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# Violent video games and aggressive behavior: mortality salience and the hostile attribution bias

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VIOLENT VIDEO GAMES AND AGGRESSIVE BEHAVIOR:

MORTALITY SALIENCE AND THE HOSTILE ATTRIBUTION BIAS

An Abstract of a Thesis

Submitted

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

Paden R. Goldsmith

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ABSTRACT

Research indicates that one of the most popular forms of media, violent video games can increase aggressive behavior and cognitions (Anderson & Bushman, 2001). Prior research has examined the effects of these media using the General Aggression Model (GAM; Anderson & Bushman, 2001; Bushman & Anderson, 2002). The current study examines an alternative method by which video games (and other forms of media) can encourage aggressive behaviors, via mortality salience effects. The current study used a 2 (mortality salience vs absence) x 2 (violent video games vs nonviolent video games) experimental design to examine the role of mortality salience and violent video game primes on aggressive cognitions and endorsed harm towards out-group members. Participants were either primed with mortality salience (or not), viewed footage from a violent (experimental) or non-violent (control) game, and completed dependent measures assessing aggressive cognitions and violence towards out-group members. Results indicate that participants exposed to violent media and mortality salience primes endorse more harm towards out-group members, and exhibit more aggressive cognitions. Emotion regulation moderates the relationship between hostile attribution biases and aggressive cognitions, as well as the relation between death-thought accessibility and aggressive cognitions, providing a protective effect.

*Keywords:* Terror Management Theory, GAM, hostile attribution bias, mortality salience, media, violence, aggression, video game

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This Study by: Paden Goldsmith

Entitled:  Violent Video Games and Aggressive Behavior:  Mortality Salience and the Hostile Attribution Bias

has been approved as meeting the thesis requirement for the

Degree of Master of Arts

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CHAPTER 1

INTRODUCTION

Violent Media

Exposure to violent media poses a large risk for the health and well-being of

children and youth (Council on Communications and Media, 2009). "Violent media is so

prevalent in society that if a child were to act out the behaviors he/she witnessed on prime

time television, within fifty days, every person in the United States would be killed"

(Medved, 1995, pp. 157).  With the advent of video games, scholars have raised

important questions about the effects of this form of media, considering the active role of

the participant in the game-playing environment (American Psychological Association

[APA], 2013). Video games and popular forms of media are often exceedingly violent. A

recent content analysis showed that as many as 85% of video games contain some form

of violent content, with nearly half of all video games including serious violent actions

such as killing or otherwise harming others (Provenzo, 1991).  Prior research has

suggested that use of violent games and other forms media are likely to predict higher

rates of aggressive behavior (Carnagey & Anderson, 2005).  Furthermore, a recent study

has calculated the cost of violence and aggression to society to be $70 billion (University

of Georgia, 2007).

Violent video games often depict excessive destruction and death. Several scenes

depicted in these violent games may make individuals aware of their own mortality

(known as mortality salience).  Although human beings often consciously work to avoid

these negative thoughts about death, a large body of recent research has examined the

effects that these thoughts may have upon the behavior and cognitions of individuals

(Greenberg & Arndt, 2012). One of the most pertinent effects is that they seem to

increase aggressive behavior towards out-group members. Given the widespread use of

violent media (Anderson & Bushman, 2001), and the relative abundance of potential

primes for mortality salience (Greenberg & Arndt, 2012), Terror Management Theory

provides an interesting approach to examine aggression. This study will examine these

effects in more detail, along with potential overlaps with the General Aggression Model

(Anderson & Bushman, 2001).

Much of the previous research on media-based aggression revolves around the

General Aggression Model (Anderson & Bushman, 2001). This model is heavily

influenced by Social Information Processing theory (Hasan et al., 2012), and incorporates

the concept of hostile attribution bias (second step of the SIP theory) into its conceptual

framework (Hasan et al., 2012), along with previous models of aggression, such as Social

Learning Theory (Anderson & Bushman, 2001; Bandura, 1978; Crick & Dodge, 1994).

Current research on violent media examines hostile attribution biases as one of the major

factors in aggression (Anderson & Bushman, 2001; Hasan et al., 2012). In general,

viewing violent media alters the encoding process such that an individual may perceive

aggressive or otherwise ill-meaning individuals in a non-aggressive and ambiguous

scenario, and therefore respond appropriately. These biases, in the long term, can

fundamentally alter his/her perception of everyday happenings in the environment.

<u>The General Aggression Model (GAM)</u>

Much research has examined violent video games and aggression, specifically utilizing the established General Aggression Model (GAM; Anderson & Bushman, 2001). The GAM, proposed by Craig Anderson and colleagues, represents a structural approach to the various causes of aggression. This conceptual framework attempts to combine many of the positive and supported components of various theories about aggression, and tends to rely on the application and activation of scripts and schemas relating to aggression (Anderson & Bushman, 2001).

According to the General Aggression Model, personal (trait and state aggression, gender, etc.) and situational factors (temperature, environmental cues, primes, etc.) interact with an individual's internal state, such as his or her level of positive or negative affect, physiological and psychological arousal, and cognitions (Hasan et al., 2012). An individual may then engage in a decision-making process, weighing potential outcomes and goals, which can lead to behavior that is thought out (often less aggressive) or impulsive (often more aggressive; Hasan et al., 2012). These behaviors, in turn, influence the personal and situational factors of others, which can lead to even further aggression (Hasan et al., 2012). Thus, according to the GAM, various factors such as affect (i.e., aggressive feelings, anger), arousal, and cognition (i.e., normalized beliefs about aggression, aggressive thoughts) cause aggressive behavior (Anderson & Bushman, 2001).

It is worth noting, however, that while the GAM does allow for genetic based input (e.g., trait aggression), these causes are rarely discussed in the actual literature to

the same depth as social causes such as media (Anderson & Bushman, 2001; Ferguson & Dyck, 2012). The typical relationship that is reviewed in literature by Anderson and his colleagues revolves around the priming of aggressive scripts, thereby making aggressive cognitions and acts more salient to those that are primed (Anderson & Bushman, 2001; Ferguson & Dyck, 2012).

The GAM focuses heavily upon how aggressive media can alter scripts for various social settings, leading to more normative aggressive responses (DeWall & Anderson, 2011). Violent video game play, violent movies, and other violent media influence these knowledge structures, according to GAM theorists (DeWall & Anderson, 2011). Cognitive and affective states brought about by the use of violent media, specifically those that lead to an increase in aggressive cognitions and behaviors, are influenced by changes to knowledge structure and experiences (Bushman & Anderson, 2002; DeWall & Anderson, 2011). Crick and Dodge's (1994) Social Information Processing Theory elaborates further upon the effects of an altered knowledge structure, as well as the hostile attribution bias, which has been found to mediate aggressive effects in the GAM (Hasan et al., 2012).

<div align="center">Social Information Processing Theory</div>

Several empirical studies that use a GAM perspective utilize concepts from Social Information Processing Theory such as the ambiguous vignette (Hasan et al., 2012), and as such, borrow assumptions and theoretical background from the theory (e.g., media may bias the encoding and interpretation of social cues, the hostile attribution bias; Anderson et al., 2010). The hostile attribution bias, for example, is commonly seen when

examining violent video game effects (Hasan et al., 2012), and seems to mediate much of the aggressive behavior in the GAM. Nicki Crick and Kenneth Dodge conceptualized the social information processing (SIP) model in 1990. This cognitive processing model examines the processes underlying aggressive and prosocial behavior (Crick & Dodge, 1994). According to Crick and Dodge, an individual's response to a situation is the result of six online steps of cognitive processing (Crick & Dodge, 1994). An individual in an ambiguous situation will first take in information (encoding stage), and then attempt to make sense of it in the interpretation stage (Crick & Dodge, 1994). The encoding and interpretation of information are automatic processes (Crick & Dodge, 1994). The individual will then decide what he/she wishes to achieve (goal stage), create a set of possible responses to the situation (response generation stage), and then weigh the advantages and disadvantages of each possible behavior in the response evaluation stage (Crick & Dodge, 1994). According to Crick and Dodge (1994), the individual will then perform the action that has the greatest number of advantages (response enactment). An essential component of this process, according to Crick and Dodge, is the database, which holds the individual's social knowledge and social schemas, as well as memories and knowledge of social rules, and interacts with each of the six steps of information processing (Crick & Dodge, 1994).

SIP research typically examines the interpretation process of the six-step model specified earlier. This research typically employs ambiguous vignettes or photographs, and subsequently asks participants why the actors in the story did what they did, and what they would do if they were in the story. Typically, researchers focus on the second step

of this SIP process, interpretation, which has also been termed as hostile attribution bias

(HAB), if biased in a negative way, and there is a great deal of research examining HAB

in relation to video games and other violent media (Hasan et al., 2012; Martins, 2013;

Moller & Krahe, 2009).  Hostile attribution biases are the belief(s) that an individual in

the environment is intentionally trying to cause harm or be mean to another in an

otherwise ambiguous scenario (Crick & Dodge, 1994; Moller & Krahe, 2009).

Moreover, a HAB appears to be specific to the type of scenario to which the individual

was exposed (i.e. individuals seeing relational aggression may exhibit a HAB in a

relational aggression scenario, but not in a physical aggression scenario, and vice versa;

Martins, 2013).

Violent media can bias the encoding and interpretation of events, and has

garnered an abundance of research into its effects (Anderson & Bushman, 2001; Moller

& Krahe, 2009).  Indeed, an individual's exposure to physical aggression and violent

media (specifically violent video games) predicts aggressive behavior up to 30 months

later (Markovits, 2013; Moller & Krahe, 2009).  These effects seem to be due to an

increased prevalence in aggressive norms, and a hostile attribution bias (Moller & Krahe,

2009).  The increase in aggressive norms seems to imply an alteration in the database of

the consumers of violent media, whereas an increase in hostile attribution biases seems to

imply an alteration in encoding and interpretation stages of the process (Moller & Krahe,

2009).  Such normative aggressive behavior may be further increased by various

cognitive and ethnic biases, such as stereotypes or mortality salience effects, which seem

to focus upon the interplay between readily identifiable social groups (e.g. African

Americans; Greenberg & Arndt, 2012).

Hostile Attribution Bias and Violent Video Games

Playing violent video games induces a great deal of negative affect, as well as a

hostile attribution bias.  While the effects in the laboratory may be small, Bushman and

Anderson (2001) likened the effect to that of smoking cigarettes and lung cancer.  While

the effect of any one game is likely to be negligible, long term, repeated exposure may be

relatively severe, perhaps resulting in an individual becoming habitually aggressive

(Bushman & Anderson, 2001).  This bias may lead to aggressive cognitions and

aggressive behavior (Anderson & Bushman, 2001; Anderson et al., 2010).  In a recent

meta-analysis of previous research (Anderson & Bushman, 2001; Anderson et al., 2010),

violent video game play has yielded an effect size of $r = .12 - .27$ for aggressive

cognitions, and $r = .18 - .21$ for aggressive behaviors in experimental, cross-sectional,

and longitudinal studies.  These indicate relatively small, but still important effects

(Anderson & Bushman, 2001).

Furthermore, these effects seem to stem at least in part from an increase in

normative aggression, and a biased interpretation of otherwise ambiguous events (HAB;

Moller & Krahe, 2009).  In one such study (Hasan et al., 2012), participants played a

violent video game (Condemned 2, Call of Duty 4, and The Club) and completed two

ambiguous story stems, which asked the participant to report on the reasons for the story

character's behaviors and their perceptions about how the character felt. Participants

could deliver a harsh noise to a confederate following this task as a measure of laboratory

aggression. Participants who played violent games showed more aggressive behaviors and cognitions than did the control group (Hasan et al., 2012). There has been some focus in the research literature on the role of potential moderators that may exacerbate or buffer individuals from the expected risk of violent games.

<u>Aggression and Gender</u>

Studies on the role of moderators in the link between violent video game play and aggressive cognitions have often examined gender. There seem to be mixed findings when examining the relationship between gender and aggression (Eagly & Steffen, 1986). These findings may stem from the type of aggression examined (e.g. physical vs. relational; Eagly & Steffen, 1986). Nevertheless, physiological differences in galvanic skin response (GSR) seem to vary by gender because of violent video game play (Carnagey, Anderson, & Bushman, 2006). GSR is a commonly used physiological measure of stress and excitation, and is an index of arousal in the sympathetic branch of the autonomic nervous system. Women tended to show greater rises in GSR than men following violent video game play (Carnagey et al., 2006). Because of this effect, along with the lesser prevalence of violent video game play among women, researchers have hypothesized that the lower GSR response to violent video game play in men may be due to desensitization towards violent and graphic media (Carnagey et al., 2006). Due to the desensitization towards violence stemming from violent video game play, as well as a greater identification with the avatar in the video game (Eastin, 2006), it seems to follow that males would exhibit a greater prevalence of aggressive behavior following violent

video game play. Many researchers explicitly control or otherwise examine gender effects in violent media (Gentile, Li, Khoo, Prot, & Anderson, 2014; Hasan et al., 2012).

The gender of the video game character also seems to matter a great deal. Greater increases in aggression result when the game characters match the gender of the player (Eastin, 2006). Given the overall prevalence of male-only characters in many video games (Williams, Martins, Consalvo, & Ivory, 2009), it is likely that men would show more aggressive cognitions than women playing the same game (Eastin, 2006). However, according to a meta-analysis by Anderson and Bushman (2001), there were no overall effects for gender on aggressive cognitions as a result of violent video game play. This is perhaps due to unidentifiable or otherwise ambiguous video game characters, especially in terms of first-person shooter games, where the player likely never sees the character in full.

Furthermore, as several researchers have noted, there appears to be a gender difference in both aggression (physical, verbal, relational) as well as prevalence of video game playing (Bartlett, Anderson, & Swing, 2009; Carnagey et al., 2006; Eastin, 2006). Indeed, while men tend to express aggression differently than women (physical or verbal vs. relational; Eagly & Steffen, 1986), violent video games have been shown to increase aggressive cognitions across both genders, although the manner in which this aggression is expressed tends to vary by gender (Carnagey et al., 2006). Furthermore, a meta-analysis by Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer (2002) shows a small ($r = .12$) effect size of the moderating effects of gender in the relationship between

hostile attribution bias and aggressive behavior, showing males to be somewhat more aggressive.

Emotion Regulation and Aggression

Emotions have a long history of being connected to aggressive responses, although cognitions themselves are often not considered inherently emotional. Under the SIP framework, as well as the GAM, emotions are critical in every step of the process from the encoding of cues, to the enactment of behavior (Lemerise & Arsenio, 2000). Emotions and cognitions may influence each other in mutually reinforcing ways. Specifically, the emotional state of an individual can influence the interpretation of societal cues, and the regulation of emotional arousal influences the verbal and behavioral responses that one may make in any scenario (Anderson & Bushman, 2001; DeWall & Anderson, 2011; Lemerise & Arsenio, 2000). Emotion regulatory factors, which include modulation and toning down the intensity of otherwise strong emotions such as anger, moderate the relation between hostile attribution biases and aggression (Lemerise & Arsenio, 2000; Orobio de Castro et al., 2002). The ability to regulate one's own emotions allows individuals that would otherwise behave aggressively to reduce the intensity of these aggressive emotions, and those that are more regulated tend to have more cognitive resources available to attend to and process the situation more accurately (Anderson & Bushman, 2001; Hasan et al., 2012). As noted in prior literature, emotion regulation buffers individuals with a hostile bias from aggressive behavior (Hasan et al., 2012; Mikulincer & Shaver, 2011; Roberton, Daffern, & Bucks, 2012).

Different types of emotion regulation (i.e., adaptive and non-adaptive forms), lend themselves differently to the reduction (or increase) of aggressive cognitions and behaviors.  Specifically, high levels of non-adaptive emotion regulation, such as suppression, increase aggressive responses (Roberton et al., 2012).  Suppression often requires using an abundance of cognitive resources to regulate and/or suppress negative emotions.  The use of these resources may increase negative affect, which in turn, may lend itself to actually promoting aggressive behavior via rumination (Brans, Koval, Verduyn, Lim, & Kuppens, 2013).  Difficulties in regulating emotions, especially anger, are linked to the tendency to ruminate, which decrease the ability to control one's own emotions (Denson, DeWall, & Finkel, 2012). This increase in rumination, and subsequent decrease in the ability to regulate emotions, is linked to an increase in aggressive behavior and aggressive cognitions (Denson et al., 2012).   Furthermore, emotion regulation, according to Roberton et al., (2012) compromises the decision-making process, and increases physiological arousal.  These unintended consequences of emotion regulation may increase aggression, especially at high levels of non-adaptive emotion regulation.  Conversely, at low levels of adaptive emotion regulation, similar difficulties follow.

Low levels of positive emotion regulation are associated with an increased proclivity to express aggressive behavior, and even to an increased prevalence of psychopathology (Roll, Koglin, & Petermann, 2012).  Emotion regulation seems to provide a protective effect against aggressive responses (both self-report and experimentally assessed; Wilkowski, Robinson, & Troop-Gordon, 2010).  While scholars

utilizing the General Aggression Model frequently explore the effects of emotion regulation (e.g. Anderson & Bushman, 2001; Roberton et al., 2012), researchers utilizing other theories of prejudice and aggression, such as Terror Management Theory (Greenberg & Arndt, 2012), do not often explore the role of emotion regulation.

<u>Alternative Explanations for Aggression</u>

The General Aggression Model (Anderson & Bushman, 2001), while somewhat comprehensive, seems to exclude some motives for aggressive cognitions and behavior that other theories have covered substantially (i.e. Terror Management Theory; Greenberg & Arndt, 2012). As such, it is necessary to examine alternative pathways and causes of aggression in order to gain a thorough understanding of the psychological factors tied to violent media. One theory that may lend itself particularly well to an alternative model of assessing violent media related aggression is the Terror Management Theory (Greenberg & Arndt, 2012), due to the somewhat overwhelming focus on death that is typically found in most violent video games and other forms of media. Mortality salience and the GAM/SIP theory both posit that media can influence behavior, although the mechanisms by which behaviors are altered vary widely across theories. Violent media has scarcely been examined with a Terror Management Theory approach of aggression/hostility (Vail III, Arndt, Motyl, & Pyszczynski, 2012).

<div align="center"><u>Terror Management Theory</u></div>

Terror Management Theory (TMT) holds that thoughts of one's own death motivate much of human behavior (Greenberg & Arndt, 2012). Reminding one of his/her own death appears to bias information processing in scenarios involving out-group

members (Greenberg & Arndt, 2012; Greenberg, Schimel, Martens, Solomon, & Pyszcznyski, 2001). When made aware of their own mortality (mortality salience; MS), people engage in the first line of defenses, such as suppression (Greenberg et al., 1994). The act of suppressing thoughts about death, paradoxically, makes thoughts about death more salient (Greenberg et al., 1994). When thoughts of death fade from conscious focus, the second line of defenses are then activated, whereby those primed with MS will attempt to alleviate these death thoughts by reinforcing their worldview (e.g., bolstering an in-group, or national figure; attacking an out-group, or foreign figure), or utilizing self-esteem increasing behaviors, such as smoking or sunbathing (Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994). TMT posits that these effects serve to resolve existential crises after death through societal creations. On the individual level, a person buffers against thoughts about death by employing self-esteem enhancing behaviors, reaffirming their level of self-esteem, or employing world-view defense responses, which serve to reduce anxiety associated with mortality salience (Greenberg & Arndt, 2012). These behaviors, therefore, reduce death-thought accessibility to some degree (Greenberg & Arndt, 2012).

As noted earlier, when primed with mortality salience, people often engage in worldview defense (Greenberg et al., 2001). Worldview defense responses may vary widely, as either a positive, society-enriching behavior (Jonas, Fritsche, & Greenberg, 2005), or a negative, detrimental behavior (Kugler & Cooper, 2010). People engaging in worldview defense may find themselves not only expressing extreme attraction to culturally representative icons, such as currency (Jonas et al., 2005), or a charismatic

leader (Landau et al., 2004), but may also express disdain, violence, and hatred for individuals that appear dissimilar to them (Kugler & Cooper, 2010).

Researchers have also examined the effects mortality salience has upon perceptions of in-group and out-group members on scenarios involving terrorism, racism, and aggression (Das, Bushman, Bezemer, Kerkhof, & Vermeulen, 2009; Greenberg et al., 2001). In one such study, following a mortality salience prime, participants were shown pictures of a target that was responsible for an attempted terrorist plot and asked to recommend a punishment to the target (Kugler & Cooper, 2010). Participants who were primed with mortality salience were more likely to endorse punitive punishments to out-group members than those who were not primed (Kugler & Cooper, 2010). Curiously, race, or at least visibility of differences, seemed to be a factor in this study, as out-group members that looked as though they could have been in-group members (e.g. a man from Belgium that appeared as though he could have been a White American citizen) were given the same punishment as in-group members (White American citizens; Kugler & Cooper, 2010). Greenberg and colleagues have shown that reminding White participants of their own mortality also causes them to show more favorable evaluations towards White racists, and more aggressive towards out-group members (Greenberg et al., 2001). A recent meta-analysis indicate that the common effect size for in- and out-group related findings tend to be around $r = .30 - .45$ (Burke, Martens, & Faucher, 2010).

<u>Mortality Salience Primes</u>

Much of the TMT literature uses a mortality salience paradigm. Under this paradigm, the experimenter utilizes a prime for thoughts about death that could range

from writing about one's own death (Greenberg & Arndt, 2012), to viewing pictures of destroyed buildings (Vail III et al., 2012). These primes make participants more likely to think about their own death, thereby making their own mortality more salient. After a brief delay, successful primes make it possible to measure the distal effects of mortality salience on world-view defense or self-esteem.

Mortality salience research uses several different primes, several of which utilize some form of violent media, such as television coverage of terrorist attacks. In the initial studies, researchers initiated a prime wherein they asked participants to write about what they believe will happen as they die, when they die, and after they have died. In the control condition of this study, they asked participants to write about dental pain or other aversive stimuli in order to control for differences in affect (Greenberg & Arndt, 2012). In subsequent research, they examined the role of the 9/11 terrorist attacks as a mortality salience prime and found that seeing the aftermath of the attacks, or watching news coverage of the attacks successfully primed participants with mortality salience. This prime caused participants to show favorable responses to the War on Terror, as well as to then President George W. Bush (Landau et al., 2004). A large amount of the scenery in violent video games revolves around military activity and terrorism, especially in recent video games. These settings may cause viewers to be primed for mortality salience, thereby providing support for an alternative model of media related aggression.

According to many terror management theorists, the body represents a nearly constant reminder of our own mortality (Goldenberg, Pyszczynski, Greenberg, & Solomon, 2000). The human body in various stages of life has been found to bring about

reminders of death (Hayes, Schimel, Arndt, & Faucher, 2010).  For example, viewing the

human body in old age (Martens, Greenberg, Schimel, & Landau, 2004), or thinking

about a person with a physical disability (Hirschberger, Florian, & Mikulincer, 2005)

brings about an increase in death-thought accessibility.  While it is not simply the body in

various states of disarray that increase death-thought accessibility, other representations

of human beings as not being unique from other mortal creatures seem to bring about

similar responses (Hayes et al., 2010).  Indeed, sex, feces, and other bodily functions

increase death-thought accessibility (Hayes et al., 2010).  Most mortality salience effects

relating to creatureliness are between $r = .30 - .45$, indicating modest to medium sized

effects (Burke et al., 2010).

Violent Video Games and Terror Management Theory

Given the extent to which mortality salience primes are found in everyday life, it

is interesting to examine other potential primes that have recently received increased

exposure in the media, such as violent video games, which heavily feature graphic

displays of violence, sex, nudity, and military action (Stermer & Burkley, 2012).  The

viewing of the effects of military action, as well as the human body in various states of

age or illness have been shown to act as effective mortality salience primes (Goldenberg

et al., 2000; Hayes et al., 2010; Martens et al., 2004). Violent video games often

incorporate military action into the plotline of the video game; indeed, there is an entire

genre of video games called "modern military shooters."  These games typically place the

player in the role of a member of the U.S. military, regardless of the country in which the

player may be.  The game then tasks players with defending the country, or attacking

different objectives on the battlefield.  Indeed, the most popular video game from the last

year, Call of Duty: Modern Warfare 3 (Guarini, 2013), tasks players to do exactly that:

defend their country at any cost.  Across the landscape of these games are destroyed

buildings, dead bodies, weapons, explosions, various articles of military equipment

ranging from machines of war to entire military bases, enemy combatants, and friendly

soldiers, all of which are in the line of fire and often suffer fatal wounding or other

physical damage.  Perhaps the most troubling aspect of this genre of game is that the

enemy that the player is tasked to fight is typically representative of an actual group of

people in the real world.  For example, in Battlefield 3, a very popular "modern military

shooter," the game tasks players with attacking the Russian army.  In Call of Duty:

Modern Warfare 3, the game tasks players, once again, with attacking the Russian army,

as well as elements of a splinter faction of the Russian army.  Similar games, such as

Homefront, task the player with defending U.S. soil from a surprise attack by the Chinese

army.

Further, many violent video games depict the violent, graphic, and grotesque

deaths of their opponents or themselves as a central theme within the game.  Perhaps one

of the worst perpetrators of this is the fighting game genre.  These games center primarily

on aggressing against an opponent in a brutal manner.  Indeed, much of the original

violent video game research evaluated Mortal Kombat, one such game, in great depth

(Anderson & Bushman, 2002).

Often, the player of these games faces overwhelming odds and may even die,

perhaps even multiple times.  The scenery and artistic design of these games incorporate

destroyed or damaged buildings, often due to a terrorist attack, or other military action. In laboratory settings, this scenery primes for mortality salience, and, therefore, the virtual depictions of these scenes may have similar effects upon viewers of this media as they did participants in research studies (Vail III et al., 2012). As such, if these video games prime for mortality salience, players of these games may be likely to show attitudes that are more conservative, be more lenient on the actions of in-group members, and be more hostile towards out-group members, provided the media does prime participants. Hence, it seems plausible to expect that viewing these violent video games may prime participants for mortality salience, thereby leading to an increase in aggression towards out-group members. There also seem to be some notable moderating effects that may influence how men and women behave under mortality salience.

Mortality Salience and Gender

Research has revealed gender differences in the role of mortality salience on risk taking behavior (Hirschberger, Florian, Mikulinger, Goldenberg, & Pyszczynski, 2002). Men show a greater tendency for risk taking behaviors and aggression as compared to women who are also primed with mortality salience (Hirschberger et al., 2002). This tendency for men to perform more risk taking and aggressive behavior following a mortality salience prime has been tested in a variety of scenarios, such as reckless driving (Taubman-Ben-Ari & Findler, 2003), and sexual behaviors (Hirschberger et al., 2002). According to Hirschberger et al. (2002), these risk-taking behaviors may function as a mortality salience buffer for men by providing an active outlet for world-view defense in the way of aggression (an inherently risk-taking behavior), or by bolstering one's self-

esteem or gender role.  Mortality salience encourages not only risk taking behaviors among men, but also makes nationalistic concepts more salient among men, but not women, as well (Fritsche & Jonas, 2005).

Evolutionarily, men had a much higher frequency of encountering out-group or foreign individuals, as competition for resources often led groups of men away from camp in search of game and other resources (Navarrete, McDonald, Molina, & Sidanius, 2010).  This increased frequency of encountering out-group individuals has, according to some researchers, led to an increase in prejudice and hostility towards out-groups that is markedly greater in men as compared to women (Navarrete et al., 2010).

Hence, the increase in aggression due to worldview defense seems to be a gendered phenomenon largely directed towards males, and by males in greater number than females (Navarrete et al., 2010).  These world-view defense responses to mortality salience lead to an increase in nationalistic attitude (Landau et al., 2004; Jonas et al., 2005), and with such an increase in nationalism, an increase in prejudice and aggression follows (Kugler & Cooper, 2010), which seems to be greater for men than women.

Mortality Salience and Emotion Regulation

Adaptive emotion regulation is linked to an increased ability to focus upon positive emotional cues, such as joy or happiness, rather than negative emotional cues, such as anxiety and fear (DeWall & Baumeister, 2007).  Furthermore, mortality salience, according to DeWall and Baumeister (2007), motivates individuals to favor, and fixate upon positive emotional words, which may influence some death-thought accessibility measures such as the lexical decision task. Specifically, individuals primed with mortality

salience by triggering an increase in spreading activation of positively valenced words, leading to an increase in reaction time in categorizing for those words. This tendency to focus upon positive emotional words, coupled with the buffering effects of emotion regulation, may serve to moderate mortality salience effects in participants at least from the perspective of experimental examination.

Different types of self-control, such as emotion regulation play a role in worldview defense responses to mortality salience (Gailliot, Schmeichel, & Maner, 2007). Recent research supports the possibility that the ability to control one's own emotions has buffering effects on mortality salience, very similar to that of self-esteem (Gailliot et al., 2007). Participants in previous research that were low on adaptive emotion regulation showed increased levels of worldview defense responses. Conversely, participants high on emotion regulation showed decreased levels of worldview defense. Specifically, those with higher existing levels of emotion regulation were able to buffer against thoughts of death (Gailliot et al., 2007; Gailliot, Schmeichel, & Baumeister, 2006).

As death-thought accessibility measures are implicit (often reaction time based) tests, emotion regulation does not merely affect death-thought accessibility manipulation checks. A higher ability to regulate one's emotions seems buffer against mortality salience effects such as worldview defense, whereas a lower ability to regulate one's emotions lessens one's ability to buffer against mortality salience effects (Gailliot et al., 2007). Furthermore, the process of controlling the activation of thoughts can limit the implicit and explicit effects of said thoughts (Anderson & Green, 2001; MacLeod, 1989).

As such, the levels of emotion regulation in an individual may influence the motivated control of aversive thoughts of death.

Self-control and emotion regulation can also be manipulated. Inhibiting a participant's ability to regulate emotions correlates positively with an increase in death-thought accessibility (Gailliot et al., 2006). Gailliot and colleagues (2006; 2007) instructed participants to regulate their emotions during and after the mortality salience prime, and found a main effect for emotion regulation. Strengthening one's ability to regulate emotions, or instructing them to do so, seems to actively inhibit worldview defense, as well as death-thought accessibility (Gailliot et al., 2006; Gailliot et al., 2007).

## Current Study

There is a great deal of methodological overlap between the GAM and TMT theories such that both use a form of priming (violent media in the case of the GAM and mortality salience in the case of TMT; Anderson & Bushman, 2002; Greenberg & Arndt, 2012). Both theories have similar moderating constructs (e.g., gender; Eastin, 2006; Hirschberger et al., 2002). Therefore, the purpose of the current study was to explore the effects of violent video games as well as mortality salience (independently and jointly) on aggressive cognitions and endorsement of out-group and in-group harm. Furthermore, the aim of the study was also to examine the various constructs that buffer or exacerbate risk for aggressive cognitions and endorsement of out-group and in-group harm (i.e., moderating effects of gender and emotion regulation). In order to do this, stimuli and primes from previous research were used to examine how the effects of mortality salience and violent video game play fit together to lead to aggressive outcomes.

The effects of media on aggression and aggressive cognitions already has a great deal of empirical support.  While the GAM (Anderson & Bushman, 2001; Anderson et al., 2010; Gentile et al., 2014) has a great deal of empirical backing, recent research has not examined the role that other theories, such as TMT (Greenberg & Arndt, 2012) might play in explaining media based aggression. TMT predicts that aggressive responses target out-group members, whereas in-group members are perceived favorably. Given the recent increase in the representation of out-group members as enemies in violent video games (Guarini, 2013), along with the tendency for violent video games to show graphic scenes which may prime for mortality salience, large amounts of aggressive behavior and cognitions may be focused upon this group of individuals.  Gender and emotion regulation differences may moderate these effects, such that emotion regulation may prove to be a protective factor, whereas males may show increased levels of aggressive responses, but not females.

Design

This study utilized a 2 (mortality salience or not) X 2 (violent video game or not) experimental design, and data were analyzed with ANOVAs and path analysis models. Independent variables were presence of mortality salience primes, and presence of violent media.  Death-thought accessibility and hostile attribution biases functioned as predictor variables.  Endorsement of out-group harm and levels of aggressive cognitions functioned as dependent/outcome variables.  Consistent with previous research, positive emotion regulation (in this case, low impulsivity and high emotional awareness; Hirschberger et al., 2002) and gender (Eastin, 2006) were expected to function as moderators.  This

design explored both mortality salience effects, as well as the effects of violent video games. Researchers have not, to my knowledge, examined violent media or video games as a mortality salience prime in prior research. Therefore, the present study also aimed to explore if violent media may function as a mortality salience prime.

<u>Hypotheses</u>

H1: The four groups (i.e., mortality salience and violent video game, violent video game only, mortality salience only, non-violent and non-mortality salient control) will be significantly different on the frequency of endorsement of aggressive treatment towards out-group members such that:

H1a: Participants primed with mortality salience and exposed to violent video games will exhibit more frequent endorsement of out-group harm when compared to the other groups in the study.

H1b: Participants primed with mortality salience only will exhibit more frequent endorsement of out-group harm than a control group, but less frequent endorsement of out-group harm than those exposed to violent video games and primed with mortality salience.

H1c: Participants exposed to violent video games only will exhibit more frequent endorsement of out-group harm than a control group, but less frequent endorsement of out-group harm than those exposed to violent video games and primed with mortality salience.

H1d: There will be no differences between the groups for endorsement of in-group harm.

H2: Emotion regulation will moderate the relationship between hostile attribution biases and frequent endorsement of out-group harm. Specifically, when the ability to regulate emotions is lower, hostile attribution bias will lead to a greater frequency of endorsement of out-group harm. When emotion regulation is higher, it will serve as a protective factor by reducing the frequency of endorsed out-group harm.

H3: Emotion regulation will moderate the relationship between thoughts about death and frequency of endorsement of out-group harm. Specifically, when the ability to regulate emotions is lower, a greater amount of thoughts about death will lead to a greater frequency of endorsement of out-group harm. When emotion regulation is higher, it will serve as a protective factor by reducing the frequency of endorsed out-group harm.

H4: Emotion regulation will moderate the relationship between hostile attribution biases and aggressive cognitions. Specifically, when the ability to regulate emotions is lower, higher hostile biases will lead to more aggressive cognitions. When emotion regulation is high, it will serve as a protective factor by reducing aggressive cognitions.

H5: Emotion regulation will moderate the relationship between thoughts about death and aggressive cognitions. Specifically, when the ability to regulate emotions is lower, a greater amount of thoughts about death will lead to a greater prevalence of aggressive cognitions. When emotion regulation is high, it will serve as a protective factor by reducing aggressive cognitions.

H6: Gender will moderate the relationship between hostile attribution biases and aggressive cognitions towards out-group members. Specifically, male participants will

show a greater association between hostile attribution bias and endorsement of aggressive behavior towards out-group members.

H7: Gender will moderate the relationship between thoughts about death (i.e., death-thought accessibility) and endorsement of out-group harm. Specifically, male participants will show a stronger association between thoughts about death and increased endorsement of out-group harm.

H8: Gender will moderate the relationship between hostile attribution biases and aggressive cognitions. Specifically, male participants will show a stronger association between hostile attribution biases and aggressive cognitions.

H9: Gender will moderate the relationship between thoughts about death (i.e., death-thought accessibility) and aggressive cognitions. Specifically, male participants will show a stronger association between thoughts about death and aggressive cognitions.

RQ1: Do violent video games function as a prime for mortality salience, as measured by an increase in death-thought accessibility?

CHAPTER 2

METHOD

Participants

A power analysis was conducted for a linear regression (conceptually the same as

the path analyses used for actual analyses), and at an alpha of .05, 3 predictors, power of

.80, and effect size of 0.15 (based upon previous research examining the moderating

effects of self-esteem; Burke et al., 2010); 77 participants were required for sufficient

power. A secondary power analysis was conducted for a fixed effects ANOVA.  At an

effect size of .3 (based upon previous research examining the support for violence against

out-group members; Burke et al., 2010), an alpha of .05, power of .80, and 4 conditions,

138 participants were required.  One hundred forty-eight participants (for demographics

see Table 1) were recruited from the Introduction to Psychology participant pool at the

University of Northern Iowa.  All data were collected in a laboratory setting in exchange

for course credit.  A majority of participants were white (90%) with a mean age of 18.91

and SD of 1.30.  The 63% of the sample were females.

Procedure

Participants recruited through the UNI Psychology participant pool entered the

research lab, were seated, and completed a consent form, which contained a cover story

stating that the study was designed to examine the effects that media has upon word

perception and cognitive functioning.  After providing consent, participants began by

completing a short demographics questionnaire (Appendix A).  Participants were

randomly assigned to one of four conditions by using Qualtrics's block randomization

(Qualtrics, 2014): (i) mortality salience/violent media; (ii) no mortality salience/violent media condition; (iii) mortality salience and no violent media, or; (iv) a pure control group with neither mortality salience nor violent media exposure.

Participants in the mortality salience condition wrote about what they believed would happen as they die, as well as after they die (Appendix B; Greenberg et al., 1994). Participants in non-mortality salience conditions (violent media and non-violent media) wrote about dental pain as a control (Appendix C; Greenberg et al., 1994).

Participants were randomly assigned to either a violent or non-violent video-game condition. Participants in the violent condition played Mortal Kombat (Appendix D; Bushman & Anderson, 2002). Participants in the low violence conditions played a short game of Bowling Evolution 2.0 (Appendix E), a recently released bowling video game. Participants played the video games for 10-minutes.

Participants then completed the impulse control difficulties and lack of emotional awareness subscales of the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), which provided a time delay, allowing for the assessment of distal defenses to death-thoughts (Appendix F; Kugler & Cooper, 2010). Participants then completed the Lexical Decision Task (Appendix G; Greenberg et al., 1994) to assess death thought accessibility. All participants then completed the ambiguous vignette measures for a hostile attribution bias (Appendix H; Coccaro, Noblett, & McCloskey, 2009). Participants completed dependent measures asking about aggression towards out-group and in-group individuals. The order of these vignettes was counterbalanced to remove order effects. The vignettes describe a man that is a suspected terrorist, and asks

participants how much procedural harm they would be willing to inflict upon the man. Subsequently, individuals were prompted to answer various questions asking about the degree to which violence would be acceptable in his/her treatment, what punishment they would recommend to the individual, and if they, as participants, would willingly harm the individual in the story (Appendix I). These measures are adapted from Kugler and Cooper (2010).

Participants then completed the State Hostility Scale in order to assess aggressive cognitions (Appendix J; Anderson & Carnagey, 2009) and were probed for suspicions about the study. Specifically, participants were asked what they thought the study was about, if they have ever played the game in the study before, or had any difficulties completing the study. Participants were then debriefed by describing the purpose of the study, the scales that they completed, and the hypotheses that the data was used to test (Appendix K). Contact information was given to the participants in the debriefing form in case any of the participants have questions or concerns.

<u>Measures and Materials</u>

*Mortality salience prime and control.* In the mortality salience prime utilized in this study, participants wrote a short paragraph about their feelings of death, and their beliefs about what would happen as they die, and after they are dead (See Appendix B). Participants in the non-mortality salience condition completed a similar essay about dental pain (Appendix C). While no statistical information is available about the reliability of this prime, its use is common in the research (Greenberg et al., 1994; Greenberg et al., 2001).

*Emotion regulation.* The Difficulties in Emotion Regulation Scale (DERS)

(Appendix F) is a 36-item Likert type scale that contains items such as "I am confused

about how I feel"(Gratz & Roemer, 2004). For this study, due to time concerns, only two

subscales were used: impulse control difficulties (6 items) and lack of emotional

awareness subscales (6 items). The DERS had an internal consistency coefficient of .89

for impulse with item-total correlations ranging from $r=.54$ to $r=.74$; one item, "When

I'm upset, I feel like I can remain in control of my behaviors," was deleted due to poor

psychometric performance. The awareness subscale performed well, obtaining an internal

consistency coefficient .90, with item total correlations ranging from $r = .51$ to $r = .82$.

Participants rated each item on a scale of 1 to 5 (*almost never* to *almost always*).

*Death-thought accessibility.* The Lexical Decision Task (Appendix G) is a

categorization task in which 13 death related words, 13 non-words, and 13 random words

are sorted into two categories: word or non-word. The Lexical Decision Task has been

widely used as a measure of death-thought accessibility due to its simplicity and accuracy

(Greenberg et al., 1994; Kugler & Cooper, 2010; Vail III et al., 2012). In this task, the

participant categorized the 39 words according to whether it is a word or not. The

participant's reaction time was recorded for each word. According to previous research,

death related words have faster response times than other words, or non-words when

participants are primed with mortality salience. The mean reaction time for death-related

words was calculated to create a continuous scale (Greenberg et al., 1994).

*Hostile attribution bias.* The use of hostile attribution bias vignettes draws from

Social Information Processing research. The Social Information Processing-Attribution

and Emotional Response Questionnaire (SIP-AEQ) consists of a series of eight stories,

with five or six questions each (Appendix H; Coccaro et al., 2009).  For example, one

vignette from the SIP-AEQ reads:

> Imagine that you are in a karate class competition and you have to demonstrate
> your abilities to your instructor. You are matched up to ''fight" with someone in
> the class who you do not know well. While you are being evaluated, your karate
> classmate hits you in a way other than the way you were taught and you are hurt.
> Why do you think your classmate hit you in a way other than the way you were
> taught? (Coccaro et al., 2009, p. 923)

Participants then indicated whether the actions of the character in the vignette

were intended to hurt or exclude them.  Responses for each item were answered on a

scale of 1 (*Unlikely)* to 3 (*Likely)*, indicating hostile intentions. Hostile intention items

were averaged to form a scale to measure hostile attribution biases.  The SIP-AEQ

demonstrated an internal consistency coefficient of .83 for hostile attribution biases.

*Aggressive cognitions.*  The State Hostility Scale (Appendix J) is a 35-item Likert

type scale designed to measure hostility and aggressive cognitions.  Researchers use this

scale in studies utilizing the General Aggression Model (Anderson & Bushman, 2001).

The State Hostility Scale consists of four subscales (Anderson & Carnagey, 2009).  The

most applicable subscale for aggression research is the "feeling mean" subscale.

Analyses were conducted with this subscale, as it has previously shown the most

susceptibility to manipulation by violent video games (Anderson & Carnagey, 2009).

Participants indicate the extent to which emotion applies to them on a scale of 1 (*Strongly*

*Disagree*) to 5 (*Strongly Agree*).  The feeling mean subscale had an internal consistency

coefficient of .92.  This scale contains items such as "aggravated, discontented, mad, and

disagreeable".  The entire 35-item scale functions as a reliable measure of state hostility

and aggressive affect/cognitions and is widely used when examining aggression, though the "feeling mean" subscale is most often used in violent media research (Anderson & Carnagey, 2009).

*Endorsement of in- and out-group harm.*  These measures are adapted from Kugler and Cooper (2010).  In the endorsement of out-group harm measure (Appendix I), participants read a short description of a Saudi-Arabian individual arrested under suspected terrorism. They were asked to rate, on a scale of 1 (*none*) to 7 (*severe*) how much discomfort should be allowed in interrogation, how much force should be used, and if they would harm the suspected terrorist. This measure was an indicator for aggression towards an out-group individual.   The endorsement of in-group harm measure is conceptually the same as the out-group member's measure, although, participants instead read about a white American.  The endorsement of out-group harm scale exhibited an internal consistency coefficient of .86, whereas the endorsement of  in-group harm scale had an internal consistency coefficient of .85.  All participants were American citizens, and no participants were of Middle Eastern heritage.

Validity

This study may have suffered from selection effects, in that those interested in a survey about violent video games may have a higher than normal level of aggression, emotion regulation, and other potential differences, such as desire to play the video game, or a preference for either violent or non-violent games.  Participants may have experienced history effects in that many participants that choose to participate in the study may have already played violent video games previously. As data collection took

place face-to-face, participants were monitored to ensure that the tasks were completed appropriately, and were randomly assigned to the manipulations groups.

Ethics

      Participants viewed popular forms of media that are prevalent in the social realm, and any potential harm was likely no greater than what the participants may have experienced had they not decided to participate in the study.  All participation in the study was purely voluntary, and no more rigorous than normal social interactions or private leisure.  The researchers had no prior interaction with participants, and participants were free to withdraw from the study at any time.

      The researchers maintained data security and confidentiality to the maximum extent allowed by electronic communication, though the researchers cannot control for breaches that may be due to malicious software on the lab computers, or potential breaches of security in the Qualtrics servers.  The informed consent document informed participants of this exception prior to beginning the study, and instructed participants that they would complete various measures to examine the effects of media on cognitive tasks as a cover story in order to obscure the true purpose of the study, which may have altered participant response patterns.  All participants were allowed to discontinue the study at any point in time without penalty.  The researcher probed participants for what they thought about the study, and any issues they may have had in completing the study measures.  All participants were debriefed at the end of the study.  The debriefing script (Appendix K) included information about each of the measures, the purpose of the

measures, and the purpose of the study as a whole.  Participants were notified about the

true meaning of the study.

CHAPTER 3

RESULTS

Findings

The purpose of this study was to examine the effects of mortality salience and the

hostile attribution bias on out-group members, as primed for by violent video games.  As

such, many of the analyses focus upon participant's self-reported endorsement of

aggressive behavior based on their responses to the ethical dilemmas associated with a

true behavioral measure of aggressive behavior.  Furthermore, aggressive cognitions were

also measured, since past research showed a strong relationship between aggressive

cognitions and aggressive behavior.

Data Coding and Plan of Analysis

The DERS measure was coded to create a mean score of the two subscales of

emotion regulation that were utilized for moderation analyses as the two measures were

highly correlated ($r = .86$).  Individual items of the endorsement of aggression towards

out-group members scale, the aggressive cognitions measure, and the SIP-AEQ scale

were averaged to create a composite score for each variable (i.e., endorsement of out-

group harm/ in-group harm, aggressive cognitions, and hostile attribution biases,

respectively).  The mean of the items in the SIP-AEQ measure was used to form a

continuous measure of hostile attribution bias (Anderson & Bushman, 2001).  All scales

were coded such that higher numbers imply a more negative outcome (e.g. a 1 for

emotion dysregulation is positive, whereas a 5 is negative and implies participants are

more dysregulated). The researchers examined the data to probe for outliers, and none were found.

Preliminary Analyses

Prior to analyses, various descriptive and inferential analyses were performed. Specifically, descriptive statistics were run (Table 2), and correlations between the key study variables were examined (Table 3). Aggressive cognitions were significantly related to hostile attribution bias ($r = .28$, $p < .01$), and emotion dysregulation ($r = .29$, $p < .01$). Hostile attribution bias was significantly correlated with endorsed out-group harm ($r = .24$, $p < .01$) and in-group harm ($r = .27$, $p < .01$). As expected, in-group harm, was significantly related to out-group harm ($r = .93$, $p < .01$), suggesting that participants answered uniformly for both conditions. Order effects were examined for participants that viewed the out-group vignettes first and the in-group vignettes last ($t(162) = .373$, $p > .05$), and those that viewed the in-group vignettes first and out-group vignettes last ($t(163) = .837$, $p > .05$), indicating that there were no order effects.

Furthermore, reaction time measurements are typically log transformed due to heavily skewed data. The death-thought accessibility reaction time measure was examined for skew, and was minimally skewed and approximately normal. Therefore, the data were not log transformed, as this would increase the skewness of the data. The death-thought accessibility data, therefore, represent the raw reaction times of participants.

The effectiveness of the violent video game as a hostile attribution bias prime was also examined. A planned comparison was performed for hostile attribution bias with the

groups exposed to mortality salience primes or violent video games weighted at .333 and the control group weighted at -1.  No significant difference was found ($t$ (162) = -1.846, $p$ = .067, $d$ = -0.29).  This indicates that there were no significant differences in exhibited hostile attribution biases across the groups, however, the effects seem to be trending in that direction, such that the group exposed to violent video games and mortality salience ($M$ = 1.64), the mortality salience only group ($M$ = 1.54) and the violent game only group ($M$ = 1.58) exhibited similar levels of hostile attribution biases to the control group ($M$ = 1.67).

Moderation with Path Analysis

Path analysis with AMOS v.21 (Arbuckle, 2006) was used to examine the moderations.  The predictor and moderator were centered prior to being included in the path analysis model.  In each model, the centered predictor, the moderator, and interaction terms are regressed upon the criterion variable. To assess significant moderation, the interaction effect would have to be significant after controlling for the predictor and the moderator in the path analysis model.  Following each path analysis, significant interactions were graphed and a simple slopes analysis was conducted to determine significance of the moderator at high (+1SD) and low (-1SD) levels of the predictor, consistent with the procedure by Aiken and West (1991).

AMOS handles missing data with a procedure called full information maximum likelihood (FIML).  Although FIML does not actually impute data, this procedure produces estimates for missing data based on existing data and thus utilizes all available data (Graham, 2003).  FIML has been rigorously tested for imputation accuracy and has

been found to be robust, only requiring that data are missing at random or missing completely at random (Enders & Bandalos, 2001). FIML produces results comparable to multiple imputation routines, though some have found that FIML produces more accurate estimates due to its ability to accurately estimate standard error (Enders & Bandalos, 2001). Missing data were analyzed and found to be missing completely at random using Little's MCAR test ($\chi2 = 20.07$, $df = 14$, $p = 0.128$). The eight missing cases were found primarily within the violent video game conditions.

Death-Thought Accessibility Manipulation Check

*Research question 1*. The Lexical Decision Task also functions as a manipulation check for mortality salience in that a slow response time for death related words means any TMT specific dependent measures are likely to find no significant results, as the prime likely would not work. To examine violent video games as mortality salience prime, a planned comparisons test was examined for the four groups with death-thought accessibility as an outcome. The comparisons were conducted such that the first three groups were weighted against the control group (.333 for the first three groups, -1 for the control). The planned comparisons revealed that exposure to violent video games or mortality salience significantly increased death-thought accessibility when compared to a control group $t$ (162) = -2.034, $p = .044$, $d = -0.31$ (see Table 4, 5). This suggests that violent video games may prime for mortality salience.

The Effects of Mortality Salience and Violent Media on Endorsement of In- and Out-

Group Harm

   *Hypothesis 1: Endorsement of in- and out-group harm.*  Two 2 (Mortality

salience: Death prime vs. dental pain prime) x 2 (Video game: Violent vs. Non-violent)

between-groups Analysis of Variances (ANOVAs) were conducted to examine the effects

of violent video game play and mortality salience on the endorsement of in- and out-

group harm (see Table 6).  No overall main-effect of mortality salience or exposure to

violent video games was found; however, a significant interaction was found for

endorsement of out-group harm ($F$ (1,160) = 4.88, $p$ = .03, $\eta_p^2$ =.03) but not for

endorsement of in-group harm ($F$ (1,160) = 2.77, $p$ = .10, $\eta_p^2$ = .02). This suggests that

exposure to violent video games and mortality salience increased endorsed out-group

harm (Table 6), but not in-group harm.  In partial support of hypothesis 1a, those

exposed to both violent video games and a mortality salience prime ($M$ = 3.88, $SD$ =

1.49) exhibited a higher level of endorsed out-group harm, as compared to those who

were exposed to only violent video games ($M$ = 3.18, $SD$ = 1.24, $p$ = .02), or only

mortality salience ($M$ = 3.15, $SD$ = 1.28, $p$ = .03).  There were no significant differences

between the control group ($M$ = 3.55, $SD$ = 1.42, $p$ = .14) and any of the other three

groups (see Table 7).  Furthermore, in partial support of hypothesis 1b, participants

primed with only mortality salience ($M$ = 3.16, $SD$ = 1.22, $p$ = .94) showed no significant

differences with the control group ($p$ = .36), but did show significantly less endorsement

than participants that played violent video games, and were primed with mortality

salience ($p$ = .03). In partial support of hypothesis 1c, participants that played a violent

video game, but were not primed with mortality salience ($M = 3.18$, $SD = 1.24$) exhibited

a similar pattern, such that there were no significant differences with a control group ($p =$

.44), but did show significantly less endorsement of aggressive behavior than participants

exposed to both mortality salience and violent video games ($p = .03$). There were no

significant differences in endorsed in-group harm, indicating that hypothesis 1d is

supported by the data.

The Moderating Effects of Emotion Regulation

*Hypotheses 2-3: The moderating role of emotion regulation for hostile attribution*

*biases and death-thought accessibility on endorsement of out-group harm.* Path analysis

was used to examine the moderating role that levels of emotion dysregulation may have

upon both the relationship between hostile attribution bias and death-thought accessibility

on the endorsement of aggressive behavior. While a hostile attribution bias functioned as

a significant predictor of endorsement of aggressive behavior ($\beta = .27$, $p < .05$), emotion

dysregulation did not (see Table 8). Similarly, no significant interaction between emotion

regulation and either hostile attribution biases, or death-thought accessibility was found

in relation to endorsed out-group harm.

*Hypothesis 4: The moderating role of emotion regulation for the relation of*

*hostile attribution biases and aggressive cognitions.* There was a significant interaction

between emotion dysregulation and hostile attribution biases in the prediction of

aggressive cognitions (see Table 9). Together with hostile attribution biases, emotion

dysregulation, and the interaction explained 14.6% of the variance. Specifically, emotion

dysregulation was found to moderate the effects of hostile attribution biases on

aggressive cognitions, and the interaction ($\beta$ =.16, $p < .05$) independently accounted for 2.3% of the variance in aggressive cognitions. As seen in Figure 1, individuals with high levels of hostile attribution biases and high emotion regulation reported more aggressive cognitions (See Table 9). At high levels of emotion regulation, there was no relationship between hostile attribution biases and aggressive cognitions. However, when individuals were more dysregulated (low levels of emotion regulation), hostile attribution biases were positively associated with aggressive affect ($p < .05$; see Figure 1). The data, therefore supports hypothesis 4.

*Hypothesis 5: The moderating role of emotion regulation for death-thought accessibility on aggressive cognitions.* DTA was used as a continuous variable where low numbers mean high DTA. Lower numbers indicate a relatively more successful prime for mortality salience. There was a significant interaction between DTA and emotion regulation in the prediction of aggressive cognitions ($\beta = -.19$, $p < .05$; see Table 10), indicating that moderation occurred. The model taken together explained 7% of the variance in aggressive cognitions, and the interaction explained 3% of the variance in aggressive cognitions. As seen in Figure 2, at high levels of death-thought accessibility, participants who were dysregulated reported higher aggressive cognitions than those who had high levels of emotion regulation. Among participants with low levels of DTA, there was no difference between the groups. This lends support to hypothesis five. Further analyses indicated that this effect may be driven by the emotional awareness subscale. There was a significant interaction between DTA and a lack of emotional awareness in the prediction of aggressive affect ($\beta = -1.18$, $p < .05$; see Table 11). The model taken

together explained 4% of the variance in aggressive affect and the interaction explained

.6% of the variance in aggressive cognitions. As seen in Figure 3, at high levels of death-

thought accessibility, those who were less aware of their emotions exhibited more

aggressive cognitions ($p < .01$). However, as death-thought accessibility weakened, there

was not much difference between the groups.

The Moderating Effects of Gender

    *Hypotheses 6-9: The moderating effects of gender on death-thought accessibility,*

*and hostile attribution biases, when predicting endorsement of out-group harm and*

*aggressive cognitions.* Much research has previously supported a different approach to

expression of aggression between men and women, such that men tend to act out more

aggressively in a physical rather than relational manner (Bartlett et al., 2009). As such, it

was expected that gender would moderate the relationship between a hostile attribution

bias, and the endorsement of aggressive behavior, as well as the relationship between a

hostile attribution bias and aggressive cognitions. Similar to hypotheses 2-5, a path

analysis was conducted with the centered variables of the predictor and the moderator.

While the path analysis supported a relationship between a hostile attribution bias and

aggressive cognitions/endorsement of aggressive behavior, there appeared to be no

significant interaction between gender and hostile attribution biases when predicting

either endorsement of out-group harm ($\beta = .03$, $p > .05$; see Table 12) or aggressive

cognitions ($\beta = .05$, $p > .05$; see Table 13). There were, similarly, no significant

interactions between death-thought accessibility and gender when predicting endorsement

of out-group harm ($\beta$ =-.08, $p$ > .05; see Table 14) or aggressive cognitions ($\beta$ =.04, $p$ >

.05; see Table 15).  As such, hypothesis 6-9 are not supported by the data.

<u>Additional Analyses</u>

Furthermore, an interaction between exposure to violent video games and

mortality salience primes was assessed as a function of endorsed aggressive behavior in a

path analysis model. Results were graphed similar to the procedure by Aiken and West

(1991).  Conceptually this analysis is an alternative way of testing hypothesis 1, that

exposure to violent video games and mortality salience primes would lead to an increase

in endorsement of out-group harm.  The above analysis was conducted primarily to

examine the relationship between exposure to violent video games and mortality salience

primes across all observed levels of such stimuli, as well as to examine the effects of

handling missing data using FIML (Graham, 2003).  A significant interaction was found

($\beta$ =.17, $p$ < .05; see Table 16).  As a whole, the model explained 4% of the variance,

with the interaction term alone accounting for 3% of the variance.  As shown in Figure 4,

participants that were exposed to both violent video games and mortality salience primes

reported the highest level of endorsed out-group harm ($p$ < .05; see Table 16).  This

finding lends further support to hypothesis 1.

CHAPTER 4

DISCUSSION

Summary

One purpose of the current study was to explore the effects of violent video games, mortality salience, and their joint effect on endorsed out-group and in-group harm. Consistent with hypothesis 1, violent video games and mortality salience interacted, resulting in an increased endorsement for out-group harm, compared to the groups exposed to violent video games or mortality salience separately, but not the control group.  The control group was not significantly different from the other groups. This finding could be indicative of boredom or frustration with the study (or video game), or acquiescence on the part of the control group participants. Furthermore, few of the measures likely made sense to the control group, as there was no unifying theme to the materials in this group.  Previous research has indicated that violent media increases aggressive cognitions and behavior (Anderson & Bushman, 2001), however, Bushman and Anderson (2002) also posit that frustration can lead to similar increases.

This study explored the moderating effects of emotion regulation in both hostile attribution biases and death-thought accessibility.  Emotion regulation functioned as a moderating factor between hostile attribution biases and aggressive cognitions (see Table 17 for hypotheses and findings summary).  Similarly, emotion regulation also moderated the relationship between death-thought accessibility and aggressive cognitions.  Emotion regulation provided a protective effect from either hostile attribution biases or death-thought accessibility in relation to aggressive cognitions, similar to previous research

(Anderson & Bushman, 2001; DeWall & Anderson, 2011; Lemerise & Arsenio, 2000). Emotion regulation and the role that it plays in interacting with aggressive thoughts and behaviors has often not been a focal point of research on mortality salience and death-thought accessibility. As demonstrated in this study, the role that emotion regulation plays in controlling aggression represents a viable focal point for reducing aggressive behavior and aggressive affect, at least when such aggressive affect stems from a hostile attribution bias or exposure to violent media.

Furthermore, this study replicated a major part of social information processing theory, and a central piece to the General Aggression Model. Hostile attribution biases played a central role in predicting both aggressive cognitions, and the endorsement of out-group harm; however, it did not seem that violent video game play or mortality salience prime exposure necessarily primed for hostile attribution biases, although the effects trended in that direction.

This study explored the novel role of violent video games as a mortality salience primes. Violent video games were also examined as a mortality salience prime. The mean differences in death-thought accessibility seem to be consistent with previous literature, and a planned comparisons analysis indicated that participants that played violent video games exhibited significantly higher death-thought accessibility than participants in a control group did. Violent video games priming for mortality salience may lead to a further increase in endorsed aggressive behavior towards out-group members, as well as the previously discussed mortality salience effects (Greenberg & Arndt, 2012). This may mean that out-group members would be targeted more often and

perhaps more harshly than in-group members in terms of aggressive behavior (Greenberg & Arndt, 2012).

This study also failed to find evidence of gender as a moderating factor in the relation between death-thought accessibility and aggressive cognitions or endorsed out-group harm. Likewise, gender did not moderate the relation of hostile attribution bias with aggressive cognitions or endorsed out-group harm.  Similarly, there were no gender differences in endorsed out-group harm, endorsed in-group harm, or aggressive cognitions.  Previous research on gender differences has been somewhat mixed, especially when behavioral measures of aggression are not used (Eagly & Steffen, 1986). As discussed previously, males tend to be more overtly aggressive, whereas females tend to be more relationally and instrumentally aggressive (Carnagey et al., 2006).  This may be the case with the current study findings, as no behavioral measure of aggression was used.  In the case of the present study, the endorsement of aggressive behavior primarily represents procedural, instrumental aggression.  As such, it may be that men and women are equally aggressive when such actions are hidden behind procedural actions taken by third-party members, such as police officers and other officials, especially when such actions can be deemed just and excusable by the actions of the suspected terrorist in the vignettes.  Simply, this endorsement of aggressive behavior may be further increased (beyond exposure to violent media and primes) by the perception that such aggression is warranted, or even necessary.  Indeed, previous literature on prejudice and discrimination has shown notable increases in discriminatory behavior when such actions can be

excused by procedural, seemingly commonplace circumstances (Nail, Harton, & Decker, 2003).

<center>Strengths</center>

This study represents novel research concerning not only violent video games and their effects, but also puts forth novel findings that contribute to the terror management theory literature. Perhaps one of the most important findings from this study is the effect that emotion regulation skills, specifically an increased awareness of one's emotions, have for buffering against aggressive thoughts, feelings, and behaviors stemming from both hostile attribution bias and mortality salience. Previous research has looked primarily at general emotion regulation skills, and how they might affect aggression overall (Lemerise & Arsenio, 2000). Research has not previously examined emotional awareness, but rather simply emotion suppression (Greenberg & Arndt, 2012). This finding may serve to further elucidate the relationship that exists between thoughts of death, and the ways that mortality salience effects might be successfully buffered. Due to this, care should be given to the focus upon emotion regulation skills as a manner of diminishing aggressive outcomes.

Furthermore, this study found that it is possible that violent video games prime for mortality salience. If this is the case, pending future replication, it would mark one of the earliest instances that this effect has been examined. Provided violent video games do indeed prime for mortality salience, this would, theoretically, mean that the prevalence of mortality salience effects is far more widespread than was previously considered. Indeed, violent video game research, often does not concern itself with mortality salience effects,

despite the often-violent imagery depicting gruesome deaths. Such a priming effect may lend insight into the domain of online aggression, as when an individual is somewhat anonymous, as is the case in many online games. From a terror management perspective, this would serve to make the out-group much larger, leading to far more aggressive and violent behaviors than would have been previously theorized. As such, future research, especially that examining online or anonymous aggression using violent video games as stimuli material should carefully consider mortality salience effects.

Beyond the novel contributions of this study, there was also replication of previous research. The violent video game literature has a long history (Anderson et al., 2010); this study sought to examine these effects further, and has concluded with mixed support. For instance, the current study found more evidence for violent video games increasing some forms of aggression, such as aggressive cognitions and endorsed aggressive behavior. While no moderating effects of gender were shown in this study, it is likely that it is due to the manner in which the aggressive outcomes were presented, which served to equalize reported aggression amongst the genders. Furthermore, this study further expanded upon the literature examining emotion regulation and its relationship with hostile attribution biases and mortality salience.

This study tells the complex story of how mortality salience primes and violent video games interact to produce aggressive outcomes (i.e. aggressive behavior and cognitions). As violent video games seem to prime for mortality salience, there seems to be substantial overlap between mortality salience effects (Greenberg & Arndt, 2012) and the aggressive outcomes from the GAM (Bushman & Anderson, 2002). Importantly,

however, these effects also seem to be moderated by emotion regulation, which acts as a protective buffer against the otherwise negative influences of mortality salience and hostile attribution biases.

## Limitations

One limitation is that although participants played violent video games, many of the participants were likely to be unfamiliar with gaming in general, especially those involving violence.  Indeed, over 70% of the sample indicated that they played less than an hour per week.  This unfamiliarity may lead to participants focusing too much on the mundane aspects of controlling the game characters, and less upon their behaviors and events in the game, despite the brief training paragraph prior to the game starting. Indeed, several participants seemed to have trouble controlling the character, or understanding the objectives of the game, despite instruction.  This may represent itself in a number of ways:  the game may be a source of frustration to the player, and thus, increase aggressive ideation (Bushman & Anderson, 2002), or the difficulty of the game may have caused some participants to simply "tune out."  While the study is designed to measure aggressive ideation, frustration due to the tasks in the study itself may not accurately represent the true effects of violent video game play or death-thought accessibility.  Furthermore, the length of the study and the unfamiliarity that some participants may have with video games may have led to an increase in test fatigue, thereby reducing the quality of data. Future research could account for prior familiarity with video games by utilizing it as a control variable in key study analyses.

This study relied heavily upon reaction time measures. Due to the nature of Qualtrics as a web-hosted survey engine, fluctuations in internet speed and response latency of the computers may have unduly influenced participant reaction times. Indeed, given that the mean response time for participants reacting to death-related words is .90 seconds, internet latency or simple bodily functions such as itching or taking one's hands of the keyboard may sufficiently alter response times, leading to inaccurate data. This may have been resolved by utilizing a client side reaction time program, such as DirectRT (Empirisoft, 2014). Beyond the influences of various sources of error in the death-thought accessibility measure, the sample size is somewhat small to detect significance across a similar set of tasks. That being said, reaction times were also analyzed for non-words ($t$ (162) = -.945, $p$ = .35) and regular words ($t$ (162) = -.877, $p$ = .38), finding no significance.

Indeed, several of the non-significant effects were, in fact, marginal, suggesting that there may simply be insufficient power to examine them fully. Unfortunately, due to insufficient participant involvement, more data could not be collected in a timely manner. Furthermore, given the need for a true comparison of in-group and out-group harm, the researchers needed to collect data on both. As discussed in the results section, there seemed to be no demand characteristics, perhaps indicating that the vignette itself was influencing ratings of endorsed out-group harm by categorizing the individual in the vignette as a "suspected terrorist." This may have led participants to presume guilt, and therefore be in need of punishment.

Furthermore, due to the limited availability of time and participants, there are several variables that were not examined in the current study, such as competitiveness, trait anger, and behavioral measures of aggression. These variables are likely to account for some of the variance between the groups, and may indeed function as mediators or moderators of the observed relationships.

Participants were given the demographics questionnaire as the first measure in the study. The demographics questionnaire asked participants about their media usage, as well as their violent media usage. This may have tipped some participants off to the true nature of the study. The researcher probed participants for their thoughts about the study. While some (approximately 10%) of participants indicated that the study may have had something to do with aggression, the vast majority (approximately 70% of the sample) indicated that they thought the study had something to do with emotions. None of the participants guessed specifically what the study was aiming to examine, but suspicion towards the true nature of the study may have influenced the results to some degree.

<u>Future Research</u>

Although this study was a notable contribution, much remains to be done when examining the effects of violent video games, aggression, and emotion regulation. Future research should consider utilizing standardized behavioral measures of aggression. Furthermore, more recent and realistic video games may provide a more robust stimulus that is also more representative of the video games that people play today. Indeed, while Mortal Kombat was chosen due to its use in previous literature as a stereotypically violent video game, future research may consider using more easily playable video

games, as several of the participants had difficulty in controlling their character adequately, or using multiple violent video games with varied control schemes to assess the effects of control on aggression.

In an effort to strengthen the methodology of future research, one may consider using a console such as the Xbox One or Xbox 360 due to the popularity of console games compared to PC. Participants would likely be more familiar with the control scheme of a console, and be able to more accurately maneuver their characters. The use of a console also opens up a variety of new games that may fit modern gaming habits. In particular, future researchers may consider using a game such as "Red Dead Redemption" that contains both violent and non-violent segments within the same game. This would help to keep the virtual environment and relative difficulty of the games closer to equal, thereby allowing for a more accurate comparison of the effects of violent vs. non-violent video games. Furthermore, future research may attempt to assess control conditions with prosocial video games, such as "Super Mario Sunshine" (Saleem, Anderson, & Gentile, 2012). This would allow a for a comparative assessment between the negative (aggressive) and positive (prosocial) effects that video game play may have on gamers, and perhaps allow for modifications to violent games to reduce the negative psychological and social effects that they may bring.

Future research should also consider using a different program to measure reaction time, and multiple measures of death-thought accessibility. Due to the nature of internet latency, responses are likely to higher than typical reaction time measures that are administered from a local computer, as opposed to a distant server. Indeed, given

even the moderate latency that is experienced when using Qualtrics, there are also various latency issues when considering browser choice, as some browsers simply load webpages faster (e.g. Chrome vs. Internet Explorer). While these issues were controlled for as much as possible (browser kept constant, etc.), future research may find it simpler to use DirectRT (Empirisoft, 2014) or a similar program that can make far more accurate and reliable reaction time measurements.

Future research may also consider piloting the word list for the lexical decision task to reduce the number of categorization errors, as such errors could negatively influence results. The verbal abilities of participants should also be considered in such research, as such cognitive skills may lead to inaccurate reaction time readings and an increase in categorization errors. A more expansive assessment of death-thought accessibility should also be used. Past research (Greenberg & Arndt, 2012) has utilized word-stem tasks and other, more direct measures of death-thought accessibility.

Further studies should also consider obtaining a community sample. The differences in general worldview are substantial between college and community samples, however, a community sample that is representative of the average video game player (25-35 years of age; Entertainment Software Association [ESA], 2013) may provide much more interesting, and indeed, generalizable results when compared to a college sample. Furthermore, researchers may find it useful to target a gamer population to ensure at least some level of familiarity with video game play. This would ensure that any results found are due to the games themselves, rather than frustration amongst some participants due to unclear objectives, or manual control difficulties. Indeed, to skirt

around the issue of control difficulties, one may consider a guided action game where movement is handled by the computer while players perform other on-screen actions such as shooting.

<div align="center">Concluding Remarks</div>

Regardless of the limitations of this study, violent media, and even more specifically, consumption of violent media is a continued issue both in the science of psychology, as well as in the public at large. President Obama recently announced a call for more research into the effects of violent video games and other violent media (Molina, 2013). A novel, detailed understanding of the influence that these forms of media can have upon individuals in society, and in the culture at large is paramount to the progress of the field, as well as understanding the effects that media may have upon the population, and the pathways that may contribute to these effects.

This study supports the buffering effects of emotion regulation. Policy makers should consider providing funding for the implementation of therapy focusing on emotion regulation strategies for individuals exhibiting aggressive behaviors in an effort to diminish such outcomes. Counselors may find it fruitful to implement behavioral intervention strategies to increase emotion regulatory skills. As the consumption of violent media rises, viewers may become primed with mortality salience and hostile attribution biases, putting them at risk for an increase in aggressive tendencies. An intervention strategy focusing upon the improvement of emotion regulatory skills may serve to reduce the influence of the rising use of aggressive media.

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Table 1.
*Demographics characteristics of participants.*

| $N = 148$ | *Percentage of Sample* | *M* |
|---|---|---|
| Variable | | |
| Age | | 18.91 (1.30) |
| Ethnicity - European American | 90.0 | |
| Ethnicity - African American | 2.0 | |
| Ethnicity - Hispanic American | 3.3 | |
| Ethnicity - Asian American | 2.7 | |
| Sex - Male | 34.7 | |
| Sex - Female | 62.7 | |
| English First Language | 94.6 | |
| Year in School – Freshman | 70.2 | |
| Year in School – Sophomore | 16.1 | |
| Year in School – Junior | 5.4 | |
| Year in School – Senior | 6.0 | |

*Note.* Standard deviation is presented in parentheses.

Table 2.
*Descriptive statistics of study measures.*

|  | M | SD | Min | Max | Range |
|---|---|---|---|---|---|
| Death-thought accessibility | .87 | .38 | .70 | 1.22 | .52 |
| Aggressive cognitions | 1.66 | .61 | 1.00 | 3.92 | 2.92 |
| Endorsed out-group harm | 3.40 | 1.42 | 1.00 | 7.00 | 6.00 |
| Endorsed in-group harm | 3.38 | 1.41 | 1.00 | 7.00 | 6.00 |
| Hostile attribution biases | 1.61 | .25 | 1.10 | 2.27 | 1.17 |
| Emotion dysregulation | 2.29 | .65 | 1.00 | 4.36 | 3.36 |
| Emotional Awareness | 2.84 | .96 | 1.17 | 5.00 | 3.83 |

*Note.* All measures other than death-thought accessibility range in possible response from 1-7.

Table 3.

*Correlations between key study variables*

| | Death-thought accessibility | Aggressive cognitions | Endorsed out-group harm | Endorsed in-group harm | Hostile attribution biases | Emotion dysregulation | Emotional awareness |
|---|---|---|---|---|---|---|---|
| Death-thought accessibility | -- | | | | | | |
| Aggressive cognitions | .01 | -- | | | | | |
| Endorsed out-group harm | -.10 | .01 | -- | | | | |
| Endorsed in-group harm | -.07 | -.01 | .93** | -- | | | |
| Hostile attribution biases | .02 | .28** | .24** | .27** | -- | | |
| Emotion dysregulation | -.05 | .29** | .03 | .01 | .29** | -- | |
| Emotional awareness | -.07 | .09 | .00 | -.03 | .11 | .86** | -- |

*Note.* **. Correlation is significant at the 0.01 level (2-tailed).

Table 4.
*Planned Comparisons of group on death-thought accessibility.*

|  | Value of Contrast | SE | t | df | p |
|---|---|---|---|---|---|
| Death-thought accessibility | -.1323 | .06506 | -2.034 | 162 | .044 |

*Note.* Groups were equally weighted such that conditions exposed to violent video games or mortality salience were each given a weighting of .333, and the control group was given a weighting of -1.

Table 5.
*Group means of death-thought accessibility by condition*

|  | N | Mean | Std. Deviation |
| --- | --- | --- | --- |
| Violent video game and mortality salience | 37 | .88 | .22 |
| Mortality salience only | 46 | .88 | .19 |
| Violent video game only | 36 | .89 | .21 |
| Control | 47 | 1.10 | .63 |

Table 6.
*2 x 2 factorial ANOVA of endorsed out- and in-group harm.*

| Source | Dependent Variable | Sum of squares | Mean Square | df | F | p | $\eta_p^2$ |
|---|---|---|---|---|---|---|---|
| Exposure to violent video games | Endorsed out-group harm | 2.39 | 2.39 | 1 | 1.22 | .27 | .01 |
| Exposure to mortality salience primes | Endorsed out-group harm | 1.94 | 1.94 | 1 | .99 | .32 | .01 |
| Interaction | Endorsed out-group harm | 9.59 | 9.59 | 1 | 4.89 | .03 | .03 |
| Error | Endorsed out-group harm | 314.13 | 1.96 | 160 | | | |
| Total | Endorsed out-group harm | 327.36 | | 163 | | | |
| Exposure to violent video games | Endorsed in-group harm | 1.44 | 1.44 | 1 | .725 | .40 | .01 |
| Exposure to mortality salience primes | Endorsed in-group harm | .530 | .530 | 1 | .268 | .61 | .00 |
| Interaction | Endorsed in-group harm | 5.48 | 5.48 | 1 | 2.77 | .10 | .02 |
| Error | Endorsed in-group harm | 316.60 | 1.98 | 160 | | | |
| Total | Endorsed in-group harm | 323.81 | | 163 | | | |

*Note*. Interaction is defined as exposure to violent video games x Exposure to mortality salience primes.

Table 7.
*LSD post-hoc group comparison of endorsed of out-group harm.*

| (I) Grouping Variable | (J) Grouping Variable | Mean Difference (I-J) | Std. Error | 95% Confidence Interval for Difference | |
|---|---|---|---|---|---|
| | | | | Lower Bound | Upper Bound |
| Violent and Mortality Salience | Non-violent and Mortality Salience | .72* | .33 | .08 | 1.37 |
| | Violent and no Mortality Salience | .71* | .33 | .05 | 1.36 |
| | Control | .33 | .33 | -.31 | .98 |
| Non-violent and Mortality Salience | Violent and Mortality Salience | -.72* | .33 | -1.37 | -.08 |
| | Violent and no Mortality Salience | -.01 | .33 | -.67 | .64 |
| | Control | -.39 | .33 | -1.03 | .26 |
| Violent and no Mortality Salience | Violent and Mortality Salience | -.71* | .33 | -1.36 | -.05 |
| | Non-violent and Mortality Salience | .01 | .33 | -.64 | .67 |
| | Control | -.37 | .33 | -1.03 | .28 |
| Control | Violent and Mortality Salience | -.33 | .33 | -.98 | .31 |
| | Non-violent and Mortality Salience | .39 | .33 | -.26 | 1.03 |
| | Violent and no Mortality Salience | .37 | .33 | -.28 | 1.03 |

*Note.* * $p < 0.05$, two-tailed test

Table 8.

*Path Analysis Model examining the moderating effects of emotion regulation on hostile attribution biases and endorsed out-group harm.*

| Variable | Unstandardized Coefficients | | Standardized Coefficients | Sig. | $R^2$ |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Hostile Attribution Bias | 1.51* | .48 | .27 | .00 | .06 |
| Emotion Dysregulation | -.10 | .18 | -.05 | .57 | .00 |
| Interaction | .20 | .62 | .03 | .75 | .00 |
| Total | | | | | .06 |

*Note*: Interaction is defined as Hostile attribution bias x Emotion dysregulation.

Dependent Variable: Endorsed out-group harm

* p <0.05, two-tailed test ** p <0.001, two-tailed test

Table 9.

*Path Analysis Model examining the moderating effects of emotion dysregulation on hostile attribution biases and aggressive cognitions.*

| Variable | Unstandardized Coefficients | | Standardized Coefficients | Sig. | $R^2$ |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Hostile Attribution Bias | .66** | .20 | .27 | .00 | .08 |
| Emotion Dysregulation | .20* | .07 | .21 | .01 | .08 |
| Interaction | .53* | .25 | .16 | .04 | .01 |
| Total | | | | | .15 |

*Note*: Interaction is defined as Hostile attribution biases x Emotion dysregulation.

Dependent Variable: Aggressive Cognitions

* p <0.05, two-tailed test ** p <0.001, two-tailed test

Table 10.

*Path Analysis Model examining the moderating effects of emotion dysregulation on death-thought accessibility and aggressive cognitions.*

| Variable | Unstandardized Coefficients | | Standardized Coefficients | Sig. | $R^2$ |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Death-thought accessibility | .17 | .15 | .09 | .25 | .01 |
| Emotion Dysregulation | .23** | .09 | .20 | .01 | .04 |
| Interaction | -.19* | .09 | -.17 | .03 | .02 |
| Total | | | | | .07 |

*Note*: Interaction is defined as Death-thought accessibility x Emotion dysregulation.

Dependent Variable: Aggressive Cognitions

* p <0.05, two-tailed test ** p <0.001, two-tailed test

Table 11.

*Path Analysis Model examining the moderating effects of lack of emotional awareness on death-thought accessibility and aggressive cognitions.*

| Variable | Unstandardized Coefficients | | Standardized Coefficients | Sig. | $R^2$ |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Death-thought accessibility | 1.97* | .79 | 1.00 | .01 | .01 |
| Lack of Emotional Awareness | .63* | .26 | .81 | .02 | .01 |
| Interaction | -.67* | .28 | -1.18 | .02 | .00 |
| Total | | | | | .04 |

*Note*: Interaction is defined as Death-thought accessibility x Lack of emotional awareness.

Dependent Variable: Aggressive Cognitions

* p <0.05, two-tailed test ** p <0.001, two-tailed test

Table 12.

*Path Analysis Model examining the moderating effects of gender on hostile attribution biases and endorsed out-group harm.*

| Variable | Unstandardized Coefficients | | Standardized Coefficients | Sig. | $R^2$ |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Hostile attribution biases | 1.32[*] | .43 | .234 | .00 | .06 |
| Gender | .27 | .23 | .09 | .23 | .01 |
| Interaction | .31 | .90 | .03 | .73 | .00 |
| Total | | | | | .07 |

*Note*: Interaction is defined as Hostile attribution biases x Gender.

Dependent Variable: Endorsed out-group harm

* p <0.05, two-tailed test ** p <0.001, two-tailed test

Table 13.

*Path Analysis Model examining the moderating effects of gender on hostile attribution biases and aggressive cognitions.*

| Variable | Unstandardized Coefficients | | Standardized Coefficients | Sig. | $R^2$ |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Hostile attribution biases | .67 | .18 | .28 | .00 | .08 |
| Gender | .01 | .10 | .01 | .89 | .00 |
| Interaction | .24 | .38 | .05 | .53 | .00 |
| Total | | | | | .08 |

*Note*: Interaction is defined as Hostile attribution biases x Gender.

Dependent Variable: Aggressive Cognitions

* $p < 0.05$, two-tailed test ** $p < 0.001$, two-tailed test

Table 14.

*Path Analysis Model examining the moderating effects of gender on death-thought accessibility and endorsed out-group harm.*

| Variable | Unstandardized Coefficients | | Standardized Coefficients | Sig. | $R^2$ |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Death-thought accessibility | -.59 | .37 | -.16 | .11 | .01 |
| Gender | .38 | .23 | .13 | .10 | .01 |
| Interaction | -.77 | .94 | -.08 | .41 | .00 |
| Total | | | | | .03 |

*Note*: Interaction is defined as Death-thought accessibility x Gender.

Dependent Variable: Endorsed out-group harm

* $p < 0.05$, two-tailed test ** $p < 0.001$, two-tailed test

Table 15.

*Path Analysis Model examining the moderating effects of gender on death-thought accessibility and aggressive cognitions.*

| Variable | Unstandardized Coefficients | | Standardized Coefficients | Sig. | $R^2$ |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Death-thought accessibility | .05 | .16 | .03 | .74 | .00 |
| Gender | .05 | .10 | .04 | .65 | .00 |
| Interaction | .16 | .41 | .04 | .70 | .00 |
| Total | | | | | .00 |

*Note*: Interaction is defined as Death-thought accessibility x Gender.

Dependent Variable: Aggressive Cognitions

* $p < 0.05$, two-tailed test ** $p < 0.001$, two-tailed test

Table 16.

*Path Analysis Model examining the moderating effects of exposure to violent video games on mortality salience and endorsed out-group harm.*

| Variable | Unstandardized Coefficients | | Standardized Coefficients | Sig. | $R^2$ |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Mortality salience | .16 | .22 | .06 | .47 | .00 |
| Exposure to violent video games | .24 | .22 | .08 | .28 | .01 |
| Interaction | .98* | .44 | .17 | .03 | .03 |
| Total | | | | | .04 |

*Note*: Interaction is defined as Mortality salience x Exposure to violent video games.

Dependent Variable: Endorsed out-group harm

* p <0.05, two-tailed test ** p <0.001, two-tailed test

Table 17.

*Hypotheses and results.*

| | Hypothesis | Supported |
|---|---|---|
| H1 | The group exposed to violent video games and mortality salience will differ from the other groups. | Supported |
| H2 | Emotion regulation will moderate the relationship between hostile attribution biases and endorsed out-group harm. | Not supported |
| H3 | Emotion regulation will moderate the relationship between death-thought accessibility and endorsed out-group harm. | Not supported |
| H4 | Emotion regulation will moderate the relationship between hostile attribution biases and aggressive cognitions. | Supported |
| H5 | Emotion regulation will moderate the relationship between death-thought accessibility and aggressive cognitions. | Supported |
| H6 | Gender will moderate the relationship between hostile attribution biases and endorsed out-group harm. | Not supported |
| H7 | Gender will moderate the relationship between death-thought accessibility and endorsed out-group harm. | Not supported |
| H8 | Gender will moderate the relationship between hostile attribution biases and aggressive cognitions. | Not supported |
| H9 | Gender will moderate the relationship between death-thought accessibility and aggressive cognitions. | Not supported |
| RQ1 | Violent video games will act as a mortality salience prime. | Supported |

*Figure 1.*
Simple slopes analysis of hostile attribution biases and emotion dysregulation on aggressive cognitions.
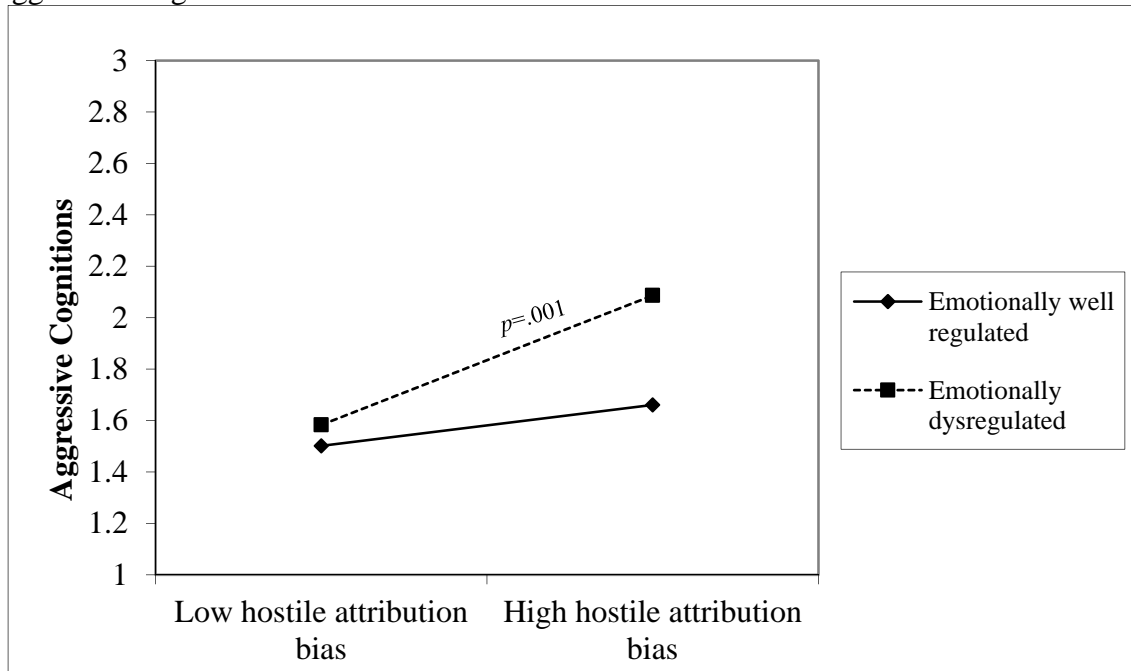


*Note*: The simple slopes analysis of hostile attribution bias and emotion regulation on aggressive affect. *p*=.001.

*Figure 2.*
Simple slopes analysis of death-thought accessibility and emotion dysregulation on aggressive cognitions.
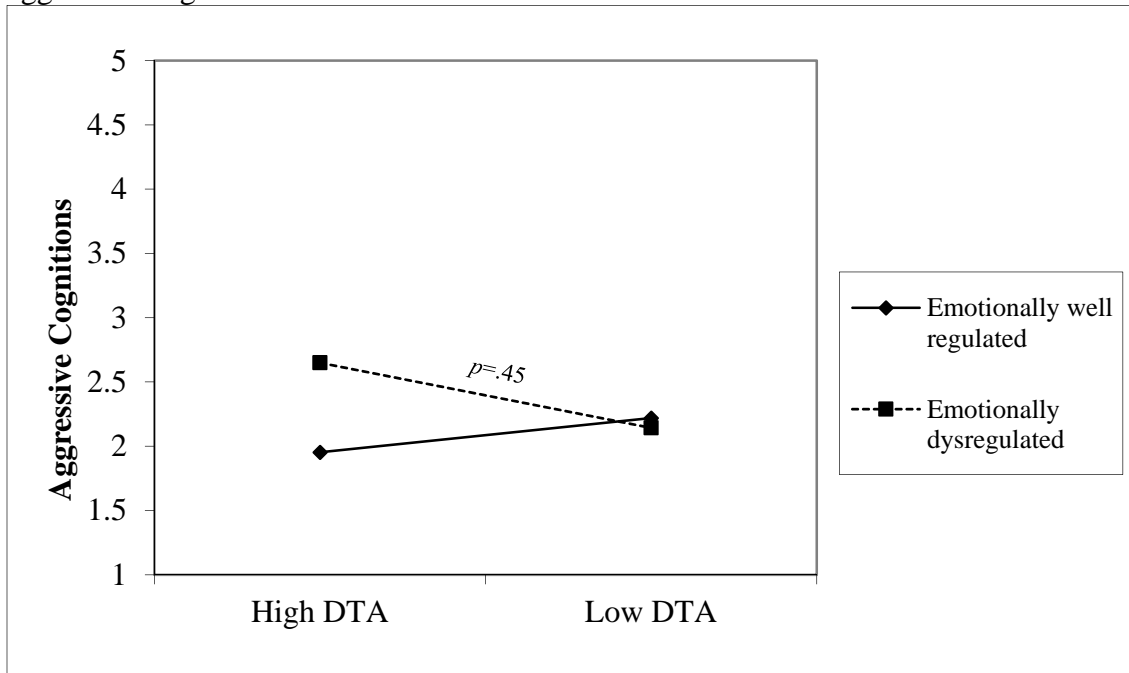


*Note*: The simple slopes analysis of death thought accessibility and emotion regulation on aggressive cognitions. Response latency is the time in seconds it took participants to categorize death related words. Lower response latency numbers indicate a successful prime. *p*=.45.

*Figure 3.*
Simple slopes analysis of death-thought accessibility and emotional awareness on aggressive cognitions.
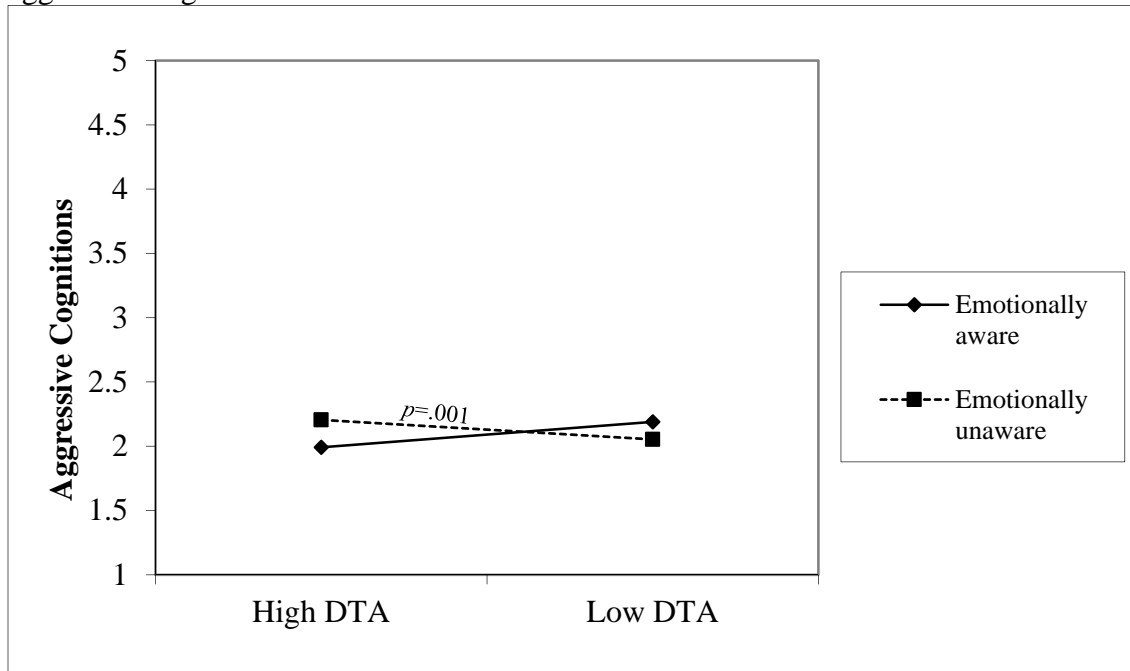


*Note*: The simple slopes analysis of death thought accessibility and emotional awareness on aggressive cognitions. Response latency is the time in seconds it took participants to categorize death related words. Lower response latency numbers indicate a successful prime. *p*=.001.

*Figure 4.*
The simple slopes analysis of violent game exposure and mortality salience prime exposure to endorsed out-group harm.
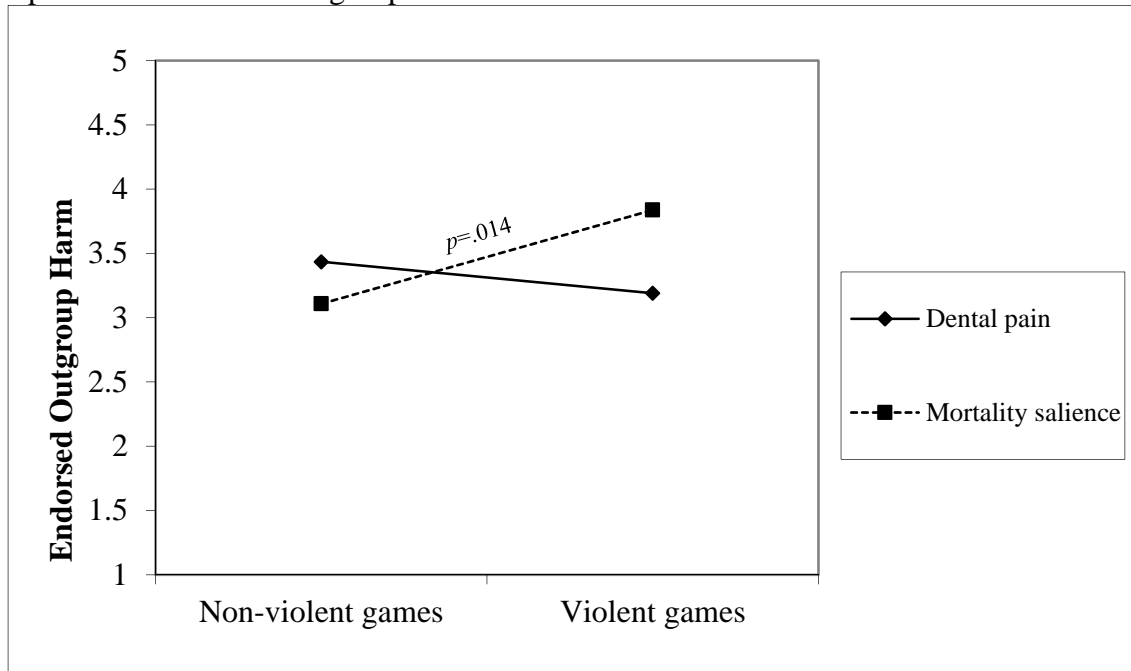


*Note*: The simple slopes analysis of exposure to violent video games and mortality salience primes on endorsed out-group harm. $p=.014$.

APPENDIX A

DEMOGRAPHIC MEASURES

Q46 What year were you born?
○ 1900 - 2006

Q58 What is your sex?
○ Male
○ Female
○ Other

Q60 With which ethnicity do you identify?
○ European American
○ African American
○ Native American/Pacific Islander
○ Hispanic
○ Asian American
○ Other _____

Q62 Are you a U.S. citizen?
○ Yes
○ No

Q64 Is English your first language?
○ Yes
○ No

Q66 With which of the following do you identify?
○ Catholic
○ Protestant (eg. Lutheran, Methodist)
○ Mormon (The Church of Jesus Christ Latter Day Saints)
○ Jewish
○ Muslim
○ Agnostic
○ Atheist
○ Other _____
○ None of the above

Q224 What is your household's annual income in the last five years?
- ❍ $0.00-$30,000
- ❍ $30,000-$50,000
- ❍ $50,000-$70,000
- ❍ $70,000-$100,000
- ❍ $100,000-$200,000
- ❍ $200,000+

Q70 What is your classification?
- ❍ Freshman
- ❍ Sophomore
- ❍ Junior
- ❍ Senior
- ❍ Graduate
- ❍ Other

Q76 How often do you watch violent media (action films, fights) per week in minutes?

Q77 How often do you spend online (surfing the internet, Facebook, etc.) per week in minutes?

Q78 How often do you play violent or graphic video games per week in minutes?

Q225 Have you ever had any issues, or are you currently seeking treatment for anger or stress?
- ❍ Yes
- ❍ No

APPENDIX B

MORTALITY SALIENCE MANIPULATION

The Projective Life Attitudes Assessment

This assessment is a recently developed, innovative personality assessment. Recent research suggests that feelings and attitudes about significant aspects of life tell us a considerable amount about the individual's personality. Your responses to this survey will be content-analyzed in order to assess certain dimensions of your personality. Your honest responses to the following questions will be appreciated.

1. PLEASE BRIEFLY DESCRIBE THE EMOTIONS THAT THE THOUGHT OF YOUR OWN DEATH AROUSES IN YOU.

_____

_____

_____

2. JOT DOWN, AS SPECIFICALLY AS YOU CAN, WHAT YOU THINK WILL HAPPEN TO YOU AS YOU PHYSICALLY DIE AND ONCE YOU ARE PHYSICALLY DEAD.

_____

_____

_____

APPENDIX C

MORTALITY SALIENCE MANIPULATION CONTROL

1. PLEASE BRIEFLY DESCRIBE THE EMOTIONS THAT THE THOUGHT OF DENTAL PAIN AROUSES IN YOU.

_____

_____

_____

2. JOT DOWN, AS SPECIFICALLY AS YOU CAN, WHAT YOU THINK WILL HAPPEN TO YOU AS YOU EXPERIENCE DENTAL PAIN, AND ONCE YOU ARE TREATED FOR DENTAL PAIN.

_____

_____

_____

APPENDIX D

VIOLENT VIDEO GAME DESCRIPTION

Violent Media

The participant will play a short game called Mortal Kombat.  This game will last

approximately 10 minutes, and show a player demonstrating various acts of violence

in a martial arts fight to the death.

APPENDIX E

NON-VIOLENT VIDEO GAME DESCRIPTION

Non-Violent Media

Participants in the non-violent media conditions will play a game of Bowling

Evolution 2.0, pictured below.

APPENDIX F

EMOTION REGULATION SCALE


Difficulties in Emotion Regulation Scale (DERS)

Q68 Please indicate how often the following statements apply to you by indicating the appropriate answer beside each item.

Q58 When I'm upset, I lose control over my behaviors.
❍ Almost never (0-10%)
❍ Sometimes (11-35%)
❍ About half the time (36-65%)
❍ Most of the time (66-90%)
❍ Almost always (91-100%)

Q69 When I'm upset, I have difficulty controlling my behaviors.
❍ Almost never (0-10%)
❍ Sometimes (11-35%)
❍ About half the time (36-65%)
❍ Most of the time (66-90%)
❍ Almost always (91-100%)

Q70 When I'm upset, I become out of control.
❍ Almost never (0-10%)
❍ Sometimes (11-35%)
❍ About half the time (36-65%)
❍ Most of the time (66-90%)
❍ Almost always (91-100%)

Q71 When I'm upset, I feel out of control.
- ○ Almost never (0-10%)
- ○ Sometimes (11-35%)
- ○ About half the time (36-65%)
- ○ Most of the time (66-90%)
- ○ Almost always (91-100%)

Q72 I experience my emotions as overwhelming and out of control.
- ○ Almost never (0-10%)
- ○ Sometimes (11-35%)
- ○ About half the time (36-65%)
- ○ Most of the time (66-90%)
- ○ Almost always (91-100%)

Q73 When I'm upset, I feel like I can remain in control of my behaviors.
- ○ Almost never (0-10%)
- ○ Sometimes (11-35%)
- ○ About half the time (36-65%)
- ○ Most of the time (66-90%)
- ○ Almost always (91-100%)

Q74 I am attentive to my feelings.
- ○ Almost never (0-10%)
- ○ Sometimes (11-35%)
- ○ About half the time (36-65%)
- ○ Most of the time (66-90%)
- ○ Almost always (91-100%)

Q75 I pay attention to how I feel.
- ○ Almost never (0-10%)
- ○ Sometimes (11-35%)
- ○ About half the time (36-65%)
- ○ Most of the time (66-90%)
- ○ Almost always (91-100%)

Q76 When I'm upset, I acknowledge my emotions.
- ◯ Almost never (0-10%)
- ◯ Sometimes (11-35%)
- ◯ About half the time (36-65%)
- ◯ Most of the time (66-90%)
- ◯ Almost always (91-100%)

Q77 When I'm upset, I believe that my feelings are valid and important.
- ◯ Almost never (0-10%)
- ◯ Sometimes (11-35%)
- ◯ About half the time (36-65%)
- ◯ Most of the time (66-90%)
- ◯ Almost always (91-100%)

Q78 I care about what I am feeling.
- ◯ Almost never (0-10%)
- ◯ Sometimes (11-35%)
- ◯ About half the time (36-65%)
- ◯ Most of the time (66-90%)
- ◯ Almost always (91-100%)

Q79 I'm upset, I take time to figure out what I'm really feeling.
- ◯ Almost never (0-10%)
- ◯ Sometimes (11-35%)
- ◯ About half the time (36-65%)
- ◯ Most of the time (66-90%)
- ◯ Almost always (91-100%)

# APPENDIX G

## DEATH-THOUGHT ACCESSIBILITY MEASURE

### Lexical Decision Task Wordlist

Participants will categorize these words according to if they are a word or a non-word.

Reaction time will be taken. Faster reaction time on death words indicate higher death-

thought accessibility.

| Non-Words | Words | Death Words |
|-----------|-------|-------------|
| Lemmt | Zeroes | Dead |
| Boudas | Wider | Grave |
| Dras | Balmy | Mortal |
| Soidik | Pawns | Skull |
| Flod | Pawed | Coffin |
| Dalter | Game | Murder |
| Larn | Fumed | Buried |
| Sointy | Fund | Corpse |
| Sout | Datum | Kill |
| Spruder | Clopped | Die |
| Thrid | Digger | Death |
| Pople | Coals | Tomb |
| Shoires | Clued | Fatal |

APPENDIX H

HOSTILE ATTRIBUTION BIAS MEASURE
SIP-AEQ

Q79 Instructions: Please read these short stories about relationships with other people and answer all   questions asked about the story as honestly as possible.

Q80 You tell a friend something personal and ask your friend not to discuss it with anyone else. However, a   couple of weeks later, you find out that a lot of people know about it. You ask your friend why she/he told other people and your friend says: ''Well, I don't know, it just came up and I didn't think it was a big deal.''Why do you think your friend shared your secret when you told them not to share it with anyone? Rate the likelihood of each statement on a scale of 0–3:

Q81 My friend wanted to expose my secret.
○ Unlikely
○ Undecided
○ Likely

Q82 My friend wanted to impress other people with their secret knowledge about me.
○ Unlikely
○ Undecided
○ Likely

Q83 My friend forgot that this was an important secret for me.
○ Unlikely
○ Undecided
○ Likely

Q84 My friend wanted me to feel stupid for asking to keep my secret.
○ Unlikely
○ Undecided
○ Likely

Q85 How likely is it that you would be angry if this happened to you?
○ Unlikely
○ Undecided
○ Likely

Q86 How likely is it that you would respond aggressively if this happened to you?
- ○ Unlikely
- ○ Undecided
- ○ Likely
- ○

Q88 Imagine that you are in a karate class competition and you have to demonstrate your abilities to your instructor. You are matched up to ''fight" with someone in the class who you do not know well. While you are being evaluated, your karate classmate hits you in a way other than the way you were taught and you are hurt.  Why do you think your classmate hit you in a way other than the way you were taught? Rate the likelihood of each statement on a scale of 0–3:

Q89 Karate classmate wanted to physically hurt me.
- ○ Unlikely
- ○ Undecided
- ○ Likely

Q90 My Karate classmate wanted to win the match.
- ○ Unlikely
- ○ Undecided
- ○ Likely

Q91 My Karate classmate did it by accident.
- ○ Unlikely
- ○ Undecided
- ○ Likely

Q92 My Karate classmate wanted me to look "bad".
- ○ Unlikely
- ○ Undecided
- ○ Likely

Q93 How likely is it that you would be angry if this happened to you?
- ○ Unlikely
- ○ Undecided
- ○ Likely

Q94 How likely is it that you would respond aggressively if this happened to you?
- ○ Unlikely
- ○ Undecided
- ○ Likely

Q95 Early one morning (at ''rush hour'') you go to a busy local coffee shop to get a   cup of coffee. While you are waiting, someone you see at the coffee shop regularly, but do not know personally, cuts in the line in front of you.  Why do you think this person cut in line in front of you? Rate the likelihood of each statement on a scale of 0–3:

Q96 The person wanted to make me wait longer for my coffee.
- ○ Unlikely
- ○ Undecided
- ○ Likely

Q97 This person was in a hurry to get to work.
- ○ Unlikely
- ○ Undecided
- ○ Likely

Q98 This person didn't realize that he (or she) cut in front of me .
- ○ Unlikely
- ○ Undecided
- ○ Likely

Q99 This person wanted to make me feel unimportant.
- ○ Unlikely
- ○ Undecided
- ○ Likely

Q100 How likely is it that you would be angry if this happened to you?
- ○ Unlikely
- ○ Undecided
- ○ Likely

Q101 How likely is it that you would respond aggressively if this happened to you?
- ○ Unlikely
- ○ Undecided
- ○ Likely

Q102 Imagine that you and a group of your co-workers went on a business trip. While at the hotel, waiting to meet a customer, you stop to buy a cup of coffee. Suddenly, one of your co-workers bumps your arm and spills your coffee over your shirt. The coffee is hot and your shirt is wet.    A. Why do you think your coworker bumped your arm making you spill your coffee? Rate the likelihood of each statement on a scale of 0–3:

Q103 My co-worker wanted to burn me with hot coffee.
○ Unlikely
○ Undecided
○ Likely

Q104 My co-worker was focused on the meeting.
○ Unlikely
○ Undecided
○ Likely

Q105 My co-worker did it by accident.
○ Unlikely
○ Undecided
○ Likely

Q106 My co-worker wanted to make me look "bad" to the customer.
○ Unlikely
○ Undecided
○ Likely

Q107 How likely is it that you would be angry if this happened to you?
○ Unlikely
○ Undecided
○ Likely

Q108 How likely is it that you would respond aggressively if this happened to you?
○ Unlikely
○ Undecided
○ Likely

Q109 You make plans with one of your friends to go on a short trip for the weekend. You're very excited about these plans and have been looking forward to the trip. However, at the last minute, your friend says that he (or she) no longer wants to go on the trip and has made plans with another friend for the weekend. Why do you think your friend said he(or she) no longer wanted to go on the trip? Rate the likelihood of each statement on a scale of 0–3:

Q110 My friend doesn't want to be with me.
- ❍ Unlikely
- ❍ Undecided
- ❍ Likely

Q115 My friend wanted to do something else.
- ❍ Unlikely
- ❍ Undecided
- ❍ Likely

Q116 My friend forgot about the plans we made.
- ❍ Unlikely
- ❍ Undecided
- ❍ Likely

Q117 My friend wanted me to feel unimportant.
- ❍ Unlikely
- ❍ Undecided
- ❍ Likely

Q118 How likely is it that you would be angry if this happened to you?
- ❍ Unlikely
- ❍ Undecided
- ❍ Likely

Q119 How likely is it that you would respond aggressively if this happened to you?
- ❍ Unlikely
- ❍ Undecided
- ❍ Likely

Q122 One day at work you decide to go to the cafeteria for lunch. After you purchase your lunch, you notice that the seating area is very crowded and no empty tables are available. You notice one of your co-workers sitting alone at a small table and ask if you can join him (or her) for lunch. Your co-worker says ''no''. Why do you think your co-worker said "no"? Rate the likelihood of each statement on a scale of 0–3:

Q123 My co-worker wanted to exclude me.
- ◯ Unlikely
- ◯ Undecided
- ◯ Likely

Q124 My co-worker wanted to be alone at that time.
- ◯ Unlikely
- ◯ Undecided
- ◯ Likely

Q125 My co-worker was "lost in thought" and didn't realize I'd asked to join him (or her).
- ◯ Unlikely
- ◯ Undecided
- ◯ Likely

Q126 My coworker wanted me to feel bad.
- ◯ Unlikely
- ◯ Undecided
- ◯ Likely

Q127 How likely is it that you would be angry if this happened to you?
- ◯ Unlikely
- ◯ Undecided
- ◯ Likely

Q138 How likely is it that you would respond aggressively if this happened to you?
- ◯ Unlikely
- ◯ Undecided
- ◯ Likely

Q131 Imagine that you go to the first meeting of a club you want to join. You would like to make friends with the other people in the club. You walk up to some of the other club members and say,''Hi!'' but they don't say anything back. Why do you think the club members didn't say anything back to you? Rate the likelihood of each statement on a scale of 0–3:

Q132 The club members wanted to ignore me.
○ Unlikely
○ Undecided
○ Likely

Q133 The club members were more interested in talking among themselves.
○ Unlikely
○ Undecided
○ Likely

Q134 The club members didn't hear me say "hi".
○ Unlikely
○ Undecided
○ Likely

Q135 The club members wanted me to feel unimportant.
○ Unlikely
○ Undecided
○ Likely

Q136 How likely is it that you would be angry if this happened to you?
○ Unlikely
○ Undecided
○ Likely

Q137 How likely is it that you would respond aggressively if this happened to you?
○ Unlikely
○ Undecided
○ Likely

Q139 You are driving in to work one day and just after you pull into a parking space, another car pulls up into the space to your right. As the person in the other car, a co-worker, gets out of his/her car, their car door hits your passenger side door and leaves a scratch on your car. The person walks away as you get out of your car.    Why do you think this person acted this way? Rate the likelihood of each statement on a scale of 0–3:

Q140 This person wanted to damage my car.
- ○ Unlikely
- ○ Undecided
- ○ Likely

Q141 This person was in a hurry to get to work.
- ○ Unlikely
- ○ Undecided
- ○ Likely

Q142 This person scratched my car by accident and didn't notice.
- ○ Unlikely
- ○ Undecided
- ○ Likely

Q143 This person wanted me to feel unimportant.
- ○ Unlikely
- ○ Undecided
- ○ Likely

Q144 How likely is it that you would be angry if this happened to you?
- ○ Unlikely
- ○ Undecided
- ○ Likely

Q145 How likely is it that you would respond aggressively if this happened to you?
- ○ Unlikely
- ○ Undecided
- ○ Likely

APPENDIX I

DEPENDENT MEASURES

Out-Group

Last week, Abd al-Karim Arif was detained by U.S. government authorities in suburban New York.  Authorities targeted Arif, a Saudi citizen, because he was suspected of involvement with a recently discovered terrorist group.  The government believes he may have provided them with bomb-making materials.  Other members of the group are still at large and considered dangerous.

There is some discussion about how much physical discomfort the police should be allowed to inflict on a suspect in the course of their interrogation (bright lights, cold rooms).  How much discomfort should they be allowed in inflict on Mr. Arif?

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |  |
|--|---|---|---|---|---|---|---|--|
|  | None |  |  |  |  |  | Severe |  |

Some have argued that the police should be allowed to use force in the interrogation of certain suspects.  How much force do you believe should be permitted in the interrogation of Mr. Arif?

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |  |
|--|---|---|---|---|---|---|---|--|
|  | None |  |  |  |  |  | Severe |  |

How much harm would you, personally, be willing to inflict on Mr. Arif?

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |  |
|--|---|---|---|---|---|---|---|--|
|  | None |  |  |  |  |  | Severe |  |

What should Mr. Arif's punishment be, if found guilty?

_____

In-Group

Last week, Jason Lockhart was detained by U.S. government authorities in suburban New York.  Authorities targeted Johnson, an American citizen, because he was suspected of involvement with a recently discovered terrorist group.  The government believes he may have provided them with bomb-making materials.  Other members of the group are still at large and considered dangerous.

There is some discussion about how much physical discomfort the police should be allowed to inflict on a suspect in the course of their interrogation (bright lights, cold rooms).  How much discomfort should they be allowed in inflict on Mr. Lockhart?

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |  |
|---|---|---|---|---|---|---|---|---|
| None |  |  |  |  |  |  |  | Severe |

Some have argued that the police should be allowed to use force in the interrogation of certain suspects.  How much force do you believe should be permitted in the interrogation of Mr. Lockhart?

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |  |
|---|---|---|---|---|---|---|---|---|
| None |  |  |  |  |  |  |  | Severe |

How much harm would you, personally, be willing to inflict on Mr. Lockhart?

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |  |
|---|---|---|---|---|---|---|---|---|
| None |  |  |  |  |  |  |  | Severe |

What should Mr. Lockhart's punishment be, if found guilty?

_____

APPENDIX J

STATE HOSTILITY SCALE

Current Mood

Please indicate the extent to which you agree or disagree with each of the

following mood statements.  Use the following 5 point rating scale. Write the

number corresponding to your rating on the blank line in front of each statement.

(1)Strong Disagree  (2)Disagree  (3)Neither Agree Nor Disagree  (4)Agree

(5)Strongly Agree

_____ I feel furious.              _____ I feel like I'm about to explode.
_____ I feel willful.             _____ I feel friendly.
_____ I feel aggravated.          _____ I feel understanding.
_____ I feel tender.              _____ I feel amiable.
_____ I feel stormy.              _____ I feel mad.
_____ I feel polite.              _____ I feel mean.
_____ I feel discontented.        _____ I feel bitter.
_____ I feel like banging on a table.  _____ I feel burned up.
_____ I feel irritated.           _____ I feel like yelling at somebody.
_____ I feel frustrated.          _____ I feel cooperative.
_____ I feel kindly.              _____ I feel like swearing.
_____ I feel unsociable.          _____ I feel cruel.
_____ I feel outraged.            _____ I feel good-natured.
_____ I feel agreeable.           _____ I feel disagreeable.
_____ I feel angry.               _____ I feel enraged.
_____ I feel offended.            _____ I feel sympathetic.
_____ I feel disgusted.           _____ I feel vexed.
_____ I feel tame.

APPENDIX K

CONSENT FORM AND DEBRIEFING PROCESS

UNIVERSITY OF NORTHERN IOWA
HUMAN PARTICIPANTS REVIEW
INFORMED CONSENT

Project Title: Effects of media on testing tasks
Name of Investigator(s): Paden Goldsmith

Invitation to Participate: You are invited to participate in a research project conducted through the University of Northern Iowa.  The University requires that you give your signed agreement to participate in this project.  The following information is provided to help you made an informed decision about whether or not to participate.

Nature and Purpose: This research is designed to examine the hypothesized relationship between media consumption and its effects on cognitive tasks.

Explanation of Procedures: As a participant in this study, you completed a short internet survey. This study is expected to take approximately 30 minutes.  At the conclusion of the study, all data will be used to compile statistical results and subsequently stored in a safe area out of reach of others.  You may discontinue involvement in the study at any time.

Discomfort and Risks: Participants in this study are expected to experience no more than normal risks experienced in daily social interaction.

Benefits and Compensation: All participants will receive .5 course credits through the SONA system.  All participants will also receive the education experience of participating in a scientific study.

Confidentiality: All data collected are strictly confidential.  Summarized data may be published in a scholarly and academic setting.  Any and all data collected may be used in future research.  Your confidentiality will be maintained to the degree permitted by the technology used. Specifically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties.

Right to Refuse or Withdraw: Your participation is voluntary.  You are free to withdraw from participation at any time or to choose not to participate at all, and by doing so, you will not be penalized or lose benefits to which you are otherwise entitled.

Questions: If you have questions about the study you may contact or desire information in the future regarding your participation or the study generally, you can contact Paden

Goldsmith at 712-621-8853 or the project investigator's faculty advisor Dr. Dilbur D. Arsiwalla at the Department of Psychology, University of Northern Iowa 319-273-7707. You can also contact the office of the IRB Administrator, University of Northern Iowa, at 319-273-6148, for answers to questions about rights of research participants and the participant review process.

Questions asked prior to debriefing:
What did you think the study was about? (Essay text box)
Did you hear anything about the study before coming in?  If so, what? (Essay text box)
Have you played the game in the study before? Yes/No

Debriefing script:
Thank you for your participation in our study!  Throughout the study you played a video game and completed several different scales.  You were told that the purpose of the study was to examine the influence that media had upon the completion of these scales.  In actuality, various things differed randomly across participants in this study.  Some participants played a violent video game called Mortal Kombat.  Others instead played a bowling game called Bowling Evolution 2.0.  The violent game (Mortal Kombat) was chosen to elicit aggressive cognitions, and perhaps thoughts about death.  The bowling game was used to compare aggressive cognitions.  We could not tell you what the purpose of these games was, as doing so may have altered your responses on later measures.  We apologize for misleading you.

Furthermore, you also wrote a short paragraph.  The writing prompt also differed across participants.  Some participants wrote about what they believe would happen when they died, as well as after they have died.  Others simply wrote about the feelings that dental pain would elicit.  This paragraph was designed to cause the participants that wrote about death to think about death, as doing so has been shown to bring about a variety of responses, such as being more harsh towards those that are dissimilar from one's self.  These effects were later measured, along with aggressive cognitions later on in the study.

We apologize for not being able to be up front with you, as telling you the true nature of the study may have altered how you would respond to the measures.  We ask for your cooperation and understanding in this matter.  If anyone asks what you did in this study, simply say that you played a video game, and completed some surveys.  Thank you in advance! If you feel troubled by any of the measures in this study, we urge you to contact the counseling center at (319) 273-2676.