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Videogames and the Brain: An Investigation into Psychopathy and Empathy

Joshua Michael Fishlock, PhD

University of Connecticut, 2016

A divide exists in the video game effects literature, such that one branch of research indicates harmful outcomes (Anderson et al., 2010), whereas other research highlights null effects (Ferguson, 2015). Clearly, video games are a heuristic topic that necessitates various methods of analysis from multiple perspectives. Using a risk factors approach, the purpose of this study is to further understand the process that is occurring when an individual plays a violent video game. Using a 2 (gender: male and female) x 2 (condition: control and violence) true experimental design, the individual difference variables of psychopathy and empathy are explored as traits that influence moral outcomes. This research begins with an exploration into social concerns related to violent video game play. Next, the contemporary research on video games will be highlighted. Next, research on the neurophysiological as well as the conceptual importance of empathy and psychopathy. Lastly, a mediated model of moral response is presented, which could explain why a small percentage of the population reacts with a serious act of violence after playing video games. This work will further explore the findings from a pilot study that was conducted to test the relationship between empathy, psychopathy and guilt and their influence on attitudes towards violence after exposure to a violent video game (Fishlock, 2015). Results suggest that post gameplay guilt mediates the link from condition to participants' attitudes towards violence, such that violent content positively predicts post gameplay guilt, and post gameplay guilt negatively predicts attitudes towards violence. Furthermore, psychopathy emerged as an individual difference variable that is also able to positively predict both verbally aggressive and physically aggressive intentions.

Videogames and the Brain: An Investigation into Psychopathy and Empathy

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Doctor of Philosophy Dissertation

Videogames and the Brain: An Investigation into Psychopathy and Empathy

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Chapter 1: Introduction

Videogames, as a form of communication, have increased in both complexity and popularity since the first home video game console, The *Magnavox Odyssey*, was released in 1972 (Martin, 2014). Since then, video games have developed into rich forms of communication that 155 million Americans interact with (Entertainment Software Association, 2015). The economic impact of the video game industry is equally impressive, grossing nearly $15.4 billion in video game software sales in the U.S alone. As a whole, the industry grosses $22.41 billion dollars a year when hardware (e.g., consoles) and gaming accessories (e.g., controllers) are included (Entertainment Software Association, 2015).

Much like any new form of mediated entertainment (e.g. rock and roll or rap music), video games have come under public scrutiny for possible negative influences. High profile cases such as Dylan Klebold and Eric Harris, who reportedly used a modification of the computer game *Doom* to train for the Columbine massacre (Johnson & Brook, 1999), strengthen the public's perception of direct negative effects. Additionally, the media also tends to vilify the first person shooter genre, such as when Adam Lanza opened fire on Sandy Hook Elementary School on December 14th, 2012. News coverage of Sandy Hook focused on how Adam was an avid player of the *Call of Duty* video game series (Bates & Pow, 2013).

These high profile cases have spurred public outcry over the dangers of video games, such as the California legislature proposing that the sale of video games be regulated in some way to restrict a minor's access to potentially harmful content (Brown vs. Entertainment Merchants Association, 2011). Meta-analyses prior to the court case (Anderson, 2004; Anderson & Bushman, 2001) had calculated effects across studies that support the claim that violent video games can negatively influence the health of adolescents. The video game industry has

responded with the argument that research tends to only find correlations and not a definitive

causal link to aggressive outcomes (Entertainment Software Association, 2015). As a result,

scholars, video game players, parents and watchdog groups alike want to know whether video

games are making those who play them more aggressive and violent, or if violent people are just

attracted to violent games.

Contradictory Findings

The effects of exposure to violent media have been studied across the fields of

communication, public health, psychology, behavioral psychology and pediatrics (American

Psychological Association, 2015). Due to the growing body of evidence, the Resolution on

Violence in Video Games and Interactive Media (American Psychological Association, 2005)

was reassessed due to increased diffusion and advances in video game technology (American

Psychological Association, 2015). The policy review statement (American Psychological

Association, n.d.) was designed to determine:

> That APA engage those responsible for developing video games and interactive media in
>
> addressing the issue that playing violent video games may increase aggressive thoughts
>
> and aggressive behaviors in children, youth, and young adults and that these effects may
>
> be greater than the well documented effects of exposure to violent television and movies.
>
> (p. 2)

The revised report by the American Psychological Association (2015), which reviews a decade

of video game research, indicates a "…consistent relation between violent video game use and

heightened aggressive behavior, aggressive cognitions, and aggressive affect and reduced

prosocial behavior, empathy and sensitivity to aggression" (p. 18). There is a clear link between

violent video games and negative effects on adolescents, more so than other forms of violent

media. Four meta-analyses (Anderson, 2004; Anderson & Bushman, 2001; Anderson et al., 2010; Greitemeyer & Mugge, 2014) also report a positive relationship between violent video game content and aggression. Although experimental studies have found that violent video game exposure has a significant influence on aggressive outcomes (American Psychological Association, 2015), there are those in the field who disagree with this paradigm.

For example, Ferguson and Olson (2014) have data that suggests a cathartic effect, such that aggression levels in children with mental health problems (e.g. depression) are lowered after violent video game play. Similarly, Ferguson (2015) finds a negative relationship of $r = -.85$ between violent video game content and societal youth violence.

Both sides of the video game effects debate agree that valid studies need to be conducted to better understand this phenomenon, as well as to better inform policy makers (Ferguson & Olson, 2014). In order to understand the process, and potential effects, of playing a violent video game, a more nuanced, interdisciplinary approach utilizing what we know about the brain, psychology, and communication is necessary. Ferguson and Olson (2014) argue that one possibility is to include a mental health approach to help explain possible mediators in the process of violent video game exposure and societal violence.

Purpose of the Current Work

To frame the following research, the National Television Violence Study (Smith et al., 1998) definition of violence will be used as many other communication researchers studying violence use this definition in the context of media use (Anderson & Bushman, 2002) and specifically video games (Eastin & Griffiths, 2006; Farrar, Krcmar & Nowak, 2006; Hartmann & Vorderer, 2010). Violence is characterized as "any overt depiction of a credible threat of physical force or the actual use of such force intended to physically harm an animate being or

group of beings'' (Smith et al., 1998, p. 30). Violent acts are specifically intended to harm another person, who does not want to be harmed, through the use force (i.e. assault or battery). An act of aggression does not need to contain violence (American Psychological Association, 2015), however human aggression is still motivated by the intent to cause harm (Anderson & Bushman, 2002), albeit of a lesser magnitude than violence.

About 42% of Americans play video games for at least three hours per week (Entertainment Software Association, 2015). Since 42% of the population is not reacting to video games in a publicly, violent act, researchers cannot conclude that video games are the sole reason for motivating acts of violence. However, this does not mean that video games are harmless either. As mentioned, research has supported that violent video games can lead to increases in aggression for the players of those video games. Berkowitz (1962) notes that verbal aggression can lead to physical aggression and impulsive violence, especially for those who feel that using violence is the only viable option for conflict resolution (Bandura, 1973). Therefore, for a certain segment of the population, aggression can be seen as a risk factor for engaging in violent behavior. A risk factors approach for studying violent video game effects acknowledges the potential harm of video games, similar to how one jigsaw puzzle piece is part of a much larger picture. One possible approach to unifying the divide in video game effects literature is to shift from studying whether effects are present or not, to identifying the possible risk factors that increase the chances of aggressive outcomes (Gentile & Bushman, 2012).

One way to better map the use of violent video games as a risk factor, is to cross disciplinary lines into neurophysiology to understand what brain structures are being activated while playing video games as well as how those brain structures influence emotions, attitudes, and behaviors. For instance, guilt has been found to partially mediate the link between empathy

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and aggressive behaviors, such that empathy increases guilt, and guilt decreases aggression (Stanger, Kavussanu, & Ring, 2012). The assumption of moral foundations theory that posits that emotions precede cognitive thought will be applied to video game effects research by looking at the influence that empathy has on guilt experienced while playing a video game, and the subsequent effects on the player's attitude towards violence and aggression.

New Directions

Therefore, it would be prudent for video game effects researchers to widen the focus of their explanatory variables as a means of examining alternative process explications for effects of playing a video game. This paper presents possible psychological variables (e.g. empathy) from a communibiological perspective (e.g., whether the amygdala responds when you see another being in pain) in reference to why an effect is occurring (e.g., feeling guilt after playing a game where you intentionally cause another being pain). Results from a pilot test (Fishlock, 2015) suggest that guilt mediates the relationship between psychopathy and attitudes towards violence. The mapping and understanding of these biologically based, trait processes can increase the scientific knowledge of why individuals react to certain stimuli. Any information obtained from this perspective will provide insight regarding possible predictor variables to attitudes towards violence and aggression. If certain risk factors such as decreased amygdala activity can predict more positive attitudes towards violence, than interventions could be utilized to educate or socialize video game players as well as parents and policy makers on these risks.

Chapter 2: Literature Review

Aggression and Video Games

Video game effects researchers have used many different types and measures of aggression. It is important to differentiate between the types of aggression used in media effects research, as each represents a specific outcome, meaning that the forms of aggression cannot be conflated with one another. Cognitive aggression refers to the accessibility of thoughts that can lead to the formation of aggressive scripts and actions (Anderson, Anderson, & Deuser, 1996; Bargh & Pietromonaco, 1982; Huesmann, 1998), which can form as a result of viewing violent media (Bushman & Geen, 1990). Affective aggression is characterized as an emotional response, typically that of anger (Anderson et al., 1996; Geen, 1990) and can lead to hostility. Behavioral aggression is characterized as risk taking behavior that has the intention of causing harm to another (Swing & Anderson, 2010) but of a lesser magnitude than violence. Severe acts of publicly visible violence (i.e. Federal Bureau of Investigation's classification of violent crimes) as a form of behavioral aggression are rare and difficult to predict from video game violence alone (Bushman, Rothstein, & Anderson, 2010). Furthermore, a direct causal claim of a video game causing societal violence is indicative of the hypodermic needle model, which is outdated model and inappropriate for modern media effects studies (Greenberg & Salwen, 1996).

As previously mentioned, the video game effects literature is currently at a divide in regards to the effects of violent video games on aggression. Researchers provide data through several meta-analyses that provide consistent relationships between exposure to violent video games and aggression (Anderson, 2004; Anderson & Bushman, 2001; Anderson et al., 2010; Greitemeyer & Mugge, 2014). Meta-analyses are useful because researchers are able to aggregate effects across studies, meaning the reported effects of a meta-analysis are more

reliable than the effects reported by a single study due in part to the averaging of individual differences and statistical artifacts (Anderson, Lindsay, & Bushman, 1999). The effects of these four meta-analyses are trending in the same direction as meta-analyses on the effects of violent television and aggression (Hogben, 1998; Paik & Comstock, 1994). Furthermore, the positive relationship between violent video games and aggression has been replicated across a variety of methodologies, including laboratory experiments (Anderson & Morrow, 1995; Anderson & Murphy, 2003; Barlett & Rodeheffer, 2009; Barlett, Rodeheffer, Baldassaro, Hinkin, & Harris, 2008; Krcmar & Lachlan, 2009; McGloin, Farrar, & Fishlock, 2015), electroencephalogram experiments (Engelhardt, Bartholow, Kerr, & Bushman, 2011) functional magnetic resonance imaging (fMRI) experiments (Gentile, Swing, Anderson, Rinker, & Thomas, 2014; Hummer et al., 2010), and cross sectional data (Farrar, Lapierre, McGloin, & Fishlock, 2015).

Anderson et al.'s (2010) recent meta-analysis calculations report zero order correlations for experiments measuring cognitive aggression of $r = .22$; for cross sectional designs, $r = .18$; and for longitudinal studies, $r = .12$. Overall, the average effect for cognitive aggression calculated an $r = .18$. Behavioral aggression measured in experimental studies is $r = .21$; for cross sectional studies, $r = .26$; and for longitudinal studies, $r = .20$. Overall, the average effect for behavioral aggression is $r = .24$ The average effect for affective aggression for experiments is, $r = .29$; for cross sectional studies $r = .10$; and for longitudinal studies $r = .08$. Overall the average effect for affective aggression is $r = .12$.

All of the correlations reported by Anderson et al. (2010) fall within the range of small to medium size (Cohen, 1992). However, in the context of social significance, with exposure to 155 million people (Entertainment Software Association, 2015), there is evidence to consider violent video game play at least as a risk factor to aggressive behavior, rather than dismiss the

research completely. Primarily, the risk factors approach acknowledges that violent media should be given the same consideration to the formation of aggressive behaviors as other risk factors (American Academy of Pediatrics, 2009; Boxer, Huesmann, Bushman, O'Brien, & Moceri, 2009). Furthermore, individual difference factors, such as psychopathy, could predispose a small segment of individuals to use violence as a result of increased aggression from violent video game play. Psychopaths are often described as being unconscientious, insincere, anti-social, impulsive, and lacking the expression of love (i.e. social bonds) (Bishopp & Hare, 2008). This approach to the effects of violent video games addresses some of the issues raised by researchers regarding the overstatement of violent video games in causing aggression.

Despite similar trends of six meta-analyses on media violence and aggression, there are those that believe that the video game effects literature is plagued by methodological issues (Ferguson, 2015; Ferguson & Dyck, 2012; Ferguson & Kilburn, 2009), publication bias (Ferguson & Dyck, 2012; Ferguson & Kilburn, 2009), and exaggerated claims of sound theoretical models (Ferguson & Dyck, 2012).

In terms of methodological criticisms, researchers (Ferguson, 2015; Markey, Markey, & French, 2014) provide arguments questioning the generalizability of laboratory measures of behavioral aggression (e.g. the application of hot sauce or noise blasts) in predicting real world violence, specifically violent crimes. This means that the negative effects of video games as measured by behavioral aggression in a laboratory setting are not the same as a public act of violence such as assault (Ferguson & Olson, 2014). This is an important distinction because over generalizing measures of aggression could cause researchers to overstate their findings and thus come to inappropriate conclusions about video games causing societal violence. Bushman, Rothstein, and Anderson (2010) have already addressed that these predictions cannot be made.

However, in terms of the external validity of laboratory aggression measures, Anderson, Lindsay, and Bushman (1999) found an $r = .73$ ($d = 2.14$), when comparing laboratory and field effect sizes for aggression. Thus laboratory aggression measures are strongly related to field measures (i.e. real world) of aggression. Research on laboratory and real world aggression (Buss, 1961; as cited by Bushman & Anderson, 1998) draw similarities between laboratory behavioral aggression such as shocking a confederate to real world violence such as assault. A lab measure of verbal aggression (i.e., an expression of cognitive aggression) such as insulting a confederate is similar to real world verbal aggression such as making derogatory statements to another person.

The second criticism raised is more in regards to the publication bias in the inclusion of studies in meta analyses. Given that most publications tend to report rejection of null hypotheses, it has been levied (Ferguson & Kilburn, 2010) that the exclusion of unpublished studies in meta-analyses would lead to biased results. Bushman, Rothstein, and Anderson (2010) note that meta analyses best practices are not reliant upon publication status as a qualifier for inclusion. Additionally, the trim and fill technique is used to attenuate for possible publication bias (Bushman et al., 2010). Furthermore, Greitemeyer and Mugge (2014) found the trim and fill effect sizes similar to the observed effect sizes in their meta-analysis on the effects of violent video game exposure, which indicates no effect of publication bias.

The final criticism raised is that a lack of sound theoretical models (i.e. the general aggression model) are being applied in explaining the data. It should be noted that the theoretical framework for violent video game research is not limited to the use of the general aggression model, rather the strength of violent video game research is that the findings are replicated and explained by theories such as mental models (Farrar, Krcmar, & Nowak, 2006),

model matching (McGloin, Farrar, & Fishlock 2015), priming (Krcmar & Lachlan, 2009), desensitization theory (Bartholow, Bushman, & Sestir, 2006; Engelhardt, Bartholow, Kerr, & Bushman, 2011), social cognitive theory (Nowak, Krcmar, & Farrar, 2008), and script theory (Krahe & Moller, 2004).

Aiding in the negative perception of violent video game research, the video gaming community tends to dismiss violent video game research as inconclusive despite a growing body of literature. A quick glance through video game message boards, such as kotaku.com, reveals the defensive and dismissive nature of the video game community towards research that demonstrates correlations or causality (Schreier, 2015). On the substantive significance of correlations, Cohen, Cohen, West, and Aiken (2003) point out, "Correlation does not prove causation; however the absence of correlation implies the *absence* of a causal relationship" (p.7, italics in original). Thus, the presence of correlations indicates an underlying relationship between variables and that there is a process occurring between exposure to violent video games and increased aggression. Secondly, the video gaming community also notes that video games are merely just that, games. However, Hartmann, Toz, and Brandon (2010) found that more guilt was experienced when players had to kill characters whose social background was known, compared to those players who had to kill characters whose social background was unknown. The differences in guilt experienced by the players suggests that video games do evoke moral responses and that players tend to discount these effects, as the violence is "just a game" (Hartmann, 2011; Hartmann, Toz, & Brandon, 2010). Not only are video games considered games, but they are also robust experiences of communication that mimic human interaction. To explain why video games can evoke moral responses, the following section explores how humans can respond socially and morally to computers.

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Video Game Characters as Social Actors

Reeves and Nass (1996) have provided evidence that humans can respond to computers, as if they are interacting with real people. The act of communicating with a computer is human-like enough to consider the computer as a social actor. Reeves and Nass (1996) were able to demonstrate that text based responses from a computer would cue a social response within the human to be polite towards the computer. Despite the level of anthropomorphism exhibited by the computer, humans still interact with computers as if they were other humans (Nowak & Biocca, 2003). Furthermore, research has ruled out the possibility that participants are being polite to the programmer and not the program even when the participants are explicitly asked about the programmer (Reeves & Nass, 1996).

Therefore, interactions with video game characters should elicit the same processes from the player as if those characters existed in real life. Research has found that when a video game player enacts a moral transgression in a video game, they can experience guilt (Grizzard et al., 2014; Hartmann et al., 2010). Olthof (2004) notes that guilt arises when a moral wrong has been committed. Therefore, when players act immoral in a video game, they are emotionally responding to the video game as if it was a social actor.

Since humans are able to react to, and experience emotions from computers or animated characters, a closer examination of the traits that facilitate these emotions is warranted. The communibiological paradigm posited by McCroskey and Beatty (2000) argues that genetic differences influence the variation within individual difference variables (e.g., communication apprehension).   This means that an individual's trait variable is influenced to some degree on a genetic level. The fluctuation in biological differences caused by genetics is applicable to emotions since emotions are caused by the release of neurochemicals (Buck, 1984; 1988; 1999;

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2014). Therefore, the communibiological paradigm is helpful in understanding the influence that individual differences in traits (e.g., empathy and psychopathy) have on emotions (e.g., guilt) that a player can experience towards a video game character.

Communibiology

Communibiology is a meta-framework that grounds communication processes in a biological perspective.   The communibiological perspective is considered a paradigm shift, because it takes into account an inherent biological element (i.e. nature) rather than a sole learning element (i.e. nurture) to human behavior. "The communibiological perspective proposes that inborn, neurological structures are responsible for communication behavior and associated processes" (McCroskey & Beatty, 2000, p.2).   Thus, traits such as empathy and psychopathy are not behaviors that are learned from the environment, but rather they are individual difference variables that have a psychobiological basis.

Beatty and McCroskey (1997) discuss the importance of psychobiology, which is a term that combines neurology, neuroanatomy, and endocrinology. Essentially, this explains that communication can be explained through the processes of the brain, the structures of the brain, and the hormones and chemicals that the brain releases. Thus, the black box (i.e. cognitive processes) that learning theorists such as Skinner (1985) have ignored, are now measurable and able to help explain learning outcomes. Differing from learning theorists, communibiologists argue that traits must originate from the brain, and that learning how individuals vary based on biological proclivities aids in the further understanding of communication processes (Beatty & McCroskey, 1997; Beatty, McCroskey, & Heisel, 1998; McCroskey & Beatty, 2000). The communibiological paradigm is supported by the recent advances made in science through the application of fMRI technology, which allows researchers to view the variance in brain activity

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amongst participants in empathy (Schulte-Ruther, Markowitsch, Shah, Fink, & Piefke, 2008) and psychopathy (Kiel et al., 2001). In order to link these biological processes to communication theory, the following section explores moral foundations theory (Graham et al., 2012; Graham, Haidt, & Nosek, 2009; Graham, Nosek, Haidt, Iyer, Koleva, & Ditto, 2011) and video game effects from a communibiological perspective.

Moral Foundations Theory

Moral foundations theory describes six domains of morality that individuals draw from while they are engaged in a decision making process. The six moral domains are harm/care, fairness/reciprocity, ingroup/loyalty, authority/respect, purity/sanctity and liberty/oppression. Of these six domains the harm/care, fairness/reciprocity, and liberty/oppression best fit the perspective of this study. The versatility of moral foundations theory is that it is able to account for attitudes and emotions when engaging in moral judgment (Graham et al., 2012). Additionally, three assumptions of moral foundations theory work in tandem with the communibiological perspective to explain how affective processes such as empathy, psychopathy, and guilt can predict attitudes and aggressive intentions.

The domains. The harm/care domain is referring to an evolutionary mechanism that makes humans sensitive to the suffering of others, provides an urge to protect those that are vulnerable, and draws upon compassion as part of the reasoning process (Haidt & Graham, 2007). The harm/care moral domain overlaps with the evolutionary justification for a trait-based approach of empathy and psychopathy. Highly empathetic individuals are compassionate towards others because they are in tune with the emotions other individuals are experiencing (de Waal, 2005). Empathetic individuals are also biologically inclined to care about the preservation of society by caring about others (de Waal, 2005). Individuals that deviate from this (i.e.

psychopaths) have been found to not be influenced by the sight of another individual in pain (Decety et al., 2013).

The second domain is fairness/reciprocity. This domain is characterized by the release of the emotion of guilt (Haidt & Graham, 2007). If an individual acts unfairly towards another individual (e.g., lying to them for personal benefit) guilt is experienced as an innate signal that a moral transgression has occurred. This ties in with the communibiological model, such that guilt developed as an evolutionary mechanism to ensure the preservation of social life by limiting transgressions against others.

The last domain, liberty/oppression, is driven by Libertarian political ideologies. This domain represents a shift in moral beliefs, such that there is more of a focus on the individual rather than the collective (Iyer et al., 2012). Research has found that this moral domain represents a lack of empathy in the decision making process (Iyer et al., 2012). Therefore, any moral choice drawn from this domain is not being influenced by the same cognitive structures as fairness/reciprocity, as the benefit of the individual is valued more than the benefits of others.

Empathy and psychopathy. The first assumption of moral foundations theory is that there are inherent biological proclivities present within our physiology that influence moral decisions (Haidt & Joseph, 2006). This assumption has been supported as research has identified areas of the brain responsible for empathy and psychopathy. Empathy is localized in the frontal lobe (Bush, Luu, & Posner, 2000; Leigh et al., 2013) and the right amygdala (Leigh et al., 2013) of the brain. Alternately, a lack of activation of the right amygdala has been found for individuals who score high in psychopathy within the context of perspective taking of others in pain (Decety et al., 2013). Since empathy and psychopathy have a biological basis, they fulfill the communibiological paradigm, which satisfies the first assumption of moral foundations theory.

Empathy. Empathy is often characterized as a personality variable that allows for emotional sensitivity within a given communication context and has been described as "taking the perspective of another or imagining oneself in another's position" (de Waal, 2012, p. 875). It is important to note that empathy is not an emotion, but rather a physiological trait that allows an individual to feel the emotional experiences of another (Bush, Luu, & Posner, 2000).

There are two types of empathy that research identifies. Affective empathy allows an individual to feel what another person is feeling (Leigh et al., 2013). Cognitive empathy is the ability to put oneself in another person's shoes by means of information processing, reasoning, attribution and agency (Leigh et al., 2013). This description implies a deliberative cognitive process to make sense of a situation and determine the appropriateness of one's action. This form of empathy is similar to hypothetical thought, in which an individual mentally places himself or herself in another person's situation via perspective taking (Leigh et al., 2013). Similarly, apes, who share a common brain structure with humans, have been found to be able to imagine the circumstances of other apes (de Waal, 2005).

Psychopathy. If empathy is essential to moral intuition, then psychopathy should be considered as well. Often, the term psychopathy invokes stigmatized visions of clinical assessments of lawless individuals with little or no emotional attachment to those around them. In reality, psychopathy is similar to empathy in that it is a variable that refers to an individual's lack of ability to process emotional information in a social manner. According to Hare, Clark, Grann and Thornton (2000), psychopaths are defined as, "short-tempered, unable to form strong emotional bonds with others, and lacking in empathy, guilt, remorse, or deep-seated emotions" (p.624).

There are four dimensions to psychopathy that clinical research identifies; interpersonal manipulation, callous affect, erratic life style, and anti-social behavior (Hare & Neumann, 2008). The interpersonal manipulation concept of psychopathy addresses the ability of an individual to manipulate others in order to get what is wanted. The concept of a callous affect of psychopathy is in reference to the perspective taking of the individual. Although a psychopath may see someone in pain, they lack the emotional recognition of it. The concept of erratic lifestyle describes the impulsive and unpredictable nature of a psychopath. Lastly, the concept of anti-social behavior is referring to the lack of a meaningful social connection a psychopath has with other individuals. Whereas empathy enables an individual to feel guilt, psychopathy is the absence of being able to experience guilt.

Sex based differences. Research has found that women tend to score higher than men on measures of empathy (Baron-Cohen, & Wheelwright, 2004), exhibit empathy more than men (de Waal, 2005), as well as show stronger neural activation in regards to emotional perspective taking (Schulte-Ruther, Markowitsch, Shah, Fink, & Piefke, 2008). Based on these findings, it is hypothesized that women will score higher than men in trait empathy (**H1**). Research has also demonstrated that men tend to score significantly higher than women on various scales of psychopathy, such as the PCL-R (Rutherford et al, 1998), PCL-R:SV (Forth et al, 1996), the SRP-II (Wilson, Frick, & Clements, 1999; Zagon & Jackson, 1994), and the PPI (Lilienfeld & Andrews, 1996). Based on these clinical and non-clinical assessments, it is hypothesized that men will score higher than women in trait psychopathy (**H2**).

Localization in the brain. The regions of the brain that contain functions related to empathy are located in the limbic system. The limbic system consists of the cingular cortex, the amygdala, the hypothalamus, the thalamus and the hippocampus (Ploog, 2003). The structures

of interest to the variables of this paper are the anterior cingular cortex and the right amygdala. Within these structures resides the capacity to experience pro-social and individualistic emotions (i.e. social attachment) through varying neurochemical levels such as oxytocin (Buck, 2015; Buck, Anderson, Chaudhuri, & Ray, 2004). The pro-social emotions are responsible for the preservation of society as well as the organism's mental well-being. "Our self preservation and affection programs allow us a highly advanced sensitivity to our environment, keeping our interactive social behaviors within survival limits as well as enabling us to perceive and appreciate the survival requirements of others" (Cory, 2000, p.389). Thus the emotional responses elicited by these sections of the brain allow humans to be social creatures, ensuring the existence of future generations.

As mentioned, one of the primary regions of the brain that research has associated with empathy is the anterior cingulate cortex. It is only recently, through fMRI studies that the functions of the anterior cingulate cortex on empathy have begun to be understood (Bush, Luu, & Posner, 2000; Leigh et al., 2013). The anterior cingulate cortex can be divided into a cognitive and emotional region. The dorsal cognitive division is located in the top portion of the anterior cingulate cortex, whereas the ventral affective division resides in the lower portion, bordering the amygdala (Bush et al., 2000).

The two sections of the anterior cingulate cortex are responsible for different mechanisms. The dorsal cognitive division focuses on cognitive processes and attention functions (Bush, Luu, & Posner, 2000). The ventral affective division of the anterior cingulate cortex "is primarily involved in assessing the salience of emotional and motivational information and the regulation of emotional responses" (Bush et al, 2000, p.216). Thusly, the primary function of the emotional portion of the anterior cingulate cortex is to understand and adapt to

the emotional states of other individuals, to feel what the other feels, which is often called

emotional empathy (Leigh et al., 2103).

Social norms are learned. The second assumption of moral foundations theory is that

cultural learning occurs, such as the learning of social norms. The application of an individual's

moral domains to certain circumstances provides situations for innate learning (Grahm et al.,

2012). Additionally, social learning theory (Bandura, 1961), proposes that humans learn when to

use aggression by observing the behaviors of social models, thus learning what is appropriate

behavior for a given situation. Humans, in essence, are socialized to be both aggressive and

non-aggressive depending on their observational experiences of others and the motivations of the

self. There is also evidence that the learning of social norms also has some biological basis.

Hurlemann and colleagues (2010) have found that oxytocin aids in socially reinforced learning,

but only with participants that did not have bi-lateral lesions in their amygdala, which has been

found to impair emotional memory (Adolphs, Cahill, Schul, & Babinsky, 1997).

Learning theorists would argue that people have learned through operant conditioning to

reduce behaviors that are socially undesirable (Skinner, 2005) which in turn helps to shape their

moral domains. Using the lens of Operant Conditioning, one can identify that the penal system

(i.e. a punishment for violent crimes) trains individuals to behave by threatening to limit their

contact with society. Skinner would note that the penal system (or threat of) relies heavily upon

negative consequences for illegal actions. Specifically, Skinner would state that the penal

system uses negative punishment since the system is taking away the offenders contact with

society to reduce unwanted behaviors, which is classified as an important commodity to social

creatures. More extreme forms of negative punishment are used, such as solitary confinement, in

which prisoners (i.e. the most violent offenders) have all forms of human contact taken away from them.

Moral intuitions. The third assumption of moral foundations theory is that a gut intuition will precede any form of moral reasoning. An individual will draw from their innate moral intuitions, such as subjective emotional experiences, to determine appropriate action when presented with a situation. Research has found that individuals who play video games often will draw upon their moral reasoning strategies during gameplay (Krcmar & Cingel, 2016) to rationalize experiential (i.e. intuitive) or "this is actually happening" feelings (Hartmann, 2011, p. 140). The following sections provide evidence to consider the traits of empathy, psychopathy and the emotion guilt within the moral intuition phase.

Empathy and guilt. Empathy has been found to regulate an individual's ability to experience certain moral emotions, such as guilt (Hoffman, 2000). Research has repeatedly found positive relationships between empathy and guilt (Konstam, Chernoff & Deveney, 2001; Leith & Baumeister, 1998; Stanger, Kavussanu, & Ring, 2012; Stuewig et al., 2010; Tangney, 1992, 1996; Tangney & Dearing, 2002; Tangney, Stuewig & Mashek, 2007). The limited research that has specifically investigated the link between trait empathy and resultant guilt in the context of videogames has been able to replicate the positive relationship found between empathy and guilt (Hartman, Toz, & Brandon, 2010).

Guilt is conceptualized as a negative prosocial emotion (Buck, 2010; Buck, Anderson, Chaudhuri & Ray, 2004). This means that if a behavior is enacted that harms others, the brain will alert the body through the subjective experience of guilt (Haidt, 2003) in order to self-regulate future transgressions (Bandura, 1991; Kroll & Egan, 2007). If unjust or unwarranted behavior is enacted upon another individual, the person engaging in that behavior will intuitively

know what they are doing is wrong. Thus if an individual is engaging in anti-social or risky behavior, guilt will be enacted to send affective cues, such as feeling bad, in order to limit or prevent that behavior. Therefore, guilt is seen as serving as a regulatory function to human behavior (Tangney, Stuewig & Mashek, 2011).

Guilt is an intuition based emotional reaction that guides judgment without an individual realizing it (Haidt, 2001). Often this manifests itself as a form of regret for a past action, which will serve to make amends for the action or prevent future transgressions to occur. Thus if an individual were to transgress a social norm, they would regret engaging in such an action and avoid that behavior in the future. Leith and Baumeister (1998) note that parents often use guilt as a way of emotional learning of acceptable behavior (i.e. as a form of operant conditioning). Guilt has also been found to increase interpersonal relationships in a positive manner such that guilt prone individuals engage in cognitive empathy more than non-guilt prone individuals (Leith & Baumeister, 1998). Guilt has also been linked to the neuropeptide oxytocin, which is often associated with social bonding and attachment (Marazziti, et al., 2006) and evidence suggests guilt is located in the limbic system (Michl et al., 2014).

Evidence has been found with fMRI technology that guilt activates the fusiform gyrus, middle temporal gyrus and the amygdala (Michl et al., 2014). The common areas of activation between guilt and empathy are the amygdala and the sections within the temporal lobe. This suggests that guilt is an emotional byproduct of empathy, which functions to regulate social behavior (Baumeister, Stillwell, & Heatherton, 1994).

As mentioned previously, players can experience the moral emotion of guilt while playing a violent video game. Weaver et al. (2012) found that players' moral intuitions will guide their in game actions to be representative of how they would behave in real life, and when

those morals intuitions are violated, guilt develops. Similarly, Schmierbach and Limperos (2013) observed guilt when players killed characters in a disposition inconsistent scenario. Therefore, it is predicted that the presence of violence will moderate the relationship between empathy and guilt, such that individuals high in empathy in the violence condition will have greater levels of self-reported guilt compared to individuals high in empathy in the control condition **(H3).**

Psychopathy and guilt. Hare and Neumann (2008) identify a lack of guilt as part of the construct of psychopathy. A pilot test (Fishlock, 2014) found a negative relationship between psychopathy and the amount of guilt experienced after playing a violent game. Triberti, Villani, and Riva (2015) found a negative relationship between the personality traits of agreeableness and extraversion with evil moral positioning (i.e., playing the evil character) in a video game. Based on the extant literature and these past findings, it is hypothesized that psychopathy will negatively predict post gameplay guilt (**H4**).

Given these characteristics, a psychopath is characterized as having little or no emotional attachment towards others. Psychopathy has been found to be negatively related to empathy and positively related to an inflated image of self (Hare, Clark, Grann, & Thornton, 2000). Research has found that individuals that score high on psychopathy measures have a lack of activity in the limbic system when they perceive others to be in pain (Decety et al., 2013). Individuals that score high in empathy, show activation within the affective portions of the anterior cingulate cortex and the anterior insular cortex when perceiving others in pain (Singer et al, 2004), whereas those high in psychopathy show no activation (Decety et al., 2013). Therefore, it is hypothesized that, prior to gameplay, a negative relationship will exist between empathy and psychopathy (**H5**).

Desensitization. In the context of video games, one important variable to consider as a covariate would be past gameplay experience. Past gameplay experience could account for a desensitization effect, which originates within the aversive motivation system (Bartholow et al., 2006), which is also known as the behavioral inhibition system (Lopez, 2009). The behavioral inhibition system is designed to "inhibit behavior that may lead to negative or painful outcomes" (Carver & White, 1994). Take for example a scene in *Grand Theft Auto V*, where the player has to brutally torture an individual in the most graphic of details. The first time the player pulls a tooth out with a pair of pliers they may wince at the graphic event. However, after playing the game several times, the player may no longer perceive the gameplay as violent, due to reduced processing in the behavioral inhibition system (Bartholow et al., 2006).

Moral intuition leads to moral reasoning. Longitudinal research has provided a causal link, supporting that affective empathy scores will negatively predict bullying behaviors (Stavrinides, Georgiou, & Theofanous, 2010). Jolliffe and Farrington (2004) conducted a meta-analysis in which a negative relationship was consistently found between empathy and criminal offenses, which is consistent with other research that suggests empathy has a negative relationship with aggressive behaviors (Bryant, 1982; Stanger, Kavussanu, & Ring, 2012). Empathy has also been indirectly linked to aggression, in which guilt was found to be a mediating variable (Stanger, Kavussanu & Ring, 2012). This means that the more empathetic an individual, the greater levels of guilt they will feel, which will in turn decrease their aggression levels. Based on these findings, it is hypothesized that participants' feelings of guilt post gameplay will negatively predict verbal aggression (**H6a**) and negatively predict physical aggression (**H6b**). Since violence towards others is characterized as immoral, and innate biological mechanisms have evolved to promote moral behavior (i.e. the preservation of society)

(Haidt & Joseph, 2004; Graham et al., 2012), it is hypothesized that participants' feelings of guilt post gameplay will negatively predict their attitudes towards violence (**H7**). Additionally, the American Psychological Association (2015) has reviewed the extensive body of literature regarding video game violence and aggression, and determined that the variables of violence and aggression are positively correlated. Cotten et al., (1994) found a moderate correlation ($r =. 42$) between student's attitudes towards violence and self-reported acts of aggression. Attitudes towards violence (Avci & Gucray, 2005) and beliefs supporting aggression (Slaby & Guerra, 1988) have been found to be mediators to aggression. Based on the extant literature and findings of past research, it is hypothesized that participants' post gameplay attitudes towards violence will be positively correlated with participants' post gameplay verbally aggressive intentions (**H8a**), and positively correlated with post game play physically aggressive intentions (**H8b**).

Empathy and psychopathy are traits that influence the moral emotion of guilt. Highly empathetic individuals tend to feel more guilt than those who are less empathetic. Highly psychopathic individuals will not feel guilt, regardless of the situation. As a moral intuition, guilt regulates unjust actions, such that individuals that experience higher levels of guilt will hold less positive attitudes towards violence and be less aggressive than those that experience lower levels of guilt. This pro-social, evolutionary approach fits the communibiological paradigm and is supported by moral foundations theory.

Chapter 3: Methodology
Pilot Test

A pilot test (Fishlock, 2015) was conducted to test the effects of empathy, psychopathy and violent video games on guilt and attitudes towards violence. A 2 x 2 (sex: male, female; by condition: control, high violence) true experimental design was utilized. Unfortunately, due to sampling bias, many of the statistical tests were underpowered and unable to detect the expected effects. The predicted interaction between empathy and condition on guilt was not supported (β = .005, p = n.s). The predicted interaction between psychopathy and condition on guilt was not supported (β = .-.18, p = n.s). However, the effects were trending in the right direction. Theoretically, as the level of violence increases, empathic individuals would feel more guilt.

Interestingly, guilt was found to mediate the relationship between psychopathy and attitudes towards violence. The path from psychopathy (IV) to attitudes towards violence (DV) approached significance (β = .19, p = .075). The path from psychopathy (IV) to guilt (M) approached significance (β = .-.19, p = .08). Finally when accounting for mediation, the path from psychopathy to attitudes towards violence was no longer significant (β = .14, p = n.s) and the path from guilt to attitudes towards violence was significant (β = .-.22 p = n.s). Results support that the relationship between psychopathy and attitudes towards violence, is mediated by feelings of guilt experienced by the player such that psychopathy negatively influences guilt, and guilt negatively predicts attitudes towards violence.

The scales assessing guilt, attitudes towards violence, and cognitive aggression were retained for use in the present study. However, several operational definitions were changed for the proposed study due to content validity issues. The pilot test used the Interpersonal Reactivity Index (Davis, 1980; 1983), which contained items that did not match up with the theoretical definition of empathy. Additionally, the psychopathy measure (Levenson, Kiehl, & Fitzpatrick,

1995) was replaced with a non-clinical, self-report measure of psychopathy (Paulhus, Newmann, & Hare, in press). Paulhus, Newmann, and Hare (in press) designed their self-report to be a non-clinical measure of the PCL-R, which is the standard for diagnosing psychopathy in clinical environments (Williams, Nathanson, & Paulhus, 2003). The self-report measure of psychopathy is also specifically designed to capture the four theoretical components of psychopathy.

Design

A 2x2 (sex: male, female; by condition: control, high violence) true experimental design is utilized.

Participants

Participants were recruited from a large Northeastern university and offered course credit for their participation. Although this sample is derived from an academic population, it is considered a purposive sample as 30% of people who play video games range in age from 18-35 years old (Entertainment Software Association, 2015). Participants reported playing an average of 2.35 days ($SD = 1.27$) in a given week, supporting the appropriateness of the sample.

The sample was initially comprised of 171 students, however data for two students were discarded due to opting out of experiment before answering post-test questions, resulting in a final sample of $N = 169$. The sample consisted of 53.3% males ($n = 90$), with a mean age of 20. The race of the sample was predominantly Caucasian (66.3%), followed by Asian (21.9%), Hispanic (4.7%), African American (4.1%), and other (3%).

A power analysis was conducted to determine the appropriate sample size to detect a small effect size of $r = .22$ in a 2 x 2 factorial design. The effect size was taken from a recent meta analysis (Anderson et al., 2010) in which the variables of interest were similar. The power analysis was conducted using the computer program, PASS which was created by the company

NCSS. NCSS is a company that specializes in creating statistical software (e.g. PASS) for use in

medical research. The program determined the appropriate sample size to be $N = 187$, to detect

an effect size of $r = .2$, at 80% power, for a one tailed hypothesis at $\alpha = .05$.

Procedure

Participants scheduled a laboratory appointment through the use of Acuity Scheduling,

which is an online appointment software. Prior to arriving to the laboratory, participants were

randomly assigned to either a condition where violence is present ($n = 94$) or a control condition

($n = 75$). After reading an information sheet and indicating verbal consent, participants were

directed to fill out preliminary measures involving demographics, prior videogame experience,

and measures of empathy and psychopathy.

After this initial portion of the survey was completed, participants were directed to play

Grand Theft Auto V on the Xbox 360. *Grand Theft Auto V* was chosen as it was the top selling

game for 2013 (Entertainment Software Association, 2014; ign.com), and the fourth top selling

game in 2014 (Entertainment Software Association, 2015). The popularity of *Grand Theft Auto

V* ensured a stimulus with high external validity. In regards to concerns raised by (Markey,

Markey, & French, 2014) on the cartoonish nature of games used for violence and aggression

research, *Grand Theft Auto V* addresses this concern with its' highly realistic graphics. The

processing power of the Xbox 360 allows for highly rendered, realistic human characters. *Grand

Theft Auto V* requires a realistic looking human being, overtly depicting the credible threat of

physical force or the actual use of such force (e.g. punching, kicking, killing someone) intended

to physically harm another realistic looking human being (Smith et al., 1998).

Additionally, *Grand Theft Auto 5* is also useable as a stimulus in both the experimental

condition as well as the control condition, which addressed methodological concerns raised by

researchers (Panee & Ballard, 2002) regarding the usage of different games for different conditions within the same experiment. Participants in the experimental condition (i.e. condition 1) played *By the Book,* a mission within the main story line of *Grand Theft Auto V*. Participants in the control condition (i.e. condition 2), played a tennis mini-game within *Grand Theft Auto 5*. Participants were given detailed instruction sheets unique to their condition on how to operate the controls. The instruction sheets contained step-by-step visual guides to explain the necessary controls.

Experimental condition. Players switch between two characters, Trevor and Michael, throughout *By the Book*. The actions undertaken by both characters would be classified as violent crimes. When the player takes control of Trevor, they torture a male prisoner on four separate occasions. The methods of torture include swinging a plumbers wrench to break bones; using pliers to pull out teeth; using jumper cables and a car battery for electrocution; and waterboarding to simulate drowning. After each instance, the captive's physical appearance indicates bruising, bleeding, and speech impediments. The captive's heartbeat is felt through the vibration feedback of the controller, increasing the intensity of the scenes. In between torture acts, the participant plays as Michael and has to drive around to various locations that are given by the person being tortured. After the last torture act, Michael must assassinate an individual with a sniper rifle. Research assistants estimated the average time to complete the mission was between twenty and thirty minutes.

Control condition. Participants assume the role of Michael and play tennis against an instructor at a country club tennis court. Participants were instructed to play five matches and were stopped after 25 minutes of play (i.e. the equivalent completion time for the experimental condition).

After completing their assigned tasks, participants then finished filling out their survey, which assessed their emotional reactions to the game, aggression, frustration, and attitudes towards violence. Upon completion of the experiment, participants were debriefed extensively and thanked for their participation.

The two participants who opted out of the experiment were immediately debriefed by research assistants. Due to the violent nature of the stimulus, the research assistants offered to walk the participants to the university counseling center, however neither participant requested to go to the counseling center.

Measures

Perceived violence. To assess whether the experimental manipulation of violent content was successful, a three-item, seven-point semantic differential was constructed ($M = 4.06$, $SD = 2.50$, $\alpha = .97$). Participants in both conditions were instructed to rate the level of violence present within the game they had just played. The three items are, "Had no violent content/ Had very violent content", "Had no blood & gore/ Had lots of blood & gore" "Had no violent graphics/ Had very violent graphics."

Guilt. The state guilt subscale (Jones, Schratter & Kugler, 2000) was used to assess participants' levels of state guilt after exposure to the stimulus material. The nine-item, seven-point, unidimensional state guilt subscale ($M = 4.82$, $SD = 1.33$, $\alpha = .90$) was modified to reflect the video game context of the experiment. Participants were asked to reflect on the actions that they had just enacted within the video game. The modified scale is composed of items such as "I have done something recently in *Grand Theft Auto* that I deeply regret," "There is at least one violent action in my recent playing of *Grand Theft Auto* that I feel bad about," and "After playing *Grand Theft Auto,* I am calm and worry free."

Attitudes towards violence. The attitudes towards violence scale (Funk, Elliot, Urman, Flores & Mock, 1999) was used to measure the participants' attitudes regarding violence. This scale is a 17-item, five-point scale ($M = 2.23$, $SD = .56$, $\alpha = .74$) that ranges from (1) *Strongly Disagree* to (5) *Strongly Agree.* Examples of items are, "It's okay to use violence to get what you want", "If a person hits you, you should hit them back" and "If someone tries to start a fight with you, you should walk away."

Empathy. To assess trait empathy, the Toronto empathy questionnaire (Spreng, McKinnon, Mar, & Levine, 2009) was used. The TEQ is a 16-item, five-point Likert Scale ($M = 3.83$, $SD = .43$, $\alpha = .78$) ranging from (1) *Never* to (5) *Always.* The TEQ is positively correlated with other operationalizations of empathy as well as negatively correlated with anti social behaviors (see Spreng et al., 2009). Examples of items are "When someone else is excited, I tend to get excited too," "I am not really interested in how other people feel" and "I get a strong urge to help when I see someone who is upset."

Psychopathy. The self report psychopathy scale III (Paulhus, Newmann, & Hare, in press) is a non-clinical measure of psychopathy designed for research purposes for non-offender samples (Williams, Paulhus, & Hare, 2007). A non-clinical method for capturing psychopathy was used, as the researcher did not have access to a clinical psychologist to administer and interpret a clinical test. The SRP III is a sixty one item, five- point, multi dimensional Likert scale ($M = 2.38$, $SD = .37$, $\alpha = .88$) ranging from (1) *Disagree Strongly* to (5) *Agree Strongly.* Previous research (Paulhus, Newmann, & Hare, in press) has demonstrated that the SRP III measured as composite scale is valid and reliable. Some examples of items are, "It tortures me to see an injured animal", "I purposely flatter people to get them on my side", and "I've done something dangerous just for the thrill of it."

State aggression. A modified Buss-Perry aggression questionnaire (Farrar & Krcmar, 2006) captures both verbally and physically aggression intentions. Previous research (Farrar & Krcmar, 2006) has validated a three factor solution using varimax factor analysis. The multi dimensional Likert scale ranges from (1) *Very Unlikely* to (7) *Very Likely*. A varimax factor analysis was conducted to test the three factor structure of the modified Buss-Perry (see Table 1). Only two factors were included for this study. All items loaded onto their respective factors (see Table 2), however factors without a .60 primary loading were discarded and not used with any future analysis. resulting in a final measure containing seven items; a four item physically aggressive intentions subscale ($M = 2.93$, $SD = 1.28$, $\alpha = .78$) and a three item verbally aggressive intentions subscale ($M = 3.93$, $SD = 1.47$, $\alpha = .84$). A Chi-Square of $\chi^2 (91) = 1189.56$, $p < .001$ was calculated. The verbally aggressive intentions subscale had an eigenvalue of 4.31 and accounted for 47.9% of the variance. The physically aggressive intentions subscale had an eigenvalue of 1.22 and accounted for 13.51% of the variance. The loadings ranging from .82 to .84 on the verbally aggressive intentions subscale, and .61 to .79 on the physically aggressive intentions subscale.

The participant is asked to respond to the following scenario:

> "Imagine" that after you're done with this survey you leave this building and someone who is texting walks right into you and knocks you down. The person then yells at you, "watch it, you idiot!" As you stand up, the person continues to yell, saying, "Are you blind? How could you not have seen me?!" The individual stands there staring at you.

Examples of items in the physically aggressive intentions subscale, "I wouldn't be able to control my urge to strike this person," "I would hit this person," and "I'd get into a fight with this person, more so than other people would". Examples of items in the verbally aggressive

intentions subscale are, "If this person annoyed me, I would tell them what I think of them," "I couldn't help getting into an argument with this person," and "I'd let my irritation show."

Demographics. Participants will be asked to indicate their age, sex and ethnicity.

Table 1

Exploratory Factor Analysis with Varimax Rotation for Physically Aggressive Intentions and Verbally Aggressive Intentions.

Factors	Eigenvalue	% of Variance	Cumulative %
1	4.31	47.90	47.90
2	1.22	13.51	61.41
3	0.91	10.10	71.50
4	0.66	7.36	78.86
5	0.55	6.15	85.01
6	0.40	4.42	89.42
7	0.38	4.21	93.64
8	0.33	3.70	97.34
9	0.24	2.66	100.00

Note. Extraction Method: Principal Component Analysis.

Table 2

Factor Loadings for Exploratory Factor Analysis with Varimax Rotation for Physically Aggressive Intentions and Verbally Aggressive Intentions.

Component	1	2
PhyAgg_1	0.04	0.74
PhyAgg_2	0.31	0.79
PhyAgg_3	0.45	0.61
PhyAgg_4	0.30	0.73
PhyAgg_5R	0.10	0.55
PhyAgg_6	0.58	0.49
VerAgg_12	0.82	0.20
VerAgg_13	0.85	0.17
VerAgg_14	0.84	0.17

Note. Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

Chapter 4: Results

Prior to any analyses, the data was cleaned. The variables of empathy and condition were standardized in order to create an interaction term. Condition (control =1, experimental = 2) and guilt (*Strongly Disagree* =1; *Strongly Agree* = 7) for easier interpretation of the path model. All hypotheses were tested using path modeling techniques in AMOS 22.

Manipulation Checks

An independent samples t test was calculated comparing the mean score of perceived violence in the control condition to the mean score of perceived violence in the violence condition. A significant difference was found, $t(167) = 27.09$, $p < .001$. The mean score of perceived violence in the control group ($M = 1.54$, $SD = 1.05$) was significantly smaller than the mean score of perceived violence in the experimental condition ($M = 6.06$, $SD = 1.10$).

Homogeneity of Experimental Conditions

An F test was calculated comparing the homogeneity of the control and experimental condition on age, sex, and ethnicity. No significant differences were found for age, $F(1, 167) = .003$, $p = ns$; sex, $F(1,168) = 1.41$, $p = ns$; and race, $F(1,168) = 1.43$, $p = ns$ between the control and experimental condition indicating homogeneity of participants' demographics between conditions.

Hypothesized Model

Hypotheses 1-8 were tested using SPSS and path modeling techniques in AMOS 22. The predicted model (see Figure 1) was tested and did not provide a good fit for the data, $\chi^2 (10) = 113.43$, $p < .001$. The root mean square error of approximation (RMSEA) for the predicted model was .25, which did reach the .08 standard cutoff for good fit suggested by Browne & Cudeck (1993). The comparative fit index (CFI) was .58, which did not reach the .90 cutoff

suggested by Bentler (1990). The standardized root mean square residual (SRMR) was .18, which did not meet the .07 cutoff suggested by Hu and Bentler (1999). The bayesian information criterion (BIC) was 205.77, which indicated that any competing model would be a better fit if it were to score a lower BIC than 205.77(Kass & Raftery, 1995). Each of these statistics indicates the predicted model was not a good fit for the data. Table 3 contains a zero-order correlation table for the variables included in the predicted model. Based on the main effects of empathy and condition, as well as the modification indices provided by AMOS, a revised path model was calculated.
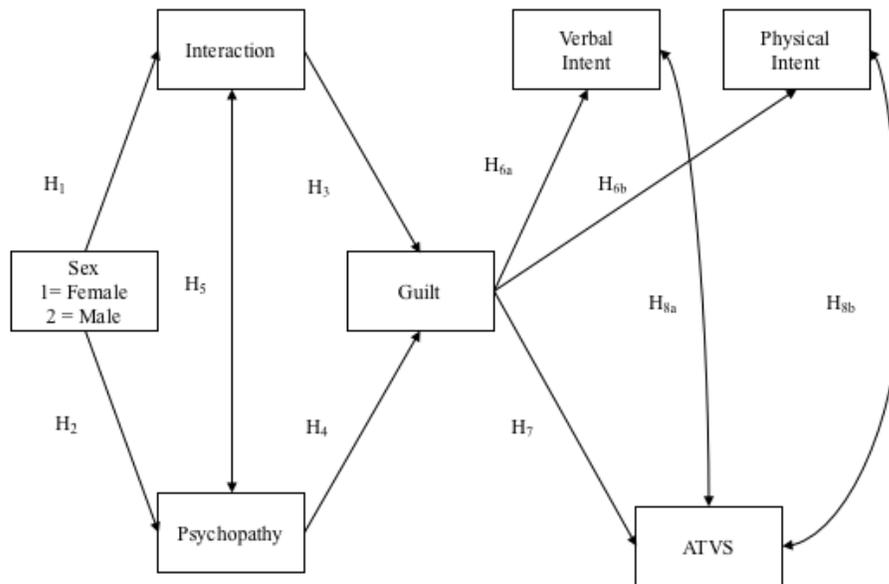

Figure 1. Hypothesized path model

Table 3

Summary of Correlations for Sex, Empathy x Condition Interaction, Psychopathy, Guilt, Physically Aggressive Intentions, Verbally Aggressive Intentions, and Attitudes Towards Violence (One-Tailed).

	Sex	Interact	Psych	Guilt	PhyAgg	VerAgg	ATVS
Sex	--	-.03	.28**	-.40**	.33**	.07	.25**
Interact	-.03	--	-.24**	.25**	-.04	.03	-.12
Psych	.28**	-.24**	--	-.16*	.39**	.26**	.57**
Guilt	-.40**	.25**	-.16*	--	.05	.09	-.20**
PhyAgg	.33**	-.04	.39**	.05	--	.53**	.53**
VerAgg	.07	.03	.26**	.09	.53**	--	.36**
ATVS	.25**	-.12	.57**	-.20**	.53**	.36**	--

Note. Interact = Empathy x Condition Interaction, Psych = Psychopathy, PhyAgg = Physically Aggressive Intentions, VerAgg = Verbally Aggressive Intentions, ATVS = Attitudes Towards Violence.
* $p < .05$. ** $p < .01$

Tested Model

The revised model (see Figure 2) was tested and provided a good fit for the data, χ^2 (14) = 20.09, $p = .13$. The RMSEA for the tested model was .05, the CFI was .98, the SRMR was .06, and the BIC was 132.95. Each of these statistics indicates the tested model was a good fit for the data. The $\Delta BIC = 72.82$ supported the inclusion of the main effects of empathy and condition in the tested model instead of the interaction term, which had a non-significant effect on guilt in the hypothesized model ($\beta = .12$, $p = ns$). Any $\Delta BIC > 10$ is decisive support for adopting the competing model (Kass & Raftery, 1995). Table 4 contains a zero-order correlation table for the variables included in the tested model. Table 5 contains the standardized effect size estimates for the tested model.
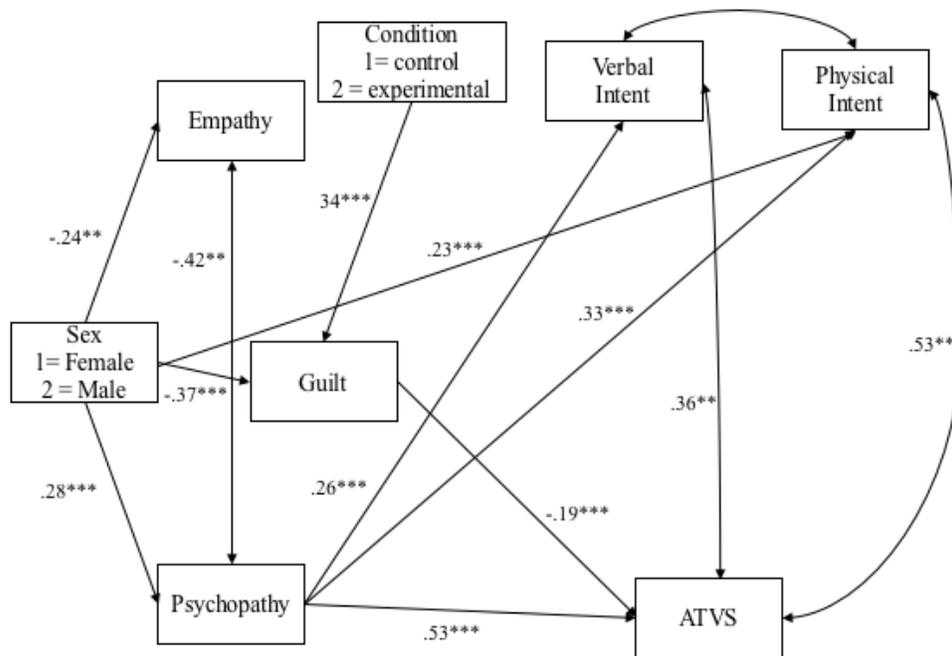
Figure 2. Tested path model

Table 4

Summary of Correlations for Condition, Sex, Physically Aggressive Intentions, Verbally Aggressive Intentions, Guilt, Psychopathy, Empathy, and Attitudes Towards Violence (One-Tailed).

	Cond	Sex	PhyAgg	VerAgg	Guilt	Psych	Emp	ATVS
Cond	--	-.09	.15*	.07	.38**	.01	-.01	-.02
Sex	-.09	--	.33**	.07	-.40**	.28**	-.24**	.25**
PhyAgg	.15*	.33**	--	.53**	.05	.39**	-.25**	.53**
VerAgg	.07	.07	.53**	--	.09	.26**	-.02	.36**
Guilt	.38**	-.40**	.05	.09	--	-.16*	.08	-.20**
Psych	.01	.28**	.39**	.26**	-.16*	--	-.42**	.57**
Emp	-.01	-.24**	-.25**	-.02	.08	-.42**	--	-.29**
ATVS	-.02	.25**	.53**	.36**	-.20**	.57**	-.29**	--

Note. Cond = Condition, PhyAgg = Physically Aggressive Intentions, VerAgg = Verbally Aggressive Intentions, Psych = Psychopathy, Emp = Empathy, ATVS = Attitudes Towards Violence.

* $p < .05$. ** $p < .01$

Analyses

Hypothesis 1 predicted that women would score higher than men in trait empathy. The tested path from sex (female = 1, male = 2) was both negative and significant (β = - .24, p < .01), suggesting that women score higher in trait empathy than men.

Hypothesis 2 predicted that men would score higher than women in trait psychopathy. The tested path from sex was both positive and significant, (β = .28, p <.001), suggesting that men score higher in trait psychopathy than women.

Hypothesis 3 predicted that the presence of violence would moderate the relationship between empathy and guilt, such that individuals high in empathy in the experimental condition would have greater levels of self-reported guilt compared to individuals high in empathy in the control condition. This hypothesis was not supported, as the non-significant path in the predicted model, (β = .12, p = ns) was not included in the tested model in order to improve the model fit.

Hypothesis 4 predicted that psychopathy would negatively predict post-gameplay guilt. The tested path from psychopathy to post-gameplay guilt was non-significant (β = -.08, p = ns), suggesting that psychopathy does not influence the amount of guilt experienced after playing a violent video game.

Hypothesis 5 predicted that, prior to gameplay, a negative relationship would exist between empathy and psychopathy. A Pearson correlation coefficient was calculated for the relationship between participants' level of empathy and psychopathy. A moderate, negative correlation was found, r = -.42, p < .01, indicating a significant linear relationship between the two variables, suggesting the more empathic an individual is, the less psychopathic they are.

Hypotheses 6a predicted that participants' feelings of guilt post-gameplay would negatively predict verbal aggression. The tested path from guilt to verbal aggression was non-

significant, ($\beta = .13$, $p = ns$), suggesting that guilt does not have an influence on verbal aggression. Hypothesis 6b predicted that participants' feelings of guilt post-gameplay would negatively predict physical aggression. The tested path path from guilt to physical aggression was non-significant, ($\beta = .15$, $p = ns$), indicating that post gameplay guilt does not positively predict physical aggression.

Hypothesis 7 predicted that participants' feelings of guilt post gameplay would negatively predict their attitudes towards violence. The tested path from guilt to attitudes towards violence was both negative and significant, ($\beta = -.19$, $p < .001$), thus suggesting that post gameplay guilt negatively influences participants' attitudes towards violence.

Hypothesis 8a predicted that participants' post gameplay verbally aggressive intentions and post gameplay attitudes towards violence would be positively correlated. A Pearson correlation coefficient was calculated for the relationship between participants' post gameplay verbally aggressive intentions and post gameplay attitudes towards violence. A moderate, positive correlation was found ($r = .36$, $p < .01$) indicating a significant linear relationship between the two variables, suggesting that the more positive attitudes towards violence are the greater the verbally aggressive intentions will be. Hypothesis 8b predicted that participants' post gameplay physically aggressive intentions and post gameplay attitude towards violence would be positively correlated. A Pearson correlation coefficient was calculated for the relationship between participants' post gameplay physically aggressive intentions and post gameplay attitudes towards violence. A moderate, positive correlation was found, $r = .53$, $p < .01$, indicating a significant linear relationship between the two variables, suggesting that the more positive attitudes towards violence are the greater the physically aggressive intentions will be. The implications of the findings are discussed below.

Table 5

Standardized Effect Size Estimates for the Revised Path Model.

Path	β	SE	*p*
Psych <-- Sex	0.28	0.06	***
Guilt <-- Cond	0.34	0.18	***
Guilt <-- Sex	-0.37	0.18	***
Emp <--Sex	-0.24	0.07	**
PhyAgg <-- Sex	0.23	0.15	***
ATVS <-- Psych	0.53	0.1	***
PhyAgg <-- Psych	0.33	0.25	***
VerAgg <-- Psych	0.26	0.3	***
ATVS <-- Guilt	-0.19	0.02	***

Note. Cond = Condition, PhyAgg = Physically Aggressive Intentions, VerAgg = Verbally Aggressive Intentions, Psych = Psychopathy, Emp = Empathy, ATVS = Attitudes Towards Violence.
** *p* < .01. *** *p* < .001

Chapter 5: Discussion

Empathy and psychopathy are evolutionarily developed, biological traits designed to preserve society. The current study sought to investigate the effects of video game violence (e.g., guilt and aggression) in consideration of the personality traits of psychopathy and empathy.

In the hypothesized model, sex negatively predicted empathy, such that women would score higher on trait empathy than men. Sex also positively predicted psychopathy, in that men would score higher on trait psychopathy than women. The relationship between empathy and guilt would be moderated by presence of violence, such that individuals who scored high on empathy in the experimental condition would feel more guilt than individuals who scored high on empathy in the control condition. A dual process would occur in that psychopathy would negatively predict guilt, while the empathy interaction positively predicted guilt. The traits of empathy and psychopathy would be negatively correlated. Guilt would negatively predict both verbally and physically aggressive intentions. Guilt would also negatively predict attitudes

attitudes towards violence. Attitudes towards violence would be positively correlated with both verbally and physically aggressive intentions. The hypothesized model failed to provide adequate model fit, χ^2 (10) = 113.43, $p < .001$, RMSEA = .25, CFI = .58, SRMR = .18, and BIC = 205.77.

A revised model was constructed that replaced the interaction term with the main effects of empathy and psychopathy. The revised model then added paths based on modification indices provided by AMOS and explained by theory. The paths added were: guilt ← condition; guilt ← sex; physically aggressive intent ← sex; verbally aggressive intent ← psychopathy; physically aggressive intent ← psychopathy; attitudes towards violence ← psychopathy.   The non-significant paths that were trimmed were: guilt ← empathy; guilt ← psychopathy; physically aggressive intent ← guilt; verbally aggressive intent ← guilt. The resultant model provided an adequate model fit, χ^2 (14) = 20.09, $p = .13$, RMSEA = .05, CFI = .98, SRMR =.06, and the BIC = 132.95. A summary of the results from the revised model are presented in the following section.

Summary of Findings

Consistent with the extant literature, men were found to score higher on psychopathy than women (Forth et al, 1996; Lilienfeld & Andrews, 1996; Rutherford et al., 1998; Wilson, Frick, & Clements, 1999; Zagon & Jackson, 1994), and women were found to score higher on empathy than men (Baron-Cohen, & Wheelwright, 2004; Schulte-Ruther, Markowitsch, Shah, Fink, & Piefke, 2008; de Waal, 2005). Empathy did not predict any other variables tested in the model, nor did empathy interact with the presence of violence and positively predict guilt as was hypothesized.

Similar to past research (Frodi, Macaulay, & Thome, 1977; Tangney, 1990), sex was found to be the best predictor of post gameplay guilt with a moderate, direct effect ($\beta = -.37$, $p < .001$), where men experienced less post-gameplay guilt than women did. Contrary to prediction, psychopathy did not negatively predict guilt. However, psychopathy's lack of influence on post gameplay guilt is still consistent with past research, in that guilt is not experienced at all by psychopaths (Hare et al., 2000; Hare & Neumann, 2008). Interestingly, guilt was found to mediate the relationship between the sex of the player and their attitudes towards violence, such that males experienced less post-gameplay guilt than women ($\beta = -.37$, $p < .001$), and guilt negatively predicted attitudes towards violence ($\beta = -.19$, $p < .001$). Guilt also mediated the relationship between condition and attitudes towards violence, such that the presence of violence positively predicted post gameplay guilt ($\beta = .34$, $p < .001$), and post game play guilt negatively predicted attitudes towards violence ($\beta = -.19$, $p < .001$). This is consistent with past research that has found that violence in video games can produce guilt (Hartmann et al., 2010).

As predicted, a negative correlation between empathy and psychopathy was calculated, $r = -.42$, which is similar to past research that has found a negative relationship between empathy and anti-social behavior (Ang & Goh, 2010; Boswell, 2010; Weyant, 2007). Psychopathy was found to be the best predictor of both physically ($\beta = .33$, $p < .001$) and verbally ($\beta = .26$, $p < .001$) aggressive intentions. This finding is consistent with past research in which psychopaths were found to have anti–social qualities (Hare et al., 2000; Hare & Neumann, 2008). Contrary to prediction, guilt did not mediate a relationship to either verbally aggressive intentions or physically aggressive intentions as these paths dropped out of significance when the final model was trimmed. The possible reason for these non-significant findings is discussed in the limitations section below. Sex was also found to positively predict physically aggressive

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intentions ($\beta = .23$, $p < .001$), which is consistent with prior meta analyses, in which males were found to be more aggressive than females (Bettencourt, & Miller, 1996; Eagly & Steffen, 1986). Finally, psychopathy positively predicted participants' attitudes towards violence ($\beta = .53$, $p < .001$), which was moderately, positively correlated with both physically aggressive intentions ($r = .53$, $p < .01$), and verbally aggressive intentions, ($r = .36$, $p < .01$). The data and past research suggest, that being high in psychopathy will not lead to guilt (Gilligan, 2003) or the subsequent less positive attitudes towards violence that result from post gameplay guilt.

Theoretical Implications

The findings of this study support the need for video game effects researchers to cross interdisciplinary lines in order to widen their focus on process explications for the effects of playing video games. Specifically, the communibiological approach, combined with the perspective that people interact with video game characters as if they were social actors, supports the application of the process of moral foundations theory (i.e., moral intuition leads to moral judgment) in the context of violent video games. The variables included in this study also provide data that supports a risk factors approach to violent video game research (Gentile & Bushman, 2012), which in turn could help mend the divide in violent video game effects research. Psychopathy emerged as the strongest predictor for verbally aggressive intentions, physically aggressive intentions, and positive attitudes towards violence. The effect of psychopathy was also stronger than the effect of sex on aggressive intent, and stronger than the predictive ability for guilt to reduce positive attitudes towards violence. Therefore, psychopathy which has not been researched extensively in violent video game research, can be considered a risk factor for aggressive intentions and attitudes towards violence, more so than being a male or being exposed to a violent video game. An individual high in psychopathy who is male and is

playing a violent video game, could experience stronger negative outcomes than individuals who are not high in psychopathy, thus being more at risk than other members of the video gaming population. This could possibly explain the discrepant results on both sides of the video game effects divide. When no direct effects are observed between violent content and aggression, psychopathy may be able to predict aggression as it did with this study, however since most studies have not measured psychopathy in the context of violent video game play, this effect cannot be statistically accounted for in their studies.

Communibiology. Although communibiology is not a theory, it provides a framework for understanding how the variables of sex and psychopathy provide support that biological differences influence communication processes.

Sex. The sex of the participant was found to positively predict psychopathy ($\beta = .28$, $p < .001$) and negatively predict empathy ($\beta = -.24$, $p < .01$), suggesting that men tend to score higher on trait psychopathy and women tend to score higher on trait empathy. As previously discussed, the traits of psychopathy and empathy have been found to have a biological basis within the limbic system. Therefore, the data suggests that sex could influence the brain structures responsible for the development of these traits. Sex was also able to negatively predict the production of guilt ($\beta = -.37$, $p < .001$), such that men experience less post gameplay guilt than women. This suggests that biological sex can also influence emotional reactions to violent media content. Finally, sex also positively predicted physically aggressive intentions ($\beta = .23$, $p < .001$) of the participant, such that men had higher physically aggressive intentions than women. Research has found that men also tend to play more violent video games (e.g. first person shooters) than women do (Greenberg, Sherry, Lachlan, Lucas, & Holstrom, 2010) and enjoy them more than women (Jung, Oh, Sng, Kwon, & Detenber, 2014). This is important, because

this suggests that sex can not only predict emotions, but it can also predict physically aggressive intentions for men. The American Psychological Association (2015) notes that in their review of the research that half of their sample either controlled for gender or investigated male only samples. As a result, it was concluded that more studies need to be conducted to determine how different genders react to different dependent variables of aggression (American Psychological Association, 2015). The communibiological approach provides the framework for understanding why that gender difference would exist.

Psychopathy. A second variable that supports the communibiological approach is trait psychopathy. Specifically, psychopathy was found to positively predict verbally aggressive intentions ($\beta = .26$, $p < .001$), physically aggressive intentions ($\beta = .33$, $p < .001$), and attitudes towards violence ($\beta = .53$, $p < .001$). Psychopathy's predictive power of these outcome variables provides support for the communibiological approach because psychopathy is a result of variations of the brain structures in the limbic system. The data suggests that psychopathy increases attitudes towards violence more than guilt decreases attitudes towards violence. Therefore, any future studies that examine aggression should include trait psychopathy, as it influences key emotional and moral outcome variables.

Video game characters as social actors. Reeves and Nass (1996) have provided a theoretical framework for understanding why humans can respond to computers as social actors. This research provides further support for this paradigm, in that the data suggests that humans will emotionally react to video game characters as if they were social actors. The presence of violence was found to positively predict the emotion of guilt ($\beta = .34$, $p < .001$), suggesting that playing a violent video game results in more post game guilt than playing a non-violent video game. Guilt, as a pro-social emotion, is designed to create feelings of regret after transgressing a

social norm. Engaging in an extreme act of violence in a video game would not foster guilt if the players did not perceive their actions as anything more than just a game. Since guilt was predicted by the presence of violence, this suggests that the characters in the game were perceived as social actors. This perspective aids in the understanding of violent video game effects by explaining why moral and emotional effects occur after playing a violent video game, rather than stating that the effects that occur.

Moral foundations theory. Although not all of the hypotheses for this research were supported, the results still provide support for the inclusion of moral foundations theory in explaining violent video game effects. The first assumption of moral foundations theory is that there are inherent biological proclivities inherent within human biology that influence moral decisions. This research has provided support for this assumption by calculating the predictive power of biological sex and trait psychopathy on key outcome variables. Males scored higher than females on trait psychopathy ($\beta = .28$, $p < .001$) and females scored higher than males on trait empathy ($\beta = -.24$, $p < .01$). Males also experienced less post gameplay guilt than females ($\beta = -.37$, $p < .001$). Not only do these biological differences satisfy the first assumption of moral foundations theory, they also provide support for the communibiological approach.

The second assumption of moral foundations theory is that social norms are learned. This assumption is fulfilled by the ability of condition to positively predict guilt ($\beta = .34$, $p < .001$) and guilt negatively predicting attitudes towards violence ($\beta = -.19$, $p < .001$). This is evidence for the existence of learning social norms because one of the social norms of society is that violence enacted against others is a moral and social transgression. The increase in guilt experienced after committing a violent act in the videogame, which in turn decreased the participants' attitudes towards violence, provides evidence that social norms were enacted. As

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previously mentioned, guilt is an emotion that regulates behavior in order to preserve society. If the participant did not transgress a social norm, then guilt would not have been experienced. Therefore, humans have been socialized to not be aggressive, even when interacting with violent content. Bushman et al. (2010) note that violent video games cannot be predictive of publicly visible violence, and the data suggests that this may be because of social norms. This furthers the need to adopt a risk factors perspective for violent video game research, because if the majority of players' experience social norms that inhibit their behavior, then only a small segment of the playing population would be at risk for violent behavior. Since the paths are standardized, the data suggests those individuals may be high in trait psychopathy, as psychopathy's influence on attitudes towards violence ($\beta = .53$, $p < .001$), could eclipse the influence guilt has on attitudes towards violence ($\beta = -.19$, $p < .001$). An increase in one standard deviation of psychopathy can increase attitudes towards violence more than an increase in one standard deviation of guilt can decrease attitudes towards violence.

The data also provide support for the third assumption of moral foundations theory, that moral intuitions precede moral judgments. This means that in a situation requiring moral reasoning, an individual will have an instinctual response that is a result of biological proclivities and social norms. After this gut intuition is experienced, an individual will provide a form of moral judgment to rationalize their intuitions. This is similar to the notion that syncretic cognition precedes analytic cognition (Buck et al., 2004). The model constructed with the data from this research provides empirical support for this process. The experimental condition of the video game required the participant to transgress a social norm by torturing another video game character. This transgression positively predicted guilt ($\beta = .34$, $p < .001$), suggesting that guilt was experienced post game play because of the actions committed during gameplay. This would

be the moral intuition phase. In order to justify their emotional reaction, participants also experienced a moral judgment phase. This phase is evident in the ability of guilt to negatively predict attitudes towards violence ($\beta = -.17$, $p < .01$). The data suggests that participants had a less favorable attitude regarding violence as a result of the guilt they experienced. Although attitudes towards violence were not predictive of either physically or verbally aggressive intent, they were highly correlated with physically aggressive intent, $r = .36$, and verbally aggressive intent, $r = .53$.

The support of moral foundations theory in predicting an outcome variable regarding violence is important to the body of research on violent video games. The data from this research suggests that moral foundations theory is able to not only predict aggressive intentions, but also the attitudes individuals will have towards violence after playing a violent video game. Additionally, the psychological variables included in this research could begin to explain why contradictory findings in video game research have persisted.

Divide in violent video game literature. As mentioned previously, there is currently a debate within the violent video game effects literature. Four meta analyses on violent video game effects support the link between violent video games and aggression. Although this study found no direct effect, it does not contradict the findings of the meta analyses. If the variable of psychopathy had not been measured in this study, then it would appear that violent video games only predict attitudes towards violence. However, psychopathy emerged as a personality variable that positively predicted aggressive intentions, when no direct effect from violent content was observed. This suggests that it is not just the video game content that can lead to aggressive intentions, but psychopathy as an individual difference variable that is present in all video game players, can account for that variance as well.

The adoption of the risk factors approach allows the inclusion of psychopathy in this study, which was found to have a direct effect on verbally aggressive intentions and physically aggressive intentions. Had psychopathy not been measured, this effect would not have been calculated. Therefore, one explanation for studies that support a null, direct effect for aggression could be that they were not measuring a third variable (e.g. psychopathy) that produces an effect for aggression when the violent content did not.

The risk factors approach acknowledges that exposure to media violence can increase the risk of negative outcomes, such as aggression. It is not the sole cause of aggression but it is considered to be a contributing factor that can increase the risk of aggressive outcomes (Boxer et al., 2009). Past research has found that the consideration of media violence exposure as a risk factor to aggressive behavior is stronger than the link between lead consumption and cognitive impairment, not using a condom and HIV infection, and calcium consumption and bone mass (Center on Media and Child Health, 2000; as cited by American Academy of Pediatrics, 2009). The current suggests that males that score highly in psychopathy are at a greater risk to have more positive attitudes towards violence, and are at a greater risk for aggressive intentions. This finding supports the position that individual difference variables (e.g., sex and psychological traits) that increase the possibility of aggressive or attitudinal outcomes parallel to the process of violent video game play, should be considered as risk factors. Although these traits did not interact with violent video game play, when statistically controlled for, their significant influence on the outcome variables is present.

The findings of this study are in line with the small correlation of $r = .08$ found between media violence and aggression by Ferguson and Kilburn (2009), and support the idea that a more nuanced approach is needed to detect outcome aggression. However, the results of this study do

not suggest that exposure to media violence reduces or relieves aggression or that there is are no effects present (Ferguson & Kilburn, 2009). Instead, the data suggest a risk factors perspective in that sex and trait psychopathy increase the possibility of aggressive outcomes when no direct effects from media violence exposure are found. The data from this study also suggest that Anderson is correct, in that there are aggressive outcomes from violent video game play for those high in psychopathy, and that had Ferguson measured psychopathy, he might have been able to account for the absence of outcome aggression. Therefore, a risk factors approach that takes into account individual differences unites both positions, explains both their findings and is supported by the data from this study.

Specifically, the mediated paths from condition positively predicting guilt, guilt negatively predicting attitudes towards violence; psychopathy positively predicting attitudes towards violence, and attitudes towards violence being positively correlated with both physically and verbally aggressive intentions is suggestive of a risk factors approach. That is to say, violent video games are not solely responsible for negative outcomes, rather individual difference variables emerge as key predictors that can increase the occurrence of negative effects. Given the strength of the effect of psychopathy on attitudes towards violence ($\beta = .53$), compared to the strength of the effect of guilt on attitudes towards violence ($\beta = -.19$), there are quantifiable, observable, opposing processes occurring, one of which is driven by an individual difference variable. The data also suggests that when people play violent video games, social norms will be transgressed, resulting in emotions designed to reduce attitudes towards violence. Since psychopathy is present in the population, and psychopathy directly increases verbally and physically aggressive intent, as well as attitudes towards violence, individuals that score high in

trait psychopathy could be at risk of experiencing aggressive and attitudinal outcomes by bypassing the regulatory function of social norms.

Limitations

Although the violence manipulation was successful, this study has limitations. First, as this research was an experimental design, there are external validity concerns regarding laboratory findings. For instance, the laboratory setting and presence of the research assistants could have created a Rosenthal effect (Rosenthal, 2009), whereby the participants may have responded differently if this was field experiment. Participants may have answered their survey based on how they think the research assistant would want them to answer.

Second the sample size was underpowered ($N = 169$), as it did not reach the required N =187 for proper power. This lack of power could have caused type II error with some of the non-significant findings of the hypotheses. This lack of power could have also failed to produce a direct effect from the condition to physically aggressive intentions and verbally aggressive intentions. Additionally, Kenney (2015) notes that a general rule of thumb for structural equation modeling (SEM) analysis is to have a sample size of at least $N = 200$, which means that this study did not meet the sample requirement for SEM analysis and could therefore have type II error as a result.

Third, the experimental condition of *Grand Theft Auto 5*, has numerous variables that could have confounded the results. For example, the person being tortured is of middle eastern descent which may have altered the players' perception of their actions, due to the increased activity of ISIS while the experiment was being conducted. Researchers (Hartmann et al., 2010; Hartmann & Vorderer, 2010) found that justified virtual violence produces less post gameplay guilt than unjustified virtual violence. Because of the social and political climate in which the

study took place, participants' may have viewed their actions as justifiable which would in turn produce less post gameplay guilt. Alternatively, the immediate, visible result of the players' actions, as well as the constant pleading and fear of the victim is a variable that is not present in most first person shooters or fighting games, could have caused a reduction in aggression.

Fourth, the sample was drawn from a general communication course population. Many of the participants knew each other, and despite requests to not talk about the experiment, it is possible that some contamination may have occurred. Fifth, although the sample was a purposive sample, given that students reported playing an average of 2.35 days ($SD = 1.27$) per week, the results would be more reliable if a representative sample of the gaming population was used. Using a representative sample would strengthen the generalizability of results by permitting inferences beyond gamers who are also college freshmen.

Sixth, many of the participants were unfamiliar with the controls of *Grand Theft Auto 5* which could have confounded the results as they had to focus on following an instruction sheet rather than being absorbed by the narrative of the game. Given that immersion has been linked to greater physically aggressive intentions (Farrar et al., 2006), it is possible that focusing on how to control the game decreased immersion levels which affected outcome aggression levels. Seventh, the SRP-III, although reliable, included sixty one questions, which is quite long for a measure. This could have induced participant fatigue and created error within the results. Lastly, due to the number of variables being studied, the moral foundations questionnaire was not administered due to risk of participant fatigue.

Future Research

This research supports that moral intuitions will precede moral judgments. Therefore, future research should explore other emotional variables within the moral intuition phase, such as

frustration or enjoyment. Video games have been found to cause frustration in players (Funk et al., 1999; Kirsch et al, 2005) and frustration has been found to increase aggression (Berkowitz, 1962; 1989). Therefore, the influence of these emotions on guilt, attitudes towards violence and aggressive intentions should be explored further in both single player and multi-player situations in order to understand how emotions influence all forms of video game play. Additionally, since this study was unable to incorporate the moral foundations questionnaire due to possible participant fatigue, future studies should include how moral domains are influencing the emotional process that occurs from playing video games.

Future research should not be limited to negative effects, but include pro-social effects as well. The presence of emotional communication in video games can increase the reach of targeted emotional education modules (TEEMS). For instance, building off of the research of Ferrer, Fisher, Buck, and Amico (2011), video games could emotionally influence children to aid in the reduction of bullying behaviors. Given that guilt has been found to decrease attitudes towards violence, research should be conducted to determine the effectiveness of modules that elicit guilt in order to teach children that bullying is immoral.

A third avenue of potential research would be to further examine the trait of psychopathy in relation to violent video game play. Since psychopathy has an effect on resultant attitudes towards violence, it would be valid to explore psychopathy's influence on other possible outcome variables, such as normative beliefs about aggression or hostility. It would also be of value to determine if people high in psychopathy tend to prefer violent video games over non violent video games. Additionally, any future research on psychopathy should also focus on a reduction of the 61 items within the SRP-III. A measure with fewer questions would reduce participant fatigue and allow for the inclusion of other measures in future surveys. Finally, as

fMRI studies continue to explore the limbic system, that data should be converged with existing quantitative studies that explore these variables to provide a biological explanation for these processes. This would provide further support for the communibiological approach and moral foundations theory by linking self-report data with biological evidence.

Conclusion

This research has important implications for the field of media effects research. First the findings from this research suggest that humans are able to react morally to video game violence, which enacts an evolutionary emotional safeguard to prevent future moral transgressions. The data suggests that guilt mediates the link between violent video game play and attitudes towards violence, such that exposure to a violent video game will enact social norms and result in post gameplay guilt. Post gameplay guilt will then reduce attitudes towards violence in order to justify the post gameplay guilt experienced.

Second, this paper provided a possible explanation as to why the adoption of a risk factors approach using individual difference variables that have a biological basis is preferential for future video game research. The structures of the limbic system vary from person to person, which allows for some individuals to be high in trait empathy and other individuals to be high in trait psychopathy. Trait psychopathy emerged as a variable that increased negative outcomes independent from violent video game play, such as increasing attitudes towards violence. Males were also found to be inherently more aggressive than women. Therefore, male individuals who are high in psychopathy may be at a greater risk for increased aggressive intentions from violent video game play. These individuals are at a greater risk of bypassing the regulatory function of guilt that occurs from violent video game play by directly increasing attitudes towards violence

Third, this research utilized a unique theoretical perspective, incorporating the communibiology paradigm, the computers as social actors paradigm, and moral foundations theory. The communibiological paradigm explained why variations within the limbic system affected trait psychopathy which in turn affected the outcome variables of attitudes towards violence and aggressive intentions. The computers as social actors paradigm explained why participants were able to morally transgress against video game characters, such that the violence they participated in within *Grand Theft Auto V* resulted in post gameplay guilt. Moral foundations theory provided the process of moral intuitions (i.e. post game play guilt) leading to moral judgments (i.e., attitudes towards violence). Communibiology provided the explication for moral intuitions, in that the intuitions experienced (i.e., post game play guilt) were a result of the release of oxytocin. The computers as social actors paradigm was able to explain that oxytocin was released due to the occurrence of a moral transgression in *Grand Theft Auto V*. Finally, moral foundations theory accounted for guilt negatively predicting moral judgment (i.e., attitudes towards violence) such that post gameplay guilt fostered less favorable opinions towards violence.

Perceived Violence

Directions: The following questions ask you to rate the video game that you just played. Semantic differential responses ranged from (1) to (7).

1. Had no violent content: Had very violent content.

2. Had no blood & gore: Had lots of blood & gore.

3. Had no violent graphics: Had very violent graphics.

Appendix B

State Guilt Subscale of The Guilt Inventory (Jones, Schratter, & Kugler, 2000)

Directions: The following statements are in regards to the emotions you may have experienced while playing the video game. Responses range from (1) *Strongly Agree* to (7) *Strongly Disagree*.

1. After playing the video game, I have felt good about myself and what I have done. *

2. I have done something in the video game that I deeply regret.

3. After playing the video game, I find it isn't easy being me.

4. After playing the video game, I have been calm and worry free. *

5. If I could replay the video game, there is absolutely nothing I have done that I would change. *

6. After playing the video game, I don't feel particularly guilty about what I have done. *

7. I would give anything if somehow; I could go back and change my actions in the video game.

8. There is at least one action I committed in the video game that I would like to change.

9. I wish I hadn't done what I did in the video game.

10. I became worried and distressed after playing the video game.

* Indicates reverse coding

Appendix C

Attitudes Towards Violence Scale (Funk, Elliott, Urman, Flores, & Mock, 1999)

Directions: Please read the following statements and indicate to the extent that you agree or disagree. Responses range from (1) *Strongly Disagree* to (7) *Strongly Agree.*

1. I could see myself committing a violent crime in 5 years. [a]

2. I could see myself joining a gang. [a]

3. It's okay to use violence to get what you want. [a]

4. I try to stay away from places where violence is likely. * [a]

5. People who use violence get respect. [a]

6. Lots of people are out to get you. [a]

7. Carrying a gun or a knife would help me feel safer. [a][b]

8. If a person hits your, you should hit them back. [b]

9. It's okay to beat up a person for badmouthing me or my family. [b]

10. It's okay to carry a gun or a knife if you life in a rough neighborhood. [b]

11. It's okay to do whatever it takes to protect myself. [b]

12. It's good to have a gun. [b]

13. Parents should tell their children to use violence if necessary. [b]

14. If someone tries to start a fight with you, you should walk away. * [b]

15. I'm afraid of getting hurt by violence. * [b]

* Indicates reverse coding

Appendix D

Toronto Empathy Questionnaire (Spreng, McKinnon, Mar, & Levine, 2009)

Directions: Below is a list of statements. Please read each statement carefully and rate how frequently you feel or act in the manner described.   Responses range from (1) *Never* to (5) *Always*.

1. When someone else is feeling excited, I tend to get excited too.

2. Other people's misfortunes do not disturb me a great deal. *

3. It upsets me to see someone being treated disrespectfully.

4. I remain unaffected when someone close to me is happy. *

5. I enjoy making other people feel better.

6. I have tender, concerned feelings for people less fortunate than me.

7. When a friend starts to talk about his/her problems, I try to steer the conversation towards something else. *

8. I can tell when others are sad even when they do not say anything.

9. I find that I am "in tune" with other peoples moods.

10. I do not feel sympathy for people who cause their own serious illnesses. *

11. I become irritated when someone cries. *

12. I am not really interested in how other people feel. *

13. I get a strong urge to help when I see someone who is upset.

14. When I see someone being treated unfairly, I do not feel very much pity for them. *

15. I find it silly for people to cry out of happiness. *

16. When I see someone being taken advantage of, I feel kind of protective towards him/her.

* Indicates reverse coding.

Self Report Psychopathy Scale III (Paulhus, Newmann, & Hare, in press)

Directions: Please rate the degree to which you agree with the following statements about you. You can be honest because your name is not associated with your responses in any way. Responses range from (1) *Strongly Disagree* to (5) *Strongly Agree*.

1. I'm a rebellious person.
2. I'm more tough-minded than other people.
3. I think I could "beat" a lie detector.
4. I have taken illegal drugs (e.g., marijuana, ecstasy).
5. I have never been involved in delinquent gang activity.
6. I have never stolen a truck, car or motorcycle.
7. Most people are wimps.
8. I purposely flatter people to get them on my side.
9. I've often done something dangerous just for the thrill of it.
10. I have tricked someone into giving me money.
11. It tortures me to see an injured animal.
12. I have pretended to be someone else in order to get something.
13. I always plan out my weekly activities.
14. I like to see fist-fights.
15. I'm not tricky or sly.
16. I'd be good at a dangerous job because I make fast decisions.
17. My friends would say that I am a warm person.
18. I would get a kick out of 'scamming' someone.
19. I have never attacked someone with the idea of injuring them.
20. I never miss appointments.
21. I avoid horror movies.
22. I trust other people to be honest.
23. I hate high speed driving.
24. I feel so sorry when I see a homeless person.

25. It's fun to see how far you can push people before they get upset.

26. I enjoy doing wild things.

27. I have broken into a building or vehicle in order to steal something or vandalize.

28. I don't bother to keep in touch with my family any more.

29. I find it difficult to manipulate people.

30. I rarely follow the rules.

31. I never cry at movies.

32. I have never been arrested.

33. You should take advantage of other people before they do it to you.

34. I don't enjoy gambling for real money.

35. People sometimes say that I'm cold-hearted.

36. People can usually tell if I am lying.

37. I like to have sex with people I barely know.

38. I love violent sports and movies.

39. Sometimes you have to pretend you like people to get something out of them.

40. I am an impulsive person.

41. I have taken hard drugs (e.g., heroin, cocaine).

42. I'm a soft-hearted person.

43. I can talk people into anything.

44. I never shoplifted from a store.

45. I don't enjoy taking risks.

46. People are too sensitive when I tell them the truth about themselves.

47. I was convicted of a serious crime.

48. Most people tell lies everyday.

49. I keep getting in trouble for the same things over and over.

50. Every now and then I carry a weapon (knife or gun) for protection.

51. People cry way too much at funerals.

52. You can get what you want by telling people what they want to hear.

53. I easily get bored.

54. I never feel guilty over hurting others.

55. I have threatened people into giving me money, clothes, or makeup.

56. A lot of people are "suckers" and can easily be fooled.

57. I admit that I often "mouth off" without thinking.

58. I sometimes dump friends that I don't need any more.

59. I would never step on others to get what I want.

60. I have close friends who served time in prison.

61. I purposely tried to hit someone with the vehicle I was driving.

Appendix F

Modified Buss-Perry aggression questionnaire (Farrar & Krcmar, 2006)

Directions: "Imagine" that after you're done with this survey you leave this building and someone who is texting walks right into you and knocks you down. The person then yells at you, "watch it, you idiot!" As you stand up, the person continues to yell, saying, "Are you blind? How could you not have seen me?!" The individual stands there staring at you. Responses range from (1) *Very Unlikely* to (7) *Very Likely.*

1. I wouldn't be able to control my urge to strike this person. [a]

2. I would hit this person. [a]

3. If this person hit me, I would hit back. [a]

4. I'd get into a fight with this person more so than other people would. [a]

5. I could think of no good reason for hitting this person. [a]

6. I might threaten this person. [a]

7. If this person annoyed me, I would tell them what I think of them. [b]

8. I couldn't' help getting into an argument with this person. [b]

9. This person would say that I'm somewhat argumentative. [b]

[a] Indicates physically aggressive intentions factor

[b] Indicates verbally aggressive intentions factor

References

Adolphs, R., Cahill, L., Schul, R., & Babinsky, R. (1997). Impaired declarative memory for

emotional material following bilateral amygdala damage in human. *Learning & Memory,*

4, 291-300.

American Academy of Pediatrics. (2009). Policy statement: Media violence. *Pediatrics,*

124(5), 1495-1503. doi: 10.1542/peds.2009-2146

American Psychological Association. (2005). *Resolution on violence in video games and*

interactive media. Retrieved from the American Psychological Association website

http://www.apa.org

American Psychological Association. (2015). *American Psychological Association task force*

on violent media: Technical report on the review of the violent video game literature.

Retrieved from the American Psychological Association website http://www.apa.org

American Psychological Association (n.d.). *Resolution on violence in video games and*

interactive media. Retrieved from the American Psychological Association website

http://www.apa.org

Anderson, C. A. (2004). An update on the effects of violent video games. *Journal of*

Adolescence, 27, 113–122. doi:10.1016/j.adolescence.2003.10.009.

Anderson, C.A., Anderson, K. B., & Deuser, W. E. (1996). Examining an affective aggression

framework: Weapon and temperature effects on aggressive thoughts, affect, and attitudes.

Personality and Social Psychology Bulletin, 22, 366-376.

Anderson, C. A., & Bushman, B. J. (1997). External validity of trivial experiments: The case of

laboratory aggression. *Review of General Psychology, 1*(1), 19-41.

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., & Bushman, B.J. (2002). Media violence and the American public

revisited. *American Psychologist, 57,* 448-450.

Anderson, C. A., Lindsay, J. J., & Bushman, B. J. (1999). Research in the psychological

laboratory: Truth or triviality? *Current Directions in Psychological Science, 8*(1), 3-9.

Anderson, C. A., & Morrow, M. (1995). Competitive aggression without interaction: Effects of

competitive versus cooperative instructions on aggressive behavior in video games.

Personality and Social Psychology Bulletin, 21(10), 1020-1030.

Anderson, C. A., & Murphy, C. R. (2003). Violent video games and aggressive behavior in

young women. *Aggressive Behavior, 29*, 423-429. doi: 10.1002/ab.10042

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,*

151-173.

Ang, R. P., & Goh, D. H. (2010). Cyberbullying among adolescents: The role of affective and

cognitive empathy, and gender. *Child Psychiatry and Human Development, 41*, 387-397.

Avci, R., & Gucray, S. S. (2005). The relationships among interparental conflict, peer, media

effects and the violence behavior of adolescents: The mediator role of attitudes towards

violence. *Educational Sciences: Theory & Practice, 13*(4), 2005-2015. doi:

10.12738/estp.2013.4.1950

Bandura, A. (1973). *Aggression: Social learning analysis.* Englewood Cliffs, N.J.: Prentice-

Hall.

Bandura, A. (1991). Social cognitive theory of moral thought and action. In W. M. Kurtines & J.

L. Gewirtz (Eds.), *Handbook of moral behavior and development* (pp. 45-103). Hillsdale,

NJ: Erlbaum.

Bandura, A., Ross, D., & Ross, S.A. (1961). Transmission of aggression through imitation of

aggressive models. *Journal of Abnormal and Social Psychology, 63*, 575-582.

Bargh, J. A., & Pietromonaco, P. (1982). Automatic information processing and social

perception. The influence of trait information presented outside of conscious awareness

on impression formation. *Journal of Personality and Social Psychology, 43*(3), 437-449.

Barlett, C. P., & Rodeheffer, C. (2009). Effects of realism on extended violent and nonviolent

video game play on aggressive thoughts, feelings, and physiological arousal. *Aggressive

Behavior*, *35*(3), 213-24. doi:10.1002/ab.20279

Barlett, C., Rodeheffer, C. D., Baldassaro, R., Hinkin, M. P., & Harris, R. J. (2008). The effect

of advances in video game technology and content on aggressive cognitions, hostility,

and heart rate. *Media Psychology, 11*, 540-565. doi: 10.1080/15213260802492018

Baron-Cohen, S., & Wheelwright, S. (2004). The empathy quotient: An investigation of adults

with Asperger Syndrome or high functioning autism, and normal sex differences.

Journal of Autism and Developmental Disorders, 34(2), 163- 175.

Bartholow, B. D., Bushman, B. J., & Sestir, M. A. (2006). Chronic violent video game exposure

and desensitization to violence: Behavioral and event related brain potential data.

Journal of Experimental Social Psychology, 42, 532-539.

Bates, D., & Pow, H. (2013, December 1). Lanza's descent to madness and murder: Sandy Hook

shooter notched up 83,000 online kills including 22,000 'head shots' using violent games

to train himself for his massacre. *The Daily Mail*. Retrieved from

http://www.dailymail.co.uk

Baumeister, R. F., Stillwell, A. M., & Heatherton, T. F. (1994). Guilt: An interpersonal

approach. *Psychological Bulletin, 115*(2), 243-267.

Beatty, M. J., & McCroskey, J. C. (1997). It's in our nature: Verbal aggressiveness as

temperamental expression. *Communication Quarterly, 45*(4), 446-460.

Beatty, M. J., McCroskey, J. C., & Heisel, A. D. (1998). Communication apprehension as

temperamental expression: A communibiological paradigm. *Communication*

Monographs, 65(3), 197-219. doi: 10.1080/03637759809376448

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin,*

107, 238-246. doi 10.1037/0033-2909.107.2.238

Berkowitz, L. *Aggression: A social psychological analysis.* New York: McGraw-Hill.

Berkowitz, L. (1989). Frustration-aggression hypothesis: Examination and reformulation.

Psychological Bulletin, 106(1), 59-73.

Bettencourt, B. A., & Miller, N. (1996). Gender differences in aggression as a function of

provocation: A meta-analysis. *Psychological Bulletin, 119*(3), 422-447.

Bishopp, D., & Hare, R. D. (2008). A multidimensional scaling analysis of the Hare PCL-R:

Unfolding the structure of psychopathy. *Psychology, Crime, & Law, 14*(2), 117-132.

doi: 10.1080/10683160701483484

Boswell, M. K. (2010). *Social norms, empathy, and attitudes toward aggression as predictors of*

bullying in school children (Doctoral dissertation). Retrieved from ProQuest Information

& Learning, US.

Boxer, P., Huesmann, L. R., Bushman, B. J., O'Brien, M., & Morceri. (2009). The role of violent media preference in cumulative developmental risk for violence and general aggression. *Journal of Youth Adolescence, 38*(3), 417-428. doi:10.1007/s10964-008-9335-2.

Brown v. Entertainment Merchants Association, No. 08-1448 (2011).

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen, & J. S. Long (Eds.), *Testing structural equation models* (pp. 136-162). Newbury Park, CA: Sage.

Bryant, B. K. (1982). An index of empathy for children and adolescents. *Child Development, 53*(2), 413-425.

Buck, R. (1984). *The communication of emotion.* New York: The Guilford Press.

Buck, R. (1988). *Human motivation and emotion.* New York: John Wiley & Sons.

Buck, R. (1999). The biological affects: A typology. *Psychological Review*, *106*(2), 301-336.

Buck, R. (2010). Emotion is an entity at both biological and ecological levels: The ghost in the machine is language. *Emotion Review, 2*(3), 286-287. Doi: 10.1177/1754073910368733

Buck, R. (2014). *Emotion: A biosocial synthesis.* New York: Cambridge University Press.

Buck, R., Anderson, E., Chaudhuri, A., & Ray, I. (2004). Emotion and reason in persuasion: Applying the ari model and the casc scale. *Journal of Business Research, 57*(6), 647-656. Doi: 10.1016/S0148-2963(02)00308-9

Bush, G., Luu, P., & Posner, M. (2000). Cognitive and emotional influences in anterior cingulate cortex. *Trends in Cognitive Sciences, 4*(6), 215-222.

Bushman, B. J., & Anderson, C. A. (1998). Methodology in the study of aggression: Integrating experimental and nonexperimental findings. In R. Geen, & E. Donnerstein (Eds.),

Human aggression (pp. 23-48). San Diego: Academic Press.

Bushman, B. J., & Geen, R. G. (1990). Role of cognitive-emotional mediators and individual differences in the effects of media violence on aggression. *Journal of Personality and Social Psychology, 58*(1), 156-163.

Bushman, B. J., Rothstein, H. R., & Anderson, C. A. (2010). Much ado about something: Violent video game effects and a school of red herring: Reply to Ferguson and Kilburn (2010). *Psychological Bulletin, 136*(2), 182-187.

Buss, A. H. (1961). *The psychology of aggression*. New York: Wiley.

Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS scales. *Journal of Personality and Social Psychology, 67*, 319-333.

Center on Media and Child Health. (2000). Retrieved from http://www.cmch.tv.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*(1), 155-159.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences.* Mahwah, N.J.: Lawrence Erlbaum Associates.

Cory Jr., G. (2000). From Maclean's triune brain concept to the conflict systems neurobehavioral model: the subjective basis of moral and spiritual consciousness. *Zygon, 35*(2), 385-414. Doi: 10.1111/0591-2385.00283

Cotten, N. U., Resnick, J., Browne, D. C., Martin, S. L., McCarraher, D. R., & Woods, J. (1994). Aggression and fighting behavior among African American adolescents: Individual and family factors. *American Journal of Public Health, 84*(4), 618-622.

Davis, M. H. (1980). A multidimensional approach to individual differences in empathy. *JSAS Catalog of Selected Documents in Psychology*, *10,* 85.

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology, 44*(1), 113-126. DOI: 10.1037//0022-3514.44.1.113

Decety, J., Chen, C., Harenski, C., & Kiehl, K. A. (2013). An fMRI study of affective perspective taking in individuals with psychopathy: Imagining another in pain does not evoke empathy. *Frontiers in Human Neuroscience*, *7,* 1-12. doi: 10.3389/fnhum.2013.00489

Eagly, A. H., & Steffen, V. J. (1986). Gender and aggressive behavior: A meta-analytic review of the social psychological literature. *Psychological Bulletin, 100*(3), 309-330.

Eastin, M.S. & Griffiths, R.P. (2006). Beyond the shooter game: Examining presence and hostile outcomes among male game players. *Communication Research, 33*(6), 448-466. Doi: 10.1177/0093650206293249

Engelhardt, C. R., Bartholow, B. D., Kerr, G. T., & Bushman, B. J. (2011). This is your brain on violent video games: Neural desensitization to violence predicts increased aggression following violent video game exposure. *Journal of Experimental Social Psychology, 47,* 1033-1036. doi:10.1016/j.jesp.2011.03.027

Entertainment Software Association. (2014). *Essential Facts About the Computer and Videogame Industry*. Retrieved from http://www.theesa.com

Entertainment Software Association. (2015). *Essential Facts About the Computer and Videogame Industry*. Retrieved from http://www.theesa.com

Farrar, K., & Krcmar, M. (2006). Measuring state and trait aggression: A short, cautionary tale.

Media Psychology, 8, 127-138. doi: 10.1207/S1532785XMEP0802_4

Farrar, K., Krcmar, M., & Nowak, K. L. (2006). Contextual features of violent video games, mental models and aggression. *Journal of Communication, 56*(2), 387- 405. doi:10.1111/j.1460-2466.2006.00025.x

Farrar, K., Lapierre, M., McGloin, R., & Fishlock, J. (2015, November). *Violent video game play and gun controller use. Effects on behavioral aggression and social norms concerning violence.* Paper presented at the meeting of the National Communication Association, Las Vegas, NV.

Ferguson, C.J. (2015). Does movie or video game violence predict societal violence? It depends on what you look at and when. *Journal of Communication*, *65*(1), 193-212. doi: 10.1111/jcom.12142

Ferguson, C.J., & Dyck, D. (2012). Paradigm change in aggression research: The time has come to retire the General Aggression Model. *Aggression and Violent Behavior, 17*, 220-228. doi: 10.1016/j.avb.2012.02.007

Ferguson, C. J. & Kilburn, J. (2009). The public health risks of media violence: A meta-analytic review. *Journal of Pediatrics, 154*, 759-763.

Ferguson, C. J., & Olson, C. K. (2014). Video game violence use among vulnerable populations: The impact of violent games on delinquency and bullying among children with clinically elevated depression or attention deficit symptoms. *Journal of Youth and Adolescence, 43*, 127-136. doi: 10.1007/s10964-013-9986-5

Ferrer, R. A., Fisher, J. D., Buck, R., & Amico, K. R. (2011). Pilot test of an emotional education intervention component for sexual risk reduction. *Health Psychology, 30*(5), 656-660.

Fishlock, J. M. (2015). *Not everyone who plays violent videogames becomes a mass shooter: An investigation into the psychological predictors of empathy and psychopathy.* Unpublished manuscript, Department of Communication, University of Connecticut, Storrs, Connecticut.

Forth, A. E., Brown, S. L., Hart, S. D., & Hare, R. D. (1996). The assessment of psychopathy in male and female noncriminals: Reliability and validity. *Personality and Individual Differences, 20*, 531–543.

Fraser, A. M., Padilla-Walker, L. M., Coyne, S. M., Nelson, L. J., & Stockdale, L. A. (2012). Associations between violent video gaming, empathic concern, and prosocial behavior toward strangers, friends, and family members. *Empirical Research, 41*, 636-649. 10.1007/s10964-012-9742-2

Frodi, A., Macaulay, J., & Thome, P. R. (1977). Are women always less aggressive than men? A review of the experimental literature. *Psychological Bulletin, 84*, 634-660.

Funk, J. B., Elliott, R., Urman, M. L., Flores, G. T., & Mock, R. M. (1999). The attitudes towards violence scale: A measure for adolescents. *Journal of Interpersonal Violence, 14*(11), 1123-1136. DOI: 10.1177/088626099014011001

Geen, R. G. (1990). *Human aggression*. Buckingham: Open University Press.

Gentile, D. A., & Bushman, B. J. (2012). Reassessing media violence effects using a risk and resilience approach to understanding aggression. *Psychology of Popular Media Culture, 1*(3), 138-151. doi: 10.1037/a0028481

Gentile, D. A., Swing, E. L., Anderson, C. A., Rinker, D., & Thomas, K. M. (2014). Differential neural recruitment during violent video game play in violent and nonviolent game

players. *Psychology of Popular Media Culture*. Advance online publication. doi: 10.1037/ppm0000009

Graham, J., Haidt, J., Koleva, S., Motyl, M., Iyer, R, Wojcik, S. P., & Ditto, P. H. (2012). Moral foundations theory: The pragmatic validity of moral pluralism. *Advances in Experimental Social Psychology*. Advance online publication. Retrieved from http://ssrn.com/abstract=2184440\

Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of moral emotions. *Journal of Personality and Social Psychology, 96*(5), 1029-1046. doi: 10.1037/a0015141

Graham, J., Iyer, R., Nosek, B. A., Haidt, J., Koleva, S., & Ditto, P. H. (2011). Mapping the moral domain. *Journal of Personality and Social Psychology, 101*(2), 366-385. doi: 10.1037/a0021847

Greenberg, B. S., & Salwen, M. B. (1996). Mass communication theory and research: Concepts and models. In M.B. Salwen, & D. W. Stacks (Eds.)n *An integrated approach to theory and research* (pp. 63-78). Mahwah, NJ: Lawrence Erlbaum Associates.

Greenberg, B. S., Sherry, J., Lachlan, K., Lucas, K., & Holmstrom, A. (2010). Orientations to video games among gender and age groups. *Simulation & Gaming, 41*, 238e259. http://dx.doi.org/10.1177/1046878108319930.

Greitemeyer, T., & Mugge, D. O. (2014). Video games do affect social outcomes: A meta-analytic review of the effects of violent and prosocial video game play. *Personality and Social Psychology Bulletin,40*(5), 578-589.

Grizzard, M., Tamborini, R., Lewis, R. J., Wang, L., & Prabhu, S. (2014). Being bad in a video game can make us more morally sensitive. *Cyberpsychology, Behavior, and Social Networking, 17*(8), 299-504. doi: 10.1089/cyber.2013.0658

Haidt, J. (2001). The emotional dog and its rational tail: A social intuitionist approach to moral judgment. *Psychological Review, 108*(4) 814-834. DOI: 10.1037//0033-295X.

Haidt, J. (2003). The moral emotions. In R. J. Davidson, K. R. Scherer & H. H. Goldsmith (Eds.), *Handbook of affective sciences* (pp.852-870).

Haidt, J., & Graham, J. (2007). When morality opposes justice: Conservatives have moral intuitions that liberals may not recognize. *Social Justice Research, 20*(1), 98-116. doi: 10.1007/s11211-007-0034-z

Haidt, J., & Joseph, C. (2004). Intuitive ethics: How innately prepared intuitions generate culturally variable virtues. *Daedalus,* 55-66.

Haidt, J., & Joseph, C. (2006). The moral mind: How five sets of innate intuitions guide the development of many culture-specific virtues, and perhaps even modules. In P. Carruthers, S. Laurence, & S. Stitch (Eds.), *The innate mind.* New York: Oxford University Press.

Hare, R. D., Clark, D., Grann, M., & Thornton, D. (2000). Psychopathy and the predictive validity of the pcl-r: An international perspective. *Behavioral Sciences and the Law, 18*, 623-645.

Hare, R. D., & Newumann, C. S. (2008). Psychopathy as a clinical and empirical construct. *Annual Review of Clinical Psychology, 4*, 217-246. doi: 10.1146/annurev.clinpsy.3.022806.091452

Hartmann, T. (2011). Users' experiential and rational processing of virtual violence. In K. Poels, & S. Malliet (Eds.), *Vice city virtue: Moral issues in digital game play* (pp. 136-149. Belgium: Acco.

Hartmann, T., Toz, E., & Brandon, M. (2010). Just a game? Unjustified virtual violence produces guilt in empathetic players. *Media Psychology, 13*, 339-363. DOI: 10.1080/15213269.2010.524912

Hartmann, T., & Vorderer, P. (2010). It's okay to shoot a character: Moral disengagement in violent video games. *Journal of Communication, 60*, 94-119. doi:10.1111/j.1460-2466.2009.01459.x

Hoffman, M. L. (2000). *Empathy and moral development: Implications for caring and justice.* New York: Cambridge University Press.

Hogben, M. (1998). Factors moderating the effect of televised aggression on viewer behavior. *Communication Research, 25*(2), 220-247.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis. Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55.

Hummer, T.A., Wang, Y., Kronenberger, W. G., Mosier, K. M., Kalnin, A. J., Dunn, D. W., & Mathews, V. P. (2010). Short-term violent video game play by adolescents alters prefrontal activity during cognitive inhibition. *Media Psychology, 13*, 135-154. doi 10.1080/15213261003799854

Huesmann, L. R. (1998). The role of social information processing and cognitive schema in the acquisition and maintenance of habitual aggressive behavior. In R. Geen, & E. Donnerstein (Eds.), *Human aggression* (pp. 73-109). San Diego: Academic Press.

Hurlemann, R., Patin, A., Onur, O. A., Cohen, M. X., Baumgartner, T., Metzler, S., . . .
Kendrick, K. M. (2010). *The Journal of Neuroscience, 30*(14), 4999-5007. doi
10.1523/JNEUROSCI.5538-09.2010

IGN Staff. (2013, September 20). The top 25 xbox 360 games [Web log post]. Retrieved from
http://www.ign.com/articles/2013/09/20/the-top-25-xbox-360-games-4?page=1

Iyer, R., Koleva, S., Graham, J., Ditto, P., & Haidt, J. (2012). Understanding Libertarian
morality: The psychological dispositions of self-identified Libertarians. *PLoS ONE, 7*(8).
doi: 10.1371/journal.pone.0042366

Johnson, D., & Brooke, J. (1999, April 22). Terror in Littleton: The suspects; portrait of
outcasts seeking to stand out. *The New York Times*. Retrieved from
http://www.nytimes.com

Jolliffe, D., & Farrington, D. P. (2004). Empathy and offending: A systematic review and meta-
analysis. *Aggression and Violent Behavior, 9*, 441-476.

Jones, W. H., Schratter, A. K., & Kugler, K. (2000). The guilt inventory. *Psychological Reports,
87*, 1039-1042.

Jung, Y., Oh, H. J., Sng, J., Kwon, J. H., & Detenber, B. H. (2014). Revisiting gender
preference for a first-person shooter videogame: effects of non-verbal sensitivity
and gender on enjoyment. *Interacting with Computers*. http://dx.doi.org/
10.1093/iwc/iwu024.

Kass, R. E., & Raftery, A. E. (1995). Bayes factors. *Journal of the American Statistical
Association, 90*(430), 773-795.

Kenny, D. A. (2015, November 24). Measuring model fit [Web log post]. Retrieved from
http://davidakenny.net/cm/fit.htm

Kiel, K. A., Smith, A. M., Hare, R. D., Mendrek, A., Forster, B. B., Brink, J., & Liddle, P. F. (2001). Limbic abnormalities in affective processing by criminal psychopaths as revealed by functional magnetic resonance imaging. *Society of Biological Psychiatry, 50*, 677-684.

Kirsh, S., Olczak, P.V., & Mounts, J. R. W. (2005). Violent video games induce an affect processing bias. *Media Psychology, 7*, 239–250.

Konstam, V., Chernoff, M., & Deveney, S. (2001). Toward forgiveness: The role of shame, guilt, anger, and empathy. *Counseling and Values, 46*, 26-39.

Krahe, B., & Moller, I. (2004). Playing violent electronic games, hostile attributional style, and aggression related norms in German adolescents. *Journal of Adolescence, 27*, 53-69.

Krcmar, M., & Cingel, D. P. (2016). Moral foundations theory and moral reasoning in video game play: Using real-life morality in a game context. *Journal of Broadcasting & Electronic Media, 60*(1), 87-103. doi: 10.1080/08838151.2015.1127246

Krcmar, M., & Lachlan, K. (2009). Aggressive outcomes and videogame play: The role of length of play and the mechanisms at work. *Media Psychology, 12*, 249-267. doi: 10.1080/15213260903052257

Kroll, J., & Egan, E. (2004). Psychiatry, moral worry, and moral emotions. *Journal of Psychiatric Practice, 10*, 352–360.

Leigh, R., Oishi, K., Hsu, J., Lindquist, M., Gottesman, R. F., Jarso, S., … Hillis, A. E. (2013). Acute lesions that impair affective empathy. *Brain A Journal of Neurology, 136*, 2539-2549.

Leith, K. P., & Baumeister, R. F. (1998). Empathy, shame, guilt, and narratives of interpersonal

> conflicts: Guilt-prone people are better at perspective taking. *Journal of Personality,*
> *66*(1), 1-37.

Levenson, M. R., Kiehl, K. A., & Fitzpatrick, C. M. (1995). Assessing psychopathic attributes in

> a non institutionalized population. *Journal of Personality and Social Psychology, 68*(1),
> 151-158.

Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-

> report measure of psychopathic personality traits in noncriminal populations. *Journal of*
> *Personality Assessment, 66*, 488–524.

Lopez, S. J. (Ed.). (2009). *The encyclopedia of positive psychology*. Wiley-Blackwell.

Markey, P. M., Markey, C. N., & French, J. E. (2014). Violent video games and real world

> violence: Rhetoric versus data. *Psychology of Popular Media Culture, 4*(4), 277-295.

Marazziti, D., Dell'Osso, B. , Baroni, S., Mungai, F., Catena, M., Rucci, P., … Dell'Osso, L.

> (2006). A relationship between oxytocin and anxiety of romantic attachment. *Clinical*
> *Practice and Epidemiology in Mental Health, 2*(28), 1-6.

Martin, D. (2014, December 7). Ralph H. Baer, inventor of first system for home video games,

> is dead at 92. *The New York Times*. Retrieved from http://www.nytimes.com

McCroskey, J.C., & Beatty, M. J. (2000). The communibiological perspective: Implications for

> communication in instruction. *Communication Education, 49*(1), 1-6.

McGloin, R., Farrar, K. M., & Fishlock, J. (2015). Triple whammy! Violent games and violent

> controllers: Investigating the use of realistic gun controllers on perceptions of realism,
> immersion, and outcome aggression. *Journal of Communication*, *65*(2), 280-299. doi:
> 10.1111/jcom.12148

Michl, P., Meindl, T., Meister, F., Born, C., Engel, R. R., Reiser, M., & Hennig-Fast, K. (2014).

    Neurobiological underpinnings of shame and guilt: A pilot fMRI study. *Social Cognitive*

    and Affective Neuroscience, 9(2), 150-157. doi: 10.1093/scan/nss114

Nowak, K. L., & Biocca, F. (2003). The effect of the agency and anthropomorphism on users'

    sense of telepresence, copresence, and social presence in virtual environments. *Presence:*

    Teleoperators and Virtual Environments, 12(5), 481-494. doi:

    10.1162/105474603322761289

Nowak, K. L., Krcmar, M., & Farrar, K. M. (2008). The causes and consequences of presence:

    Considering the influence of violent video games on presence and aggression. *Presence,*

    17(3), 256-268.

Olthof, T., Ferguson, T., Bloemers, E., & Deij, M. (2004). Morality and identity related

    antecedents of children's guilt and shame attributions in events involving physical illness.

    Cognition and Emotion, 18(3), 383-404. doi: 10.1080/02699930341000077

Paik, H., & Comstock, G. (1994). The effects of television violence on antisocial behavior: A

    meta-analysis. *Communication Research, 21*(4), 516-547.

Panee, C. D., & Ballard, M. E. (2002). High versus low aggressive priming during video game

    training: Effects on game violence, state affect, heart rate, and blood pressure. *Journal of*

    Applied Social Psychology, 32(12), 2458-2474. doi: 10.1111/j.1559-

    1816.2002.tb02751.x

Paulhus, D. L., Neumann, C. S., & Hare, R. D. (in press). *Manual for the Hare Self-Report*

    Psychopathy scale. Toronto, Ontario, Canada: Multi-Health Systems.

Ploog, D. W. (2003). The place of the triune brain in psychiatry. *Physiology & Behavior,*

    79(3), 487-493. Doi:10.1016/S0031-9384(03)00154-9

Reeves, B., & Nass, C. (1996). *The media equation: How people treat computers, television, and new media like real people and places.* New York: Cambridge University Press.

Rosenthal, R. (2009). Interpersonal expectations: Effects of the experimenter's hypothesis. In R. Rosenthal, & R. Rosnow (Eds.), *Artifacts in behavioral* (pp.138-210). New York: Oxford University Press.

Rutherford, M. J., Alterman, A. I., Cacciola, J. S., & McKay, J. R. (1998). Gender differences in the relationship of antisocial personality disorder criteria to Psychopathy Checklist—Revised scores. *Journal of Personality Disorders, 12*, 69-76.

Schmierbach, M., & Limperos, A. M. (2013). Virtual justice: Testing disposition theory in the context of a story-driven video game. *Journal of Broadcasting & Electronic Media, 57*(4), 526-542. doi: 10.1080/08838151.2013.845828

Schreier, J. (2015, August 14). Why most video game aggression studies are nonsense [Web log comment]. Retrieved from http://kotaku.com/why-most-video-game-aggression-studies-are-nonsense-1724116744

Schulte-Ruther, M., Markowitsch, H. J., Shah, N. J., Fink, G. R., & Piefke, M. (2008). Gender differences in brain networks supporting empathy. *NeuroImage, 42*, 393-403.

Sergeant, M. J. T., Dickins, T. E., Davies, M. N., & Griffiths, M. D. (2006). Aggression, empathy, and sexual orientation in males. *Personality and Individual Differences*, *40*, 475-486.

Singer, T., Seymour, B., O'Doherty, J., Kaube, H., Dolan, R. J., & Frith, C. D. (2004). Empathy for pain involves the affective but not sensory components of pain. *Science, 303*, 1157-1162.

Skinner, B.F. (1985) Cognitive science and behaviourism. *British Journal of Psychology, 76*(3), 291-301.

Skinner, B. F. (2005). *Science and human behavior.* New York: The Free Press

Slaby, R. G., & Guerra, N. G. (1988). Cognitive mediators of aggression in adolescent offenders: I. Assessment. *Developmental Psychology, 24,* 580-588.

Smith, S. L., Wilson, B. J., Kunkel, D., Linz, D., Potter, W. J., Colvin, C. M., & Donnerstein, E. (1998). Violence in television programming: University of California, Santa Barbara study. In *National Television Violence Study* (Vol. 3, pp. 5-220). Newbury Park, CA: Sage.

Spreng, R. N., McKinnon, M. C., Mar, R. A., & Levine, B. (2009). The Toronto empathy questionnaire: Scale development and initial validation of a factor-analytic solution to multiple empathy measures. *Journal of Personality Assessment, 91*(1), 62-71. doi: 10.1080/00223890802484381

Stanger, N., Kavussanu, M., & Ring, C. (2012). Put yourself in their boots: Effects of empathy on emotion and aggression. *Journal of Sport and Exercise Psychology, 34,* 208-222.

Stavrinides, P., Georgiou, S., & Theofanous, V. (2010). Bullying and empathy: A short-term longitudinal investigation. *Educational Psychology, 30*(7), 793-802. DOI: 10.1080/01443410.2010.506004

Stuewig, J., Tangney, J. P., Heigel, C., Harty, L. & McCloskey, L. A. (2010). Shaming, blaming, and maiming: Functional links among the moral emotions, externalization of blame, and aggression. *Journal of Research in Personality, 44*, 91-102.

Swing, E. L., & Anderson, C. A. (2010). Media violence and the development of aggressive

      behavior. In M. Delisi & K. M. Beaver (Eds.) *Criminological theory: A life-course*

      approach (pp. 87-108). Sudbury, MA: Jones and Bartlett

Tangney, JP., & Dearing, R. (2002). *Shame and guilt*. New York: Guilford

Tangney, J. P. (1990). Assessing individual differences in proneness to shame and guilt:

      Development of the self-conscious affect and attribution inventory. *Journal of*

      Personality and Social Psychology, 59(1), 102-111.

Tangney, J. P., Miller, R. S., Flicker, L., & Barlow, D. H. (1996). Are shame, guilt, and

      embarrassment distinct emotions? *Journal of Personality and Social Psychology, 70*(6),

      1256-1269.

Tangney, J. P., Stuewig, J., & Mashek, D. J. (2007). Moral emotions and moral behavior.

      Annual Review of Psychology, 58, 345-372. DOI:

      10.1146/annurev.psych.56.091103.070145.Moral

Tangney, J.P., Stuewig, J., Mashek, D., & Hastings, M. (2011). Assessing jail inmates'

      proneness to shame and guilt: Feeling bad about the behavior or the self? *Criminal*

      Justice and Behavior, 38, 710-734.

Tangney, J. P., Wagner, P., & Gramzow, R. (1992). Proneness to shame, proneness to guilt, and

      psychopathology. *Journal of Abnormal Psychology, 101*(3), 469-478.

Triberti, S., Villani, D., & Riva, G. (2015). Moral positioning in video games and its relation

      with dispositional traits: The emergence of a social dimension. *Computers in Human*

      Behavior, 50, 1-8. doi: 10.1016/j.chb.2015.03.069

de Waal, F. B. M. (2005). *Our inner ape: A leading primatologist explains why we are who we*

      are. New York: Riverhead Books.

de Waal, F. B. M. (2012). The antiquity of empathy. *Science, 336*, 874-876. doi

       10.1126/science.1220999

Weaver, A. J., & Lewis, N.L. (2012). Mirrored morality: an exploration of moral choice in video

       games. *Cyberpsychology, Behavior, & Social Networking, 15*, 610–614. doi:

       10.1089/cyber.2012.0235

Weyant, J. M. (2007). Perspective taking as a means of reducing negative stereotyping of

       individuals who speak English as a second language. Journal of Applied Social

       Psychology, 37, 703–716.

Williams, K., M., Nathanson, C., & Paulhus, D. L. (2003, August). *Structure and validity of the*

       Self-Report Psychopathy scale-III in normal populations. Poster session presented at the

       meeting of the American Psychological Association, Toronto, Canada.

Williams, K. M., Paulhus, D. L., & Hare, R. D. (2007). Capturing the four-factor structure of

       psychopathy in college students via self-report. *Journal of Personality Assessment,*

       88(2), 205-219.

Wilson, D. L., Frick, P. J., & Clements, C. B. (1999). Gender, somatization, and psychopathic

       traits in a college sample. *Journal of Psychopathology and Behavioral Assessment, 21*,

       221–235.

Zagon, I. K., & Jackson, H. J. (1994). Construct validity of a psychopathy measure. *Journal of*

       Personality and Individual Differences, 17, 125–135.