

Video Games: The Good, The Bad, and The Ugly

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TABLE OF CONTENTS

Chapter One: Introduction.....	3
Chapter Two: Literature Review.....	5
I. The Relationship Between Video Game Play and Negative Developmental Outcomes.....	6
II. The Relationship Between Video Game Play and Positive Developmental Outcomes.....	15
Chapter Three: Method.....	21
Chapter Four: Results.....	22
Chapter Five: Discussion.....	24
References	27
Appendix	31

CHAPTER ONE

INTRODUCTION

Research shows that 72% of children in the United States begin their involvement with video games as early as age 2 (Gentile, Swing, Lim, & Khoo, 2012). This reveals how ubiquitous video games are in children's lives today. According to the Kaiser Family Foundation (2010), 87% of homes in the United States have video game consoles such as Xbox, Play Stations, and Wii's, and 50% of 8 to 18 year olds have video consoles directly in their bedrooms. Additional research suggests that 97% of adolescents in the United States play video games. This demonstrates how prevalent video games are in children's and adolescents' lives and its easy access.

Video game technology has rapidly advanced since the 1980's. Video games in the 1980's were primarily basic, with simple graphics and objectives. Today, the multibillion dollar industry produces thousands of video games per year that have now increased in complexity with strikingly realistic graphics and highly violent content. Today, video games 'inappropriately violent content draws the attention of most children and adolescents, which has sparked concern for many parents and adults. The debate on video games remains a controversial topic for many parents and families.

Most of the research that currently exists focuses largely on video games' negative developmental outcomes on children and adolescents, specifically, aggression. Many correlational studies have found that children and adolescents that reveal playing violent video games frequently have self-reported higher instances of aggressive behavior. Additionally, many experimental studies have found that participants who were assigned to play violent video games revealed more indicators of aggression than children and

adolescents who were assigned to play non-violent, neutral video games (Anderson, Gentile, Buckley, 2007). Other negative developmental outcomes such as video games' influence on adolescent's engagement in risky behavior is less widely discussed and are in need of more developed research. However, some research exists regarding racing video games and reckless driving behavior. Very few studies explore video games' influence on adolescent gambling and use of illicit substances.

Though research on video games and its negative developmental outcomes is most widely discussed, research on the benefits of video games also exists. Studies reveal that playing prosocial video games can increase prosocial behavior (Greitemeyer & Osswald, 2011). Additional research on the benefits of video games explores how it improves perceptual and visual skills. On visual and perceptual tasks such as tracking an object or switching attention to a different object, gamers have higher scores than non-gamers (Green and Bavelier, 2007). Other skills, such as contrast sensitivity, are also discussed.

In this project, the following literature presents both positive and negative developmental outcomes of video games among children and adolescents. I created a website using a digital platform called "Wix" to relay the information from the literature review to parents and adult. It is designed to present the information in a manner that is user friendly, easy to read, informative, and engaging. It is intended to offer parents and adults research evidence for both sides of the video game debate.

The website is titled "A Guide to Children's Use of Video Games" and begins with a "Home" page. The "Home" page is designed to captivate the audience's attention and to provide background information such as why video games are a topic of debate, why children play video games, and examples of video game genres. Another page is titled

“Naughty” that is designed to relay the negative developmental outcomes of video games as discussed in the literature review. Similarly, another page is titled “Nice” that relays the positive developmental outcomes of video games as discussed in the literature review. Following the “Nice” page, a page is titled “Resources” and provides links to additional resources as well as a list of references. Finally, there is an “About” section that provides details as to the purpose of this project, information about the author, and a comments section. All pages of the website include videos, slideshows, and statistics combined with interactive graphics to engages and hold the audience’s interest.

If given additional time to expand on this project, a survey would be given to a sample of participants to measure their beliefs about video games. They would then be given the link to the website and time to explore all avenues of the site. Following that, a final survey would be given to measure the effectiveness of the website at relaying the information, its presentation, and its content. Regardless of potential improvements, the website is an online resource available to the public.

CHAPTER TWO

LITERATURE REVIEW

There has been a tremendous rise in the pervasiveness of video games among today’s youth. Data from a nationally representative study of video game play in the United States indicates that 97% of adolescents play video games (Lenhart, Kahne, Middaugh, Macgill, Evans, & Vitak, 2008). The Kaiser Family Foundation (2010) reports that children and adolescents between the ages of 8 and 18 years old are exposed to video games for approximately an hour a day. It is estimated that 89% of homes have video game consoles, 50% of which are located in 8 to 18 year old children’s and adolescent’s

bedrooms. Within the past few decades, many studies report findings indicating a positive correlation between violent video game play and various indicators of aggression. For example, experimental research suggests that playing violent video games increases aggressive behavior, aggressive cognition, and aggressive affect (Anderson, Gentile, Buckley, 2007). Though there is an impressive amount of research linking video games with aggression, what is more concerning and less known is the association between video games and adolescents' engagement in risk-taking thoughts and behaviors.

Research exploring intersections between video game playing and risk-taking behaviors primarily focuses on reckless driving, although there is limited additional research on such other risk-taking behaviors as gambling and substance use. Another lesser known area of research considers the potential positive benefits of video game play by exploring whether and how it may increase prosocial thoughts and behaviors, sensation-perception skills, and attention. To fully understand the implications of video games on adolescents' development, it is imperative that multiple outcome variables of video games, including but not limited to aggression, are examined. The current project reviews the effects of video game playing on both positive (e.g., prosocial behavior and sensation-perception skills) and negative (e.g., aggression and risk-taking behavior) developmental outcomes.

The Relationship Between Video Game Play and Negative Developmental Outcomes

The following section explores the relationship between video games and aggression. Violent content in the context of video games is heavily discussed followed by how such content influences aggressive behaviors among children and adolescents. Other negative developmental outcomes regarding risk-taking behavior are also discussed such as reckless driving, gambling, and substance use.

The Relationship Between Video Games and Aggression

Aggression can be defined in a number of ways. Physical aggression includes behaviors that cause physical harm, such as bodily harm, fighting, and violent acts. By contrast, social aggression takes many non-physical forms, from indirect to relational aggression. All types of aggression are common among adolescents (Farrell, Kung, White, & Valois, 2000). Generally, aggressive behaviors progress from less severe to more severe over the course of adolescence (Loeber & Hay, 1997). Concerns that the violent content of video games contributes to adolescent aggressive behaviors are widespread in both public discourse. To evaluate this concern, it is necessary to verify that video games do contain substantial levels of violent content, and to explore research demonstrating a relationship between video game play and measures of aggression.

Violent content. One concern with regard to adolescents' engagement in video game play is that many of these games tend to contain violent content. A content analysis of the presentation of violence in popular video games showed that 68% of video games from the sample that were rated either "T for teen" (suitable for ages 13+), "M for mature," (suitable for ages 17+), or "E for everyone" (suitable for all ages) by the U.S. Entertainment Software Rating Board featured at least one or more instances of violence (Smith, Lachlan, & Tamborini, 2003). This finding is consistent with results Thompson and Haninger's (2001) analysis of 55 video games that were rated "E." Although all of the games were judged suitable for children of all ages, 64% contained intentional violent acts. In contrast, Dietz (1998) analyzed 33 best-selling video games and found that 79% contained some form of violence. Thus, evidence shows that violence is a common theme within a variety of video games, even within games rated suitable for young children.

The high levels of violent content in today's video games can be accounted for by the recent increase in fighting games and first-person shooter games (Dietz, 1998). In addition, the level of violence in video games today is notably more graphic with more realistic depictions of human violence (Dietz, 1998). Shooter-games contained most violence and were characterized by high rate of kills per minute (Moller & Krahe, 2009). In first-person shooter games, a player "sees" the video game through the eyes of the player (rather than afar as in earlier fighting games). The player is able to move around, explore a three-dimensional environment, intended to make the player feel as though he or she is the one fighting, killing, and being killed (Anderson, Gentile, & Buckley, 2007).

Aggressive behaviors. M for mature rated video games contain "heinous or inappropriate violence" and are suitable for ages 17+ (Olson, Kutner, Baer, Beresin, Warner, & Nicholi, 2009). One study examined the link between children's M-rated video game playing and everyday aggressive behaviors. A large sample of seventh and eighth grade students from two states completed surveys measuring amount of time spent playing mature-rated games, game preference, and motivation for game use, and average days per week of video game play. The researchers also measured delinquent behaviors, physical aggression, and aggressive personality. Analyses revealed that M-rated game doses predicted higher risks for bullying and physical fights. The odds of engaging in these behaviors increased with the relative dose of M-rated game exposure. However, M-rated game dose did not predict of delinquent behaviors or being a victim of bullies.

Researchers have investigated whether exposure to violent video game play relates to higher frequencies of aggressive behaviors and cognitions. There are theoretical reasons to predict that such a relationship exists. Social learning theory would be

consistent with the hypothesis that direct participation in violent video game play would lead to higher levels of aggression, more so than observing violent television programs. According to social learning theory, a player virtually becomes the character of the video game (Bandura, 1994). Because of the player's control over the character's behavior, it is expected that violent video games have a larger effect on aggression than viewing of television, in which there is no control over a character's behavior. Polman, Castro and Aken (2008) examined whether active exposure (direct involvement in playing a violent video game) leads to higher levels of aggression than passive exposure (observation of watching the same violence on screen). Children between the ages of 10 to 13 years were randomly assigned to one of three game conditions. Children in the active violent condition played a violent video game, children in the passive violent condition watched the violent video game being played on a television screen, and children in the third condition played a nonviolent video game for 15 minutes. The researchers then asked children to fill out a questionnaire measuring their gaming habits. Afterwards, the children engaged in two free play sessions with other participants. Following the free play session, participants nominated peers who they thought behaved aggressively. Results indicated that both playing and observing violent video game play increased aggression among participants. However, active participation in violent video games had a larger effect on aggression with peers than passively watching the same video game content. This effect was larger for boys than girls, perhaps because boys reported playing violent video games more frequently and may have more experience with its violent content.

Actively engaging by playing the violent video game is related to significantly

higher increases in aggressive behavior, above and beyond passively observing.

Television viewers simply watch characters, whereas video game players are encouraged to take the perspective of the violent character in order to successfully play the game.

Another explanation for the higher incidence of aggressive behavior seen by the active players of video games in the Polman et al. (2008) study is that the interactive features of video games encourage players to identify with its violent characters. Konijn, Bijvank, and Bushman (2007) tested whether violent video games are especially likely to increase aggression when players identify with violent game characters. Because adolescent boys are the most invested in violent video games, the researchers used a sample of adolescent boys who were randomly assigned to play a violent (i.e. *America's Army*, *Killzone*, *Doom*) or non-violent video game (i.e. *Mario Sunshine*, *Final Fantasy*). Next, the participants competed against a confederate on a reaction time task in which the winner could blast the competitor with loud music through headphones (the aggression measure). Researchers informed participants that high noise levels could potentially cause permanent hearing damage. After the reaction time task, participants completed surveys to measure wishful identification with the main character in the video game, immersion level, violence level, frustration level, and likeability of the game. As hypothesized, the most aggressive participants were those who played in the violent game condition and identified with a violent character in the game. These participants used noise levels high enough to cause permanent hearing damage to their competitors without being provoked. This demonstrates that identifying with violent video game characters increases aggression among players. This is consistent with social learning theory in which an observer desires to emulate a character through imitation (Bandura, 1994).

Saleem, Anderson, and Gentile (2002) also examined the ways that engaging in violent video game play, such as those that are M-rated relates to hurtful behaviors and decreased helpful behaviors. They asked a sample of children between the ages of 9 and 14 to play a prosocial, neutral, or violent video game. They assessed helpful and hurtful behaviors and found that prosocial games increased helpful and decreased hurtful behavior. By contrast, violent games had the opposite effect. Thus, across several studies a consistent story is emerging with regard to violent video game play: heavy play of Mature-rated video games appears to predict a greater risk for problem behaviors and aggression among children and adolescents.

Despite the numerous correlational and experimental studies that find a positive relationship between violent video game play and aggression, there is less evidence to support a long-term relationship between video game play and aggression. Willoughby, Adachi, and Good (2012) examined sustained violent video game play and aggressive behavior across the high school years in an effort to explore two competing hypotheses: the socialization hypothesis and the selection hypothesis. The socialization hypothesis refers to the notion that violent video game play predicts aggression over time, whereas the selection hypothesis refers to the notion that aggression predicts violent video game play. Willoughby et al. (2012) surveyed a large sample of adolescents were annually from grades 9 to 12 about their video game use and aggressive behaviors. Sustained video game play across the years was significantly associated with increases in adolescents' trajectory of aggression,, even after controlling for previous levels of aggression. This finding supports the socialization hypothesis. Similarly, Moller and Krahe (2009) found that adolescents who played more violent video games at the

beginning of their study were more likely to report physically aggressive behaviors 30 months later than those who did not play video games often. By contrast, adolescents who were more physically violent at the beginning of the study were not more likely to play violent video games 30 months later. This study also provides additional support for the socialization hypothesis. Thus, at least two studies demonstrate support for the socialization process, which suggests that violent video game exposure leads to increased aggressive behavior over time. Further longitudinal studies on violent video game play and aggression are needed.

The Relationship Between Video Games and Risk-taking Behaviors

Risk taking refers to “one’s purposive participation in some form of behavior that involves potential negative consequences or losses as well as perceived positive consequences or gains” (Ben-Zur & Zeidner, 2009, p. 110). Adolescence is a developmental and transitional period between childhood and adulthood consisting of notable changes including the onset puberty, physical growth, and cognitive development. Adolescence is also a period of heightened risk taking due to peer pressure and a sense of invincibility. Researchers have begun to investigate the relationship between video game playing and engagement in such risk taking behaviors such as: reckless driving, gambling, alcohol use, and drug use. Although limited, findings from available studies on these topics are reported below.

Reckless driving. Most of the research literature regarding risk-taking behaviors primarily focuses on reckless driving. Racing games have recently emerged as one of the top selling categories in the video game industry. In a preliminary study with a large sample of participants between the ages of 13 and 17 years of age, 77% of participants

reported playing racing games regularly (Kubitzki, 2006). Racing games such as Need for Speed, Burnout, and Grand Theft Auto allow players to drive recklessly at high speeds, crash into other cars, intentionally drive over pedestrians, and perform risky stunts with the vehicle. Similar to first-person shooter games, players have full control over the actions of video game characters. Given past research that demonstrates a positive association between violent video game play and heightened aggression, researchers predict that racing games also have negative impacts on behaviors by promoting risk taking in real-life driving situations. In a series of studies, researchers investigated whether playing racing games affects cognitions and behaviors that promote risk taking in real-life traffic situations (Rischer, Guter, Frey, Kubitzki, 2007). In Study 1, Rischer et al. collected data from men and women randomly recruited to self-report their competitive behaviors in street traffic, intentions to impress others while driving, attitudes toward cautious behaviors in road traffic, number of accidents, and experience with racing games. The researchers found that the frequency of play of racing games was positively associated with competitive driving, obtrusive driving, and car accidents. They also found a negative association between racing game play and cautious driving. In Study 2, students played either video racing games or neutral video games. Participants who played the racing game reported a higher accessibility of risk-taking cognitions and affect after playing the racing game than those who played the neutral game. Fischer et al. (2007) also asked participants to play either a racing game or a neutral video game. Results indicated that men who played the racing game took higher risks in computer simulated critical road traffic situations than did men who played the neutral game. Longitudinal research investigating the association between playing risk-glorifying video

games and risky driving among adolescents yields similar results (Hull, Draghici, & Sargent, 2012). Through random digit dial, participants between the ages of 13 and 17 years completed a survey on video game use, driving behaviors, and personality (i.e. sensation seeking). Across multiple waves of data collection, results demonstrated that playing video games was associated with self-reported risky driving. More specifically, racing game play was associated with reports of car accidents, being pulled over by police, and a variety of unsafe driving habits (i.e. speeding, tailgating, weaving, breaking traffic rules). Racing game play was also associated with a more apparent willingness to drink and drink drive (Hull et al, 2012). In sum, there is evidence to support that there is a strong association between racing games and risky driving. Research supports that racing games have an effect on adolescents' and young adults' willingness to break traffic rules, which translates over to risk taking in real driving situations.

Gambling. Gambling is explored by some researchers as a potential consequence of video game play. Although gambling is typically thought of as an adult activity, recent analyses show that it has become a popular activity among children and adolescents, with 86% of the sample self-reporting having gambled in some form (Acruri, Lester, & Smith, 1985; Ladouceur & Dube, 1994). Video games and gambling games share a number of attractive properties including elements of randomness and reinforcing stimuli (i.e. color, music, graphics). Gupta and Derevensky (1996) conducted a study to examine the relationship between video game play and gambling behavior among children and adolescents. A large sample of children between the ages of 9 and 14 completed a questionnaire designed to measure video game habits and gambling behavior. Researchers administered a computerized blackjack game individually to participants to

measure risk-taking behavior. Results demonstrated that participants who reported high levels of video game play were significantly more likely to engage in gambling than those who did not play video games. Additionally, high frequency video game players were found to wager more money on the blackjack task than more infrequent video game players, which suggests that high video game play was related to higher risk-taking behavior. Though causality cannot be established, evidence supports an association between video game play and gambling behavior.

Substance use. Substance use is emerging as a topic of interest among researchers who examine video game play and risk-taking behaviors. Research on substance use as a consequence of video games is scarce. In the only available study on the topic, Armstrong, Bush, and Jones (2010) explored whether the number of hours playing video games is associated with substance use. They invited a sample of over 4,000 students to complete a survey questionnaire (California Healthy Kids Survey) measuring topics such as drug use, alcohol use, video game playing time, and home life. Results revealed that rates of alcohol use and sniffing solvents were associated with hours of video games played, controlling for other factors. Participants who reported playing more than the recommended two hours of video games had higher frequencies of alcohol use, sniffing solvents, marijuana use, and tobacco chewing. The study offers a first window into a potential relationship between substance use and video game playing. A possible explanation could be that parents and caregivers are permissive and allow children to play more than the recommended 2 hours of video game playing. Additional studies are necessary to further understand why these two behaviors might be related.

The Relationship Between Video Game Play and Positive Developmental Outcomes

The Relationship Between Video Games & Prosocial Behavior

Violent video game play and prosocial behaviors. Much research focuses primarily on the negative consequences of video games such as aggression and, to some extent, risk-taking behaviors such as reckless driving, gambling, and substance use. However, researchers have recently started to explore potential benefits of video game playing, including some investigations of the potential for positive benefits of violent video game play. Gitter, Ewell, Guadagno, Stillman, and Baumeister (2013) recently pursued this topic. In Study 1, participants in their study played either a violent game (i.e. *Evil Dead*) or another violent game which included prosocial contexts (i.e. protecting another character from other violent creatures). Following the game session, participants completed a questionnaire measuring their gaming habits and their aggressiveness. Results found that participants who played the violent game that included prosocial contexts or motives showed lower levels of short-term aggression than did participants who played the violent video game with no prosocial contexts. Study 2 incorporated a third video game option which was a nonviolent and non-prosocial video game. Consistent with Study 1, results demonstrated that participants who played the violent game with prosocial contexts displayed higher levels of prosocial cognition than either of the other two groups of players. The presence of a prosocial context within a violent video game can lower aggressive behavior and increase the likelihood of behaving in a prosocial manner. Previous research addresses the strong association between violent video games and aggression and although violent video games with prosocial contexts and motives can greatly reduce aggression and encourage prosocial behavior, aggression is not eliminated entirely.

Prosocial video games and prosocial behaviors. With evidence to support that violent video games with a prosocial context can mitigate the effects of aggression, one might expect that engaging in prosocial video games without any violent content would also increase the accessibility of prosocial thoughts and behaviors. Greitemeyer and Osswald (2011) examined this question by randomly assigning participants to either a prosocial video game condition or a neutral game condition. Following the gaming session, participants completed a survey about the video game. Lastly, they performed a lexical decision task in which some of the words were prosocial words. Reaction times to prosocial words, neutral words, and nonwords were recorded and averaged. Results indicated that playing a prosocial game resulted in faster reaction times to prosocial words. In contrast, reaction times to non words and neutral words were unaffected by video game exposure. Playing a prosocial video game encourages cognitive associative networks related to prosocial behavior (Greitemeyer & Osswald, 2011). However, faster recognition of prosocial words does not necessarily translate to accessibility of prosocial thoughts nor can it predict prosocial behavior.

In a series of three studies, Gentile Anderson, Yukawa, Ihori, Saleem, Ming, Shibuya, Liao, Khoo, Bushman, Huesmann, and Sakamoto (2009) further explored the nature of prosocial games by investigating their effect on both short-term and long-term increases in prosocial behaviors. In the first study, a cross-sectional correlational study, Gentile et al. examined video game habits and prosocial behaviors by surveying a sample of 727 Singaporean children between seventh and eighth grade. The survey included questions to measure participants' favorite games, hours per week spent playing each game, ratings of violent video game contexts and prosocial game contexts, and prosocial

behavior. As hypothesized, prosocial game exposure was positively correlated with self-reported prosocial behaviors and traits. By contrast, violent video game exposure was negatively correlated with prosocial behaviors and traits. In their second study, a longitudinal study, Gentile et al. (2009) examined the effects of habitual playing of prosocial video games on prosocial behavior months later. A sample of 780 fifth, eighth, and eleventh graders in Japan completed surveys assessing prosocial video game exposure and how often they engaged in specific prosocial behaviors. The survey questionnaire was administered both at Time A and then again at Time B (4 months later). As predicted, playing prosocial games at Time A predicted prosocial game play and prosocial behaviors at Time B. Again, a causal interpretation cannot be established, but rather a correlational relationship. In an experimental study, the same researchers again randomly assigned participants to play either a prosocial game, a violent game, or a neutral game. Following game play, participants chose 11 tangram puzzles for their assigned partner. The tangram puzzles varied in difficulty, some fairly easy to complete, others extremely difficult to complete. Lastly, participants completed a video game evaluation in which they rated the game to which they had been assigned and completed the Buss-Perry Aggression Questionnaire. Results revealed that those who played the violent game picked harder puzzles for their partners than did those who played the other games. By contrast, those who played the prosocial game picked easier puzzles. However, the difficulty of tangram puzzles and fast reaction times to prosocial words may not be accurate indicators of prosocial behavior, which again is defined by behavior intended to help others. There is a need for further studies to better operationalize prosocial measures that more closely translate to real-life prosocial behavior.

Overall, several studies support that engaging in prosocial video game play increases prosocial behavior in both the short term and the long term. Although the literature on prosocial video games and prosocial behavior is not as comprehensive as research on violent video games and aggression, there is sound evidence to support the correlational relationship between prosocial video games and prosocial behavior.

The Relationship Between Video Games & Perception

Vision. It is a common assumption that playing video games damages vision. A study by Li, Polat, Makous, and Bavelier (2009) challenged this notion by examining video game play and changes in players' contrast sensitivity. Contrast sensitivity is the "ability to detect small increments in shades of gray on a uniform background... [it] is one of the main limiting factors in a wide variety of visual tasks" (Bavelier et al., 2009, p. 550). A sample of non-gamers played in one of two game conditions for 50 hours over 9 weeks. The first group was "action-trained" by playing an action video game such as Call of Duty 2 and the second group was "non action-trained" by playing a video game that was visually rich, complex, and engaging, but without any action. The action-trained group improved in contrast sensitivity by 43%, whereas the non action-trained group showed no improvements at all. This demonstrates a newfound plasticity in the adult visual system encouraged by playing video games.

Video game playing is not restricted to enhancing contrast sensitivity, but also is related to other skills involving perception. Boot, Kramer, Simons, Fabiani, and Gratton (2008) examined differences in expert gamers and non-gamer on tasks involving perception. Expert gamers were better able to track objects at greater speeds, detect

changes to objects stored in visual short-term memory, switch more quickly from one task to another, and mentally rotate objects more efficiently. To explore whether these benefits are true for younger parents, Dye and Bavelier (2010) invited children aged 7 to 17 years and adults aged 18 to 22 years to participate in an interview on their gaming habits. Based on this interview, the researchers identified non gamers and action video game players. They tested all participants on three aspects of visual attention: the ability to distribute visual attention across a scene to search for a target, the time required for attention to recover from being directed towards a target, and the number of objects to which attention can be simultaneously allocated. Compared to the non-gamers, the action video game players required the stimulus to be available for less time on the spatial attention task in order to accurately locate a peripheral target in the scene of distractors. They also had faster recovery times on the temporal attention task. Finally, action video gamers also had improved peripheral performance and were better able to track objects in the multiple object tracking task than non gamers. These results paralleled those found in studies of adult video gamers, suggesting that action video games enhance visual attentional skills in children and in adults. Thus, there is evidence to disqualify the notion that video games damage vision and evidence suggestive of a positive impact.

Spatial. According to Green and Bavelier (2007), video game players have better spatial ability than non-gamers. Further, inexperienced people who are trained with video games improve their visual-spatial skills. Feng, Spence, & Pratt (2007) address that there is a gender difference in spatial skills. A series of experimental studies by Feng et al. (2007) demonstrated that playing an action video game can eliminate the gender difference in spatial attention and decrease the gender disparity in mental rotation ability.

In Experiment 1, differences in spatial attention were defined by gender and video game experience. Researchers recruited a sample of undergraduate students to complete a spatial attention task. Results demonstrated that there was, in fact, a gender difference for both non gamers group and the video-gamers group. Feng et al. (2007) compared spatial attention and cognition before and after a 10 hour training session of action video games. After only 10 hours of action video game training, participants improved in both spatial and mental rotation ability, with women benefitting more than men. The control group who played a non-action game showed no improvement in either abilities. Overall, there is evidence to support that playing video games enhances a variety of visual, perceptual, and spatial skills among children and adolescents.

Conclusion

Although video game playing is a popular activity among youth today, it is important to consider the impact it has on children's development. Most research demonstrates a strong association between video games and negative consequences, such as aggression and risky behavior. Despite this, few studies there is no direct causality. Much of the research focuses on establishing a positive correlation between video game play and aggression. Limited, yet existing research addresses other negative outcomes of video games such as reckless driving, gambling, and substance use. Other emerging research reveals a number of positive benefits of playing video games from reduced aggression, increased prosocial behavior, and enhanced skills in vision, perception, and spatial ability. There is strong evidence that addresses video game's negative and positive outcomes. It remains a dichotomous, controversial topic today that calls for a dire need for further exploration for answers to sway public policies, raise general awareness, and

protect the development of today's youth. Taking into consideration how video game play can be associated with both positive and negative outcomes can provide a more extensive understanding of the way video games affect children and what measures are necessary to promote age appropriate development. In order to relay positive and negative research findings about video games, I developed an online available resource for parents and adults.

CHAPTER THREE

METHOD

Audience

Recipients of the video game service project will consist of teachers, educators, parents, caregivers, and anyone member of the general public who encounter the information online.

Process

The media portrays video games as the catalyst for the rise of aggression among children and adolescents. Most research indicates that violent video games are in fact associated with aggression. However, several other outcome variables such as risk-taking behaviors, prosocial behaviors, and other positives receive minimal attention from the public and researchers alike. My project will aim to make more information, both positive and negative, about video game research available to others. Using an online educational tool called Wix, I will create a user-friendly website that provides information regarding my research called "A Guide to Children's Use of Video Games" at www.lindsaynakamura.wix.com/videogames. I will use friendly and inviting language and clear graphics that will engage a wide range of audiences and convey the information

in a less formal way than a written in the literature review. In order to ensure that the video game Wix website will be appropriate for my intended audience, I will consult with teachers to look over my draft to ensure it is user friendly, easy to comprehend, and graphically inviting. I will also consult with my senior project advisor to ensure that the information is presented in a valid and educationally reliable manner. I will also provide a link to my email so that the audience has the opportunity ask questions or make comments to facilitate further discussion beyond the means of the Wix website.

CHAPTER FOUR

RESULTS

First, the Wix starts by presenting the basic information that introduces the topic of video games on the “Home Page.” This includes a brief overview of the purpose of the website, quick facts and statistics, attention-grabbing pictures, reasons why people play video games, and examples and descriptions of what video games children and adolescents are currently playing. The Home page also mentions video games and its context in today’s world, its prevalence among today’s youth, and why it’s important to address the controversy over video games. The Wix continues on to relay information on video games and its negative developmental outcomes, called “Naughty.” It’s sub-pages will include the subtopics of my literature review such as “Aggression,” “Risky Behavior,” “Reckless Driving,” “Gambling,” and “Substance Use.” The information from my literature review is presented in an engaging, fun way that is geared toward the audience. Following that, the Wix website continues on to positive developmental outcomes, called “Nice”. Similar to “Naughty,” it’s sub-pages includes subtopics such as “Prosocial Behavior” and “Vision and Perception.” The Wix then provides additional

information such as links and references under “Resources.” Finally, the Wix comes to an end with a section “About Me” and the history behind the Wix website and my Video Game literature review and senior project. Under “About me” is a section for “Comments” in which a comment box is located for audiences to send their thoughts, comments, and questions. The Wix website is available to the general public. It is intended to be used as a resource or learning tool to provide accurate information on video games, not available from mass media, to help others formulate opinions based on current available research evidence.

CHAPTER FOUR

DISCUSSION

“A Guide to Children’s Use of Video Games” is designed to inform parents and adults about the reality of video game use among children and adolescents. By presenting a culmination of research regarding the consequences and benefits of video game use, parents and adults are able to formulate their own opinions free from bias.

While the website presents such information in a user-friendly and easily accessible manner, there are some limitations that have hindered its overall success. Though the website was designed to inform, educate, and guide parents and adults, very few have actually viewed the completed website. Due to lack of time, the website was not distributed to a large sample of adults and parents which inhibits the opportunity to explore and learn the information provided in the site. Rather, very few adults and professors have viewed the completed site. However, it is important to note that site will remain a public online resource that can be found through any search engine such as Google. Given more time, a link to the website would be sent to faculty members,

professors, parents, and adults through email. Another option would be to publicly advertise the website. Through advertisements, the number of views will increase as well as the opportunities for adults and parents to learn the information provided.

Another limitation is that there is a lack of an evaluative measure to demonstrate that website's overall effectiveness. Given more time, there would be a pre-website survey in which a random sample of parents and adults would self-report their beliefs and knowledge about video games. The sample would then have an appropriate amount of time to explore the completed website. There would then be a post-website survey in which participants would report on how effective the website is. The post-website survey would include measures of how easy the website is to navigate, how interesting the graphics are, how clearly the information is stated, how helpful the additional resources are, and finally, how much has been learned from the website. For example, parents would be asked "Please rate the following on a scale of '1 strongly disagree' to '5 strongly agree.' 'I was able to easily navigate the website.'" With more extensive evaluation of the website, improvements can be made to increase the website's overall effectiveness, success, and credibility as an online resource.

In addition, some aspects of the website were highly underdeveloped due to a lack of research currently available. For example, "Risky Behavior," "Gambling," and "Substance Use" lacked information. Future research in such underdeveloped aspects of video game research can reveal a great deal about the extent of video games' negative influence on children's and adolescents' development.

In sum, the goal of this project was to explore not only the highly researched outcome of video games which is aggression, but also to explore other under-looked

avenues, both positive and negative. The goal was to explore both sides of the video game debate and provide an online resource with empirical research findings that allows parents and adults to formulate their own valid opinions about video games. The project successfully explored several avenues of video games. However, with more awareness, adults and parents will be better equipped to choose appropriate video games for children to play, make better choices about which video games to buy, and encourage parents to be cognizant of the consequences and benefits of video games.

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Appendix



Figure 1. Home.



Figure 1a. Home: Beliefs about video games (slideshow)



Figure 1b. Home: Beliefs about video games (slideshow)



Figure 1c. Home: Beliefs about video games (slideshow)



Figure 1d. Home: Beliefs about video games (slideshow)



Figure 1e. Home: Beliefs about video games (slideshow)



Figure 1f. Home: Beliefs about video games (slideshow)

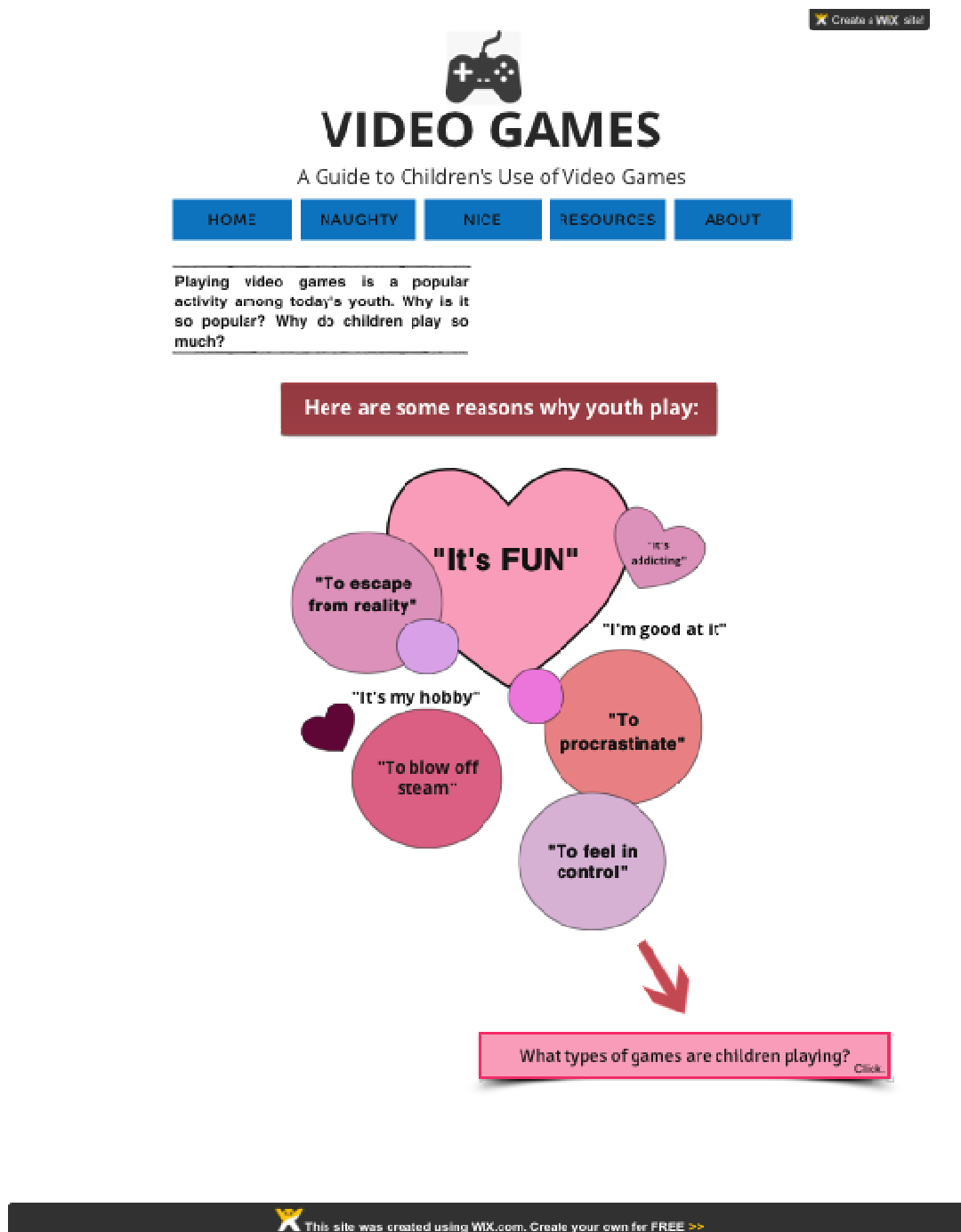


Figure 2. Home: Why do people play?



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RESOURCES
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Top 10 Video Games in 2014



Of this top video games, 4 are Action, 3 are Sports, 2 are Adventure, and 1 is Strategy.

Types of Video Games

Action
Action games tend to have a high amount of violence because of its fast paced nature. Many games in this category are rated "M" for mature audiences. Some games are less violent, but still have suggestive themes. Action games create competition between players and involves battling, fighting, shooting, and attacking as prerequisites for winning or for high scores. Examples of action games are Halo, Call of Duty, Star Wars: Jedi Knight, and Battlefield.

Sports
Sports games emulate the playing of traditional physical sports. Some emphasize actually playing the sport, while others emphasize the strategy behind the sport. One of the best selling series in this genre is the FIFA series. Other examples of sports video games include Madden's NFL, MLB The Show, NBA Street, and Tony Hawk's Proskater.

Adventure and Role Playing
Adventure and role playing games are usually less graphic than action games and typically have an element of fantasy. These games are often combined with a storyline element and allow the character to initiate dialogue. While less intense than action games, they often do include violence. It should be noted that these games tend to be among the most addictive due to the narrative/fantasy themes. Examples of this genre are Starcraft, Skyrim, Final Fantasy, and World of Warcraft.

Strategy
Strategy games most often involve tactical movement of players. These games may be warfare based or may be as basic as chess. The content of many of these games can be appropriate for children but they tend to be difficult to play. It requires careful and skillful thinking and planning in order to achieve higher levels. Some examples are Advanced Wars and Chessmaster® 2000.

Simulation

Figure 3. Home: What are children playing?



Number 10
Tomb Raider

Figure 3a. Top 10 Video Games in 2014 (slideshow): Number 10 Tomb Raider.



Number 9
Lego Marvel Super Heroes

Figure 3b. Top 10 Video Games in 2014 (slideshow): Number 9 Lego Marvel Heroes.



Number 8
FIFA 2014

Figure 3c. Top 10 Video Games in 2014 (slideshow). Number 8 FIFA 2014.



Number 7
Minecraft

Figure 3d. Top 10 Video Games in 2014 (slideshow). Number 7 Minecraft.



Number 6
Madden NFL 25

Figure 3e. Top 10 Video Games in 2014 (slideshow). Number 6 Madden 25.



Number 5
Grand Theft Auto V

Figure 3f. Top 10 Video Games in 2014 (slideshow). Number 5 Grand Theft Auto V.



Number 4
Assassin's Creed IV: Black Flag

Figure 3g. Top 10 Video Games in 2014 (slideshow). Number 4 Assassin's Creed IV.



Number 3
Battlefield 4

Figure 3h. Top 10 Video Games in 2014 (slideshow). Number 4 Battlefield 4.



Number 2
NBA 2K14

Figure 3i. Top 10 Video Games in 2014 (slideshow). Number 2 NBA 2K14.




Number 1
Call of Duty: Ghosts

Figure 3j. Top 10 Video Games in 2014 (slideshow). Number 1 Call of Duty Ghosts.



Figure 4. Naughty.


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Aggression:

Refers to a range of behaviors that can result in both physical and psychological harm to oneself, other or objects. Aggression can be manifested in a number of ways: verbally, mentally, emotionally and physically.

What does aggression look like in childhood and adolescence?

Hitting, screaming, breaking objects, expressing anger and resentment, argumentative, verbally abusive to others, and difficulty controlling temper.

During a class on technology's impact on children and adolescents, my classmates and I produced a short documentary that summarizes our literature review of video games and it's influence of youth. Sit back, watch, and enjoy!



0:00
YouTube

Video game use is related to aggression.

Researchers have conducted many studies, most of which have found that video game use is related to increases in aggressive behaviors and tendencies.

Let me break it down for you!

How do researchers know?


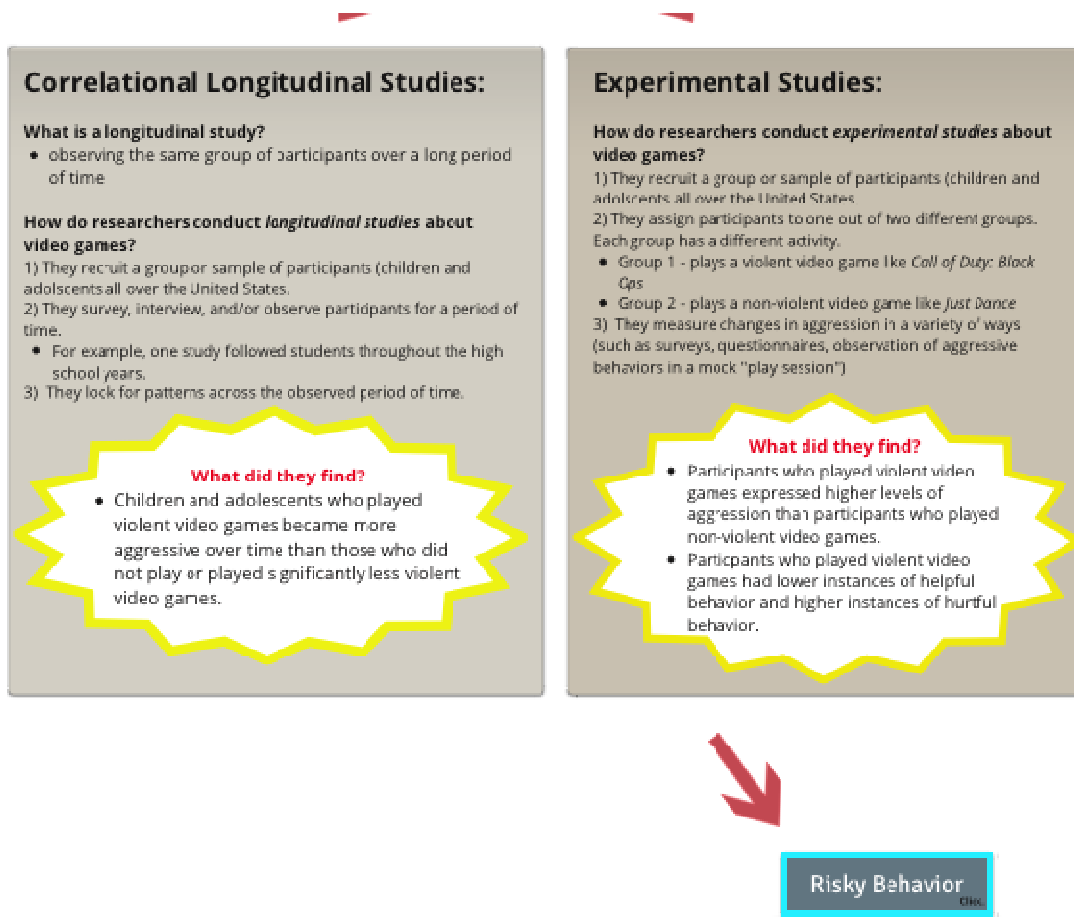
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Figure 5. Naughty: Aggression.



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Figure 5. Naughty: Aggression (cont.)

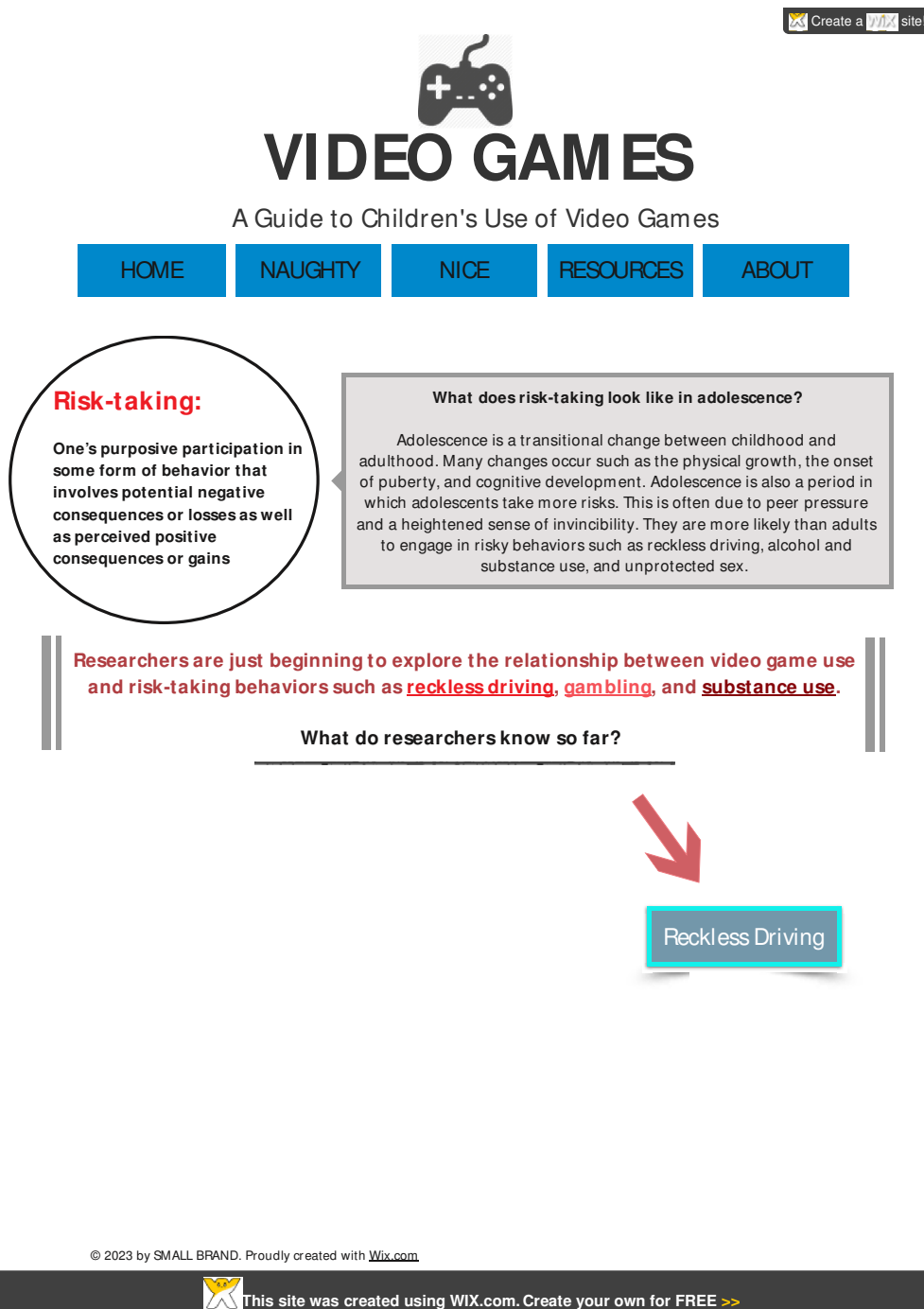




Figure 6. Naughty: Risk-Taking

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1. Reckless Driving

Racing games are one of the top selling categories of video games. **77%** of teenagers play racing games regularly such as *Grand TheftAuto* and *Need for Speed*.

What are racing games like?
Racing games allow players to drive recklessly at high speeds, crash into other cars, intentionally drive over pedestrians, and perform risky stunts with vehicles.



Adolescents and adults self-reported about their use of video games and their driving habits and driving record. **They found that people who frequently played racing games were less cautious drivers.**

Researchers recruited a sample of adults and randomly assigned them to two groups. The first group played a racing game and the second group played a neutral game (such as a puzzle). What happened? Researchers used computer simulated road situations to find out. **The group who played a racing game took higher risks in simulated traffic and drove more recklessly.**

Researchers surveyed adolescents over an extended period of time. **They found that adolescents who play racing games had higher instances of car accidents, being pulled over by police officers, and driving violations such as speeding and driving through red lights.**

Gambling


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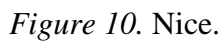
Figure 7. Naughty: Reckless Driving.



Figure 8. Naughty: Gambling.



Figure 9. Naughty: Substance Use.



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Prosocial Behavior

behaviors intended to help other people. Prosocial behavior is characterized by a concern about the rights, feelings, and welfare of other people. It includes feeling empathy and concern for others and behaving in ways to help or benefit other people.

Much research focuses primarily on the negative consequences of video games such as aggression and, to some extent, risk-taking. However, researchers have recently started to explore potential benefits of video game playing, including some investigations of the potential for positive benefits of violent video game play.

This is a YouTube video that explains video games and prosocial behavior in a fascinating, awesome way!



Can playing violent video games really encourage prosocial behaviors among players?

Researchers have conducted experimental studies to find out!

Let me break it down for you!



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Figure 11. Nice: Prosocial Behavior

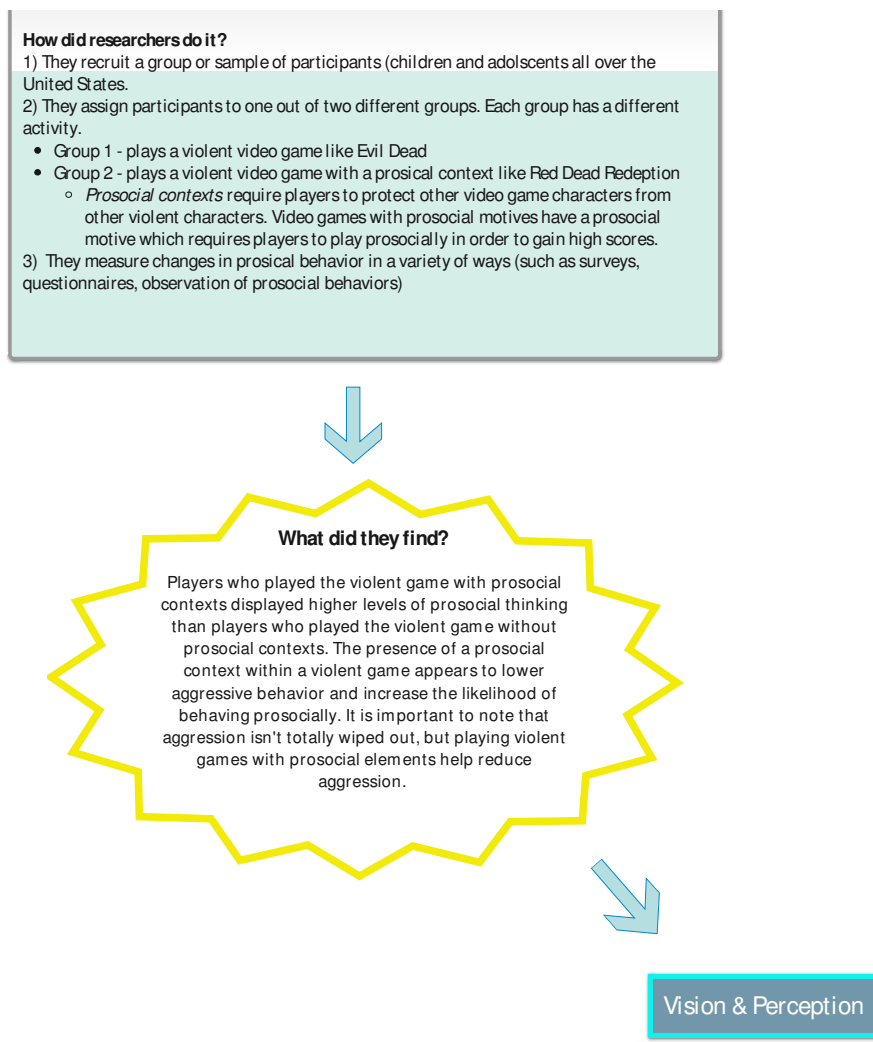


Figure 11. Nice: Prosocial Behavior (cont.)



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NAUGHTY
NICE
RESOURCES
ABOUT



Study busts video game myth
GAMES 'GOOD FOR EYES'

Some children and adolescents spend hours and hours playing video games. It is very common for parents and adults to be concerned about the possible damage staring at a digital screen can have on children's vision and perception. What do researchers know about video games and perception so far?

Contrast Sensitivity:

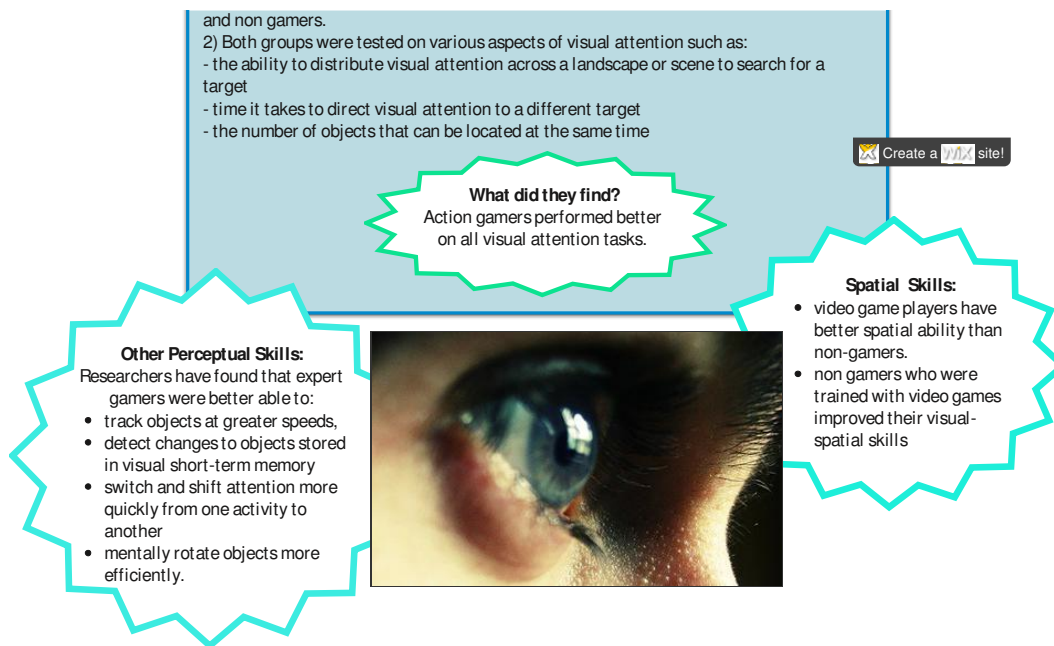
What is Contrast Sensitivity?
the ability to distinguish between an object and its background.
High Contrast: imagine a black dog sitting on a white snowy landscape
Low Contrast: imagine a white dog sitting on a white snowy landscape.
How did researchers study video games and contrast sensitivity?
1) A group of people who don't typically play video games were separated into 2 groups.
- Group 1: this action-trained group played an action video game Call of Duty
- Group 2: this non-action trained group played a puzzle game that had no action, but was still visually complex

What did they find?
The group who played the action-filled Call of Duty improved in contrast sensitivity.
The group who did play Call of Duty showed no improvements at all.

Visual Attention

How did researchers study video games and visual attention?
1) Researchers interviewed a group of children and adolescents on their gaming habits.
Based on their responses, researchers separated them into two groups: action gamers

Figure 12. Nice: Vision & Perception.



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Figure 12. Nice: Vision & Perception.

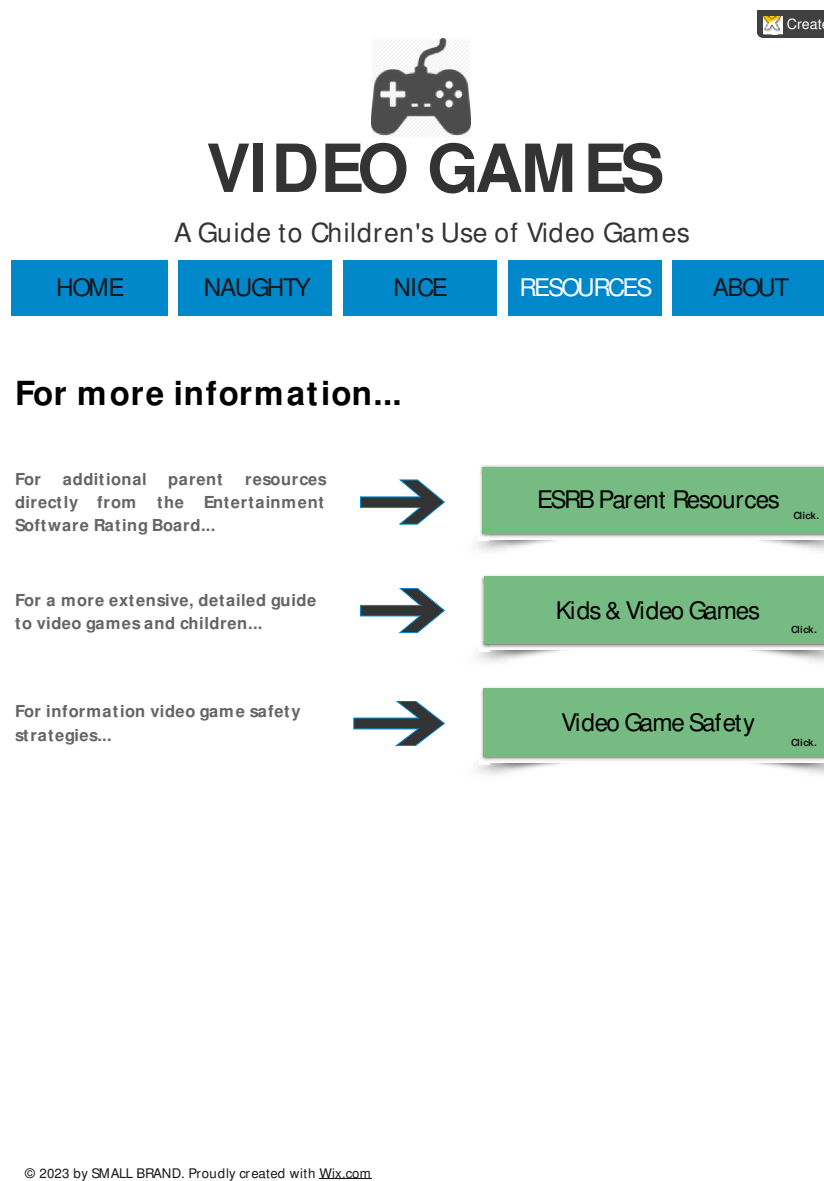



Figure 13. Resources.

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Figure 14. Resources: References

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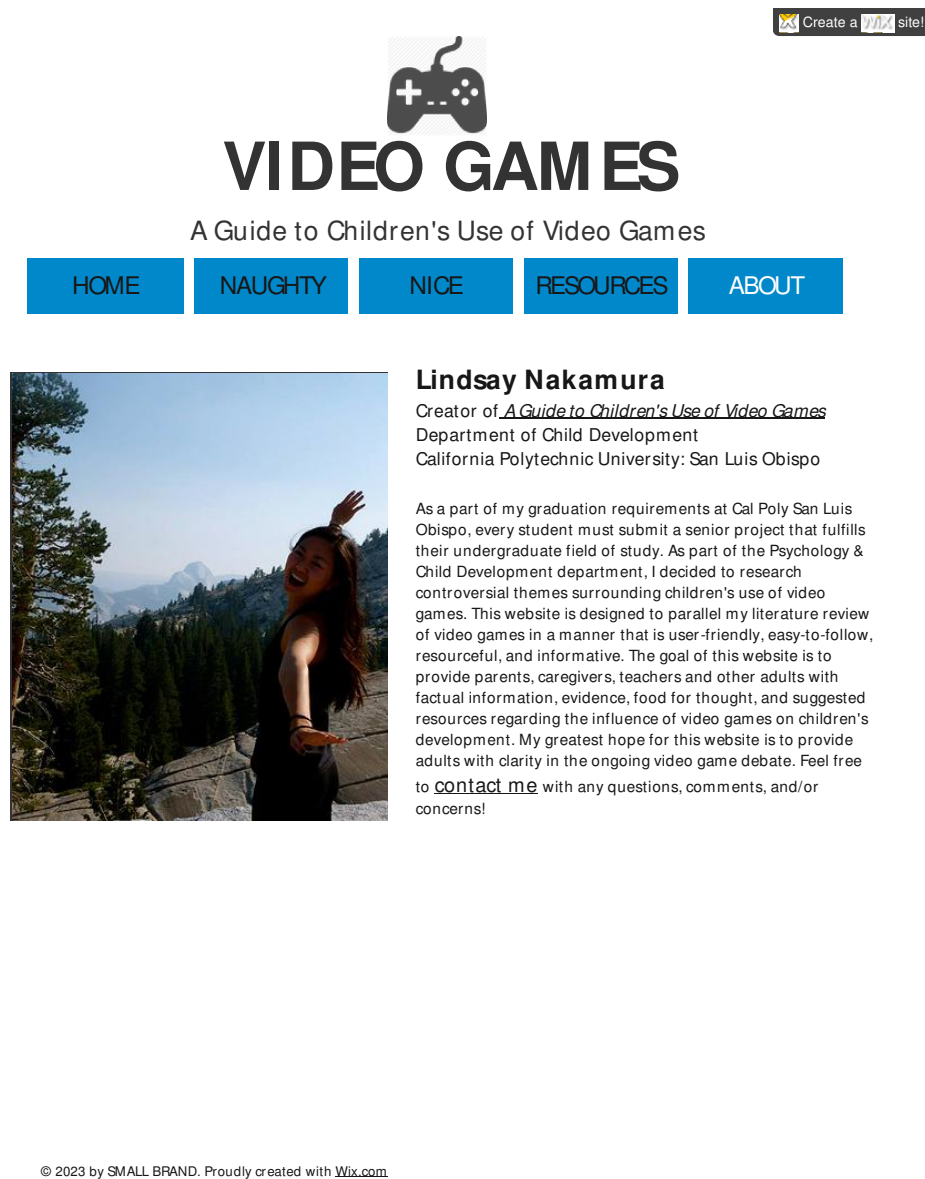


Figure 15. About.

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Figure 16. About: Comments.