

THE PROSOCIAL USER EXPERIENCE OF EMPATHY LESSON PLANS  
IN MINECRAFT FOR ADOLESCENTS

A THESIS

SUBMITTED TO THE GRADUATE SCHOOL  
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE

MASTER OF ARTS

BY

JUSTIN DAVIS

DR. KUO-TING HUANG - ADVISOR

BALL STATE UNIVERSITY

MUNCIE, INDIANA

DECEMBER 2019

## ABSTRACT

**THESIS:** The Prosocial User Experience of Empathy Lesson Plans in Minecraft for Adolescents

**STUDENT:** Justin Davis

**DEGREE:** Master of Arts

**COLLEGE:** Communication, Information and Media

**DATE:** December 2019

**PAGES:** 49

Video games have grown in storytelling and graphical accomplishment in the past couple decades, and studies into how they can promote prosocial behavior and empathy are needed to better understand how this media can promote positive psychological development in adolescents. One video game that is popular with this demographic is *Minecraft: Education Edition*, which offers structured lesson plans that promote empathy and prosocial behavior.

This thesis documents a study that uses quantitative analysis to better understand the relationship between *Minecraft: Education Edition* and the promotion of empathy and prosocial behavior in these lesson plans. The study results partially support the hypotheses that individuals who play a video game with lesson plans specifically designed to instruct them to act empathetically will show more empathy and prosocial behaviors in the short term than those who play the same game without predetermined goals or lesson plans. Although there was not a significant difference between the two groups in the total score for the three scales measuring empathy or prosocial behavior, one individual item score on each scale was significantly or marginally improved in the experimental group. These three individual items were related to prosocial behavior and perspective taking, which is a subset of empathy.

## Chapter 1: Introduction

Video games have been around since the middle of the 20th century. In their earliest forms, they were rudimentary two-dimensional simulations that displayed on monitors severely limited by low processing power, computer memory, large physical size, and prohibitively high costs. As the price of computers decreased, their processing power expanded exponentially, and hardware became smaller. These rapid developments allowed this media form to grow in popularity and technical accomplishment in a relatively short period of time.

Moore's law, the concept that computer processing power doubles every two years, is evident in the evolution of video games, perhaps more than any other type of digital media. Until recently, the revolutionary graphics and user experiences of one version of a game quickly became antiquated when the game's sequel or a new console was released, usually only in a matter of months or years (Moore, 1965). Nowadays though, alignment with Moore's law has somewhat slowed down and has been replaced by more incremental improvements, and perhaps more important, has become an accepted part of daily life.

For the past couple of decades, researchers have begun to dig deeper than original research into whether video games are able to increase visio-spatial skills or reaction times. Many researchers are now studying the media's effect on potential prosocial behavior and demonstration of empathy among players. This is due to video games' inherent capability to immerse players in interactive storyworlds and help them identify with fictional characters. The interactive nature of video games has suggested fascinating possibilities for the media form's potential effect on human behavior and thought.

One of the many video games that needs additional study in the area of prosocial behavior and empathetic responses is the remarkably popular *Minecraft*. It is a commercial off-the-shelf (COTS) software that's available to billions of players around the world. This thesis seeks to measure whether this specific video game possesses the ability to promote these responses using predetermined game modes and lesson plans, specifically with adolescents aged 11 to 17. The data generated by this study will be valuable to other COTS games and the future of video games in general by demonstrating how prosocial experiences can be implemented in them as well as providing an argument for their overall importance.

A specific version of *Minecraft*, titled *Minecraft: Education Edition*, has been commercially available to educational institutions and libraries since November 2016, and it is designed specifically for use in the classroom. It advertises itself as a facilitator of immersive learning and classroom collaboration, and it hosts a wide variety of lesson plans on various topics. Additionally, it features useful tools for educators like overworld maps that show all students' locations and customizable lesson plans that teachers can select and implement. Also, teachers can guide game sessions to meet preset educational goals by removing students that are disruptive to a class's ability to achieve its learning goals (Stuart, 2016).

For instance, some lesson plans strive to teach individuals prosocial skills that build empathy toward others and encourage cooperation with fellow players in the game world. This is a profound example of how video games have grown beyond their initial stereotypes as mere vessels of vacuous entertainment, as well as how this media plays host to a diverse set of genres. Research into the effectiveness of video games' ability to instill prosocial behavior is necessary to better understand its effects and overall importance so that future developers can incorporate these concepts into the development of their games. As video games advanced technologically,

researchers predominantly focused on the relationship between violence in video games and its negative effects on players (Anderson & Bushman, 2001). The extensive research on the negative effects of violent and aggressive video games has led to the perception that this media in its entirety can be harmful toward the public and the developing minds of adolescents (Gentile, Lynch, Linder, & Walsh, 2004). In Anderson & Bushman's (2001) survey of existing data on the topic, they decisively concluded the following: Violent video games increase aggression, decrease prosocial behavior, and amplify aggressive thoughts and feelings across all demographic and gender lines. The authors conclude that due to this data, exposure to anti-social video games is a serious public health issue that needs to be addressed (Anderson & Bushman, 2001). In a 2010 survey of existing literature on the topic, researchers concluded that playing violent video games had a relation to increased aggression and decreased empathy and prosocial behavior (Anderson, et al. 2010).

However, there are other researchers that have studied interactions with violent video games and their potential effects on aggressive behavior, and concluded that there was no discernable link (Ferguson, 2007). Whether or not there is a relationship between these two factors, the continuing academic analysis of this problem space is important and needs more exploration. Additionally, researchers in 2017 analyzed existing literature on the topic from 2009 to 2013, and concluded that although there was a risk factor between playing violent video games and adverse behavior, there was no established link between this media and actual criminal behavior or violence (Calvert, et al. 2017). In another article from 2019, researchers extensively analyzed the relationship between video games and violence, and reached a similar conclusion: playing violent video games did not result in any significant decrease in prosocial behavior or changes in aggression (Ferguson & Wang 2019).

Additionally, studies that link video game violence to anti-social behavior are necessary and important critiques of a growing form of media, and it's important for consumers to know about these issues when they make decisions on what type of video games they purchase for themselves or for their children. These studies provide insight and understanding into these complex issues and foster necessary conversations about this media; however, there is also the possibility that this form of media can promote prosocial behavior and ethical decision making through emotive game structure, storytelling, and structured user experience design.

Prosocial behavior is defined as a behavior or action one undertakes voluntarily to help another person. (Eisenberg, Spinrad, & Knafo-Noam, 2015). The origins of this phenomena have been well studied and explained as everything from evolutionary responses, genetic dispositions, and social conditioning. Empathy and altruism are two words that frequently accompany descriptions of this topic, and prosocial behavior has widely been viewed as a positive force in human development and society due to its perceived opposition to the concepts of selfishness and antisocial behavior and thought. Research on video game's prosocial effects are limited compared to other topics, even though the interactive nature of video games gives them an innate ability to enable the player to experience a new perspective, different from the perspective they inherently possess in their daily life.

There are many types of playable video games available, including role-playing games, first-person shooters, action, adventure, survival-horror, racing, sports, fighting, simulation, puzzle, platform, point and click, and more. However, this thesis will focus on the subset of video games that use storytelling and structured gameplay to affect prosocial behavior and thought. Examples of such games include *That Dragon, Cancer*; *Journey*, *Proteus*, *Thomas Was Alone*, and *Minecraft: Education Edition*. These games represent an emergent genre of video

games, which are developed to elicit player emotional responses and nurture prosocial behavior through storytelling and attachment to game worlds and characters. They are non-violent and non-competitive. Players do not compete against the game world or mechanics so much as inhabit them to gain a different perspective than their own. Additionally, the graphics in these prosocial games are for the most part not at the pinnacle of technological advances because the point of them isn't to impress the viewer with visuals but rather to immerse them and have them experience a story. For instance, although the colorful visual interface of *Proteus* is blocky and simplistic to the point of abstraction, they are used to create a unique experience for the players that relates emotions through the use of synthesized music and compels them to explore the storyworld (Twisted Tree Games, 2013).

*Minecraft: Education Edition* is a prime example of a video game that has used storytelling and structured gameplay to elicit prosocial and empathic responses in audiences. In a report published by an educational consulting firm found that teachers and interviewees conclusively state that Minecraft helps build children's decision making and communication skills ("How Minecraft Supports Social and Emotional Learning in K-12 Education," 2017). The report continues to cite individual case studies where teachers and educators use this video game to teach students social and global issues like tsunamis and natural disasters in other countries. The authors conclude that "the game provides an opportunity for students to develop skills such as problem solving, critical thinking, communication, collaboration, negotiation, delegation, and even empathy", and that *Minecraft: Education Edition* "transcends the traditional curriculum, presenting exciting possibilities for social and emotional development in real time" ("How Minecraft Supports Social and Emotional Learning in K-12 Education," 2017).

Research into the effects of Minecraft on other facets of education also have precedent. In the article, *Mining Learning and Crafting Scientific Experiments: A Literature Review on the Use of Minecraft in Education and Research*, the authors provide a review of the existing literature into this topic, as well as its' purported benefits, and conclude that the video game is an excellent conduit for instructing students in topics ranging from coding to teamwork (Nebel, et al, 2016).

Video games are still considered a relatively new form of media compared to literature or film, even though they have been around for almost 70 years. However, video games are here to stay whether critics want them to or not. The time has come to analyze video games in ways that go beyond their ability to improve visuospatial skills or increase aggression.

There is a possibility for video games to contribute to the betterment of the player through emotive game design and interactive storytelling. The specific research question raised by this thesis is this: Can the COTS video game, *Minecraft: Education Edition*, promote prosocial behavior and empathy in adolescents through structured lesson plans?

## Chapter 2: Literature Review

The research on the potential prosocial effects of video games has been accumulating steadily for the past decade or more. The methodology and analysis differ by source, but all resources share the same common goal: quantifying whether prosocial behavior as a result of video game playing exists and whether universal lessons can be applied toward developing future video games.

This topic has often been overshadowed by the potential negative effects of video games, specifically those that contain violent imagery and interactions through the player character and game world. The previous research into this topic is relevant to the overarching goal of this thesis and warrants discussion as well. There are also important texts that discuss the nature and origin of prosocial behavior that are important to this topic, and they need to be analyzed to gain a better understanding of this subject area so that the concepts that are explored are clearly defined. Additionally, a brief review of the history of video games is necessary to fully understand the context that this study takes place in.

### History of Video Games

To begin to understand this problem space, a brief review of the history of video games is necessary. In the middle of the 20th century, new computer technologies assisted users with work duties and also provided entertainment through brief interactive stories. Early games, such as *Spacewar* and *Pong*, gave rise to more sophisticated games, such as *PacMan* and *Pitfall*. These titles eventually paved the way for modern technological marvels like *The Witcher* and

*Crysis*. The previously solitary activity of playing video games became a cooperative and communal experience through the introduction of consoles that plugged into television sets, allowing families to play together in their homes or in social gathering spots like arcades where friends could play together (Kent, 2010). Additionally, the ability for video games to tell immersive stories also grew exponentially along with increased development budgets, additional inputs on controllers, and an improved focus on writing.

Video game technology continued to improve dramatically through the 1980s and 1990s. Video games once considered cutting edge became antiquated in just a few years and were replaced by titles with higher polygon counts, processing speeds, and layers of storytelling not previously possible in the past. During this era, competition inspired much innovation but also destroyed companies. Consoles like the *Sega Dreamcast*, *Atari Jaguar*, *Sega Saturn*, and *NeoGeo 3D* were economic casualties of the never-ending quest for better graphics and more immersive experiences. For example, it was barely a year after the commercially successful release of the *Sega Dreamcast* in 1998 that consumers turned away from it, when news was released about the upcoming release of the much more graphically powerful *Playstation 2* by Sony (Kent, 2010).

Today though, the race to create the most graphically impressive video games has settled down a bit, and the rate of development of game-changing graphics has become more gradual. By the 2010's, video games rendered digital experiences in astonishing detail and immersed players through narratives and world-building using the latest 3D graphics processing technology, which was available to consumers for a relatively low cost and through a variety of competing consoles and modular computer components (Kent, 2010).

The industry that produces video games has grown substantially in both size and scope as well. Game studios employ thousands of programmers and coders, and development budgets for popular titles can soar into the hundreds of millions of dollars (Kent, 2010). For instance, it was reported in 2014 that Activision Blizzard Incorporated invested half a billion dollars developing and promoting the brand-new video game franchise *Destiny* as a strategy to create a new intellectual property and to create a new source of revenue for the company (Grover & Nayak, 2014).

According to the Entertainment Software Association's 2018 annual report, the economic impact of the gaming industry is substantial financially and as a source of job creation. In 2017, there were more than 65,000 workers in the industry across the United States, consumers spent approximately \$36 billion on video games and their related accessories, and the video game development and publishing industry provided a yearly contribution to the economy of almost \$12 billion (Entertainment Software Association, 2018). These are significant figures and demonstrate how video games have reached maturation and need analysis beyond that of visual spatial abilities and mere entertainment value.

### **Video games and violent effects**

The conversation around the negative effects of video games has been ongoing for some time and predominantly involves how violence affects audience behavior. For example, in 1999, after a mass murder at Columbine High School in Colorado, reports indicated the assailants played a modified version of a hyper-violent computer game known as *Doom* prior to the killings. Likewise, after the 2007 Virginia Tech shootings, the shooter was purported to have been a fan of the popular first-person shooter video game *Counter-Strike*. More recently,

individuals blamed video games like *Grand Theft Auto*, *Mortal Kombat*, *Bulletstorm*, and *Splatterhouse* in the wake of the 2012 Sandy Hook tragedy (Lejacq, 2012).

Academic research also asserts that violent video games have negative behavioral and psychological effects. Anderson & Bushman (2001) discuss this topic in their influential 2001 article *Effects of Violent Video Games on Aggressive Behavior, Aggressive Cognition, Aggressive Affect, Physiological Arousal, and Prosocial Behavior: A Meta-Analytical Review of the Scientific Literature*. They argue the importance of this review by stating that although there are numerous educational and nonviolent video games available, violent titles are the ones marketed most heavily to consumers. As an example, one study reports that 59% of fourth-grade girls and 73% of boys identified their favorite video games as violent in design (Buchman & Funk, 1996).

Research has also been conducted on the negative portrayals of gender in video game titles, which can also lead to poor prosocial skills and empathy toward others. An analysis of 33 titles in the late 1990s discovered the following: 41% games contained no females, 28% had women exclusively as objects of men's desires, 80% contained violence inherent in the game design, and 21% portrayed violence toward women (Dietz, 1998). Although this research was published 20 years ago, it is extremely relevant to the discussion due to recent controversy in the gaming community, perhaps most notably concerning one colloquially known as Gamergate, which involved numerous video game players engaging in anti-social behavior including threats of violence and harassment against female developers and journalists.

Methodology for Dietz's study included contacting video game stores and requesting lists of their best-selling titles as well as reviewing video game publication's lists of most popular video games. The lists were cross referenced, and titles that appear more than once were given

higher priority. Seventeen Nintendo and 16 Sega titles were chosen. The author argues that because video games act as “agents of socialization,” i.e. instructional stories on how to act in society, these portrayals of women can reinforce gender roles in developing minds (Dietz, 1998).

Carnagey and Anderson discuss how video games that reward violent behavior affect aggression in subjects (Carnagey & Anderson, 2005). They compare these titles to those that punish players for violent actions, as well as those that do not contain violence at all. They hypothesize that video games that reward aggressive behavior will lead to more aggressive behavior because they encourage aggressive thoughts and lead to a perception in the players’ mind that future violent behavior will be similarly rewarded.

There were three experiments to test this idea: 43 men and 32 women were selected as participants for the first experiment, and a blood pressure monitor was attached to one of their arms as they played a predesignated video game title for twenty minutes. Afterwards, they completed the State Hostility Scale and were debriefed on the experiment. Twenty-nine men and 37 women were selected for the second experiment, which was identical to the first except that the State Hostility Scale was replaced with the Word Fragment Task, which is a measurement of aggressive thoughts (Carnagey & Anderson, 2005).

The third experiment involved 68 men and 73 women and used the Taylor Competitive Reaction Time Task, which is used to measure aggressive behavior. Participants were told that they would be competing with another person to press a computer mouse button first, and that the loser would hear a loud burst of white noise. Prior to the beginning of the rounds, participants could select the volume of the noise their opponents hear. They were assigned to write a brief essay on the topic of abortion, which was then given back to them by their experiment partners

with extremely critical grades and comments on the paper. After this scripted incident, they played a violent video game title and took the CRT Task survey (Carnagey & Anderson, 2005).

After conducting these experiments and analyzing the data from the surveys and observations, the researchers concluded that rewarding violence in video game titles can increase aggressive behavior and thought. Experiment one showed that playing a violent game, regardless of how violence was rewarded, increased aggression compared to non-violent titles. Experiments two and three showed that punishment of violent actions did not have a significant statistical difference on aggressive behavior and thought compared to non-violent video games (Carnagey & Anderson, 2005).

Anderson and Bushman (2001) discuss how exposure to this violent media increases aggression by using the General Aggression Model (GAM), which is a psychological framework for understanding the phenomena. Using this model, the authors argue that violent video games teach audiences how to act by activating their aggressive thoughts and teaching them methods for how to respond to various situations. According to the authors, an interaction with a violent situation in a video game is a sort of like a learning trial where the player learns how to react to similar situations in the real world. Every time the violence is repeated in a video game, the situation is rehearsed and reinforced to the audience (Anderson & Bushman, 2001). In this context, once a similar situation is presented in the real world, the player is more likely to act out their rehearsed behavior.

To survey the existing literature on this subject, the authors combed through PsycINFO using relevant Boolean logic terms. They were able to find 35 research reports, and they concluded through analysis that video games with violence were highly associated with increased aggression past the point of dispute. This data clearly demonstrates that exposure to

violent video games represents a threat to the psychological development of children and young adults, going as far as to label the issue a public health crisis. Specifically, the authors conclude that exposure leads to higher levels of aggression and lower levels of prosocial behavior.

Funk, et al. (2003) discuss how prolonged exposure to violent video games in children can lead to greater desensitization and lower levels of empathy. They emphasize the importance of this research by describing how video games have become a staple of entertainment for young individuals, and that a recent survey listed over half of respondent's favorite titles as having violent content. To assess whether violent video exposure leads to desensitization and lower empathy, the researchers recruited 66 children aged 5 to 12 with recruits from various socioeconomic statuses (Funk, Buchman, Jenks, & Bechtoldt, 2003). The children completed a preliminary questionnaire before reporting their video game playing habits and listed their favorite video games. Additionally, they labelled their favorite titles with the following criteria: educational, general entertainment, sports without violence, sports with violence, human violence, fantasy violence). Afterward, they completed questionnaires measuring attitudes toward violence and empathy (Funk, Buchman, Jenks, & Bechtoldt, 2003).

### **The other side of the coin: The benefits of video games**

However, there is also academic literature that disputes the assertion that video games affect audiences negatively. Ferguson (2007) analyzes the currently available literature on the relationship between video games and potential outcomes and concludes that there is no relationship between this media and aggressive behavior in its' audience. Additionally, the authors state that violent video games can benefit participants with their visuo-spatial cognition (Ferguson, 2007). Additionally, when used properly, violent video games could even help individuals if used in an educational setting. Finally, the author asserts that this topic needs

additional research into whether micro populations are at risk when playing violent video games. For example, there is not enough information available to determine whether individuals already at risk for violent behavior are triggered by violent video games or whether video games make them more likely to commit acts of violence (Ferguson, 2007).

In a more recent study, researchers studied the potential link between violent video games and increased aggression in individuals. They noted throughout the paper that there was still no consensus in academia whether playing violent video games resulted in aggressive behavior. They argue that prior research into this topic implemented flawed methodologies and testing procedures, and had insufficient sample sizes (Ferguson & Wang 2019). The authors recruited a sample size of 3,034 Singaporean youth participants, and tested the assertion that violent video games result in increased aggression and decreased prosocial behavior using seven variables: Prosocial Behavior, Physically Aggressive Behavior, Socially Aggressive Behavior, Aggressive Fantasies, Cyberbullying Perpetration, Trait Anger, and Trait Forgiveness. The authors concluded that there was no discernable link between violent video games and notable increases in aggression or decreased in prosocial behavior (Ferguson & Wang 2019)

Other studies also found the positive impacts of video games in both daily life and classroom settings. For example, Przybylski, Rigby and Ryanwrite (2010) argue that video games provide the basic psychological needs of competence, autonomy, and relatedness. For another instance, video games could be used in a classroom setting to improve learning, motivation, and relationships in the classroom (Rosas et al. 2003).

Furthermore, researchers even found that violent video games could be used as educational materials. Since playing is an integral part of how children develop their critical thinking and social skills, the authors hypothesize that educational video games will be beneficial

in their development. However, this idea has seen resistance from many teachers and educators, who view video games as merely tools for entertainment and distraction. The authors counter this by arguing that video games can be beneficial because they closely align with student's interests (Rosas, et al. 2003). Building from previous research that found that computer games encourage school achievement, cognitive abilities, motivation towards learning, and attention and concentration, the authors conducted a series of experiments to test their hypothesis (Rosas, et al. 2003). Methodology included a video game console similar in design to the handheld Nintendo Gameboy device, and five video games that were designed with the following parameters: Gameplay focused on playing and not learning, the games becoming increasingly difficult and following school curriculum, the difficulty settings being dynamic and adjusted based on player input, and the video games being designed to appear similar to popular video games (Rosas, et al. 2003).

Analysis of the data displayed significant differences between experiment and control groups in initial learning in math, reading comprehension, and spelling after playing the video games. The possibility that the games encouraged students to learn was observed in the following ways: First, participants preferred to keep playing video games instead of leaving the classroom to go on recess. Second, teachers observed that students were more punctual with attendance after playing the games. Third, teachers reported students were more concentrated on lectures after video game play. Fourth, teachers observed that the video games had a positive effect on self-esteem and cooperation and interaction among students (Rosas, et al. 2003).

Beale, Kato, Marin-Bowling, Guthrie, & Cole, (2007) conducted an experiment to determine whether a third-person shooting video game could educate adolescents suffering from chronic illnesses on self-care and illness management. They recruited 375 pediatric and young

adult cancer patients, and depending on their group, either received a normally commercially available video game or a video game titled *Re-Mission* that instructed individuals on the proper methods of self-care when suffering an illness. After analyzing the data, the authors concluded that patients who played *Re-Mission* demonstrated better knowledge of self-care than the control group and that this was attributable to the video game they played. *Re-Mission* is by its inherent design a violent video game. It is a third-person shooter in which players control an avatar that is inside the bodies of young people suffering from various types of cancer. The player beats the game levels by destroying cancer cells with weapons, all the while carefully monitoring their ammo count. Adding to the educational value, they are accompanied by a mentor during the game that teaches them about treatments and self-care. This video game exemplifies how video games – even violent ones – can be beneficial to audiences if used in an educational setting.

### **Theories of Prosocial Behavior**

Batson and Powell (2003) seek to define prosocial behavior, quantify whether it actually exists independently of egocentric beliefs, and measure it using personal and institutional variables. Dispositional variables included anomie, authoritarianism, autonomy, deference, intelligence, Machiavellianism, nurturance, religiosity, self-esteem, social desirability, social responsibility, submissiveness, and succorance. Situation variables included ambiguity and severity of need, physical appearance of victim, similarity to victim, friendship, number of bystanders, location (city versus rural), and cost of helping (Batson & Powell, 2003). Although most social psychologists concluded at first that situation variables factored more importantly in this behavior, others have disagreed more strongly with this assertion as research continued. Dispositional factors have become more favorable towards predicting prosocial behavior. Additionally, since the 1970s, other variables have been factored into research, such as biological

and cultural predictors.

Further, social researchers have also applied universal theories of human behavior to this phenomenon, which include Social Learning, Tension Reduction, Norms and Roles, Exchange of Equity, Attribution, Esteem Enhancement/Maintenance, and Moral Reasoning (Batson & Powell, 2003). Social Learning Theory states that prosocial behavior is a result of the learned benefits or punishments that follow an action, as well as the ultimate reward that an individual receives after the costs are factored in.

The Negative-State Relief Hypothesis factors into Social Learning Theory by stating that individuals can be rewarded with an improved mood when they help others. For instance, when a person feels bad, helping somebody else will make them feel better. When they already feel good, helping makes them feel even better. One possible explanation for this is that people help others so they themselves can be in a good mood. Tension Reduction claims that individuals engage in prosocial behavior because seeing somebody else in distress causes them to be upset, and the easiest way to feel better is to help the other person in need. Examples would for instance include a crying child or someone who had lost their car keys.

Norms and Roles' (2001) explanation for prosocial behavior is that it is a trait people learn from others as they age, and that it is one of the things that is expected of them based on the norms of society. Helping others is a role they are assigned to fill by society's expectations of them. Specific roles that are discussed in detail are Reciprocity and Social Responsibility.

Exchange of Equity describes prosocial behavior as an attempt by people to have a balanced relationship with one another that isn't always based on material goods. For instance, if an individual helps someone who cannot return the favor, the respect that is bestowed upon the helper serves as a sort of balance.

Attribution is the theory that people help others based on the perceived responsibility of the victim with their current problem. For instance, a helper is more likely to assist somebody if they are viewed as suffering from something that they did not cause themselves.

Esteem Enhancement/Maintenance explains prosocial behavior as a way people act to improve or enhance their self-image. Researchers have viewed this as an acceptable explanation for why some people who have high self-esteem often refuse help from others. Moral Reasoning includes a six-stage process group in three levels that individuals go through when deciding to act prosocially.

The authors also discuss instances and explanations of why at times people fail to act prosocially. They cite the example of Kitty Genovese, who was murdered by her ex-partner in front of 38 people and was never helped by anyone. If there are other people watching an event unfold, people start to ask why they should individually come to the rescue. Nobody wants to appear foolish by overreacting to a situation, so they watch what others do first. This notorious incident with the victim Kitty Genovese came to be a prime example of what is now known as the Bystander Effect (Batson & Powell, 2003).

Victim blaming is also discussed as a reason for failing to act prosocially. The authors write that if a person is raised to believe that long term hard work pays off, and that they achieve their personal dreams because of it, looking at others who do not have as much as them violates their notion that the world is fair. It is easier for them to view the victim as deserving of their plight (Batson & Powell, 2003).

The authors conclude that the research currently available on prosocial motivation and theories is ongoing and that more is needed if there is to ever be a consensus on what drives this human phenomenon. They end their text by noting that the contradictory nature of our species

makes this idea difficult to measure, and that quantifying this idea for its' theoretical and practical purposes will be extremely challenging for future researchers (Batson & Powell, 2003).

### **Positive effects and applications of video games**

Harrington and O'Connell (2016) recruited 538 students aged 9 to 15 and measured their prosocial reactions to playing videos games using various surveys. Surveys used included the Computer/Video Game Habits Questionnaire, Children's Empathic Attitudes Questionnaire, Prosocial Orientation Questionnaire, and five-Item Prosocial Behavior Subscale of the Strengths and Difficulties Questionnaire. They concluded through their research that there is a significant relationship between playing prosocial video games and cooperation and empathy (Harrington & O'Connell, 2016).

Bachen, Hernández-Ramos, and Raphael (2012) analyzed the title REAL LIVES, a video game where players live the life of another person in another part of the world. The authors studied the effect the video game had on promoting global empathy and learning in a classroom study of 301 high school students in three schools. The authors conclude that Real Lives inspires students to better empathize and identify with cultures beyond their own, as well as increases their interest in learning about other countries (Bachen, Hernández-Ramos & Raphael, 2012).

Adachi and Willoughby (2012) argue that this media meets the Larson (2000) criteria for nurturing social initiative in young adults, which is an important aspect of positive social development (Adachi & Willoughby, 2012). The three critical aspects of the Larson model for positive youth development include personal motivation, concentration and mental effort, and sustained effort and focus over a period of time to achieve a long-term goal (Larson, 2000).

Adachi and Willoughby argue that video games meet these requirements because adolescents are inherently motivated to participate in this media, often playing video games more

than other activities like sports or television, Additionally, video games require dedicated concentration and mental effort to achieve goals, with games often times increasing in difficulty as the player progresses through the program. Finally, video games require a sustained effort to achieve goals, like finishing the game, and this media often features numerous in game setbacks that require discipline on the part of the player, like introductions of new game mechanics that were previously not available (Adachi & Willoughby, 2012).

In a 2017 study, the authors conclude that Minecraft can effectively teach SEL (social and emotional learning) skills, and they argue that it is effective because of its appeal outside of the classroom setting. Furthermore, they argue that the game is most effective at teaching SEL skills when teachers set concise rubrics for game activities and outcomes (“How Minecraft Supports Social and Emotional Learning in K-12 Education,” 2017). Some of the positive effects of SEL (social and emotional learning) skills include: Increasingly positive attitudes toward self, others and tasks including self-efficacy, confidence, persistence, empathy, connection and commitment to school, and a sense of purpose, more positive social behaviors and relationships with both peers and adults,” and a reduction in conduct problems and risk-taking behavior. These are all traits that align with prosocial behavior and thought.

The Getting Smart Research Report (2017) also provides useful information relevant to this thesis. The authors were primarily interested in the ability of Minecraft: Education Edition to potentially teach Social and Emotional Life Skills to children in Kindergarten through 12th Grade. They used a variety of methodologies, including online surveys, onsite observations of Minecraft Education Edition sessions, reviews of previously existing Social and Emotional Learning literature, phone interviews, and informal data gathering through social media (“How Minecraft Supports Social and Emotional Learning in K-12 Education,” 2017).

Additionally, Woodbridge (2017) wrote specifically about the potential for Minecraft to foster prosocial interactions with players in the game world and how to design experiences that encourage this. The author concluded that through specific game design by server administrators, Minecraft had the potential to create a prosocial environment for players. Woodbridge recommended that to create the optimal prosocial environment in Minecraft, player vs. player conflict should be avoided and cooperation encouraged. Additionally, the multiplayer servers should facilitate a policy of greeting and saying goodbye to players to encourage social interaction. Overall, the author writes that a shared and continued dedication to a game world will foster a prosocial atmosphere in the game of Minecraft. Finally, the author includes a helpful appendix for readers interested in fostering a prosocial Minecraft community. It includes a glossary of common game terms, various recommendations for server administration, strategies on keeping the game design simple, and leadership by moderators.

Finally, Greitemeyer and Osswald (2010) explore how to measure if prosocial video games can affect prosocial behavior. The authors conducted a test where groups played a prosocial or neutral video game and their responses to spontaneous events (such as a researcher appearing to accidentally drop a pencil on the floor) were recorded in a lab setting. In a more serious example, users played a prosocial or neutral video game and were then placed in the middle of a verbally hostile situation of which they were previously unaware.

For instance, after eight minutes of testing, a scripted scene occurred: an actor playing a female researcher's ex-boyfriend rushed into the room and harassed her. The authors found that people who played the prosocial video game were more likely to help the experimenter pick up a dropped pencil, to volunteer to participate in additional experiments, and to intervene when a researcher was being harassed than their counterparts who played the neutral video game. The

authors conclude that although violent video games can be dangerous and lead to aggression, this media can also be part of the solution with prosocial game design and content, and that there is a larger need for games that are non-violent and marketable to consumers, since 70 to 85% of games contain violence (Greitemeyer & Osswald, 2010).

Greitemeyer, et al. (2010) studied how playing prosocial video games related to empathetic and antisocial reactions toward others. The authors theorize that since individuals often either feel empathy or schadenfreude for others suffering from misfortune, playing a video game that promotes prosocial behavior will have an impact on what type of behavior they display. The authors conducted two experiments (prosocial vs. neutral game & prosocial vs. anti-social games) and concluded that people who played the prosocial video games were more likely to engage in prosocial behavior in the short term.

### **Research Hypotheses**

Based on previous research into available literature, the current research proposes the following hypotheses: individuals who play a video game with lesson plans specifically designed to instruct them to act empathetically will show more empathy (H1) and prosocial behaviors in the short term (H2) than those who play the same game without predetermined goals or lesson plans.

## Chapter 3: Research Design

### Research design

The lesson plan employed in the experiment is titled *Empathy Education with MCEE*, and is available for review and download on the official *Minecraft: Education Edition* website (Kelly, 2018). The lesson plan lists the following learning objectives as part of its' design: "Students will develop their creativity and individual abilities to empathize with given families in need, students will critically examine model family struggles and brainstorm empathetic solutions, and students will critically select solutions from a brainstorming list to implement for a family in need". The lesson plan includes the biographies of eight unique families in need, lists the circumstances that put them in this position, and touches upon serious themes like unemployment, trauma, mental illness, poverty, war, unintended pregnancies, safety from violence, death of parents, and more (Kelly, 2018). The families that the players help will be randomly assigned at the beginning of the study, but all feature various iterations on the aforementioned themes.

This lesson plan describes the purpose of the exercise like this: "Students will be presented with different families in Minecraft suffering in different ways. Illness, expanding family, loss of jobs and even in-laws needing to move in are all situations they could encounter. Students will examine their situation, generate creative solutions, critically examine and choose

solutions that will best help and finally implement them while building the family a dream home” (Kelly, 2018, p.2).

After describing these characters, the lessons ask players to brainstorm ideas to help improve the lives of the families and then create a list of their ideas. They then provide the final list to the administrator alongside a timeframe they believe they need to complete the project. After approval from the educator, they work on developing the project in the *Minecraft* game world and document it with in game screenshots. At the end of the game, they discuss their idea and how it will be used by the family to better their lives (Kelly, 2018).

There were two distinct groups of participants. The experimental group played *Minecraft: Education Edition* with the empathy lesson plan for 60 minutes. The other group, which serves as the control group, played the creative mode without overarching goals or instruction from the administrator for the same duration. After the participants played the video game for the predetermined amount of time, they were administered the Prosocial Tendencies Measure (PTM), Empathy Concerns/Perspective Taking Scales (ECPT), and Children’s Empathic Attitudes Questionnaire (CEAQ) and then debriefed afterwards. The survey results were analyzed and compared to one another for potential differences using the T-Test statistical model to determine whether there were statistically significant differences between the two groups.

Participants were recruited from two approaches: in-person and online. The in-person study was conducted at the Art and Journalism Building at the Ball State University Campus, and participants played *Minecraft: Education Edition* on iMac computers. Funding for the licenses was provided by the Center for Emerging Media Design & Development. Additionally, remote testing was conducted at the homes of participants to allow for individuals to take part in the study who would otherwise not be able to due to scheduling conflicts, mobility issues, or long

distances from the Ball State University campus. There was no significant difference in outcome variables between in-person and online participants.

### **Participants**

Twenty-seven participants were recruited for this study through Ball State University listserv emails, in-person outreach with local community organizations in the Midwestern cities of Muncie and Indianapolis, and through the author's existing professional network. All participants were between the ages of 11 to 17 and were provided consent forms for themselves and their parents and/or guardians to review, sign, and provide back to the principal investigator.

There was only one disqualification for participants in the age range of 11 to 17, and it was for individuals with epilepsy. This was a necessary precaution due to the bright lights and constantly changing colors in the *Minecraft* video game. It was determined that although this was a very small risk overall, it warranted exclusion on the basis of safety.

The study was conducted from April 2019 to June 2019. Twelve individuals participated in the study remotely, while the rest attended the study in person on the Ball State University campus. The remote participants were located in Florida, New Jersey, New York, and various regions of central and northern Indiana.

### **Stimulus**

*Minecraft* is a video game that puts players in a procedurally generated infinite world, and the player has the option to either play the title in survival or creative mode. Survival mode forces the player to mine throughout the world for valuable sources to craft materials that they need to survive, like food, shelter, weapons, and armor. During the daytime, the player can traverse the gameworld with relative ease, but when the sun goes down monsters of varying

strength will appear and attack and eventually cause the player's death if they are not careful (Microsoft, 2016).

The player can build materials to fight the monsters, both weapons and defensive structures, as well as everyday items like beds and houses. They can domesticate animals for food, and even befriend animals like dogs and wolves for pets. If an individual plays the game with enough skill, they can enter other dimensions, known in the game as the Nether and The End, to invade monster infested territories to fight for and gather rare materials to craft even more marvelous structures. At a certain point, Minecraft is a game of limitless options and the way it is played is entirely up to the player (Microsoft, 2016).

Creative mode is much different than survival. The player has unlimited health, can fly in any direction throughout the digital world, and has access to all game items at the start. There are no monsters or threats to their avatar's well-being and the player character is practically omnipotent. They are freely available to create or modify their surrounding structures in any way they choose, and can explore the endless world at their prerogative.

Players have an unlimited number of options and can choose to practically do anything they want in creative mode without fear of monsters, death, or even the weather, which they also control. In fact, creative mode has been the choice of players throughout the game's history when they have wanted to create visually impressive structures, ranging from cities, dungeons, amusement parks, replicas of historic buildings, and even functioning eight-bit arithmetic logic unit circuits (Microsoft, 2016).

Survival and creative mode are both available in *Minecraft: Education Edition*, but with one critical difference: The optional presence of an administrator which oversees all player related activity that can control the activities and flow of the game, and in extreme and warranted

circumstances, can remove players that exhibit poor or antisocial behavior with their fellow players.

Additionally, *Minecraft: Education Edition* specializes in offering the unique Minecraft experience in a classroom setting so that teachers and educators can instruct their students on a wide variety of topics within the game world. For example, this version of the game comes with pre-developed lesson plans in Language Arts, Science, History & Culture, Computer Science, Math, and Art & Design, and even features valuable instructional topics ranging from land usage issues, coding, sustainability, and Boolean logic (Microsoft, 2016). The wealth of educational content available to teachers through *Minecraft: Education Edition* is a boon to educators in the 21st century that wish to teach their students using technology.

### **Procedures and Measures**

The current study includes two outcome variables: prosocial behavior and empathy. For prosocial behavior, the current study adopted the Prosocial Tendencies Measure (PTM), which has been used to measure similar concepts in previous studies (Carlo and Randall, 2002). The PTM has 23 items, and the audience is directed to indicate how much each statement describes them using a 5-point scale, with one being “does not describe me at all”, and five being “describes me greatly” (Carlo and Randall, 2002).

Statements in the PTM scale ( $\alpha = .083$ ) include: I can help others best when people are watching me, I think that one of the best things about helping others is that it makes me look good, I prefer to donate money anonymously, I never hesitate to help others when they ask for it, one of the best things about doing charity work is that it looks good on my resume, and many more. The authors designed these to correspond with one of the six different types of prosocial

behavior the authors identified, which include altruism, compliant, emotional, public, anonymous, and dire (Carlo and Randall, 2002).

Regarding empathy, the Children's Empathic Attitudes Questionnaire (CEAQ,  $\alpha = .074$ ) and Empathy Concerns/Perspective Taking Scales (ECPT,  $\alpha = .083$ ) and are used to measure the level of empathy. The two scales have been validated in measuring empathy in previous studies (e.g., Prot, et al. 2016). The CEAQ was designed to meaningfully identify antisocial behavior patterns with adolescents and young adults in order to intervene before they act out in dangerous and illegal activities that could endanger the wellbeing of themselves and others (Funk, Fox, Chan, & Curtiss, 2008). The CEAQ is a questionnaire that includes 16 prompts, and the participants identify how much they agree with the statements. The survey includes prosocial statements like, "Other people's problems really bother me", "I would get upset if I saw someone hurt an animal", and "I understand how other kids feel". At the end of the CEAQ, the participants write down their age, school grade, and gender (Funk, Fox, Chan, & Curtiss, 2008).

The (ECPT) Scale was administered to the participants last. These two scales have been scientifically validated measurement tools for these human phenomena (e.g., Prot, et al. 2016). The scales define empathy into four separate categories of human experience: fantasy items, perspective taking, empathic concern, and personal distress. After conducting the reliability tests of these dimensions, items related to fantasy and personal distress were not included in the data analysis due to low reliability. All the items are listed in Table 1.

**Table 1**

PTM1	I can help others best when people are watching me.
PTM2	It is most fulfilling to me when I can comfort someone who is very distressed

PTM3	When other people are around it is easier for me to help needy others
PTM4	I think that one of the best things about helping others is that it makes me look good.
PTM5	I get the most out of helping others when it is done in front of others.
PTM6	I tend to help people who are in a real crisis or need
PTM7	When people ask me to help them, I don't hesitate
PTM8	I prefer to donate things anonymously
PTM9	I tend to help people who hurt themselves badly
PTM10	I tend to help needy others most when they do not know who helped them
PTM11	I tend to help others particularly when they are emotionally distressed
PTM12	Helping others when I am in the spotlight is when I work best
PTM13	It is easy for me to help others when they are in a dire situation
PTM14	Most of the time, I help others when they do not know who helped them
PTM15	I believe I should receive more recognition for the time and energy I spend on charity work
PTM16	I respond to helping others best when the situation is highly emotional
PTM17	I never hesitate to help others when they ask for it

PTM18	I think that helping others without them knowing is the best type of situation
PTM19	One of the best things about doing charity work is that it looks good on my resume
PTM20	Emotional situations make me want to help needy others
PTM21	I often make anonymous donations because they make me feel good
PTM22	I feel that if I help someone, they should help me in the future
CEAQ1	Seeing a kid who is crying makes me feel like crying
CEAQ2	Other people's problems really bother me
CEAQ3	I would feel bad if the kid sitting next to me got in trouble
CEAQ4	It bothers me when my teacher doesn't feel well
CEAQ5	When I see a kid who is upset it really bothers me
CEAQ6	It would bother me if my friend got grounded
CEAQ7	I understand how other kids feel
CEAQ8	When I see someone who's happy, I feel happy too
CEAQ9	I would feel bad if my mom's friend got sick
CEAQ10	I feel sorry for kids who can't find anyone to hang out with
CEAQ11	I'm happy when the teacher says my friend did a good job

CEAQ12	I feel happy when my friend gets a good grade
CEAQ13	When I'm mean to someone, I usually feel bad about it later
CEAQ14	If two kids are fighting, someone should stop it
CEAQ15	I would get upset if I saw someone hurt an animal
PT1	Before criticizing somebody, I try to imagine how I would feel if I were in their place.
PT2	If I'm sure I'm right about something, I don't waste much time listening to other people's arguments (REVERSED SCORE)
PT3	I sometimes try to understand my friends better by imagining how things look from their perspective.
PT4	I believe that there are two sides to every question and try to look at them both.
PT5	I sometimes find it difficult to see things from the "other guy's" point of view. (REVERSED SCORE)
PT6	I try to look at everybody's side of a disagreement before I make a decision.
PT7	When I'm upset at someone, I usually try to "put myself in his shoes" for a while.
EC1	When I see someone being taken advantage of, I feel kind of protective toward them.

EC2	When I see someone being treated unfairly, I sometimes don't feel very much pity for them. (REVERSED SCORE)
EC3	I often have tender, concerned feelings for people less fortunate than me. I would describe myself as a pretty soft-hearted person.
EC4	Sometimes I don't feel sorry for other people when they are having problems.
EC5	Other people's misfortunes do not usually disturb me a great deal. (REVERSED SCORE)
EC6	I am often quite touched by things that I see happen.

### **Analytic Techniques**

There are two analytic techniques implemented in the current study. First, descriptive statistics were used to summarize the demographic information of the participants. Second, the results from the surveys and scales collection from both groups were compared for statistical differences using the Independent Samples t Tests. Both tests were conducted via SPSS 25.0.

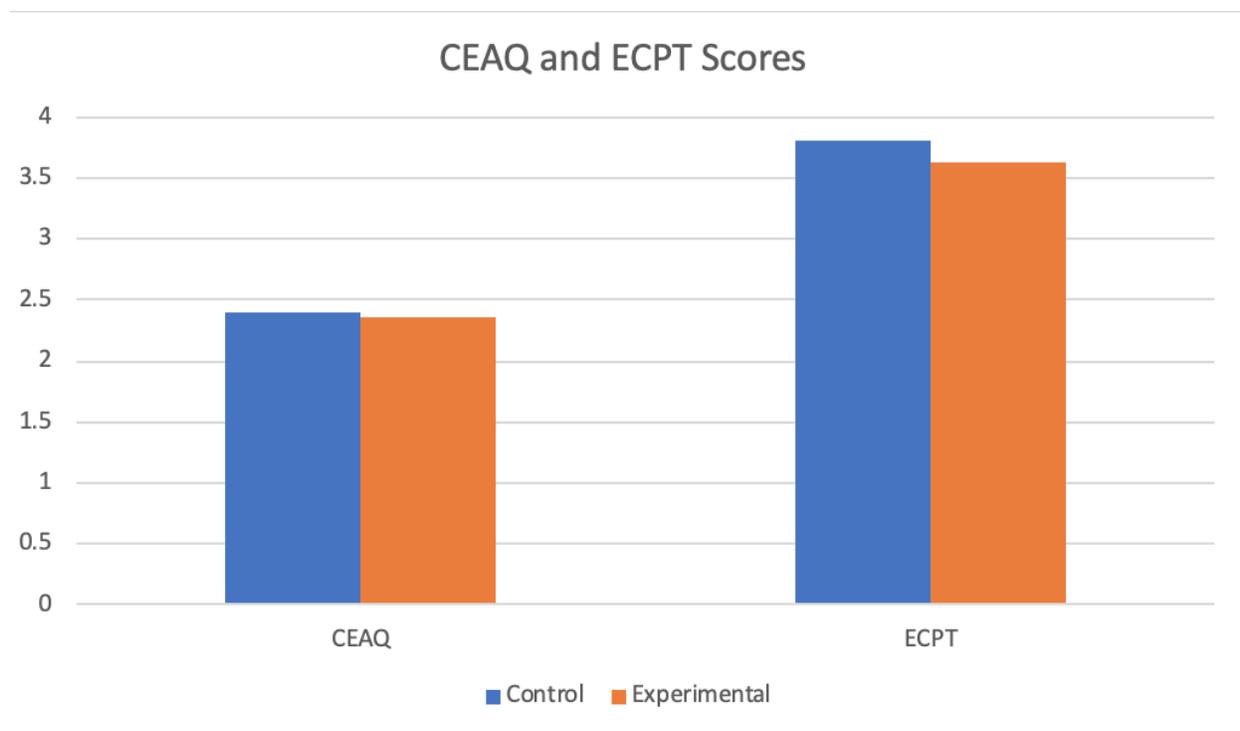
## **Chapter 4: Results**

### **Demographic Information**

The individuals who participated in the study were diverse and represented numerous parts of the American population ages 11 through 17. There were 12 female participants and 15 male participants in the study, 17 of which were Caucasian, six African American, two Latino, and two Middle-Eastern. Two individuals were members of the LGBT community, with one identifying as transgender.

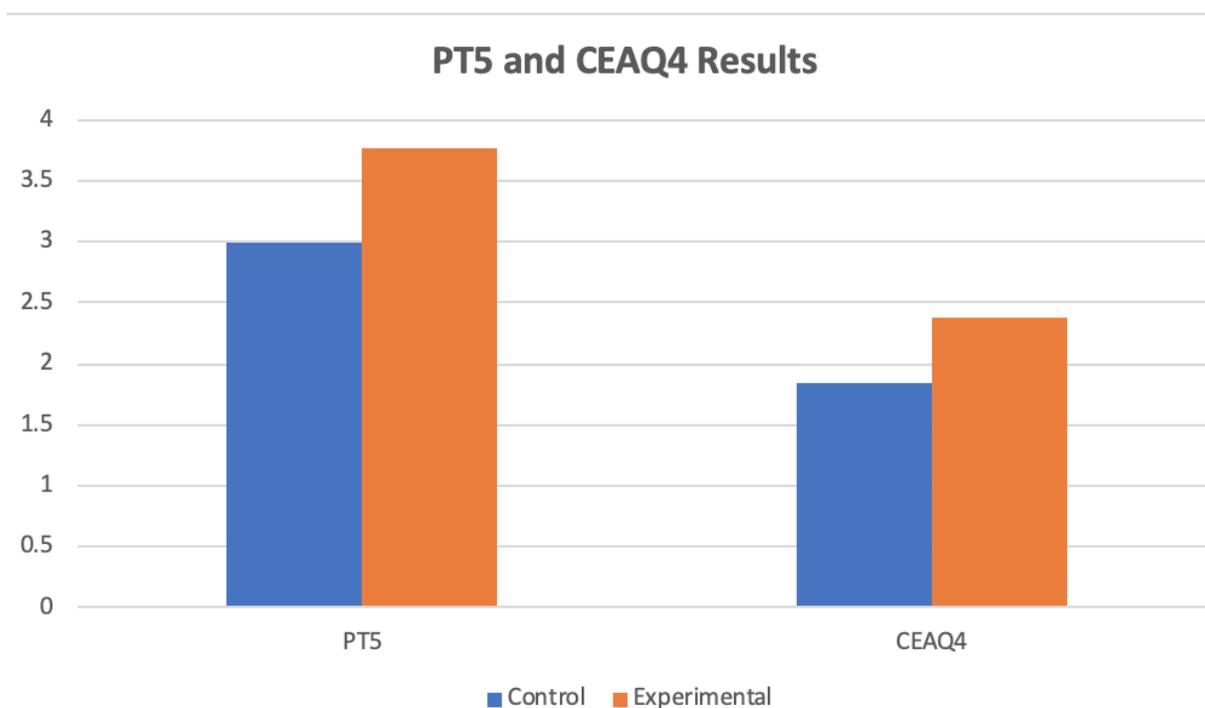
### **Independent Samples T- Tests**

#### **Figure 1: CEAQ and ECPT Mean Scores by Conditions**



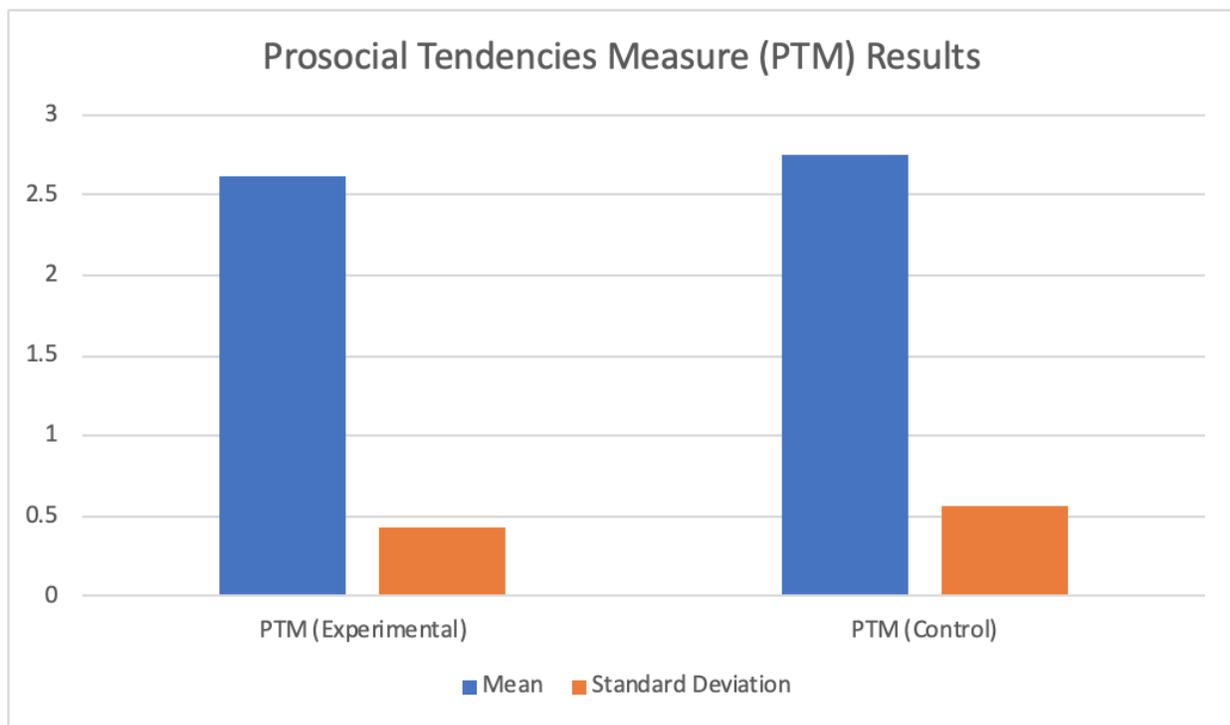
To test the hypotheses, a series of independent samples *t*-tests were conducted. Regarding the first hypothesis – that individuals who play a video game with lesson plans specifically designed to instruct them to act empathetically will show more empathy – participants’ scores for the Children’s Empathic Attitudes Questionnaire (CEAQ) were lower for the experimental group ( $M = 2.36$ ,  $SD = .40$ ) than for the control group ( $M = 2.40$ ,  $SD = .262$ ). Additionally, scores for the Empathy Concerns/Perspective Taking (ECPT) Scale were lower for the experimental group ( $M = 3.64$ ,  $SD = .83253$ ) than the control group ( $M = 3.80$ ,  $SD = .561$ ). These results suggest that, as a whole, there was not a significant difference between the two groups in empathic responses post gameplay.

**Figure 2: PT Item 5 and CEAQ Item 4 Mean Scores by Conditions**



Further investigation into whether there was a difference between the individual items of the CEAQ and ECPT scales found that one item from each scale showed a difference between the experimental and control conditions at either a significant or marginally significant level. Regarding the CEAQ scale, the experimental group scored higher in an item measuring empathy toward their teacher (CEAQ Item 4: It bothers me when my teacher doesn't feel well) ( $M = 2.38$ ,  $SD = .65$ ) than the control group ( $M = 1.85$ ,  $SD = .80$ ) at a marginally significant level ( $t(25)=1.89$ ,  $p=.072$ ). For the ECPT scale, the experimental group also scored ( $M = 3.77$ ,  $SD = .92$ ) higher than the control group ( $M = 3.00$ ,  $SD = 1.17$ ) in an item measuring perspective taking (PT Item 5): I sometimes find it difficult to see things from the "other guy's" point of view) at a marginally significant level ( $t(24)=1.88$ ,  $p=.072$ ) after the scores were reverse coded, meaning that higher scores displayed better perspective taking abilities. Therefore, the first hypothesis is partially supported.

**Figure 3: Results of Prosocial Tendencies Measure Analysis**

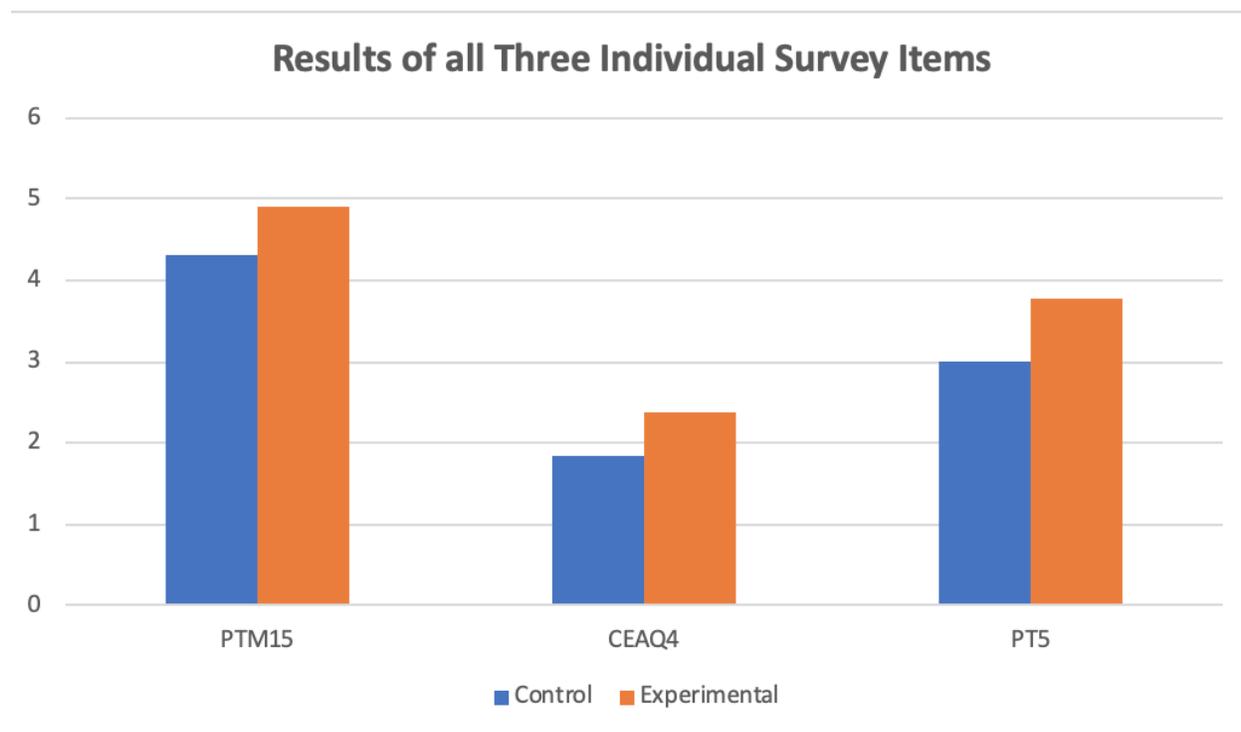


Regarding the second hypothesis, that individuals who play a video game with lesson plans specifically designed to instruct them to act empathetically will show more prosocial behaviors in the short term (PTM), scores were lower for the experimental group ( $M = 2.62$ ,  $SD = .44$ ) than for the control group ( $M = 2.7$ ,  $SD = .57$ ). The results suggest that there was no significant difference in overall prosocial attitudes between the groups post gameplay. In other words, no difference was found in these three measures between two conditions.

Further investigation was conducted to explore whether there was a difference between the individual items of the PTM scale. One item measuring public prosocial behaviors (PTM Item 15: I believe I should receive more recognition for the time and energy I spend on charity work) resulted in a significant difference between the two groups ( $t(25) = -2.966$ ,  $p = .007$ ). Specifically, the average score of the item (PTM15) in the experimental group ( $M = 4.92$ ,  $SD =$

.27) was higher than the control group ( $M = 4.3$ ,  $SD = .73$ ). Therefore, the second hypothesis was partially supported.

**Figure 4: Mean Results of Statistically Significant Individual Items**



**Table 2. T-Test Results for Statistically Significant Individual Items.**

Survey	t	DF	Sig. 2-Tailed
PTM15	-2.97	25	.007
CEAQ4	1.88	24	.072
PT5	-1.89	25	.072

**Table 3. Mean & Standard Deviation for Statistically Significant Individual Items.**

Survey	Group	Participants	Mean	Std. Deviation
PTM15	Experimental	13	4.92	.277
	Control	14	4.29	.726

CEAQ4	Experimental	13	2.38	.650
	Control	13	1.85	.801
PT5	Experimental	13	3.77	.927
	Control	14	3.00	1.18

**\*Higher scores still mean more prosocial and empathic**

### Summary of Findings

At first glance, the group statistics of the overall Prosocial Tendencies Measure (PTM), Children's Empathic Attitudes Questionnaire (CEAQ) and the Empathy Concerns/Perspective Taking (ECPT) Scales did not yield any statistical significance between the experimental and control groups at a significant level, even though there were certain aspects of prosocial behavior and perspective taking that the experimental group excelled in. Although there were slight differences in the mean and standard deviation between the two groups, none of them were large enough to conclude that the experimental group experienced more overall prosocial behavior or empathic impulses than the control group post gameplay in Minecraft: Education Edition.

After conducting T-Tests for individual items, there were differences in all three scales between the two groups. For instance, the individual item on the Prosocial Tendencies Measure displayed a significant statistical difference between the experimental and control group, while the individual items on the Children's Empathic Attitudes Questionnaire and the Empathy Concerns Perspective Taking surveys displayed a marginal statistical difference. These individual results from the three surveys demonstrate an increased level of prosocial behavior and perspective taking, a subset of empathy, under certain conditions for the experimental group.

Overall, the results from this study partially support the hypothesis in this thesis. These surveys are multidimensional and measure various subsets of different types of empathy and prosocial behavior. For example, the PTM is divided into six separate categories of prosocial tendencies, which include altruism, compliant, emotional, public, anonymous, and dire. In this

context, item 15 in the PTM is part of the public category (Carlo & Randall, 2002). Similarly, the CEAQ and the ECPT surveys are multidimensional measurements of various subsets of empathy and prosocial behavior.

The T-Test results of the CEAQ and ECPT between the experimental and control group were statistically insignificant and show that there was not a meaningful difference in empathy between the groups post gameplay. Additionally, the overall results of the PTM between the experimental and control groups do not display a statistically significant difference, and shows that there was no meaningful prosocial response with participants post gameplay. In other words, the overall results for the three surveys display no difference in empathy or prosocial behavior post gameplay.

However, analysis of individual items reveals significant statistical differences on one question in each survey. Simply put, there was a difference between the experimental and control group in certain subsets of the three surveys that partially support (H1) and (H2) of this thesis; that individuals who play a video game with lesson plans specifically designed to instruct them to act empathetically will display more empathy (H1) and prosocial behaviors (H2) in the short term than those who play the same game without predetermined goals or lesson plans.

## **Chapter 5: Discussion**

### **Overview**

The study yielded valuable data for review, and provided a novel experience for participants in both conditions. The experimental group was provided lesson plans that told the stories of families and individuals in need within the world of *Minecraft*, and then tasked the participants to come up with creative solutions to solve the problems that confronted the

characters. In contrast, the control group played *Minecraft: Education Edition* however they chose with no oversight. Both conditions were given sixty minutes to play the game. After the time limit was reached, the experimental group shared their solution with the group and principal investigator, and explained why they felt it would improve the lives of the characters in the lesson plan. Afterwards, both groups were administered three scientifically validated surveys that measured empathic and prosocial responses. The empathy lesson plans are available to download for the public through the official website of *Minecraft: Education Edition*, and are titled *Empathy Education with MCEE* (Kelly, 2018).

Put simply, the results of this study show that there was not a significant statistical difference in the results for the three surveys in their entirety, but that there were significant differences in specific items on the three surveys regarding certain subsets of prosocial behavior and empathy. The items that scored higher at a significant margin between the two conditions display a heightened level of prosocial tendencies and perspective taking, which is a subset of empathy. In other words, if empathy and prosocial behavior are considered unidimensional concepts, then the results of the study display no differences post gameplay between the two groups. However, if the three surveys are viewed as accurate measurements of the multidimensional nature of these human behaviors, then the hypotheses of this thesis are partially supported.

### **Analysis of Findings**

There was a significant statistical difference in the responses for three individual items on the three surveys between the two conditions. Overall, the experimental group for these conditions displayed a higher level of perspective taking and prosocial tendencies. One explanation for the results of the individual items of the surveys is that the structured lesson

plans in *Minecraft: Education Edition* primarily affect users in specific subsets of empathic responses and prosocial behavior. For example, item 15 of the Prosocial Tendencies Measure identifies public prosocial behavior, and the question reads, “I believe I should receive more recognition for the time and energy I spent on charity work”. Item 4 of the CEAQ and item 5 of the ECPT both measure perspective taking, a subset of empathy. CEAQ4 reads “it bothers me when my teacher doesn’t feel well”, and PT5 reads, “I sometimes find it difficult to see things from the other guy’s point of view”.

Every session of the study was conducted with experimental groups that contained multiple participants at the same time. The individuals were given the lesson plan together as a group, played at the same time, and presented their solutions to the principal investigator with others in the group present. It can be inferred that this had an effect on the user’s perception of how his or her charitable acts should be viewed by others in public settings, which would likely increase their Prosocial Tendencies Measure score in the public category. Using this logic, the groups also scored higher on the perspective taking section of the ECPT survey because the lesson plans in *Minecraft: Education Edition* were more effective at helping users see things from another person’s point of view than at imbuing a general sense of empathy. Batson & Powell’s (2003) Theory of Social Learning can help explain this phenomenon. For instance, the theory states that individuals exhibit prosocial behavior based on what they have been taught society expects of them, and that they will act accordingly based on the expectation of a reward. Simply put, it is possible that the students in the experimental condition displayed more prosocial behavior because they expected to be praised by the principal investigator and receive respect from their peers. These factors could have played a large role in the significant difference in the two conditions with the scores on the individual items of the PTM, CEAQ, and ECPT.

Another explanation of the study results from the individual item that measured prosocial behavior and perspective taking is that these behaviors were affected due to the interactivity in the lesson plan and *Minecraft: Education Edition*. It is possible that playing the game with their digital avatars enabled participants to have a better understanding of different perspectives and other people's problems than they would have if the lesson had been a story told through a non-interactive media. For instance, the participants were able to directly intervene in the problems of characters in the lesson plans and offer solutions. This is a different experience than being a passive consumer through film or novels. By empowering them to not just see the problem described in the empathy lesson plans, but to solve it, the video game potentially promoted the development of better perspective-taking abilities by giving the players agency in the predicaments they were told about. Examples of predicaments that they were told about included families that faced recent job loss, unexpected pregnancies, homelessness, and threats of violence. This is consistent with Bachen, Hernández-Ramos, and Raphael's studies (2012), which argues that a video game titled *REAL LIVES* is able to promote better perspective taking in participants due to the increased interactivity of the media. The data also aligns with the 2002 study that argues that video games could teach children valuable life skills due to the inherent interest of this demographic in the media (Rosas, et al. 2003). Like the 2002 study, the participants were potentially able to learn prosocial behavior more effectively because they were more interested in playing *Minecraft: Education Edition* than they would have been if the experience had been presented as a novel or film.

The study is also consistent with Adachi and Willoughby's paper (2012), which argues that video games could be used to foster positive social development in adolescents. They argue that since this age group is inherently drawn to this form of media, video games are able to

provide an educational experience on a range of topics that promote positive development along with entertainment the user enjoys.

The data generated demonstrates that (H1) - individuals who play *Minecraft: Education Edition* with lesson plans that instruct players to act empathetically will show more empathy in the short term than those in a control group, and (H2) – individuals who play *Minecraft: Education Edition* with lesson plans that instruct players to act empathetically will show more prosocial behaviors in the short term than those in a control group – is partially supported by the study. Specifically, users in the experimental group displayed a high level of perspective taking (a subset of empathy) and prosocial tendencies post gameplay as displayed through individual items in the three surveys. The multidimensional nature of these surveys helped to identify these key subsets that were affected during gameplay.

### **Importance of Findings & Contribution to Prosocial Video Games Scholarship**

The findings of the current study provide value to researchers that study similar topics in the future, individuals who are interested in this specific title and its relationship to prosocial behavior, and academics that want to design studies with similar methodologies. The study partially supports the hypotheses due to the multidimensional nature of the PTM, CEAQ, and ECPT surveys. As the data demonstrated, there was a partial prosocial user experience of the empathy lesson plans in *Minecraft: Education Edition* in this study due to the results of the individual questions “I believe I should receive more recognition for the time and energy I spent on charity work (PTM Item 15)”, “it bothers me when my teacher doesn’t feel well (CEAQ Item 4)”, and “I sometimes find it difficult to see things from the other guy’s point of view (PT Item 5)”.

The study results supplement the conclusions of Greitemeyer & Osswald's (2010) paper involving the experiment regarding prosocial and neutral video games, and their effect on the prosocial behavior of participants. The participants that played the prosocial video game were more likely to help in situations ranging from investigators "accidentally" dropping a cup of pencils, to more serious situations like scripted scenes involving a verbally abusive ex-boyfriend.

The results of this study also found that there is a prosocial response in participants who played video games that are designed to elicit these responses. Although the participants of this study were not involved in scripted incidents like the ones previously described, those who played a prosocial video game did display quantifiable levels of increased prosocial behavior afterwards.

Additionally, this study supplements the paper written by Woodbridge (2017), which discusses the potential for structured gameplay sessions in *Minecraft*, overseen by an administrator, to foster prosocial behavior. One of the criteria the author mentioned that would assist in this would be disabling player vs. player conflict, which this study did. The quantitative data from this study argues in favor of Woodbridge's assertion that *Minecraft*, under specific circumstances, can promote prosocial behavior.

The study contributes to the overall study of prosocial video game scholarship in a number of ways. First, it provides a structural framework for the design of a study that includes multidimensional surveys which measure various subsets of empathy and prosocial behavior into distinct and quantifiable categories. For instance, the study makes the argument for surveys that measure the specific subcategories of prosocial behavior in not just *Minecraft: Education Edition*, but also other open world video games that provide players with nearly unlimited freedom of choice. Video games ranging from *Roblox*, *Garry's Mod*, *The Elder Scrolls: Skyrim*,

*Fallout*, *Red Dead Redemption* and even the controversial *Grand Theft Auto* series could be studied under the same parameters of this thesis' design given an appropriate stimulus.

Additionally, the breadth of quantitative analysis of the data gathered by the study demonstrates the value of using the PTM, CEAQ, and ECPT in conjunction with one another when studying this area of academia. As mentioned previously, these surveys are multidimensional, and measure various subsets of empathy and prosocial behavior. The study demonstrates the importance of measuring these subsets to better understand how video games can affect each subset individually. For instance, this study found an increased level of perspective taking and public prosocial behavior through these multidimensional surveys. Further, the study also displays the importance of measuring both empathy and prosocial behavior in video game studies.

The study has a high external validity for future researchers and can be used for future studies into the relationship between video games and prosocial behavior and empathy. The study replicates how participants would interact with *Minecraft: Education Edition* in a classroom environment because it was conducted primarily in a computer lab with equipment similar to what is available to consumers. Also, the computer lab used in the study was an environment similar to those found in schools and libraries. Additionally, the study methodology and procedures can be easily replicated in *Minecraft: Education Edition*, and other games as well, to measure differences in prosocial behavior and empathy post gameplay. For instance, the data was collected through the commercially available software *Qualtrics*.

Finally, the survey results that display a statistically significant difference between the experimental and control groups in empathy post-gameplay provide valuable data to researchers interested in the relationship between empathy and prosocial behavior. This is important toward

understanding the multidimensional nature between these two concepts and how they are different from another. Video games, through additional research, can provide more information on the contrast between these two psychological factors. This data is useful for developing a better understanding of the gaps between these two psychological states, as well as their application in video game user experience design in the future.

### **Limitations and Future Research**

The simulation tested in the study was narrowly focused on *Minecraft: Education Edition* and how its' structured lesson plans can cause these reactions for players in the short-term. The study results do not apply to other video games and their potential, or lack thereof, to promote these behaviors. It also does not provide any information on how video game play with empathy lesson plans can cause long-term increases in prosocial behavior or empathy. The surveys only measured these behaviors immediately after gameplay, so this study cannot provide any information to scholars interested in long-term effects of video games.

Another consideration is how a group atmosphere may have affected the study, as the players in each group played together both physically as well as in the game worlds. It is possible that this proximity affected the survey score compared to the outcome had each player played alone. Future research should investigate how a social atmosphere might affect prosocial behavior and empathy.

The study also included participants that had varying levels of experience with *Minecraft: Education Edition* and the regular game prior to the study. Some participants had never played the game before, others played casually, and many were avid fans. Also, there were many players that had only played the game previously on consoles like the *Xbox One*, *Xbox 360*, and

*Nintendo Switch*, and never on a computer. The study did not document which participants fell into which category.

A similar study into structured lesson plans in *Minecraft: Education Edition* needs to be conducted with a larger sample size. The study involved the participation of 27 individuals, but the data would be infinitely richer if there were 100. Also, though this study documented gender, race, and sexual and gender identity, it did not analyze the data within these subsets due to the relatively small sample size. These are all avenues that need to be researched in the future with a larger sample size. Additionally, similar research should also be conducted into video games like *Minecraft: Education Edition* with the inclusion of Virtual Reality technology to gain insights into how this emerging form of video game play can promote prosocial behavior and empathy compared to traditional gameplay on computers and video game consoles.

## **Conclusion**

The ongoing conversation about the potential negative or positive effects of video games shows no sign of slowing down in the near future. As scientific measurements continue to grow more advanced in this area, there will be more data available for arguments on both sides. Additionally, cutting-edge technologies like virtual reality and augmented reality will complicate this issue due to the increased levels of interactivity and immersion inherent in the format. It is more important than ever to understand how videogames can promote prosocial tendencies and empathy in players so that new technologies can take advantage of these techniques to help foster positive growth in users.

The study has practical implications for educators, parents, and players of the game. The data suggests that under the right conditions, this video game can promote a partial prosocial response in participants, which is encouraging to teachers or administrators that are considering

adding this product to school or library computers for student activities. It is also an important factor that should be considered for parents that are weighing the pros and cons of purchasing *Minecraft* for their child. Also, it provides an argument for the value of these empathy lesson plans available for download through the official *Minecraft: Education Edition* website. The results of this study can be cited by the developers of this game to promote these lesson plans to consumers.

The study has shown through quantitative analysis that structured empathy lesson plans in *Minecraft: Education Edition* partially supports increased levels of perspective taking and prosocial tendencies in users. It also illustrates the importance of conducting future studies on this topic to better understand this phenomenon, both in *Minecraft: Education Edition*, and other similar video games. The Prosocial Tendencies Measure, Children's Empathic Attitudes Questionnaire, and Empathy Concerns / Perspective Taking Scales were immensely valuable surveys used to collect the data for the study, and they became even more useful when cross-referenced with one another. Together, they were used to analyze prosocial tendencies alongside empathy and understand the different reactions in players post gameplay regarding the two behaviors. The analysis of the study, alongside previous literature on the topic, strengthens the argument for analyzing prosocial behavior and empathy responses within the context of the various subsets that compose these human behaviors.

It is important to continue to study this topic so that future user experiences can be crafted in video games that help develop empathy and prosocial behavior with players. The growing ubiquity of video games in society necessitates a better understanding of how it can affect human behavior and promote the positive psychological growth of players. As video games continue to evolve, it will become imperative to understand the potential prosocial user

experience, not just of *Minecraft: Education Edition*, but of all other games as well. Overall, the partial prosocial user experience of empathy lesson plans in *Minecraft: Education Edition* makes the case for continuing the study of prosocial behavior and empathy in this software title, and provides a strong case for the potential of video games to help promote positive psychological development in adolescents.

### References

- Adachi, P. J., & Willoughby, T. (2013). Do video games promote positive youth development? *Journal of Adolescent Research*, 28(2), 155-165.
- Anderson, C. A., & Bushman, B. J. (2001). Effects of violent video games on aggressive behavior, aggressive cognition, aggressive affect, physiological arousal, and prosocial behavior: A meta-analytic review of the scientific literature. *Psychological Science*, 12(5), 353–359.

- Anderson, C. A., Shibuya, A., Ihori, N., Swing, E. L., Bushman, B. J., Sakamoto, A., ... & Saleem, M. (2010). Violent video game effects on aggression, empathy, and prosocial behavior in Eastern and Western countries: A meta-analytic review. *Psychological bulletin*, *136*(2), 151.
- Bachen, C. M., Hernández-Ramos, P. F., & Raphael, C. (2012). Simulating REAL LIVES: Promoting global empathy and interest in learning through simulation games. *Simulation & Gaming*, *43*(4), 437–460.
- Batson, C. D., & Powell, A. A. (2003). Altruism and prosocial behavior. *Handbook of Psychology*
- Beale, I. L., Kato, P. M., Marin-Bowling, V. M., Guthrie, N., & Cole, S. W. (2007). Improvement in cancer-related knowledge following use of a psychoeducational video game for adolescents and young adults with cancer. *Journal of Adolescent Health*, *41*(3), 263-270.
- Calvert, S. L., Appelbaum, M., Dodge, K. A., Graham, S., Nagayama Hall, G. C., Hamby, S., ... & Hedges, L. V. (2017). The American Psychological Association Task Force assessment of violent video games: Science in the service of public interest. *American Psychologist*, *72*(2), 126.
- Carlo, G., & Randall, B. A. (2002). The development of a measure of prosocial behaviors for late adolescents. *Journal of youth and adolescence*, *31*(1), 31-44.
- Carnagey, N. L., & Anderson, C. A. (2005). The effects of reward and punishment in violent video games on aggressive affect, cognition, and behavior. *Psychological Science*, *16*(11), 882–889.
- Davis, M. H. (1980). A multidimensional approach to individual differences in empathy. *JSAS Catalog of Selected Documents in Psychology*, *10*, 85. Retrieved from [http://www.uv.es/~friasnav/Davis\\_1980.pdf](http://www.uv.es/~friasnav/Davis_1980.pdf)
- Dietz, T. L. (1998). An examination of violence and gender role portrayals in video games: Implications for gender socialization and aggressive behavior. *Sex Roles*, *38*(5–6), 425–442.

- Eisenberg, N., Spinrad, T. L., & Knafo-Noam, A. (2015). Prosocial development. *Handbook of Child Psychology and Developmental Science*, 1–47.
- Entertainment Software Association. (2018). *Essential Facts About The Computer and Video Game Industry*. Retrieved from [http://www.theesa.com/wp-content/uploads/2018/05/EF2018\\_FINAL.pdf](http://www.theesa.com/wp-content/uploads/2018/05/EF2018_FINAL.pdf)
- Ferguson, C. J. (2007). The good, the bad and the ugly: A meta-analytic review of positive and negative effects of violent video games. *Psychiatric Quarterly*, 78(4), 309-316.
- Ferguson, C. J., & Wang, J. C. (2019). Aggressive video games are not a risk factor for future aggression in youth: a longitudinal study. *Journal of youth and adolescence*, 48(8), 1439-1451.
- Funk, J. B., Buchman, D. D., Jenks, J., & Bechtoldt, H. (2003). Playing violent video games, desensitization, and moral evaluation in children. *Journal of Applied Developmental Psychology*, 24(4), 413–436.
- Funk, J., Fox, C., Chan, M., & Curtiss, K. (2008). The development of the Children's Empathic Attitudes Questionnaire using classical and Rasch analyses. *Journal of Applied Developmental Psychology*, 29(3), 187-196.
- Gentile, D. A., Lynch, P. J., Linder, J. R., & Walsh, D. A. (2004). The effects of violent video game habits on adolescent hostility, aggressive behaviors, and school performance. *Journal of Adolescence*, 27(1), 5–22.
- Greitemeyer, T., & Osswald, S. (2010). Effects of prosocial video games on prosocial behavior. *Journal of Personality and Social Psychology*, 98(2), 211.
- Greitemeyer, T., Osswald, S., & Brauer, M. (2010). Playing prosocial video games increases empathy and decreases schadenfreude. *Emotion*, 10(6), 796.

Grover, R., & Nayak, M. (2014, May 5). Activision plans \$500 million date with “Destiny.” *Reuters*.

Retrieved from <https://www.reuters.com/article/us-activision-destiny/activision-plans-500-million-date-with-destiny-idUSBREA4501F20140506?feedType=RSS>

How Minecraft Supports Social and Emotional Learning in K-12 Education. (2017). *Getting Smart*

*Research Report*. Retrieved from <http://www.gettingsmart.com/wp-content/uploads/2017/04/How-Minecraft-Supports-SEL.pdf>

Harrington, B., & O’Connell, M. (2016). Video games as virtual teachers: Prosocial video game use by children and adolescents from different socioeconomic groups is associated with increased empathy and prosocial behaviour. *Computers in Human Behavior*, 63, 650-658.

Kelly, B. (2018). Empathy Education with MCEE. Retrieved from

<https://education.minecraft.net/lessons/empathy-education-with-mcee/>

Larson, R. (2000). Toward a psychology of positive youth development. *American Psychologist*, 55(1), 170–183. <https://doi.org/10.1037/0003-066X.55.1.170>

Lejacq, Y. “After Sandy Hook, Should Violent Video Games Call a Cease-Fire?” *Wall Street Journal* 21 Dec. 2012. <http://blogs.wsj.com/speakeasy/2012/12/21/after-sandy-hook-should-violent-video-games-call-a-cease-fire/>

Kent, S. L. (2010). *The Ultimate History of Video Games: from Pong to Pokemon and beyond... the story behind the craze that touched our lives and changed the world*. Three Rivers Press.

Microsoft. (2016). *Minecraft: Education Edition* [Windows PC]. English, Microsoft. Retrieved from

<https://education.minecraft.net/>

Moore, G. (1965). Cramming more components onto integrated circuits. *Readings in computer architecture*, 56.

- Nebel, S., Schneider, S., & Rey, G. D. (2016). Mining learning and crafting scientific experiments: a literature review on the use of minecraft in education and research. *Journal of Educational Technology & Society, 19*(2), 355.
- Przybylski, A. K., Rigby, C. S., & Ryan, R. M. (2010). A motivational model of video game engagement. *Review of General Psychology, 14*(2), 154.
- Prot, S., Gentile, D. A., Anderson, C. A., Suzuki, K., Swing, E., Lim, K. M., ...Horiuchi, Y., Jelic,(2014) Long-Term Relations Among Prosocial-Media Use, Empathy, and Prosocial Behavior. *Psychological Science, 25* (2): 358-368
- Rosas, R., Nussbaum, M., Cumsille, P., Marianov, V., Correa, M., Flores, P., ... López, V. (2003). Beyond Nintendo: design and assessment of educational video games for first and second grade students. *Computers & Education, 40*(1), 71–94.
- Stuart, K. (2016). Minecraft Education Edition: why it's important for every fan of the game. The Guardian.
- Twisted Tree Games. (2013). *Proteus* [PC]. English, Twisted Tree Games. Retrieved from <http://twistedtreegames.com/proteus/>
- Woodbridge, K. A. B. (2017). “Whimsical and fun and weird and interesting”: prosocial community in minecraft.