able to customize an avatar, they feel more connected to the avatar, can identify with the character, and can imitate the actions of the character they control. In violent videogames, gamers are more aggressive after playing when they are able to customize the avatar, rather than play a preassigned avatar (Hollingdale & Greitemeyer, 2013).

Cultural stereotypes that influence gameplay do not stop with race. Gender is also an important factor with the impact that avatar's have on a player. When both men and women play a violent videogame as a male avatar, they are more aggressive after the game ends than when playing as a female. Players also reported more aggressive thoughts when playing as a male avatar. This effect is stronger in men, but significantly different for both groups. Women reported the strongest levels of aggression when playing against a male avatar and the lowest levels when both characters were female. Similar to race, when a player acts in ways that approve stereotypes, that men are more aggressive, these ideas affect the players and appear true (Yang, Huesmann, & Bushman, 2014).

Gender plays a large number of roles in interactions online. When going off stereotypes, one typically thinks of the standard gamer as a relatively young male. On average, females report significantly lower levels of videogame play, with less regularity and shorter durations (Griffiths & Hunt, 1995; Griffiths, 1997). There are a variety of reasons for why videogames are viewed to be dominated by men: the types of

videogames that are popular (Griffiths, 1997), the negative stereotype of girl gamers, and the treatment of females online (Bertozzi, 2012; O'Leary, 2012).

When looking at motivation for females to play videogames, social components have a large role, either encouraging or discouraging play. Research is divided on the appeal that social factors play on females playing videogames. Sellers (2006) found that social enjoyment was a crucial factor in enjoyment that women find online. Components like a persistent identity, and easy ways to communicate with others have been found to add to social enjoyment for women.

Although social support and fun with friends online can be appealing, the social aspect of videogames can also keep women away from playing videogames. In the study previously discussed by Sherry, et al. (2006), the largest difference in motivation to play videogames between males and females was social interaction. While the motivators to play videogames (arousal, challenge, competition, diversion, fantasy, and social interaction) were mostly ranked in the same order for both genders, males had social interaction much higher on the list than females. This study suggested that social interaction might not be a motivator to play for both males and females because of the low ratings that were given. Males also rated all of the motivators higher than females did, possibly showing that males find greater enjoyment in videogames than females.

One reason to explain why social interaction can be negative online for women is the role that gender plays in cyberbullying. Many studies have found that males have higher rates of committing cyberbullying than females. Looking at perpetration rates throughout schooling before college, males were found to have higher levels of being perpetrators of cyberbullying than females, and with time, females were more likely to

stop cyberbullying (Chang et al., 2015). Similar studies found that males are more likely to be perpetrators of cyberbullying, and females are more likely to be bullied online (Walrave & Heirman, 2011; Wang, Iannotti, & Nansel, 2009). The increased likelihood of victimization can be an important factor that can take away some of the enjoyment that females can find online.

Because of societal standards and stereotypes, women can find and enjoy an entirely different experience in the virtual world compared to the real world. Videogames can give power and freedom to females that can be withheld as a result of societal expectations. Within the patriarchal society that many women are raised, opportunities to learn to obtain and defend power are typically learned through play that is dominated by males (Yalom, 2004). This play often comes in the forms of physical activities such as sports and involves aggression. Women are naturally disadvantaged and even discouraged from participating in many of these kinds of play by society.

A review by Bertozzi in 2012 analyzes the positive impact videogames can have on women as an outlet from the restrictive society in which they live. She found that females are able to participate in the play that teaches manipulation of power online because of the natural equality that can be granted online. Many factors that can negatively impact a female's interaction with others, such as relative attractiveness or body mass index, are unknown to the online community. One does not have to reveal their gender online, and players can play completely free from societal expectations during the entire time online.

When choosing which videogames to play, females often prefer games that value culturally-enforced feminine ideas, such as self-beautification, shopping, and prosocial

behaviors. Examples of games that meet these criteria are the Sims, Farmville, and Animal Crossing. Bertozzi continues to argue that females will find many benefits in predation games and violent games that do not stress these values. The virtual world offers a unique environment where females can freely learn and practice skills that would not otherwise be easy or culturally acceptable to rehearse. Bertozzi defines predation games as "games in which the player's representation (the main character or player avatar) finds itself in a situation where it is under attack by enemies seeking to eliminate it from the game environment and where the player is motivated by ingame rewards to respond with equivalent violence to achieve the goals of the game" (p. 448). Predation games teach players how to react and excel in rapidly changing, stressful, dangerous environments. These games also require players to remain relaxed when confronted with tense and difficult situations and environments, learn to adapt to intelligent opponents and their strategies, and deal with death as a motivating factor that cannot always be avoided. Because of the strong influence of the environment, players are forced to look outside of themselves and focus outward towards accomplishing an external task. Although practiced online, dealing with the stress and difficult problems that videogame worlds can create can be transferred and applied outside the videogame once these skills have been mastered. Another benefit that videogames have in teaching adaptation is the lightened effect of failure. When one fails within a predation game, the consequence is typically respawning and being forced to start again. The real world does not always allow second chances when dealing with mistakes.

Although there are many positive benefits to playing these types of videogames, some females may be hesitant to engage in these types of environments. Because

videogames can serve as a haven and escape from the outside world, many gamers do not want problems that exist outside of the games to follow them online. To females, the real world can seem to hold many of the aspects of predation that can exist online. The impact of the fear of being raped or sexually or physically harassed offline, a common reality for females, can prevent them from wanting to participate in high stress environments online (Whitzman, 2007). Griffiths (1997) found that on average females preferred videogames that did not have violent components. Additionally, as a result of the online disinhibition effect, people can behave in harsher manners online, only exaggerating the previously held fears of would-be female gamers. In tense situations online, many gamers act in very aggressive and harsh ways, further increasing the fear that females can have of being an object of predation. This aggression coupled with the misogynistic and anti-female culture that exists online, reduces the appeal that predation games have (O'Leary, 2012). However, Bertozzi (2012) argues that if females take part in these aggressive online communities, females may better understand the harsh behavior and be able to compete against males better.

The anti-female culture that exists online is not only encouraged by the players but also the games. Because males are the primary players of violent videogames, some games incorporate sexist elements. A study by Gabbiadini, Riva, Andrighetto, Volpato, and Bushman (2016) found that within these violent-sexist videogames, males who identified with the violent character had increased levels of masculine and sexist beliefs and decreased levels of empathy for the female victims. By viewing and controlling the actions against the victims, gamers experience a greater connection to the violent character and a difficult time understanding the perspective of the victim. The increased

masculine beliefs that these types of games can create are negatively related to feelings of empathy for female victims. These results only held true for males, and females did not have lower levels of empathy for other females within these violent videogames. This effect is a possible explanation for why males are more likely to cyberbully than females, and although not intentional, videogames have the power to impact beliefs about others in real life, offline.

Prevention. With the increasing epidemic that cyberbullying and online aggression have become, there has been a recent focus on the best ways to prevent these negative actions online. With younger populations, good relationships between parents and children can remove the possibility of cyberbullying. Jeong and Kim (2011) found that a strong relationship between children and parents was the most important factor in preventing gaming addiction. People who spend three hours or more online daily are two and a half times more likely to come into contact and feel the need to report harsh levels of cyberbullying (Ybarra & Mitchell, 2004). Because of the influence that revenge can have on cyberbullying, parents reducing time that youth spend online can decrease the perpetration rates of cyberbullying.

Another effective way to combat cyberbullying is through effective school programming. By teaching students proper ways to deal with cyberbullying as protective measures, perpetration rates decreased in schools (Chang et al., 2015). Schools have also attacked cyberbullying by teaching that cyberbullying is harmful and showing the effects that can arise (Couvillon & Ilieva, 2011; Heirman & Walrave, 2012). Similar to how students are taught to behave in formal settings, schools should also teach students proper

etiquette with their interactions, dispelling the myth that behaviors can be different online.

Perhaps an undervalued way to prevent cyberbullying is by looking at the types of games that are used when the cyberbullying and cyberaggression occur within a videogame. Because themes and stories within videogames have the power to influence gamers, such as changing how males view females within violent sexist videogames (Gabbiadini, et al., 2016), videogame designers have a responsibility when designing games and storylines. When players take part in the actions of videogames, they live and experience what a character is going through, and when these games include negative components, gamers adopt these ideas. By encouraging positive ideas, videogame designers could reduce the rates of cyberbullying.

In summary, cyberbullying is a problem that has quickly risen over the past decade with the increased emphasis on and advancement of technology. This form of bullying is unique in many ways, including the ability to remain anonymous (Barlett, Gentile, & Chew, 2016), and the change in character that can occur as a result of unique environment the internet can offer (Suler, 2004). Factors that can uniquely influence cyberbullying are social anxiety (Pabian & Vanderbosch, 2016), and revenge (Konig, Gollwitzer, & Steffgen, 2010). The aggression that takes place online can be influenced by a number of factors like race (Yang et al., 2014) and gender (Yang, Huesmann, & Bushman, 2014). Cyberbullying can have many negative effects, but research is lacking in the role that cyberbullying and more specifically cyberaggression can have on self-efficacy.

Self-Efficacy

Basic theory. One of the leading psychologists of the twentieth century, Albert Bandura discovered and researched the idea of self-efficacy, defined as "peoples' beliefs in their capabilities to produce desired effects by their own actions" (Bandura, 1997, p. vii). This construct plays a large role in not just the motivation of individuals to carry out a task but can also influence the choice of activities, settings, and the accomplishment of the activity.

Self-efficacy is not innate in people and can be influenced by a number of factors. Bandura believed that people are heavily influenced by their environments and adjust to new stimuli. One of the ways that the environment can influence the individual is through modeling. New behavioral patterns are learned as a result of cognitive processes coding and retaining symbols for memory representation. Because these cognitive processes can occur without much thought, transitory, seemingly unimportant experiences can influence an individual, even to the point of behavioral changes. Although an individual may have never consciously focused on a behavior, learning can take place as a result of modeling the observed response or task (Bandura, 1977).

Learning that can impact behaviors also occurs as a result of the outcomes after tasks. Consequences after any action can serve as a way to inform an individual how much success or failure occurred. The outcomes of one's own actions are beneficial because they show what was done correctly to achieve positive results or what should be changed to avoid more future negative results. The consequences are not spoken and give honest feedback without the bias that others can give. In order for the consequences to impact behaviors, individuals must be able to see how the feedback is directly related to their behavior. When random responses occur after efforts, people are not impacted

and do not change their behaviors because of the inability to control the situation (Bandura, 1977).

This ability to learn from one's behaviors can directly impact one's level of self-efficacy. Another factor that helps develop self-efficacy is previous successes from similar situations. Specifically, the ability to focus on positive thoughts relating to previous successful completions of related tasks was found by Bandura (1977) to help develop high self-efficacy.

Other factors that Bandura found to increase levels of self-efficacy are visualization of the intended action and verbal persuasion. In order for the visualization to have a positive effect on self-efficacy, one should specifically focus on the intended goal and imagine the attempt as successful. This change on self-efficacy can also come from others. The persuasive comments of an individual that can be described with one of the following characteristics—powerful, trustworthy, expert, and attractive—can influence the actions and beliefs of the listener, ideally increasing the level of self-efficacy (Bandura, 1977).

Because there are varying levels of self-efficacy, one's beliefs in their actions can also be harmed. Previous unsuccessful attempts and thoughts about the failures can lead to diminished levels of self-efficacy. One's level of arousal and emotion can greatly impact current levels of self-efficacy, either for better or worse. Similar to how recalling positive memories from previous successes can benefit self-efficacy, when arousal is paired with positive emotions, one can experience an enhancement to self-efficacy. However, when one is psychologically aroused and experiences negative emotions, self-efficacy levels can drop (Bandura, 1977). Regardless of previous successes or failures,

one's current mental state is very important and influential when determining their confidence and success levels for specific tasks.

Self-efficacy can play a direct role on one's motivation to accomplish a certain task, either positively or negatively. With a pre-conceived idea of level of success within an activity, effort involved will continually increase or decrease in order to match how one expects to perform. When one has high self-efficacy with a specific task, there will be a higher level of motivation in order to achieve the desired success. Self-efficacy increases the level of effort that one is willing to put into a task because of the idea that one will have success in accomplishing the task, adding further encouragement. Similarly, if one fails and performs at a lower level than what was believed should be achieved, motivation can also increase in order to bring the performance equal to what one believes should be achieved (Bandura, 1997).

Motivation can also be harmed as a result of low self-efficacy. Tasks are avoided and can even be feared when one thinks that the activity is beyond one's ability level. Once self-efficacy has been diminished, individuals may quit an activity that was enjoyed because of the perception that there will not be success or completion of the task desired. With already low levels of self-efficacy, individuals will find greater discouragement in failure, which can eventually lead to a self-fulfilling prophecy where one always expects to fail at a certain task (Bandura, 1997).

Self-efficacy with computers and technology. As previously stated, self-efficacy has the ability to influence decision making and what activities are enjoyed. Igbaria and Iivari (1995) found that self-efficacy played a direct role in the desire to use and learn new technology. In order to accept and successfully use new technology,

individuals needed to have a high self-efficacy with technology. With the anticipation of success and belief that technology can bring beneficial outcomes, participants reported lower levels of anxiety in relation to technology and found the process to be easier and more useful. These individuals with high self-efficacy with technology also reported much higher usage of computers. The biggest determinant of self-efficacy within this study was previous successes with technology.

Within videogames, self-efficacy has served as a predictor for a variety of factors. Self-efficacy when dealing with videogames has been found to strongly correlate with enjoyment, immersion, achievement motivation, and performance (Trepte & Reinecke, 2011). With a belief that one will perform well with videogames, devotion to the videogame is likely to increase, leading to greater immersion and achievement motivation. Because challenge is an important reason to play videogames, motivation is higher for these individuals to reach the level of play that is expected.

In order to be clarify between goals in the real world compared to the virtual world, Trepte and Reinecke (2011) looked into the idea of game-related self-efficacy. Self-efficacy can play a larger role in videogames than other environments because of the direct, immediate feedback that videogames give. When one makes a decision within the videogame, a player is either rewarded or punished depending on the choice and execution of the actions. As a result of this immediate feedback, successful gameplay can be very encouraging to gamers, increasing the perception of the performance and even leading to increased performance and enjoyment within the game. With the increased focus on the ability to play a role and control the environment, game-related

self-efficacy is defined as "a player's ex-post assessment of his/her ability to master and to control the game" (Trepte & Reinecke, 2011, p. 555).

In addition to impacting enjoyment, self-efficacy also predicts participation with videogames and in technological fields. Similar to game-related self-efficacy, computer self-efficacy is "a judgment of one's capability to use a computer." (Compeau & Higgins, 1995, p. 192) High computer self-efficacy can lead to numerous benefits: higher expectations for personal success with technology, and increased participation in computer related fields (Hasan & Ali, 2004; Johnson & Marakas, 2000).

Computer self-efficacy is positively impacted when students have high levels of persistency. The desire to persevere leads to a higher level of self-efficacy, which can develop into greater levels of academic success (Lin, 2015). In the study, high persisters reported higher levels of academic success, and more positive feedback from friends, family members, and teachers about academic performance than those with lower levels of persistence. This factor contributes to increasing self-efficacy because the extra effort is given with thoughts of finding personal success.

Although the technology fields see the standard factors that can influence self-efficacy, gender can also play a role in self-efficacy within these fields. Because of the connection between self-efficacy and motivation, there are substantially fewer women in fields dealing with computers globally. For example, in the United States the highest percentage of graduates in the computer science and computer engineering fields that were female was 13.8% in the past few years (Zweben, 2011). Part of the explanation for the smaller percentage of women in the field is that females are more likely to drop a computer science major than males, especially during the first two years (Cohoon, 2001).

The tendency to change majors or even drop out of school after the struggles in computer fields could be as a result of lack of persistence and motivation or perceived success.

Objectively, researchers have been unable to discover a connection between academic success and gender in computer fields (Ilias & Kordaki, 2006; Singh, Allen, Scheckler, & Darlington, 2007). Although there is the idea that computer sciences are a career for males, females do not score any lower in these fields than their male counterparts. Even with similar academic success, women rate themselves lower in academic competency than males within computer and technology fields (Katz, Allbritton, Aronis, Wilson, & Soffa, 2006). As a result of this diminished self-efficacy in computer fields, women have lower rates of persistence in technology fields and are less likely to enter these male-dominated fields (Irani, 2004; Galpin, 1992).

Returning to the idea of Bandura that social persuasion plays a large role in forming self-efficacy, Lin (2015) found the influences of others were critical in the development of self-efficacy for women. Being in a field dominated by men, women are at a slight disadvantage when working with computers because of preexisting perceptions. Lin found a large amount of variance in the levels of learning and programming self-efficacy between males and females that was accounted for because of social persuasion. For women who may have doubts entering the technology field as a minority, positive influences from others can greatly improve their self-efficacy and raise their confidence in a field where they are capable of performing equally with males.

Hypotheses

Because of the unique environment that the internet provides, cyberbullying has developed into a widespread problem. While there has been a lot of research looking into

the negative results of cyberbullying and cyberaggression, literature is lacking that has explored how the effects of feedback received online impact self-efficacy of related and unrelated tasks. The present study seeks to investigate the potential connection between videogame self-efficacy and self-efficacy for a memory test after one is told harsh comments online. This study will help better inform those who chose to enter the online world to play videogames about potential risks that could carry over after signing off. This study will be investigating numerous hypotheses. First, after receiving the negative or positive feedback from an anonymous gamer online after losing a typing videogame game, one's self-efficacy to perform well in another racing game or on an outside memory test will either decrease or increase respectively, depending on the message received. In addition to the impact on self-efficacy, the message that was sent will then affect the participants' performance during the second typing game. Participants who received a positive message will perform significantly better in the second typing game, while those who received the negative message will perform significantly worse. Similarly, it is hypothesized that the message will have a lasting impact on the participants by increasing or decreasing their self-efficacy on the unrelated Digit Symbol Coding Task (DSCT), depending on the message that was received, positive or negative respectively. Finally, the performance on the DSCT will either improve from the positive message or diminish from the negative message.

Method

Participants

Participants were taken from a small, southeastern, private university using convenience sampling. There were 29 participants that agreed to take part in the study:

13 males and 16 females. Participants were asked about the time they spent online in order to see if time online affected the results in unforeseen ways. The amount of time spent playing online videogames was relatively evenly spread with 13 participants not playing online videogames online, 7 playing 1-2 hours each week and 9 playing at least 3 hours every week, with 3 of those individuals playing for at least 10 hours on a weekly basis.

Instruments

Nitrotype.com. This is a competitive typing website where players race each other by typing a short message. Each player is represented with a car, and a player wins by typing everything first. The participants used the default blue car.

Skype.com. This application on the computer was used to send the feedback to the participants. The visible username of the Skype account that participants saw was "Racer."

Lenovo Ideapad Y510P. Laptop used for the videogame portion of the research.

Form of Informed Consent. The form that is asking for the participants' signatures to agree to the study that states their awareness of the possible risks and their freedom to drop out of the study at any time (see Appendix A).

Demographics Questionnaire. A short questionnaire for participants to fill out their gender, assign themselves a three digit number in order to preserve anonymity, and indicate how often they play online videogames with social interactions (See Appendix B).

Task Specific Self-Efficacy Scale. The series of questions used to measure one's self-efficacy (See Appendix C).

Digit Symbols Coding Task. Two charts with randomly generated numbers. Subjects had 60 seconds to memorize certain symbols that correlated to numbers and then another 60 seconds to recall and match the symbols to the numbers. Subjects would complete this task a second after all of the racing. This task is used to measure memory as an unrelated task to the typing game. The three parts were given to participants separately, first the pairings, then the top table, and finally the bottom table (See Appendix D).

Script. The predetermined feedback that was sent to participants depending on their assigned group (See Appendix E).

Procedure

Participants were divided into three groups through random assignment: a control group, a group that received a positive message, and a group that received a negative message. The groups were assigned using a random number generator. Participants arrived one at a time to an empty classroom and were instructed to have a seat at one of the tables. In the back of the classroom there was a computer set up with nitrotype.com and skype both pulled up. After signing the form of informed consent, participants were instructed on how to perform the Digit Symbol Coding Task. Participants had 60 seconds to memorize the pairings of symbols with numbers. A timer was set to measure the 60 seconds, and when the timer sounded, the researcher exchanged the paper with the pairings for the first table with just the numbers and reset the timer for 60 seconds. After time ran out, the researcher collected the paper. Before completing the coding task, participants filled out their first task specific self-efficacy scale after stating they understood how the memory test would work. Subjects then performed the coding task.

Next, participants were told that they would simulate a session online in the game Nitrotype. In order to do so, participants walked to the computer in the back of the classroom. Participants were informed that they controlled a car that would go faster based on how fast they typed, and the race was over when the message that the game provided was fully typed. The researcher also notified participants that capitalization and punctuation do count, but accuracy will not affect their score. The researcher told participants that the goal was to win the race. After understanding how the online race would work, participants filled out a second task specific self-efficacy scale. While the participants were filling out the scale, the researcher texted a preset racer in another room to invite the account that was already pulled up on the computer at which the participant was sitting. The preset racer was very skilled and won every race, typing around 110 words per minute. This racer sent the invitation to the account and started the race when the participant clicked on the green join button. The name of the account that the participant raced on was called "Rand0mAcc0unt" and the avatar was the standard blue car, with which all accounts start. The participant then raced against four other racers in the match and placed fifth every game. In order to reduce possible anxiety, the researcher was on the other side of the classroom during the race and not staring over the shoulder of the participant. The preset racer recorded the average words per minute that each participant typed.

After the first race, a message was possibly sent over skype to the subject. The control group did not receive a message, the positive group received an encouraging message, and the last group received a message insulting their skill. Participants were instructed to change tabs to join the chat with the other racers from the race and check for

messages. The name in Skype matched the username from nitrotype.com. If asked about responding to the message, the researcher told participants that they could respond if they desired in order to properly simulate the online world. If a message was sent back to the other racer, there would be no further response. After checking the chat, participants were told that there would be a second race against the same group of racers and then asked to fill out a third self-efficacy scale related to this second race. Subjects then raced one final time.

After the second race, the researcher told the participants that the final task would be to perform another coding task. Before completing the final part of the DSCT, participants filled out a fourth self-efficacy scale. After completing the self-efficacy scale, participants were given the last table with different numbers in order to write the symbols under the numbers. Participants were not given the pairings again before starting the last portion of the DSCT. The subjects were debriefed after the final DSCT and told that one of the racers was preset to win every race based on skill alone. The researcher also notified participants that all messages were predetermined and were not related to performance in the race. Participants were directed to possible help if the messages created a lasting, negative impact.

Results

In order to determine whether or not the type of message received online impacted one's self-efficacy and performance, a one-way between subjects ANOVA was performed. It was hypothesized that a negative message sent would negatively impact a participant's self-efficacy towards an unrelated activity, the DSCT. The scores of the self-efficacy scales were averaged, and then the first average score for the DSCT was

subtracted from the self-efficacy score before the second memory test. When looking at the differences between self-efficacy scores before each attempt on the DSCT, the positive message group (M = 0.875, SD = 1.71) saw an increase for average score on the self-efficacy scale, while both the negative message group (M = -0.44, SD = 2.65) and control group (M = -0.725, SD = 1.38) led to lower scores. Although the one way ANOVA test did not reach significance (F (2, 26) = 1.892, p = 0.171), the positive message group did trend in the opposite direct than the other two groups.

In regards to self-efficacy scores in the videogame, there were not any significant changes like the hypothesis predicted. A one-way between subjects ANOVA was performed in order to test if a negative message (M = -0.81, SD = 1.74) would harm one's self-efficacy in regards to typing compared to a control group (M = -1.28, SD = 1.47), while a positive message (M = -0.65, SD = 1.92) would significantly increase one's self-efficacy, but the ANOVA test was not near significance (F (2, 26) = 0.358, p = 0.703).

When exploring the effects of the messages received on performance, there were no significant differences. Although it was hypothesized that a negative message would diminish typing speed (M = 4.89, SD = 7.03) and performance on the DSCT (M = 0.67, SD = 2) when compared to the control group for typing (M = 3.6, SD = 8.21) and the DSCT (M = 0.1, SD = 3.35), and the positive message would increase typing speed (M = 5.5, SD = 7.01) and performance on the DSCT (M = 0.8, SD = 4.17), the one-way between subjects ANOVA test did not reveal significance for the typing speed difference (F (2, 26) = 0.169, p = 0.845) or performance on the DSCT (F (2, 26) = 0.124, p = 0.884).

Discussion

The purpose of the present study was to determine the effect of cyberaggression on self-efficacy and performance both inside and outside the virtual world. Messages sent anonymously online to participants were used to see if there was a change in performance or self-efficacy for participants, either positively or negatively. There has been a lot of prior research investigating the negative effects that cyberbullying can have on individuals in both the virtual world and the real world (Ybarra, Mitchell, Wolak, & Finkelhor, 2006; Chang, Lee, Chiu, Hsi, Huang, & Pan, 2013). Research looking into cyberaggression and whether or not it can have the same levels of impact that cyberbullying can have has lagged behind. Cyberaggression differs from cyberbullying because it does not meet the requirement for repetition as identified by Barlett, Gentile, and Chew (2016). Based on prior research by Bandura (1997), the increased levels of emotions and arousal from the messages should have impacted self-efficacy, and Trepte Reinecke (2011) found a strong correlation between self-efficacy in videogames and performance; however, the current study does not support these past findings because there were no significant differences found between the means when looking at both self-efficacy and performance. The hypotheses that the type of message received would either negatively or positively impact both self-efficacy and performance inside and outside the videogame were found to be false.

One explanation for the lack of difference between groups is that the messages sent to participants may not have had the intended effects. It was hypothesized that the diminished self-efficacy would lead to a worse performance, but without the higher levels of emotions that Bandura stated are crucial to affecting self-efficacy, there would not be a change (1997). Similarly, the negative message could have varying results on different

individuals: What may seem like a cruel message to one person might fuel motivation to perform better in another. The messages also could not have been persuasive enough. The anonymous racer met the requirement of being considered an "expert" because of the superior typing skills, so because the racer should have been believable, more fault could lie in the messages.

Possible proof that the racer met the expert requirement is because of the approaching significance for the positive message group. Although results were not significant, this group did trend in the opposite direction from the other group, seeing an increase in self-efficacy about performance outside the videogame. Further research should investigate if there is a connection here, and if there is, this phenomenon could be explained because of the more persuasive message from the racer and the chance to focus on the positive, previous attempt, a condition that Bandura identified to increase self-efficacy (Bandura, 1997).

If the results of the present study hold true, negative interactions online might not have large impacts on gamers. As indicated in all of the previously mentioned research on cyberbullying, there are a large amount of negative, lasting influences, and the distinction between cyberaggression and cyberbullying is important because of the possible consequences. This study does highlight the resiliency of individuals to continue with the task at hand and overlook negative input from outside sources. The internet has provided a unique way for individuals to interact, leading to out of characteristic behavior in some individuals as a result of the online disinhibition effect, but while technology and videogames can lead to new types of enjoyment, the effects that

are both positive and negative can have long lasting influences that could follow a user into the real world.

Limitations and Future Research

Although the results were not very close to approaching significance, there are a few limitations that could have made a difference in the results. When collecting participants to take part in the study, a convenience sample was used. Because many of the participants signed up with friends, there were a lot of people that played videogames on a regular basis, possibly higher than average for the population.

Another flaw was the script that was used for the study. The messages were very short and simple. Oftentimes online gamers are a lot more passionate than the script allowed. Because of issues with the institute's Institutional Review Board (IRB), the script was not allowed to fully reflect a true online environment where profanity is commonplace, and many insults and threats are sent. Some of the participants were visibly not adversely affected by the negative messages, and a few even laughed after reading the insult. Similarly, participants might not have been invested enough into the videogame for the message to have a large impact. While the preassigned racer did meet the condition of being an expert because of the skills in the race, participants might not have been concerned with the message after a typing game. Other videogames online can lead to much longer interactions between players, with many Multiplayer Online Battle Area (MOBA) games lasting around 30 minutes, and Massive Multiplayer Online Role Play Games (MMORPGs) lasting an indefinite amount of time. A videogame where there is more interaction online might lead to messages playing a larger role on participants.

Although typing allowed for a way to measure in game performance for all participants, even those without any videogame experience, there was a large amount of variance in typing speeds. The variance could be explained as individuals adjust and adapt to the game, figuring it out. Similarly, the first race could have been a way for some racers to warm up and practice typing skills they had not used in some time, while other participants may have just come from typing a paper.

Future research can attempt to look further into the individual hypotheses of this study in more depth. Because the positive message was the closest to significance related to unrelated tasks, future research would be most beneficial investigating the positive effects that nice messages can have in a videogame. Similar studies could also explore cyberaggression in other types of videogames and not just typing games, especially games where those that are winning have more interaction with the player. Future studies could also look into the idea that negative messages can increase motivation and determination, instead of strictly harming performance. If cyberaggression does not lead to changes in self-efficacy and performance, future research could try to identify at what point negative interactions online lead to negative consequences.

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Appendix A

Consent Form

You are being asked to participate in a study that is investigating the effects of online interactions. The study involves a digit symbol coding task, typing game, survey, and a possible conversation over the internet. You will be simulating an experience online with other people. It is possible that sad or upset feelings may arise as a result of the study. Your name will not be used when the results are reported in a paper and presentation. You are free to decline participating and are able to drop out at any time. If you have any questions or experience any discomfort as a result of participating in this study, please let your researcher know and please feel free to contact the advising professor, Dr. Morgan (jmorgan@gardner-webb.edu).

Thank you for agreeing to participate in this experiment. Your participation will help explore the effects of interactions online.

By signing this consent form, you are indicating that you understand and agree with all of the above information, that you are at least 18 years of age, and that you are willingly participating in the study.

_____	_____	_____
Participant's Printed Name	Participant's Signature	Date

Appendix B

Demographics Questionnaire

Identifying Number: _____

Gender: _____

In an average week, roughly how many hours do you spend playing videogames online?

a. 0 hours
b. 1-2 hours
c. 3-5 hours
d. 6-10 hours
e. 10+ hours

Appendix C

Task-Specific Self-Efficacy

Please circle the number of the scale that corresponds most closely with your feelings about the upcoming task.

How confident are you that you will perform adequately on this task?

0----1----2----3----4----5----6----7----8----9----10

Not at all Very Much

How confident are you that you will perform well on this task?

0----1----2----3----4----5----6----7----8----9----10

Not at all Very Much

How do you rate your ability for this task?

0----1----2----3----4----5----6----7----8----9----10

Not at all Very Much

How motivated are you to perform well on this task?

0----1----2----3----4----5----6----7----8----9----10

Not at all Very Much

Appendix D

Digit Symbol Coding Task:

You will have 60 seconds to memorize the symbols associated with the numbers. After the time is up you will see a sequence of numbers and will have to draw the symbols under the numbers.

0	1	2	3	4	5	6	7	8	9
&	@	$	%	^	)	<	#	=	>

You have 60 seconds to correctly match these numbers with the appropriate symbols.

8	9	6	3	0	2	6	1	7	4
5	4	7	9	1	5	8	3	0	2

You have 60 seconds to correctly match these numbers with the appropriate symbols.

4	1	7	5	2	8	6	9	3	1
4	0	9	8	1	2	3	5	4	6

Appendix E

Scripts:

Negative Group: "Wow that was awful. You clearly didn't learn how to type properly. I didn't know people could type so slowly."

Positive Group: "Hey, great job! That was a very fun race. Good luck in the next one!"