

2006

# Using an implicit association test to examine the effects of violent video games on the values we place on others

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**Using an implicit association test to examine the effects of violent video games  
on the values we place on others**

by

**Ryan Luke Tapscott**

A thesis submitted to the Graduate College  
in partial fulfillment of the requirements for the degree of  
**MASTER OF SCIENCE**

Major: Psychology

Program of Study Committee:  
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Ames, Iowa

2006

UMI Number: 1439916



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## ABSTRACT

The effect of exposure to violent video games on automatic devaluations of others was investigated in a sample of 337 undergraduate students. Contrary to our prediction, participants who played a violent video game did not automatically associate others with devaluation on an Implicit Association Test more than did participants who played a non-violent game. Additionally, playing a violent game did not lead participants to automatically associate themselves more with worth than participants who played a non-violent game. However, males automatically associated themselves with worth more after playing a violent game, while females automatically associated themselves more with worth after playing a non-violent game. Furthermore, playing a violent video game led participants to experience less state empathy, less positive and more negative emotions, and less compassion. These results suggest that violent video game exposure may impair a person's ability to experience the emotional aspects necessary for empathy. Results are discussed in relation to the General Aggression Model.

## INTRODUCTION

In 2004, the video game industry set a record for domestic sales with over \$7 billion (Hewitt, 2005). As video games become more popular in our culture, so does the research being conducted on their effects. However, studying the effects of media violence is not a new concept. For almost 50 years, researchers have been investigating the effects of viewing violent television on subsequent aggression (Bandura, Ross, & Ross, 1963; Ellis & Sekyra, 1973; Eron, Huesmann, Lefkowitz, & Walder, 1972; Huston-Stein, Fox, Greer, Watkins, & Whitaker, 1981; Liebert & Baron, 1972). It has only been within the past 10-15 years that researchers have begun studying the effects of video games. Video games have become a large part of American culture. On average, boys between the ages of 8 to 13 play video games more than 13 hours per week (Gentile et al., 2004). In 1999, 14.8% of college freshmen reported playing more than 6 hours of video games per week as a high school senior (Cooperative Institutional Research Program, 1999).

One reason that violent video games have become a topic of interest to empirical researchers is their alleged role in several school shootings across the country since 1997. In the most infamous case, the Columbine school massacre, two teenagers opened fire upon classmates and teachers killing 13 and wounding 23 before killing themselves. Though there are undeniably a number of factors that led to this tragedy, the killers were obsessed with the bloody, shooting game Doom. The shooters even created a customized version of the game that made it more violent. Their murder spree at Columbine paralleled the action and violence inherent to their version of Doom (Achenbach & Russakoff, 1999). Playing the violent game Doom was not the sole causal factor in the Columbine shooting, but it is one of several risk factors, that cumulatively can lead to such violent acts.

Because of incidents such as the Columbine tragedy, there has been a growing body of literature investigating the effects of violent video games. Within this literature, a number of both correlational and experimental studies have shown that playing violent video games increases aggression (Anderson & Dill, 2000; Bushman & Anderson, 2002; Fling et al., 1992; Panee & Ballard, 2002). Violent video game exposure has been found to be positively related to aggressive thoughts, feelings, behavior, physiological arousal, and negatively related to prosocial behavior across studies (see meta-analysis by Anderson & Bushman, 2001). Of particular interest for the present study, is the finding that exposure to violent video games is positively associated with aggressive cognitions and feelings (Bushman & Anderson, 2002).

### *General Aggression Model*

The General Aggression Model (GAM) was developed in part to synthesize the numerous existing theories of aggression into one model (Anderson & Bushman, 2002a; Anderson & Dill, 2000; Carnagey & Anderson, 2003; Lindsay & Anderson, 2000). The GAM integrates a number of the most influential theories in the area of aggression, including Bandura's social learning theory (Bandura, Ross, & Ross, 1961, 1963), Zillman's excitation transfer model (1983), Geen's affective aggression model (1990), Dodge and Crick's social information processing model (1990), the social cognitive model of media violence effects (Huesmann, 1986), and Berkowitz's cognitive neoassociationist model (Berkowitz, 1984, 1990).

The GAM is a multistage theory that can predict and explain both short-term and long-term effects of aggressive exposure (e.g., violent video game play). Both personal and situational variables are responsible for causing aggressive behavior in the short-term version

of the model (Carnagey & Anderson, 2003; see Figure 1). Personal variables are defined as one's personality, consisting of the attitudes or beliefs that a person brings to a situation (Bushman & Baumeister, 1998; Dill, Anderson, Anderson, & Deuser, 1997), whereas a situational variable is a type of provocation or external stressor, such as video game play, uncomfortable temperature, or insult. The personal and situational variables interact and affect one's present internal state, which includes affect, arousal, and cognitions. For example, violent games can cause an increase in hostile and angry feelings and emotions, as well as an increase in arousal which may lead to aggressive responses or actions (Anderson, Anderson, & Deuser, 1996; Anderson, Anderson, Dill, & Deuser, 1998). Playing violent video games can also prime aggressive knowledge structures that activate one's aggressive scripts and schemas (Carnagey & Anderson).

This cognitive prime of aggressive knowledge structures can affect one's appraisal and decision processes (see Figure 2) such that one may respond with a thoughtful action or an impulsive one, as the internal state determines the type of response (i.e., of the immediate appraisal). Impulsive actions are seen as relatively immediate appraisals to a provocation that occur spontaneously and with little effort or awareness. This type of appraisal includes affective, goal, and intention information. For instance, a hostile appraisal may generate an angry affect, an aggressive goal, and an intention to fulfill that goal. Responses will vary from person to person because of such variables as social learning history, as well as the existing knowledge structures activated.

Thoughtful actions occur via a reappraisal process, which is characterized more by effort and conscious awareness than the immediate appraisal. It is contingent on two main

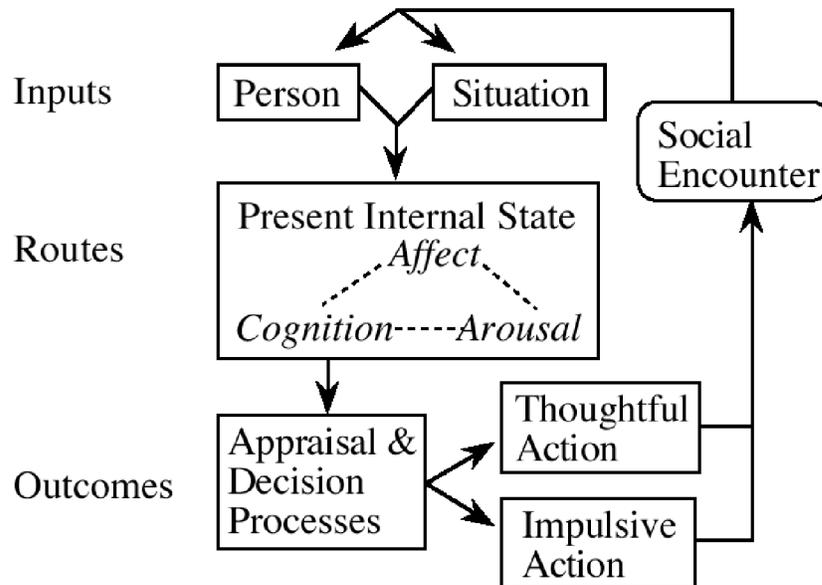


Figure 1. The General Aggression Model: Episodic processes.

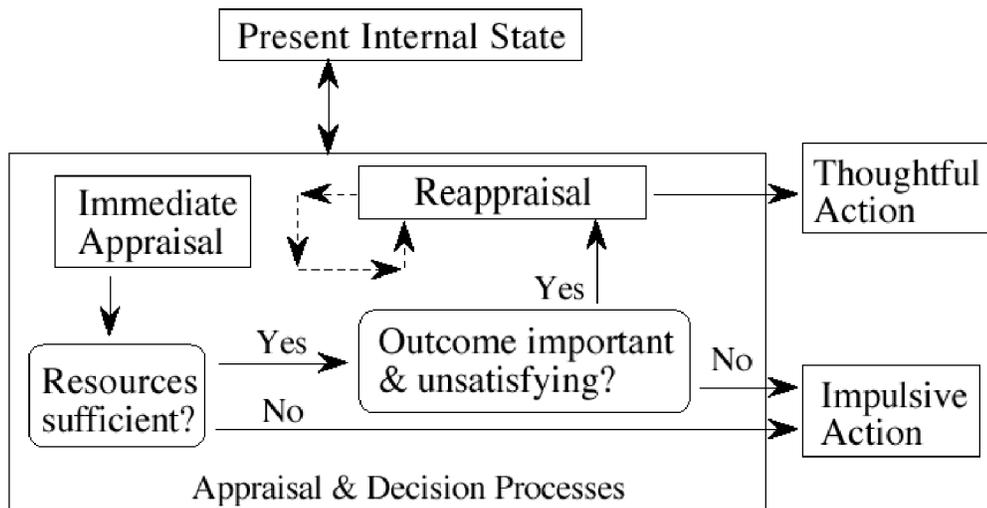


Figure 2. The General Aggression Model: Expanded appraisal & decision processes.

factors: (1) resources and outcome importance and (2) satisfaction. If a person has enough resources (e.g., time and cognitive capacity), and judges the immediate appraisal as important and unsatisfactory reappraisal occurs. Reappraisal is characterized by scanning for an alternate view of the situation. A number of different reappraisal cycles can occur, in which one will implement different knowledge structures to help explain the current situation. At some point, the cycle ends and the person makes a thoughtful action. The thoughtful action does not have to be non-aggressive; it could simply be a more calculating type of aggressive act (see Figure 2). The ensuing social behavior then sends the encounter to its next episodic cycle.

As previously mentioned, empirical research has shown results consistent with the single episode model of the GAM (Anderson & Dill, 2000; Bushman & Anderson, 2002; Carnagey, Bartholow, Anderson, & Benjamin, 2005). Simply showing a person a gun can create a priming effect by causing activation of aggressive related thoughts that ultimately led to an increase in aggressive behavior (Berkowitz & LePage, 1967). More recently, it was found that simply showing a person a picture or word representing a weapon followed by an aggressive word caused that person to identify and read the aggressive word more quickly on a reaction time task than when shown a non-aggressive word (Anderson, Benjamin, & Bartholow, 1998).

Short-term priming effects have also been documented through a single-episode exposure to violent video games. Participants were randomly assigned to play either a violent or non-violent game and then completed an implicit association test (IAT). The IAT was designed to measure the extent to which participants made unconscious associations between two target categories (self-other) and two target attributions (aggressive-peaceful), where

faster reaction times signified stronger associations in memory. Results from the IAT showed that participants who played a violent game were more likely to automatically associate themselves with aggressiveness than those who played a non-violent game (Uhlmann & Swanson, 2004).

Over time, these single-episode exposures accumulate and aggressive knowledge structures develop because of the aggressive responses individuals have learned from violent media exposure (Bushman & Anderson, 2002). The GAM identifies five resulting knowledge structures from long-term media violence exposure: (1) aggressive beliefs and attitudes, (2) aggressive perceptual schemata, (3) aggressive expectation schemata, (4) aggressive behavior scripts, and (5) aggressive desensitization. Recently, the long-term mechanism of the GAM was modified to include a sixth knowledge structure – conditioned emotional response. This postulates that repeated violence exposure could lead to conditioned emotional responses, such that certain emotions (e.g., anger) become more easily accessible, especially in the presence of aggressive stimuli (Gentile, Bonacci, & Walsh, in preparation). Essentially, this structure hypothesizes that constantly pairing violent video games and anger classically conditions a person to respond to situations with more anger and aggressive behavior (Gentile & Gentile, 2005; see Figure 3).

With continuous exposure, these structures become more complex and more difficult to change. The short-term effects that result from exposure to violent media content can, over repeated encounters, cause aggressive or hostile knowledge structures to become more salient and accessible for an individual. This can create a process of automatization, in which the structure is so readily available it can create an aggressive personality (Anderson & Dill,

2000; Potter, 1999; see Figure 3). In sum, the GAM predicts that long-term media violence consumers become more aggressive in outlook, perceptual biases, attitudes, beliefs, emotional responsiveness, and behavior than they were before the repeated exposure (see Figure 4).

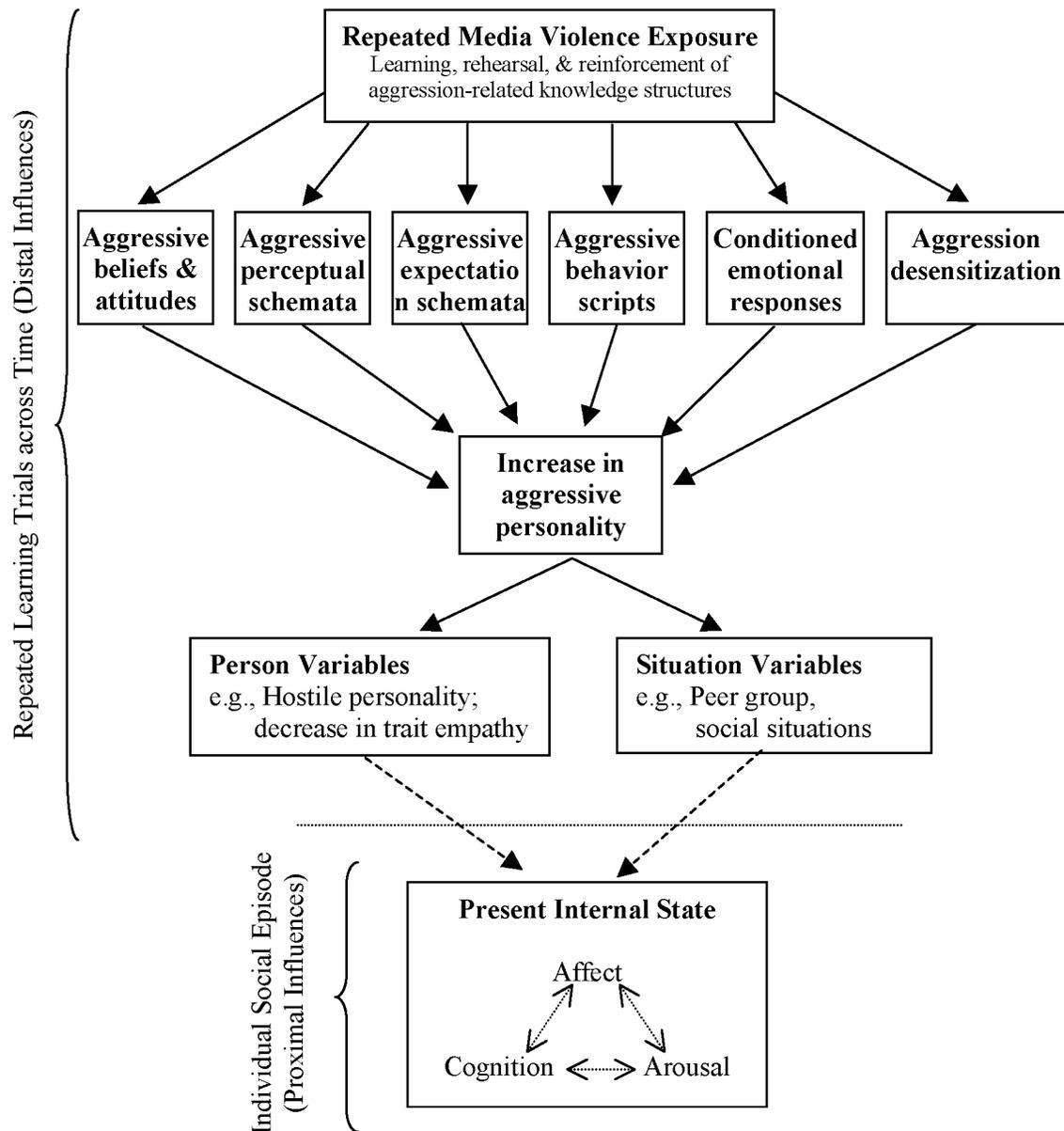


Figure 3. The General Aggression Model: Long-term effects.

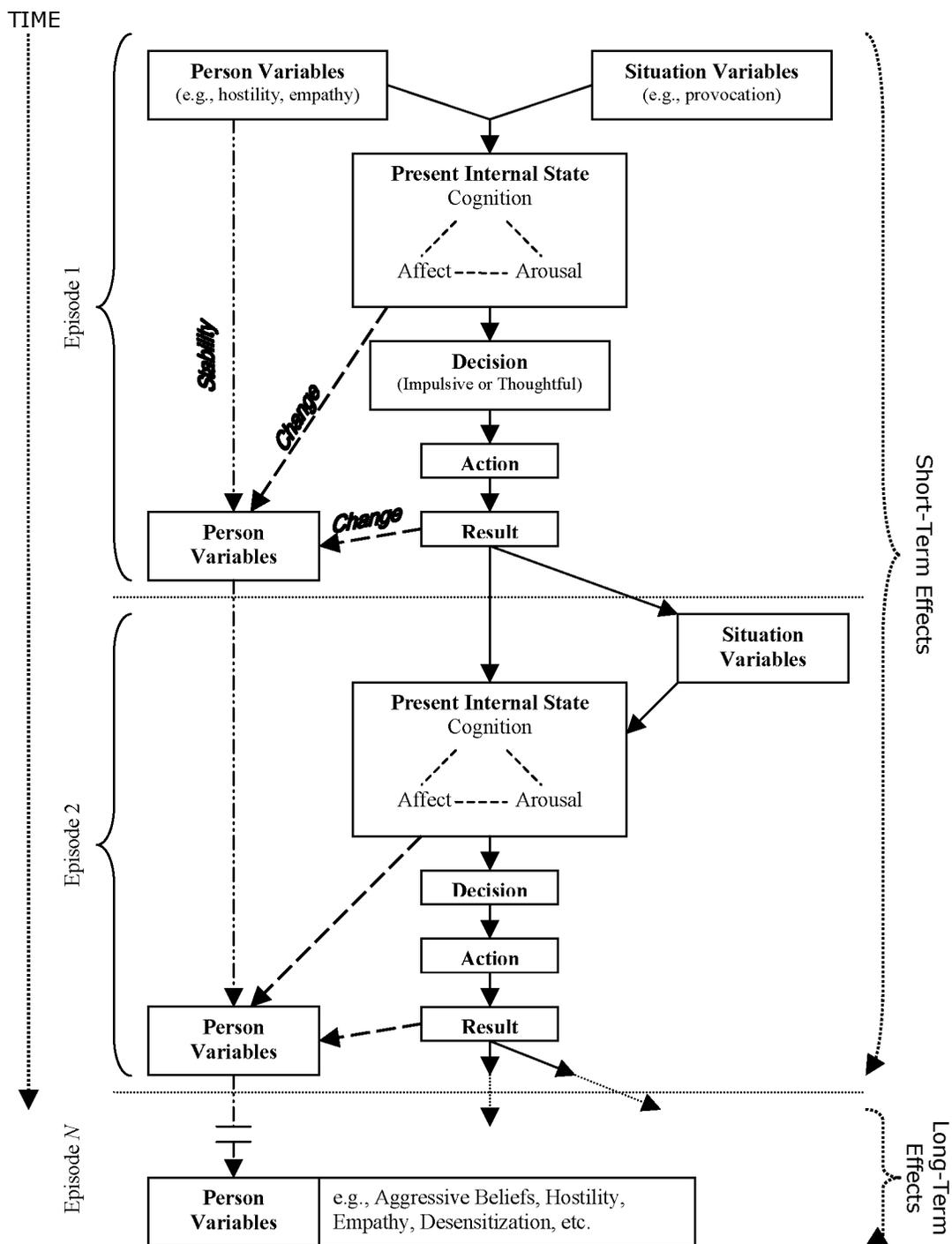


Figure 4. The General Aggression Model: Episodic processes leading to long-term change

*Empathy*

Empathy is defined as a person's ability to understand and experience the feelings of another. Empathy has both cognitive and emotional properties, such that an empathic response prompts one to not only take on the perspective of another (cognitive), but to also vicariously experience another's emotions. Empathy develops over time in response to exposure to positive socialization experiences (e.g., viewing empathic models; Cohen & Strayer, 1996), however exposure to situations that lack empathic models or opportunities to experience and express such emotions can theoretically hinder a person's empathic development (Funk, 2003).

The experience of empathy requires that individuals have the capacity to evaluate how their actions affect others. This idea has been coined "moral evaluation" (Funk, Buchman, Jenks, & Bechtold, 2003). The successful development of empathy is predicated on the notion that moral evaluation becomes an internalized and automatic process, such that individuals respond to stimuli with thoughtful, other-oriented, prosocial behavior, thereby causing it to become more cognitively salient and automatic. However, the development of empathy (which ultimately leads to appropriate prosocial behavior) may be hindered by playing violent video games. Violent video games lack the appropriate opportunities for an individual to respond with thoughtful, other-oriented behavior and indeed often reward ignoring pain cues from other game characters. Therefore, it is possible that playing violent video games over time will actually impede a person's empathic development and prosocial behavior, replacing it with aggressive responses and behaviors. In fact, research has shown that aggressive children show less empathy than non-aggressive children (Boldizar, Perry, & Perry, 1989).

Other research has shown that children who reported their favorite game as being violent responded more aggressively to hypothetical everyday situations (Funk, 2003). Limited research has even begun to show that adolescents whose favorite video game was violent were more likely to have lower scores on a measure of trait empathy (Burnett et al., 1997). This appears to lend some support to the long-term effects of violent video game play proposed by the GAM.

However, these findings raise the question about the short-term mechanism through which one would expect to see such long-term effects regarding empathy. The GAM would propose that multiple episodic exposures to a situational variable, such as violent video games, would begin to change one's personality characteristics over time (e.g., less empathy). In most violent video games, the primary goal is to inflict harm on others in order to gain points, health, and other rewards while ignoring their agonizing pain and cries for help. This situation, common to most violent video games, is devoid of both empathic models and responses. Therefore, the short-term effects of playing violent video games are likely to cause some change in the internal states of the player, whether it is an increase in physiological arousal, aggressive cognitions, and/or aggressive affect, which are inversely related to empathy. As such, repeated exposure to violent video games may consistently create such a change in these internal states and, over time, this could cause individuals to have less exposure to empathic models, less opportunity to provide empathic responses, and to experience less empathy, by learning to devalue others. Previous research has demonstrated a similar finding using a different medium. Participants who watched a single episode of televised violence implicitly valued others less, as evidenced by their responses on a lexical decision task (Anastasio, 2005). The present study extended this line of research to

video games. More specifically, the present study attempted to identify the short-term cognitive effects of violent video games on empathy, in the hope that our results shed some light on long-term mechanism through which this effect may be occurring (see Figure 4).

### *Present Study*

In the current study, participants played a violent or non-violent game. After playing the game, participants completed an IAT to assess the extent to which they associate others and decreases in worth (devaluation) together in memory. According to the GAM, playing a violent video game changes one's internal state. This means that one's arousal, affect, and/or cognitions can be affected by playing a violent game. Therefore, playing a violent video game, which rewards devaluing others (i.e., by awarding points, health, etc. for aggressing against other characters while ignoring pain and suffering cues), could theoretically cause short-term changes in one's cognitions (i.e., valuing others less, as well as becoming desensitized to violence and pain cues). Because of this, we hypothesized that participants who played a violent game would automatically associate others with devaluation more than participants who played a non-violent game would.

This proposed short-term mechanism should lead to personal changes (e.g., less empathy) over time. Although such trait-based changes are not likely to occur with only a single episode exposure to violent video games, it may still be theoretically interesting to determine the stability of trait empathy. For this reason, pre-post changes in trait empathy were examined following exposure to a violent video game, though it is predicted that the traits would be stable and unlikely to change in the experimental context.

Because it is unlikely for trait empathy scores to vary much after a single exposure to a violent video game, we also measured state empathy following game play. Very few

studies have examined the variability of state empathy. Instead, most research on empathy has focused on only the more stable, long-term trait empathy. State empathy refers to empathy that has been temporarily induced by an environmental trigger (Nezlek, Feist, Wilson, & Plesko, 2001). Because state empathy is affected by changing environmental and social contexts, it is possible that playing a violent video game will elicit and affect state empathy levels. Therefore, it was predicted that participants who played the violent video game would experience significantly lower state empathy scores than participants who played the non-violent game.

We previously defined empathy (state and trait) as having both cognitive and emotional properties. Although we included direct measures of state and trait empathy, we also wanted to measure the cognitive and emotional properties of empathy separately. We have already discussed the use of an IAT to measure the cognitive component of empathy. We also included a measure of state emotion because it taps into a person's own emotional reaction to stimuli in the social environment, and is not contingent on cognitive understanding of another's situation. Similar to our predictions about state empathy, we hypothesized that participants who played the violent video game would experience significantly fewer positive emotions and more negative emotions than would participants who played the non-violent game.

## METHOD

### *Participants*

Participants were 337 students (167 male; 170 female) enrolled in an undergraduate psychology course at Iowa State University who previously participated in a mass testing session. Mass testing sessions are held each semester in which participants fill out a number of questionnaires in return for partial class credit. All participants in the present study attended a mass testing session in which they completed an empathy questionnaire (see Appendix A; Mehrabian & Epstein, 1972).

### *Design*

Participants were randomly assigned to play a non-violent or violent video game (between-subjects variable). Following game play, all participants completed an IAT and then the same empathy questionnaire they completed in mass testing to assess pre and post game play changes (within-subjects variable). Other dependent measures included a measure of state emotion (Zucker & Lubin, 1965) and a state empathy scale.

### *Materials*

*Empathy Questionnaire.* During a mass testing session prior to the study, participants completed a measure of empathy that was used as selection criteria for participation in the study. Mehrabian & Epstein's (1972) Emotional Empathy Questionnaire is a 30-item measure of emotional empathy in which respondents read a statement (e.g., I tend to get emotionally involved with a friend's problem) and provide their level of agreement based on a five-point scale that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). This questionnaire was also given as a dependent measure so we could examine the presence of any pre-post video game play differences on the measure (see Appendix A).

*Buss-Perry Questionnaire (BP)*. The BP is a 29-item self-report questionnaire that assesses trait hostility on four subscales: physical aggression, verbal aggression, anger, and hostility (Buss & Perry, 1992). The physical aggression subscale contains nine items (e.g., “Once in a while I can’t control the urge to strike another person”), verbal aggression subscale includes five items (e.g., “I tell my friends openly when I disagree with them”), anger subscale has seven items (e.g., “I flare up quickly but get over it quickly”), and hostility subscale contains eight items (e.g., “At times I feel I have gotten a raw deal out of life”). Participants are instructed to respond on a 5-point scale that ranges from 1 (*extremely uncharacteristic of me*) to 5 (*extremely characteristic of me*; see Appendix B).

*General Media Habits*. Participants completed a measure assessing their media consumption habits. Participants listed their five favorite television shows, movies, and video games, and rated each on a variety of dimensions. For each television show, movie, and video game, participants indicated how frequently they watch, the level of violence, how often the characters tease each other, and how often people help each other. All of these were rated on a seven-point scale, with lower scores representing the lower presence of these dimensions. Participants also answered questions about the number of hours they spent each week playing video games, and watching TV or movies. The questionnaire also asked participants about their school grades and extra-curricular activities, as well as some demographic questions (see Appendix C).

*Multiple Affective Adjective Checklist (MAACL)*. The MAACL is a measure of state mood that includes 132 positive and negative mood-related adjectives. Respondents are instructed to check the adjectives that measure their current mood (Zuckerman & Lubin, 1965). In the present study, a brief 49-item version of MAACL was used to measure positive

and negative affect (see Appendix D). The MAACL has been shown to have satisfactory internal reliability (Gallagher, 1987).

*Video Games.* Participants were randomly assigned to play either a non-violent or violent video game. To determine the non-violent and violent game to use for the study we pilot tested a number of games in order to match them on a number of characteristics (e.g., arousal, enjoyment, frustration, etc.) except violent content. Analyses demonstrated that *Unreal Tournament* (violent game) and *Pharaoh* (non-violent game) matched on the dimensions tested, such that the only significant difference between the two was on violent content. All games were pilot-tested on Dell personal computers.

*Violent Game.* A PC version of the game *Unreal Tournament 2003* was used in the study. *Unreal Tournament* is a violent, first-person shooter game, meaning that the player takes on the perspective of a character in the game. The goal of the game is to obtain as many weapons as possible and destroy all computerized opponents to gain points. Realistic graphics are seen and heard throughout the game.

*Non-Violent Game.* A PC version of the game *Pharaoh* was used as the non-violent game in this study. The game is set in ancient Egypt where players act as the ruler of a civilization. Players must create, develop, and maintain their civilization by working cooperatively with the computer controlled citizens of their civilization. By creating and maintaining a thriving civilization, players are rewarded with bonuses, such as extra building materials or funding. If they fail to successfully manage the civilization and meet the needs of its citizens, fires and other disasters may occur.

*Implicit Association Test (IAT).* The IAT (Greenwald, McGhee, & Schwartz, 1998) is a task designed to tap into the strength of people's underlying associations between two

concepts or attributes. For example, a person should respond faster when one target category, flowers (e.g., rose, tulip, etc.) is paired with a positive attribute (e.g., pleasant, nice) than when it is paired with a negative attribute (unpleasant, gross, etc), as long as people generally have a positive mind-set to flowers.

In a standard IAT, two contrasted target categories (white or black) and two contrasted attribute categories (pleasant and unpleasant) are paired together on a number of trials (four categories total). There are typically five different trials that present eight stimuli each (e.g., words and/or pictures) that represent some variation of the target and attribute categories being studied. For example, in trial one black names and white names may be flashed on a computer screen and participants are told to press the “D” key if a black name appears on the screen and the “K” key if a white name appears on the screen. In trial two pleasant and unpleasant words flash on the screen and participants are instructed to press the “D” key if a pleasant word appears or the “K” key if an unpleasant word appears. In trial three, the target categories (black and white) are paired with the attributes (pleasant and unpleasant). For instance, black names and pleasant words are paired and white names and unpleasant words are paired together. This pairing is based on the training participants received in trials one and two in which they pressed the “D” key for black names and pleasant words, and the “K” key for white names and unpleasant words. In trial four the target categories are reversed. Participants are shown a series of black and white names, only now they are told to press the “D” key if a white name appears and to press the “K” key if a black name appears. The keys used to represent the presence of the target attributes do not change. Finally, in trial five the target categories and target attributes are once again paired. Only now, white names are paired with pleasant words and participants are instructed to

strike the “D” key, whereas black names are paired with unpleasant words and told to strike the “K” key. Trials three and five are called “critical trials” because it is in these two trials that the target categories are paired with target attributes, and are used in assessing the degree of various underlying associations. In the present example, if individuals hold prejudiced attitudes we would expect them to be quicker at sorting the white-pleasant stimuli and black-unpleasant stimuli than at sorting the white-unpleasant and black-pleasant stimuli (Greenwald et al., 1998).

The IAT has been used to study a number of phenomena, including gender biases (Banaji & Greenwald, 1995), age biases (Hummert, Garstka, O’Brien, Greenwald, & Mellott, 2002), and sexuality biases (Jellison, McConnell, & Gabriel, 2004). The IAT has even been administered following video game play to determine if playing a violent video game primed participants to associate themselves with aggressive thoughts in memory (Uhlmann & Swanson, 2004). In this study, participants played a violent or non-violent video game and then completed the IAT. The target categories used in their study were self and other, and the target attributes were pleasant and unpleasant. In one critical trial, participants were instructed to press a certain key when self and peaceful stimuli were presented, and to press a different key when other and aggressive stimuli were presented. In the other critical trial, the target categories were reversed such that participants were directed to press one key when self and aggressive stimuli were presented, and to press a different key when other and peaceful stimuli were presented. Participants who played the violent game were more likely to automatically associate themselves with aggression than participants who played the non-violent game.

The present study utilized an IAT to measure the strength of participants' automatic association between others (e.g., they, them, etc.) with devaluation (e.g., boring, undeserving, etc.). According to the GAM and previous research in which a different measure of implicit cognition, a lexical decision task, was administered after watching televised violence (Anastasio, 2005), exposure to violence should alter a person's internal state and link these two concepts together in memory. Therefore, participants who played a violent video game, in which the goal is to aggress against others, should implicitly associate others with devaluation more strongly than those who played a non-violent game.

The current study used the standard IAT procedure laid out by Greenwald et al. (1998). Participants were told the task measured reading decision time and they should try and respond as quickly and accurately as possible. They were instructed that various stimuli would be presented and they were to categorize the stimuli into one of two groups by either pressing the "E" key or the "I" key with their index finger. Participants had to discriminate between self-other stimuli and worth-devaluation

There were five categorization trials, similar to Greenwald et al. (1998). Three of the trials were practice trials and two were critical trials. In the first trial, participants classified words as either representing the self or others by pressing the "E" or "I" key, respectively. In the second trial, participants classified words as either representing worth or devaluation by pressing the "E" or "I" key. In the critical third trial participants were asked to make self-worth classifications and others-devaluation classifications. In the fourth trial, the target categories, self and other, were reverse keyed. Whereas participants pressed the "E" key when presented with words representing the self and the "I" key when presented with words representing others in trial one, they now pressed the "E" key when other stimuli is presented

and the “I” key when self stimuli is presented. Finally, in critical trial five, participants made others-worth classifications and self-devaluation classifications. To control for order effects, the order of the critical trials and their relative practice trials were counterbalanced across participants. Each practice trial contained 20 stimuli and each critical trial contained 40 stimuli. The target category stimuli (self-other) were taken from previous research (Uhlmann & Swanson, 2004). There were four words for self-stimuli (I, me, myself, and mine) and four words for other-stimuli (others, they, them, and theirs). The target attributes (worth-devaluation) were taken from results of pilot testing. Eight “worth” words were used (worthy, deserving, important, powerful, admirable, respected, valued, and honorable) and eight “devaluation” words were used (boring, stupid, irritating, worthless, useless, unimportant, insignificant, and undeserving).

*State Empathy Scale.* Ten photographs depicting various emotional scenes (e.g., child hugging dog, boy receiving medical treatment for war injuries; see Appendix E) were rated as to “how moving” and “how emotional” each was on a 10-point scale that ranged from 0 (*Not at all*) to 10 (*Extremely*). Reliability analyses conducted as to “how moving” the ten photographs were demonstrated a high level of internal consistency,  $\alpha = .88$ . We also found a high level of internal consistency on “how emotional” the ten photographs were,  $\alpha = .90$ . We then combined the two measures, “how emotional” and “how moving,” and again found high internal consistency,  $\alpha = .95$ .

### *Procedure*

Participants who completed a mass testing session and had a valid score on Mehrabian and Epstein’s (1972) Empathy Questionnaire were recruited via telephone to participate in the study. Participants were told they were being given a chance to participate

in an experiment under the guise that this was a study investigating video games and reading decision time. When participants arrived to the lab, they completed an informed consent document, Buss & Perry Aggression Questionnaire (Buss & Perry, 1992), a General Media Habits Questionnaire, and a MAACL.

Participants were then randomly assigned to play either the violent or a non-violent video game for 25 minutes. Immediately following game play participants completed a second MAACL. They then completed the IAT, under the impression that it only measured reading decision time. Following the IAT, participants completed a state empathy scale and a measure of trait empathy (Mehrabian & Epstein, 1972).

Following the self-report measures, participants were asked questions to explore any suspicions they may have had during the study. Participants were then debriefed and given credit for their participation.

## RESULTS

*Implicit Association Test*

Only data from the two critical blocks (Other = Worth and Other = Devaluation) were retained for analysis, while the practice blocks were discarded. The first two trials of each critical block were deleted because response rates were generally longer. The IAT provides two main pieces of data, response time in milliseconds and error rates. Error rates generally demonstrate weaker patterns than response time and are not usually analyzed (Greenwald et al., 1998; Greenwald & Nosek, 2001). In order to correct for inattention and anticipatory responses, response latencies less than 300 ms and greater than 3,000 ms were recoded as 300 ms and 3,000 ms (Greenwald et al.). Secondly, participants with abnormally high error rates (less than 70% accuracy) or extremely long average response latencies (greater than 1,000 ms) were omitted from analysis. The data were then log transformed to normalize the distribution, identical to the procedure used by Greenwald et al.

Participants' IAT scores were calculated by subtracting their average response latency on the Other = Worth critical block from the average response latency on their Other = Devalue critical block. Overall, participants associated others more with "Devalue" words than with "Worth" words on the IAT ( $M_{IAT\ effect} = -158\ ms$ ,  $SD = 153\ ms$ ),  $t(309) = -18.17$ ,  $p < .001$ ,  $d = 1.20$ . This indicates that participants were more likely to automatically associate others with devaluation regardless of game condition.

We also calculated participants' IAT scores for the self, by subtracting average response latencies on the Self = Worth critical block from the average response latency on their Self = Devalue critical block. Overall, participants associated themselves more with "Worth" than with "Devalue" on the IAT, ( $M_{IAT\ effect} = 166\ ms$ ,  $SD = 139\ ms$ ),  $t(309) = 21.01$ ,

$p < .001$ ,  $d = 1.40$ . Thus, participants were more likely to automatically associate themselves with worth, regardless of game condition.

We examined participants' IAT scores in relation to the video game they played. We hypothesized that participants who played the violent game would be more likely to automatically associate others with devaluation. To examine the effects of game play on the IAT we conducted an ANCOVA (game condition: violent vs. non-violent) on participants' IAT scores, controlling for several theoretically relevant variables, including trait hostility, violent media exposure, and entertainment level of the game<sup>1</sup>. Sex<sup>2</sup> was included as a between-subjects factor to examine possible interaction effects. The intercorrelations between covariates and dependent variables used in the present study are presented in Table 1. Contrary to our expectations, participants in the violent video game condition were not significantly more likely to automatically associate others with devaluation ( $M = -162$  ms,  $SD = 225$  ms) than were participants in the non-violent video game condition ( $M = -153$  ms,  $SD = 214$  ms),  $F < 1$ . Our hypothesis was not supported, as playing the violent game did not increase automatic devaluation of others (see Figure 5).

Finally, we wanted to examine the effects of game play on the "Self" and "Worth" critical block of the IAT more closely. We conducted an ANCOVA to assess the effects of game play (violent vs. non-violent) on participants' IAT scores. Participants in the violent video game condition were not significantly more likely to automatically associate

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<sup>1</sup> For all other analyses in the present study frustration level replaced entertainment level as a covariate. Entertainment level was the only game criterion that was significantly correlated with the IAT and therefore served as a covariate on these analyses. However, frustration level was significantly correlated with all other dependent variables in the present study and used as a covariate in those analyses.

<sup>2</sup> Because of the sex differences in emotional expression and empathy (Brody, 1985) we were inclined to use sex as a covariate in the present study. However, we did include it as a between-subjects factor on several analyses in the present study to investigate interaction effects.

Table 1.

*Intercorrelations between covariates and dependent variables in the present study (Ns range between 244 and 337)*

	1	2	3	4	5	6	7	8	9	10	11
1. Violent Media Exposure											
2. Violent VG Exposure	.83 <sup>c</sup>										
3. Trait Hostility	.35 <sup>c</sup>	.18 <sup>b</sup>									
4. Sex	-.50 <sup>c</sup>	-.49 <sup>c</sup>	-.35 <sup>c</sup>								
5. Game Frustration	.16 <sup>b</sup>	.15 <sup>a</sup>	.14 <sup>a</sup>	-.27 <sup>c</sup>							
6. IAT Other Val. (dvl.-val.)	.07	.02	.08	.01	-.08						
7. IAT Self Val. (dvl.-val.)	-.09	.01	-.15 <sup>a</sup>	.06	.01	-.59 <sup>c</sup>					
8. State Empathy	-.08	-.01	-.18 <sup>b</sup>	.30 <sup>c</sup>	-.19 <sup>b</sup>	.05	.11				
9. Trait Empathy (T2)	-.20 <sup>b</sup>	-.18 <sup>b</sup>	-.30 <sup>c</sup>	.49 <sup>c</sup>	-.10	.06	.01	.46 <sup>c</sup>			
10. Positive Emotions	.04	.06	-.08	-.06	.42 <sup>c</sup>	-.06	.04	.02	.18 <sup>b</sup>		
11. Negative Emotions	-.10	-.06	.08	.14 <sup>b</sup>	-.46 <sup>c</sup>	.02	-.02	.14 <sup>a</sup>	.001	-.45 <sup>c</sup>	
12. Compassion	.03	.03	-.10	-.02	.38 <sup>c</sup>	-.06	.04	.05	.22 <sup>c</sup>	.98 <sup>c</sup>	-.42 <sup>c</sup>

*Note.* Regarding sex, negative correlations signify stronger association with males, and positive correlations signify stronger associations with females.

<sup>a</sup> $p < .05$  <sup>b</sup> $p < .01$  <sup>c</sup> $p < .001$

themselves with worth ( $M = 174$  ms,  $SD = 202$  ms) more than participants in the non-violent video game condition ( $M = 162$  ms,  $SD = 193$  ms),  $F < 1$ . Thus, participants who played the violent game did not automatically associate themselves with worth than participants in the non-violent video game condition (see Figure 6).

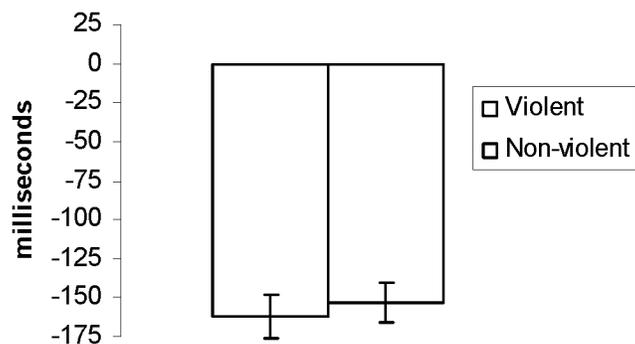


Figure 5. Other devaluation as a function of game condition on the IAT.

Note. Error bars represent standard error. Relatively more negative IAT effects indicate a stronger automatic association between others and devaluation.

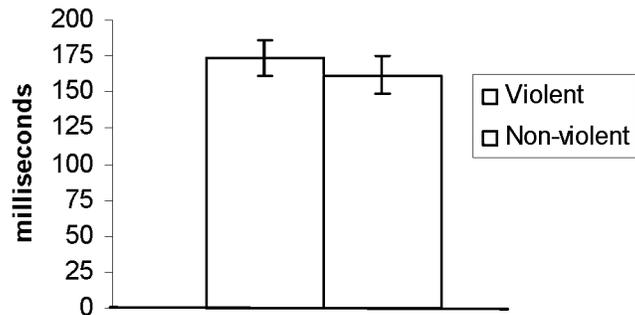


Figure 6. Self worth as a function of game condition on the IAT.

Note. Error bars represent standard error. Relatively more positive IAT effects indicate a stronger automatic association between self and worth.

\* $p < .01$

We did, however, find an interaction between game condition (violent vs. non-violent) and sex. Males in the violent video game condition automatically associated themselves more with worth ( $M = 206$  ms,  $SD = 321$  ms) than did females in the violent video game condition ( $M = 144$  ms,  $SD = 288$  ms), whereas females automatically associated themselves more with worth in the non-violent video game condition ( $M = 179$  ms,  $SD = 282$  ms) than did males ( $M = 144$  ms,  $SD = 296$  ms). This was a statistically significant finding,  $F(1, 277) = 7.88, p < .01, \eta_p^2 = .03$ . Thus, males automatically associated themselves more with worth after playing a violent video game, while females automatically associated themselves more with worth after playing a non-violent game (see Figure 7).

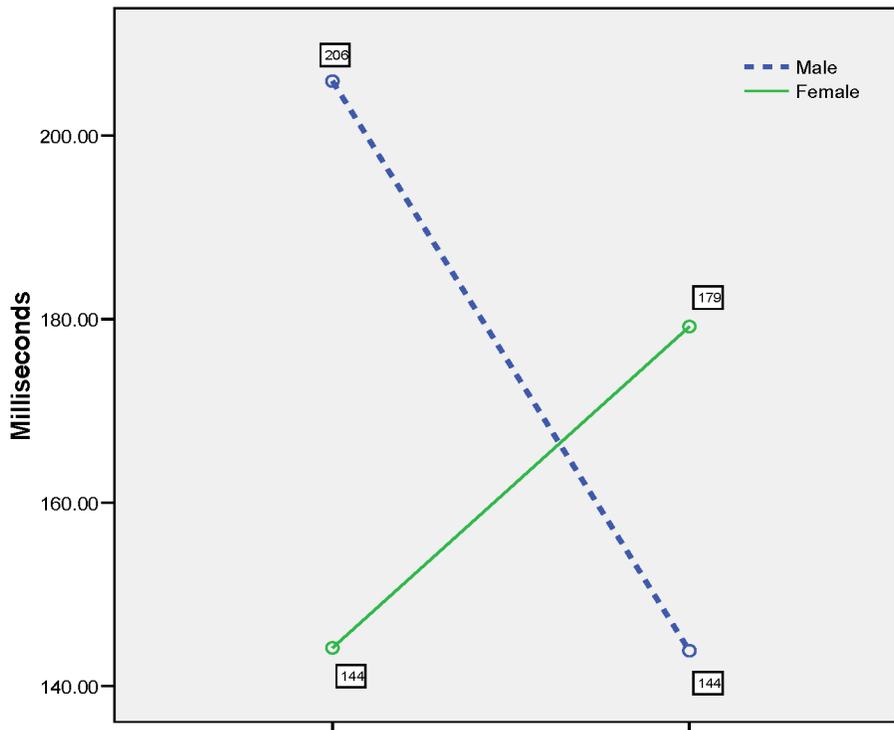


Figure 7. Self worth as a function of video game condition and sex on the IAT.

*Note.* Males who played the violent video game automatically associated themselves more with worth on the IAT, whereas females automatically associated themselves more with worth after playing the non-violent video game.

*Pre-Post Game Play Changes in Trait Empathy*

We conducted a repeated measures ANOVA to examine any pre-post changes in trait empathy due to game play (game condition: violent vs. non-violent). Participants in both the violent video game condition and the non-violent video game condition demonstrated a slight increase in empathy from Time 1 to Time 2, ( $M = .03$ ,  $SD = .48$  and  $M = .05$ ,  $SD = .41$ , respectively). This finding was not statistically significant,  $F < 1$ . Because of the systematic increase, it suggests that the environmental change, from mass testing sessions for Time 1 to a laboratory setting for Time 2, is responsible for the increase in empathy scores over time.

We also conducted an ANCOVA to examine the effects of game play (violent vs. non-violent) on trait empathy (Time 2) using our standard covariates. Participants in the violent video game condition had only marginally lower empathy scores ( $M = 3.46$ ,  $SD = .41$ ) than participants in the non-violent video game condition ( $M = 3.50$ ,  $SD = .41$ ),  $F(1,311) = 1.48$ ,  $p = .26$ ,  $d = .10$  (Table 2). This is not surprising as empathy is a trait measure, which we expected would be difficult to manipulate following a single exposure to a video game.

Table 2

*Means for Participants' Scores on Dependent Variables by Game Condition*

DV <sup>a</sup>	UT <sup>b</sup>	Pharaoh
State empathy	6.26	6.59
Trait empathy	3.46	3.50
Positive emotions	4.71	9.35*
Negative emotions	4.70	2.59*
Compassion	2.59	6.68*

<sup>a</sup> $N = 338$ . <sup>b</sup>UT = Unreal Tournament.

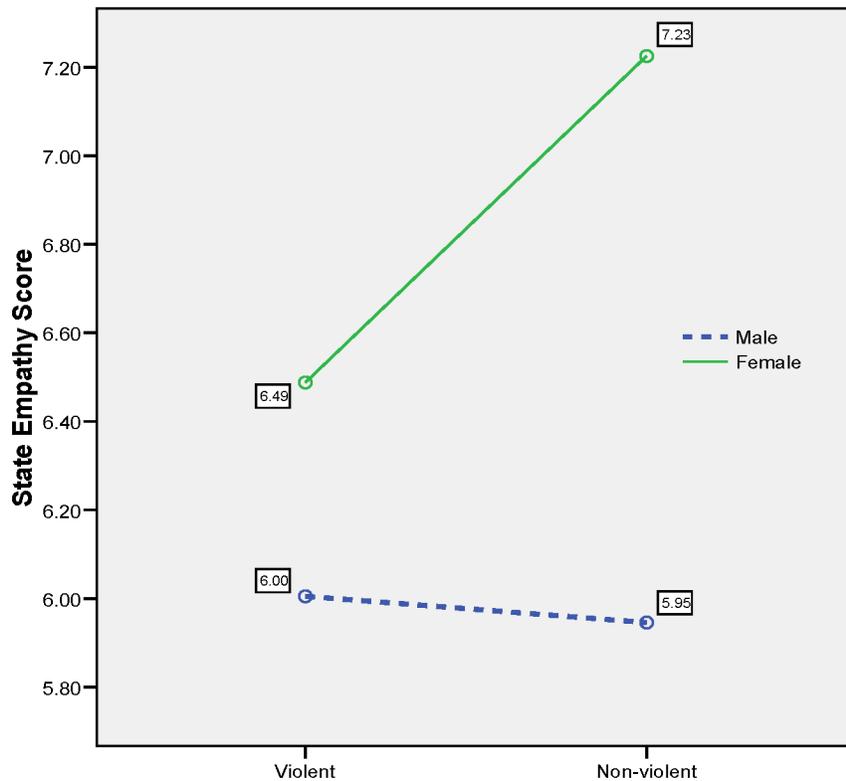
\* $p < .001$

### *State Empathy Scale*

To test the effects of video game play on our state empathy scale we create a mean score by averaging the two questions comprising the scale (“How moving is this photograph” & “How emotional is this photograph”) across all photographs. We conducted an ANCOVA game condition (violent vs. non-violent) on participants’ state empathy scores with our standard covariates, though sex was used as a between-subjects factor to investigate possible interaction effects. Participants in the violent video game condition displayed less state empathy ( $M = 6.26, SD = 2.08$ ) than participants in the non-violent video game condition ( $M = 6.59, SD = 2.05$ ), though the difference was only marginally significant,  $F(1, 311) = 3.81, p = 0.052, d = .16$ . We also conducted a 2 (game condition: violent vs. non-violent) x 2 (sex) ANCOVA on participants’ state empathy scores. We found that females had a greater decrease in state empathy after playing the violent game ( $M_{diff} = .74, SD = .07$ ), whereas males actually slightly increased in state empathy after playing the violent game ( $M_{diff} = -.06, SD = .09$ ). This finding was statistically significant,  $F(1, 311) = 5.76, p < .05, \eta_p^2 = .02$ . Thus, it appears that playing the violent video game affected state empathy in the expected direction even after controlling for sex, but this effect was only marginally significant. We did find a significant interaction, such that playing the violent video game led females to experience a greater decrease in state empathy than males (see Figure 8).

### *State Emotion*

*Positive vs. Negative Emotions.* Reliability analyses conducted on 23 positive emotions (e.g., caring, happy, thoughtful) on the brief MAACL demonstrated high internal consistency ( $\alpha = .94$ ). We also conducted reliability analyses on 23 negative emotions (e.g., angry, cynical, inconsiderate) that also showed high internal consistency ( $\alpha = .82$ ). Three



*Figure 8.* State Empathy as a Function of Game Condition and Sex on the IAT.

*Note.* Females experienced less state empathy after playing the violent video game, whereas males experienced slightly more state empathy after playing the violent video game.

emotion adjectives were not included because they were difficult to categorize as wholly positive or negative (energetic, interested, and powerful).

We conducted an ANCOVA to examine the effects of game play (game condition: violent vs. non-violent) on both positive and negative emotion scores. Sex was again included as a between-subjects factor to investigate possible interaction effects. Participants in the violent video game condition reported experiencing fewer positive emotions ( $M = 4.70$ ,  $SD = 8.02$ ) than did participants in the non-violent video game condition ( $M = 9.35$ ,  $SD$

= 8.02),  $F(1, 311) = 51.81, p < .001, d = .58$ . Regarding negative emotions, participants in the violent video game condition felt more negative emotions following game play ( $M = 4.70, SD = 4.27$ ) than did participants in the non-violent video game condition ( $M = 2.59, SD = 4.16$ ),  $F(1, 311) = 37.70, p < .001, d = .50$ . There was no evidence of an interaction effect between game condition (violent vs. non-violent) and sex ( $F < 1$ ) on either positive or negative emotions, suggesting that this effect was equally likely to occur for males and females.

*Compassion.* To test a specific cluster of emotions related to empathy (e.g., compassion), we conducted reliability analyses on 16 emotion items (e.g., affectionate, considerate, friendly) on the MAACL. Analyses showed high internal consistency ( $\alpha = .88$ ) and were used to create our compassion scale.

To examine the effects of game play on compassion we conducted an ANCOVA (game condition: violent vs. non-violent) on participants' compassion scores with our standard covariates, though sex was included as a between-subjects factor. Participants in the violent video game condition reported experiencing less compassion ( $M = 2.95, SD = 5.89$ ) more than participants in the non-violent video game condition ( $M = 6.33, SD = 5.75$ ),  $F(1, 311) = 50.82, p < .001, d = .58$ . There was no significant interaction between participant sex and game condition ( $F < 1$ ).

## DISCUSSION

Approximately 15 years of research on the effects of violent video games have demonstrated that playing violent video games leads to increases in aggressive affect, cognitions, and behavior (Anderson & Bushman, 2001). Research has demonstrated that playing a violent video game increases automatic aggressive associations we make with our selves (Uhlmann & Swanson, 2004). It is possible that playing violent video games will also lead to decreases in empathy. Previous research has shown that participants who watched violent television were more likely to automatically devalue others on a measure of implicit cognition (Anastasio, 2005). The present study attempted to extend these findings to violent video games. Though the measure of implicit cognition used in the present study (IAT) did not directly measure empathy, it did measure the value judgments we place on others, which are components in the construct empathy (Cialdini, Brown, Lewis, Luce, Neuberg, 1997; Mikulincer et al., 2001; Thompson, 2001; Watson, Grisham, Trotter, & Biderman, 1984). However, our results only provided partial support for the hypothesis that playing a violent video game would decrease the value we place on others in the short term.

Across game condition, participants automatically associated self with worth more than with devaluation, and others with devaluation more than worth. However, we did not find any main effects regarding self-worth and other-devaluation due to game on the IAT. We did find an interaction between game condition and sex on automatic associations of self and worth on the IAT, such that males associated themselves with worth more after playing the violent game and females associated themselves more with worth after playing the non-violent game.

This result is not surprising based on our knowledge of gender roles and stereotypes. From an early age males are taught to be more aggressive, dominant, and assertive than females (Bornstein & Lamb, 1999). It is considered masculine to have physical prowess, and this is characterized in early male interactions as rough and tumble play. To some extent males are even taught to solve their problems through physically aggressive means. Contrary to this, females are taught to be more emotional and sensitive. Females are socialized to be nurturing caregivers who provide support and affection to others (Bornstein & Lamb). Based on the differences in gender roles between males and females, it is consistent that males would value themselves more after a violent, aggressive video game and females would value themselves more after a non-violent video game. This does not imply that violent video game exposure affects males and females differently on aggressive affect, cognitions, and behavior (Anderson & Bushman, 2001), though it does suggest that sex might mediate the relation between violent media exposure and associations with self-worth.

As previously mentioned, participants automatically associated others with devaluation across game conditions, although the hypothesis that playing a violent video game would lead participants to associate others with devaluation was not supported. There are a number of possible reasons for this outcome. We defined empathy as a person's ability to understand and experience the feelings of another. This definition suggests that empathy has two key properties, cognitive and emotional/affective. Empathy is characterized as an emotional response that prompts one to take on the perspective of another (cognitive), as well as vicariously experiencing another's emotions. We employed the use of an IAT to measure the cognitive component (e.g., value judgments we place on others) of empathy. However, because the IAT is a measure of implicit cognition, it would not necessarily tap into any

emotional experiences or reactions. Therefore, even asking participants to make value judgments of others, which is considered a cognitive task, may still tap into emotional properties and elicit emotional responses. By isolating the cognitive component of empathy on the IAT, we may have missed the emotional component that violent video games may manipulate. In fact, several findings with our other dependent measures lend support to the notion that the emotional properties of empathy might be the driving force in finding an effect due to violent video games.

One of the dependent measures of interest is the state empathy scale that was designed for use in the present study. Previous studies that have investigated state empathy have simply modified the language of trait empathy measures to fit with more day-to-day events and situations. We wanted to create a measure that was specifically used to measure state empathy. To do so, we showed participants ten pictures depicting various empathy-evoking situations (e.g., child smiling and hugging dog, boy crying while getting wounds treated) and had them rate each as to “how moving” and “how emotional” each was on a 10-point scale. The scale had high internal consistency,  $\alpha = .95$ , and demonstrated a significant positive correlation with our trait measure of empathy  $r(338) = .46, p < .001, d = 1.04$ . Therefore, it appears that our measure was tapping into empathy.

Even though we did not find a significant result due to video game on the state empathy scale, results approached significance and were in the expected direction. For each picture, participants were asked to rate “how moving” and “how emotional” each was. So, how do these questions relate to empathy? In one photograph a young boy is writhing in pain as doctors’ work on bandaging his severed arms. Not only could these questions elicit an emotional reaction, but also they may cause participants to adopt the boy’s perspective and

understand his experience. Though the cognitive and emotional properties cannot be considered completely independent of each other, rating photographs on their “moving” and “emotional” qualities is likely to measure the emotional properties of empathy. The importance of the emotional component in state empathy is demonstrated by the positive correlation between the state empathy scale (how moving, how emotional) and the emotional trait empathy scale (see Table 1).

Furthermore, these results provide some support for the short-term mechanism proposed by the GAM. Because participants who played the violent video game reported less state empathy than those who played the non-violent game, it appears that the game affected participants’ internal state. We have speculated that our measure of state empathy taps into the emotional properties of empathy, so it is likely that playing the violent video game changed the emotions and feelings (i.e., angry feelings and emotions) as well as potentially affecting the arousal levels of participants. We found that participants who played the violent game reported feeling more negative emotions than participants who played a non-violent game. Therefore, it is possible that experiencing such an increase in negative affect and arousal inhibited participants’ ability to experience state empathy. According to the GAM, this negative affect would cause individuals to respond to environmental stimuli and situations more aggressively. The definition of aggression—the intent to inflict harm on another who is trying to avoid being harmed (Franzoi, 2003)—suggests that an aggressive response is strongly associated with devaluing others. Conversely, valuing others is a necessary component for an empathic response. Therefore, an increase in negative affect could lead to devaluation of others and account for experiencing less state empathy.

Though we found results in the expected direction on our measure of state empathy, we did not find similar results on trait empathy. This was not surprising, as trait empathy is defined as a stable, personality characteristic and is therefore not likely to change after playing a violent video game for 25 minutes. However, it was somewhat surprising to witness a slight increase in trait empathy from Time 1 to Time 2. One interpretation of this change would be that participants' empathy increased simply by walking into the lab. However, it is more likely that something about the research methods used contributed to this finding. First, participants could have simply been paying less attention to the questionnaire during the mass testing session (Time 1) than in the lab (Time 2). It is also possible participants were responding in a manner to make them appear more socially desirable in the lab, when they had one-on-one interactions with a research assistant. That is, their responses in the lab may have been given in such a way to make them appear more empathic.

Nonetheless, we found a correlation between trait empathy and participants' habitual violent video game exposure as well as their overall habitual violent media exposure. Participants' trait empathy scores were significantly negatively correlated with violent video game exposure and violent media exposure,  $r(244) = -.18, p < .01, d = .37$  and  $r(338) = -.20, p < .001, d = .41$ , respectively. This suggests that the more violent content in video games specifically, and violent media in general, that individuals expose themselves to is associated with lower trait empathy. This finding lends support to the long-term mechanism proposed in the GAM that leads to personality changes over time.

With repeated exposure to violent video games, participants should continue to have empathic emotions and responses inhibited by increases in angry emotions and aggressive actions or responses. This is likely to occur after each "episode" of game play and, over a

long-term period, the effects of these episodic exposures accumulate and begin to change existing knowledge structures. Regarding empathy, we can only speculate that playing violent video games most likely changes a person's conditioned emotional responses over time. It is possible that both desensitization to violence and increases in aggressive beliefs and attitudes will cause decreases in a person's trait empathy over time. Hence, we found a negative correlation between participants' trait empathy and habitual violent video game exposure as well as habitual media violence exposure.

We were also interested in investigating the effects of game play on state emotion, so we created positive and negative emotion categories from the emotion adjectives on the MAACL. Participants who played the violent game reported experiencing significantly fewer positive emotions and significantly more negative emotions than participants who played the non-violent game. Theoretically, this finding supports the short-term effects of exposure to media violence posited by the GAM.

Additionally, we combined emotion adjectives specifically related to the construct of empathy (e.g., affectionate, compassionate, thoughtful, etc.). Participants who played the violent video game reported feeling significantly lower compassion-related emotions than participants who played the non-violent game. This is an important finding because compassion is a construct related to empathy. Specifically, compassion is defined as a feeling of being aware of another's pain and suffering and wanting to alleviate that pain. Furthermore, empathic concern is conceptualized as including the feeling of compassion, which suggests that compassion is perhaps a satisfactory representation of the emotional component of empathy (Eisenberg, 2002). Moreover, that participants felt less compassion after playing the violent video game provides support to the notion that emotion may be the

driving force behind empathy and specifically the value judgments we place on others. This is not to say that the cognitive properties have no effect, it simply means that cognition alone may not be enough to affect how we value others, and that is one possible explanation for why the IAT did not succeed. Conversely, another possible explanation may be relevant.

During pilot testing, the violent video game, *Unreal Tournament*, and the non-violent video game, *Pharaoh*, were matched on a number of different characteristics based on participants' ratings, including some theoretically relevant items such as, frustration, difficulty, and arousal level. However, when we examined these same 14 variables in the present study, the games differed significantly on eleven of them (though violent content was expected; see Table 3). Three items of theoretical interest that differed significantly by game condition were arousal, frustration, and difficulty (frustration and difficulty are highly collinear, as a difficult experience is often frustrating; we will only speak in terms of frustration). These are of particular interest because of their relation to aggression and subsequent effect on empathy.

When first developed, the frustration-aggression hypothesis stated that frustration leads to an increase in arousal that always leads to aggressive behavior (Dollard, Doob, Miller, Maurer, & Sears, 1939). Berkowitz (1989) revised the theory to state that frustration is simply one of many factors that can cause aggression, and this occurs mainly because it causes increases in arousal and unpleasantness. Frustration does not always have to lead to aggression, but often does because of the relationship between negative affect and aggression. This has an important implication regarding participants' responses on the IAT. Because participants rated the non-violent game as more difficult and frustrating, it is conceivable that this led to aggressive cognitions and/or affect. This may have then

Table 3.

*Means for participants' ratings of various video game criteria*

Game Criteria	UT <sup>a</sup>	Pharaoh	Difference
Action packed	5.98	2.18	3.80 <sup>c</sup>
Entertaining	4.15	3.52	.63 <sup>b</sup>
Exciting	4.35	3.06	1.29 <sup>c</sup>
Frustrating	2.76	3.56	-.80 <sup>c</sup>
Fun	3.78	3.59	.19
Boring	4.81	4.09	.72 <sup>b</sup>
Violent	6.71	1.55	5.16 <sup>c</sup>
Difficult to play	3.28	4.26	-.98 <sup>c</sup>
Absorbing	4.17	3.55	.62 <sup>b</sup>
Arousing	3.52	2.58	.94 <sup>c</sup>
Enjoyable	3.71	3.57	.14
Involving	4.53	4.10	.43 <sup>a</sup>
Stimulating	4.33	3.57	.76 <sup>c</sup>
Addicting	3.10	2.96	.14

*Note.* Participants were asked to rate the video games on various criteria using a 7-point scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree).

<sup>a</sup>UT = Unreal Tournament

<sup>a</sup> $p < .05$ . <sup>b</sup> $p < .01$ . <sup>c</sup> $p < .001$ .

manifested itself on the IAT, which led them to devalue others much more than we predicted. Therefore, it is possible that these differences were responsible for outcomes on the IAT, though we cannot know for sure.

Some inherent game differences may have also accounted for performance on the IAT. For example, *Pharaoh* is a third-person game, giving players the impression of a top-down view where they are able to see all characters in their civilization. Players do not actually take on the perspective of a single character in the game; they actually serve as ruler of a civilization and have to provide food, shelter, etc. to their citizens. In contrast, *Unreal Tournament* is a first-person shooter game in which players take on the perspective of the player they are controlling. *Unreal Tournament* is designed to give players a sense of being in the game, as they see the action directly from the viewpoint of their character. On the surface, this may seem like a trivial difference, but may be relevant to the lack of other-devaluation on the IAT. Though *Pharaoh* is a non-violent game, other civilizations in the game do attempt to steal grain and animals from the civilization controlled by the player. Hence, it is possible that *Pharaoh* actually primes an ingroup bias. Moreover, it may actually lead players to develop ingroup favoritism, such that they begin to discriminate in preference of their ingroup (their civilization) over outgroups (other civilizations). Ingroup favoritism has even been found to be powerful enough to affect the language we use. For instance, a player in *Pharaoh* may begin to refer the characters in their civilization as “us” and “we,” which can elicit positive emotions and cognitions, whereas players may refer to characters in other civilizations as “they” and “them,” which elicits negative emotions and cognitions (Brehm, Kassin, & Fein, 1999).

As a second possibility, games such as Pharaoh, sometimes referred to as “God games,” might cause players to view all characters as “others.” Games such as Pharaoh give players God-like abilities, in that they are able to manipulate and control nearly all aspects of the game (Wikipedia, 2006 November 8). This could create a sense of superiority over all characters in the game. As a result, it is possible that Pharaoh still primes a sense of outgroups, only now the outgroup includes all characters within the game, and this leads to the null results when measuring participants’ implicit value judgments on others on the IAT. This is related to our previous contention that value judgments we place on others may be affected by more than just violent content, although this is speculation at this point.

The game differences present some potentially critical limitations in the present study. Because participant ratings showed significant differences on 10 of the 14 video game evaluation variables, it is difficult to make any strong claims as to the effects of game play. Granted, we did not find any significant differences due to game condition on the value judgments we place on others, but this could be due to the games themselves. Previous research has shown that this research paradigm is successful with violent television (Anastasio, 2005), so there is no reason to believe that it could not be successful with violent video games. Because of the immersive nature of video games, one could argue that there should be a stronger effect after playing violent video games. However, because of the differences between the video games it is simply too difficult to determine any specific causal mechanism to account for our results on the IAT.

Regarding the IAT procedure employed here, this is the first known instance that worth and devalue have been used as attribute categories on an IAT. Consequently, it is also the first occurrence in which eight descriptor words for worth (worthy, deserving, important,

powerful, admirable, respected, valued, and honorable) and eight for devalue (boring, stupid, irritating, worthless, useless, unimportant, insignificant, and undeserving) have also been used. Pilot testing revealed that these words best represented the concepts of worth and devalue, but it is possible that these concepts are too abstract for the purposes of an implicit measure of cognition, or that there may be better words than the ones used here.

Future research should address the limitations mentioned above. It is imperative for video game research that the games utilized match on a number of criteria (Gentile & Anderson, 2003). Though it is difficult to understand how the games matched during pilot testing and then did not match during the present study, it is not likely due to differences in our sample. Regardless of the differences in game criteria, the structural differences observed between the two games should be added to the list of matching criteria, especially for a study sensitive to the nature of ingroups and outgroups.

Though we did not find the predicted results with the IAT, we may have learned something about the construct of empathy. Collectively, our results on the IAT and state emotion, specifically compassion, suggest that the emotional properties of empathy may be more responsible for changes in empathy than the cognitive properties. Future research should attempt to study these two components of empathy so we can begin to understand how they are separately affected by violent media exposure.

Theoretically, the present study provides support for the short-term and long-term mechanisms that lead to stable personality changes over time posited by the GAM. We found marginally significant evidence of a short-term drop in state empathy after playing a violent video game. This is the first time the state empathy scale has been used in empirical research. We found it to have high internal consistency as well as a positive relation to trait empathy,

but future research should more closely investigate its psychometric properties. In terms of game condition, we found marginally significant results on the state empathy scale, so future research may want to look more closely at each of the ten photographs used in the scale to determine the validity of each photograph. By improving the quality of the state empathy scale future research can begin to make more conclusive arguments as to the short-term effects of violent media on state empathy.

Though we did not predict changes in trait empathy after playing a violent video game, we did find a significant relation between trait empathy and both habitual violent video game exposure and habitual media violence exposure. This suggests that over time, the more violent exposure an individual consumes the more likely he/she is to experience less trait empathy. We speculate that numerous episodic exposures to media violence will decrease an individual's stable, trait empathy, which would support the GAM. However, this result was correlational in nature, so a longitudinal study should be conducted to better understand the causal nature of this relation.

## APPENDIX A

## EMOTIONAL EMPATHY QUESTIONNAIRE

Directions: Read each statement and indicate how true each is for you using the following scale.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
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1. It makes me sad to see a lonely stranger in a group.
2. People make too much of the feelings and sensitivity of animals.
3. I often find public displays of affection annoying.
4. I am annoyed by unhappy people who are just sorry for themselves.
5. I become nervous if others around me seem to be nervous.
6. I find it silly for people to cry out of happiness.
7. I tend to get emotionally involved with a friend's problems.
8. Sometimes the words of a love song can move me.
9. I tend to lose control when I am bringing bad news to people.
10. The people around me have a great influence on my moods.
11. Most foreigners I have met seemed cool and unemotional.
12. I don't get upset just because a friend is acting upset.
13. I like to watch people open presents.
14. Lonely people are probably unfriendly.
15. Seeing people cry upsets me.
16. Some songs make me happy.
17. I really get involved with the feelings of the characters in a novel.
18. I get very angry when I see someone being ill-treated.
19. I am able to remain calm even though those around me worry.
20. When a friend starts to talk about his problem, I try to steer the conversation to something else.
21. Another's laughter is not catching for me.
22. Sometimes at the movies I am amused by the amount of crying and sniffing around me.
23. I am able to make decisions without being influenced by people's feelings.
24. I cannot continue to feel OK if people around me are depressed.
25. It is hard for me to see how some things upset people so much.
26. I am very upset when I see an animal in pain.
27. Becoming involved in books or movies is a little silly.
28. I become more irritated than sympathetic when I see someone's tears.
29. I become very involved when I watch a movie.
30. I often find that I can remain cool in spite of the excitement around me.
31. Little children sometimes cry for no apparent reason.

## APPENDIX B

## BUSS-PERRY AGGRESSION QUESTIONNAIRE

Please rate each of the following items in terms of how characteristic they are of you. Use the following scale for answering these items.

1	2	3	4	5
Extremely Uncharacteristic Of Me				Extremely Characteristic Of Me

1. Once in a while I can't control the urge to strike another person.
2. Given enough provocation, I may hit another person.
3. If somebody hits me, I hit back.
4. I get into fights a little more than the average person.
5. If I have to resort to violence to protect my rights, I will.
6. There are people who pushed me so far that we came to blows.
7. I can think of no good reason for ever hitting a person.
8. I have threatened people I know.
9. I have become so mad that I have broken things.
10. I tell my friends openly when I disagree with them.
11. I often find myself disagreeing with people.
12. When people annoy me, I may tell them what I think of them
13. I can't help getting into arguments when people disagree with me.
14. My friends say that I'm somewhat argumentative.
15. I flare up quickly but get over it quickly.
16. When frustrated, I let my irritation show.
17. I sometimes feel like a powder keg ready to explode.
18. I am an even-tempered person.
19. Some of my friends think I'm a hothead.
20. Sometimes I fly off the handle for no good reason.
21. I have trouble controlling my temper.
22. I am sometimes eaten up with jealousy.
23. At times I feel I have gotten a raw deal out of life.
24. Other people always see to get the breaks.
25. I wonder why sometimes I feel so bitter about things.
26. I know that "friends" talk about me behind my back
27. I am suspicious of overly friendly strangers.
28. I sometimes feel that people are laughing at me behind my back.
29. When people are especially nice, I wonder what they want.

## APPENDIX C

## GENERAL MEDIA HABITS QUESTIONNAIRE

ISU ID: \_\_\_\_\_

Study ID: \_\_\_\_\_

**CONFIDENTIAL****Do not open this survey until you have read all the instructions.**

## INSTRUCTIONS:

- ◆ This survey is mostly about television, movies/videos, and video games. When we ask about video games, we mean any games you play on computer, on video game consoles (such as Nintendo), on hand-held game devices (such as Gameboys), or in video arcades.
- ◆ Please answer each question in order and do not look ahead.
- ◆ On most questions, all you need to do is check ONE box – whichever one comes closest to your answer. It's important that people tell us the truth when they answer the questions. If you really don't want to answer a particular question, please leave it blank rather than making up an answer.
- ◆ On some questions, there are arrows that tell you to go to a certain question based on your answer. Please answer each question in order, and do not skip ahead unless there is an arrow that tells you to.

Example: Have you ever owned a dog?

 Yes → **GO TO QUESTION A** No → **SKIP TO QUESTION B**

## 1. What are your five favorite television shows?

- a. Title #1: \_\_\_\_\_
- How often do you watch this show?      **Rarely:** 1 2 3 4 5 6 7 **:Often**
- How violent is this show?              **No violence:** 1 2 3 4 5 6 7 **:Extremely violent**
- How often do characters tease each other  
or say sarcastic things in this show?      **Never:** 1 2 3 4 5 6 7 **:Often**
- How often are people helping each other or  
being nice in this show? (*Circle one*)      **Never:** 1 2 3 4 5 6 7 **:Often**
- b. Title #2: \_\_\_\_\_
- How often do you watch this show?      **Rarely:** 1 2 3 4 5 6 7 **:Often**
- How violent is this show?              **No violence:** 1 2 3 4 5 6 7 **:Extremely violent**
- How often do characters tease each other  
or say sarcastic things in this show?      **Never:** 1 2 3 4 5 6 7 **:Often**
- How often are people helping each other or  
being nice in this show? (*Circle one*)      **Never:** 1 2 3 4 5 6 7 **:Often**
- c. Title #3: \_\_\_\_\_
- How often do you watch this show?      **Rarely:** 1 2 3 4 5 6 7 **:Often**
- How violent is this show?              **No violence:** 1 2 3 4 5 6 7 **:Extremely violent**
- How often do characters tease each other  
or say sarcastic things in this show?      **Never:** 1 2 3 4 5 6 7 **:Often**
- How often are people helping each other or  
being nice in this show? (*Circle one*)      **Never:** 1 2 3 4 5 6 7 **:Often**
- d. Title #4: \_\_\_\_\_
- How often do you watch this show?      **Rarely:** 1 2 3 4 5 6 7 **:Often**
- How violent is this show?              **No violence:** 1 2 3 4 5 6 7 **:Extremely violent**
- How often do characters tease each other  
or say sarcastic things in this show?      **Never:** 1 2 3 4 5 6 7 **:Often**
- How often are people helping each other or  
being nice in this show? (*Circle one*)      **Never:** 1 2 3 4 5 6 7 **:Often**
- e. Title #5: \_\_\_\_\_
- How often do you watch this show?      **Rarely:** 1 2 3 4 5 6 7 **:Often**
- How violent is this show?              **No violence:** 1 2 3 4 5 6 7 **:Extremely violent**
- How often do characters tease each other  
or say sarcastic things in this show?      **Never:** 1 2 3 4 5 6 7 **:Often**
- How often are people helping each other or  
being nice in this show? (*Circle one*)      **Never:** 1 2 3 4 5 6 7 **:Often**

## 2. What are your five favorite movies/videos/DVDs?

a. Title #1: \_\_\_\_\_

How often do you watch this movie? **Rarely:** 1 2 3 4 5 6 7 **:Often**How violent is this movie? **No violence:** 1 2 3 4 5 6 7 **:Extremely violent**How often do characters tease each other  
or say sarcastic things in this movie? **Never:** 1 2 3 4 5 6 7 **:Often**How often are people helping each other or  
being nice in this movie? (*Circle one*) **Never:** 1 2 3 4 5 6 7 **:Often**

b. Title #2: \_\_\_\_\_

How often do you watch this movie? **Rarely:** 1 2 3 4 5 6 7 **:Often**How violent is this movie? **No violence:** 1 2 3 4 5 6 7 **:Extremely violent**How often do characters tease each other  
or say sarcastic things in this movie? **Never:** 1 2 3 4 5 6 7 **:Often**How often are people helping each other or  
being nice in this movie? (*Circle one*) **Never:** 1 2 3 4 5 6 7 **:Often**

c. Title #3: \_\_\_\_\_

How often do you watch this movie? **Rarely:** 1 2 3 4 5 6 7 **:Often**How violent is this movie? **No violence:** 1 2 3 4 5 6 7 **:Extremely violent**How often do characters tease each other  
or say sarcastic things in this movie? **Never:** 1 2 3 4 5 6 7 **:Often**How often are people helping each other or  
being nice in this movie? (*Circle one*) **Never:** 1 2 3 4 5 6 7 **:Often**

d. Title #4: \_\_\_\_\_

How often do you watch this movie? **Rarely:** 1 2 3 4 5 6 7 **:Often**How violent is this movie? **No violence:** 1 2 3 4 5 6 7 **:Extremely violent**How often do characters tease each other  
or say sarcastic things in this movie? **Never:** 1 2 3 4 5 6 7 **:Often**How often are people helping each other or  
being nice in this movie? (*Circle one*) **Never:** 1 2 3 4 5 6 7 **:Often**

e. Title #5: \_\_\_\_\_

How often do you watch this movie? **Rarely:** 1 2 3 4 5 6 7 **:Often**How violent is this movie? **No violence:** 1 2 3 4 5 6 7 **:Extremely violent**How often do characters tease each other  
or say sarcastic things in this movie? **Never:** 1 2 3 4 5 6 7 **:Often**How often are people helping each other or  
being nice in this movie? (*Circle one*) **Never:** 1 2 3 4 5 6 7 **:Often**

3. How often do you play video games? (*Mark one.*)

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Almost every day<br><input type="checkbox"/> About 4 or 5 times a week<br><input type="checkbox"/> About 2 or 3 times a week<br><input type="checkbox"/> About once a week<br><input type="checkbox"/> A couple of times a month<br><input type="checkbox"/> About once a month<br><input type="checkbox"/> Less than once a month<br><input type="checkbox"/> I never play video games | } | → <b>CONTINUE WITH #4</b><br><br>→ <b>SKIP TO #25</b> |
|--|---|---|

4. For how many years have you been playing video games? \_\_\_\_\_ years

5. When you play video games, for how long do you usually play at one sitting?  
\_\_\_\_\_ minutes

6. What are your five favorite video games?

a. Title #1: \_\_\_\_\_

How often do you watch this game?      **Rarely:** 1 2 3 4 5 6 7 **:Often**

How violent is this game?      **No violence:** 1 2 3 4 5 6 7 **:Extremely violent**

How often do characters tease each other  
or say sarcastic things in this game?      **Never:** 1 2 3 4 5 6 7 **:Often**

How often are people helping each other or  
being nice in this game? (*Circle one*)      **Never:** 1 2 3 4 5 6 7 **:Often**

b. Title #2: \_\_\_\_\_

How often do you watch this game?      **Rarely:** 1 2 3 4 5 6 7 **:Often**

How violent is this game?      **No violence:** 1 2 3 4 5 6 7 **:Extremely violent**

How often do characters tease each other  
or say sarcastic things in this game?      **Never:** 1 2 3 4 5 6 7 **:Often**

How often are people helping each other or  
being nice in this game? (*Circle one*)      **Never:** 1 2 3 4 5 6 7 **:Often**

c. Title #3: \_\_\_\_\_

How often do you watch this game?      **Rarely:** 1 2 3 4 5 6 7 **:Often**

How violent is this game?      **No violence:** 1 2 3 4 5 6 7 **:Extremely violent**

How often do characters tease each other  
or say sarcastic things in this game?      **Never:** 1 2 3 4 5 6 7 **:Often**

How often are people helping each other or  
being nice in this game? (*Circle one*)      **Never:** 1 2 3 4 5 6 7 **:Often**

d. Title #4: \_\_\_\_\_

How often do you watch this game? **Rarely:** 1 2 3 4 5 6 7 **:Often**

How violent is this game? **No violence:** 1 2 3 4 5 6 7 **:Extremely violent**

How often do characters tease each other or say sarcastic things in this game? **Never:** 1 2 3 4 5 6 7 **:Often**

How often are people helping each other or being nice in this game? (*Circle one*) **Never:** 1 2 3 4 5 6 7 **:Often**

e. Title #5: \_\_\_\_\_

How often do you watch this game? **Rarely:** 1 2 3 4 5 6 7 **:Often**

How violent is this game? **No violence:** 1 2 3 4 5 6 7 **:Extremely violent**

How often do characters tease each other or say sarcastic things in this game? **Never:** 1 2 3 4 5 6 7 **:Often**

How often are people helping each other or being nice in this game? (*Circle one*) **Never:** 1 2 3 4 5 6 7 **:Often**

7. Do you understand the computer and video game ratings (such as E, T, or M)?

Yes, all of them       Some of them       No

8. Do you sometimes try to limit your own playing?

Yes → If yes, are you successful in limiting yourself?

No

Yes

No

Sometimes

(Please circle the appropriate letter next to each question)

	<u>Yes</u>	<u>No</u>	<u>Sometimes</u>	<u>Don't Know</u>
--	------------	-----------	------------------	-------------------

9. Do you download video games from the Internet?      Y      N      S      DK

10. Do you ever play so much that it interferes with your homework?      Y      N      S      DK

11. On a scale of 1 to 10, how much violence do you like to have in video games? (*Circle one*)

**No Violence:** 1 2 3 4 5 6 7 8 9 10 **:Extreme Violence**

12. Compared to two or three years ago, how much violence do you like to have in video games?

A lot more than two or three years ago

A little more

About the same amount

A little less

A lot less than two or three years ago

Don't know

13. Compared to other college students of the same sex, do you believe that you are more or less affected by the violence in the video games you play?

- A lot less affected       About the same as others       A lot more affected  
 A little less affected       A little more affected       I never play violent video games

14. Compared to other college students of the same sex, do you believe that you are more or less affected by the violence in the TV and movies you watch?

- A lot less affected       About the same as others       A lot more affected  
 A little less affected       A little more affected       I never watch violent TV/movies

<i>(Please circle the appropriate letter next to each question)</i>	<u>Yes</u>	<u>No</u>	<u>Don't Know</u>
15. Have you played video games as a way of escaping from problems or bad feelings?	Y	N	DK
16. Do you become restless or irritable when attempting to cut down or stop playing video games?	Y	N	DK
17. Have you ever done poorly on a school assignment or test because you spent too much time playing video games?	Y	N	DK
18. Do you own your own video games?	Y	N	DK
19. Do you need to spend more and more time and/or money on video games in order to achieve the desired excitement?	Y	N	DK
20. Over time, have you become more preoccupied with playing video games, studying video game playing, or planning the next opportunity to play?	Y	N	DK
21. Have you ever lied to family or friends about how much you play video games?	Y	N	DK
22. Have you ever felt angry and played video games to release your anger?	Y	N	DK
23. Have you ever committed illegal/unsocial acts such as theft from family, friends, or elsewhere in order to get video games?	Y	N	DK
24. Do you have any friends that you would say are "addicted" to video games?	Y	N	DK
25. Have you ever felt like you were addicted to video games?	Y	N	DK
26. How often do you buy or rent new games?			
<input type="checkbox"/> More than once a week	<input type="checkbox"/> About once a month	<input type="checkbox"/> About once a year	
<input type="checkbox"/> About once a week	<input type="checkbox"/> Every couple of months	<input type="checkbox"/> Less than once a year	
<input type="checkbox"/> About every two weeks	<input type="checkbox"/> A couple of times a year	<input type="checkbox"/> I never buy or rent new games	

27. How often do you watch MTV?

- Almost every day       About once a week       I almost never watch MTV  
 About 2-3 times a week       A couple times a month       I never watch MTV

28. How often do you watch wrestling on TV?

- Almost every day       About once a week       I almost never watch wrestling  
 About 2-3 times a week       A couple times a month       I never watch wrestling

29. On average, how many *minutes* a day do you spend reading for pleasure? \_\_\_\_\_ minutes

30. On average, how many *hours* a day do you spend listening to music (radio, CDs, tapes, MTV, etc)? \_\_\_\_\_ hours

31. On a typical week day (Monday through Friday), for how many *hours* do you watch TV/videos during each of the following times? (Please write numbers in the spaces below.)

6 am - Noon	Noon - 6 pm	6 pm - Midnight	Midnight - 6 am
_____ hours/day	_____ hours/day	_____ hours/day	_____ hours/day

32. On a typical weekend day (Saturday or Sunday), for how many *hours* do you watch TV/videos during each of the following times? (Please write numbers in the spaces below.)

6 am - Noon	Noon - 6 pm	6 pm - Midnight	Midnight - 6 am
_____ hours/day	_____ hours/day	_____ hours/day	_____ hours/day

33. On a typical school day (Monday through Friday), for how many *hours* do you play video games during each of the following times? (Please write numbers in the spaces below.)

6 am - Noon	Noon - 6 pm	6 pm - Midnight	Midnight - 6 am
_____ hours/day	_____ hours/day	_____ hours/day	_____ hours/day

34. On a typical weekend day (Saturday or Sunday), for how many *hours* do you play video games during each of the following times? (Please write numbers in the spaces below.)

6 am - Noon	Noon - 6 pm	6 pm - Midnight	Midnight - 6 am
_____ hours/day	_____ hours/day	_____ hours/day	_____ hours/day

35. Do you have a TV in your own room?       Yes       No

36. When you were in high school, did you have a TV in your own room?

- Yes       No

37. Do you play video games in your own room?       Yes       No

38. When you were in high school, did you play video games in your own room?

- Yes       No

39. What types of extra-curricular activities do you participate in regularly? (*Mark all that apply.*)

- Team sports       Music       Church or religious activities  
 Individual sports       Drama       Other (*Specify:* \_\_\_\_\_)  
 Clubs       Part-time job

40. In the past year, about how many times have you attended church or religious services?

- Never       About once a month       More than once a week  
 Once or twice       2 or 3 times a month  
 Several times       About once a week

41. Have you been in a physical fight in the past year?       Yes       No

42. What is your **average** school grade? (*If you are a freshman, please answer for your senior year of high school; Please mark only ONE.*)

- A+ (average scores of 97 or higher)  
 A (93 - 96)  
 A- (90 - 92)  
 B+ (87 - 89)  
 B (83 - 86)  
 B- (80 - 82)  
 C+ (77 - 79)  
 C (73 - 76)  
 C- (70 - 72)  
 D+ (67 - 69)  
 D (63 - 66)  
 D- (60 - 62)  
 F (Under 60)  
 Don't know

43. What is your GPA (Grade Point Average)? (*If you are a freshman, please answer for your senior year of high school.*) \_\_\_\_\_

44. Are you:     Male     Female

45. How would you classify yourself?

- African American       Latino/Hispanic       Native American  
 Asian/Pacific Islander       Multi-Racial       White       Other (*Specify:* \_\_\_\_\_)

46. What is the highest level of education your mother (or stepmother) finished?

- Some high school       Some college       Graduate or professional school  
 High school       College       Don't know

47. What is the highest level of education your father (or stepfather) finished?

- |   |                                       |  |
|---|---------------------------------------|--|
| <input type="checkbox"/> Some high school | <input type="checkbox"/> Some college | <input type="checkbox"/> Graduate or professional school |
| <input type="checkbox"/> High school      | <input type="checkbox"/> College      | <input type="checkbox"/> Don't know                      |

Is English your native language?       Yes    No

## APPENDIX D

## BRIEF MAACL

Time: A B

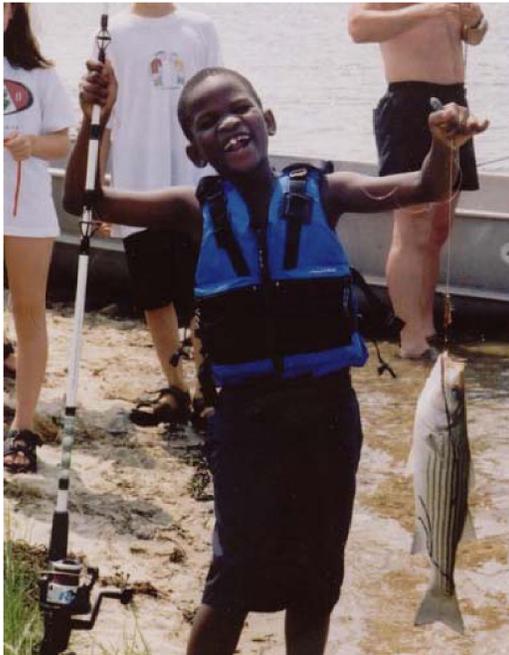
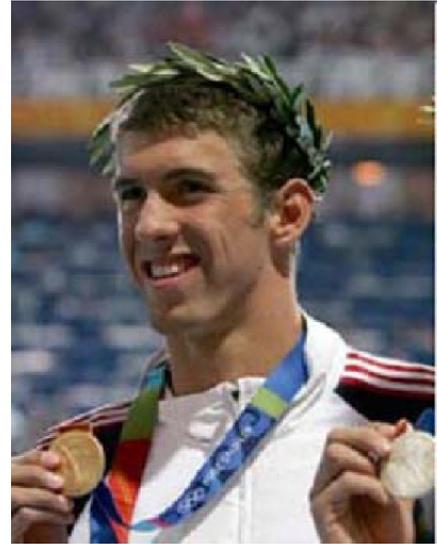
Study ID: \_\_\_\_\_

**DIRECTIONS:** On this sheet you will find words which describe different kinds of feelings. Mark an X in the boxes beside the words that describe how you feel right now. Some of the words may sound alike, but we want you to check all the words that describe your feelings. Work rapidly.

- |   |  |  |
|---|--|--|
| 1. <input type="checkbox"/> affectionate  | 17. <input type="checkbox"/> disgusted     | 34. <input type="checkbox"/> miserable     |
| 2. <input type="checkbox"/> agitated      | 18. <input type="checkbox"/> energetic     | 35. <input type="checkbox"/> obliging      |
| 3. <input type="checkbox"/> agreeable     | 19. <input type="checkbox"/> friendly      | 36. <input type="checkbox"/> open          |
| 4. <input type="checkbox"/> aggressive    | 20. <input type="checkbox"/> furious       | 37. <input type="checkbox"/> peaceful      |
| 5. <input type="checkbox"/> angry         | 21. <input type="checkbox"/> gentle        | 38. <input type="checkbox"/> pleasant      |
| 6. <input type="checkbox"/> calm          | 22. <input type="checkbox"/> gloomy        | 39. <input type="checkbox"/> polite        |
| 7. <input type="checkbox"/> caring        | 23. <input type="checkbox"/> happy         | 40. <input type="checkbox"/> powerful      |
| 8. <input type="checkbox"/> cautious      | 24. <input type="checkbox"/> helpful       | 41. <input type="checkbox"/> sad           |
| 9. <input type="checkbox"/> compassionate | 25. <input type="checkbox"/> hostile       | 42. <input type="checkbox"/> skeptical     |
| 10. <input type="checkbox"/> considerate  | 26. <input type="checkbox"/> inconsiderate | 43. <input type="checkbox"/> sympathetic   |
| 11. <input type="checkbox"/> contented    | 27. <input type="checkbox"/> interested    | 44. <input type="checkbox"/> tense         |
| 12. <input type="checkbox"/> cooperative  | 28. <input type="checkbox"/> irritated     | 45. <input type="checkbox"/> thoughtful    |
| 13. <input type="checkbox"/> critical     | 29. <input type="checkbox"/> joyful        | 46. <input type="checkbox"/> understanding |
| 14. <input type="checkbox"/> cruel        | 30. <input type="checkbox"/> kindly        | 47. <input type="checkbox"/> unhappy       |
| 15. <input type="checkbox"/> cynical      | 31. <input type="checkbox"/> lonely        | 48. <input type="checkbox"/> unsociable    |
| 16. <input type="checkbox"/> disagreeable | 32. <input type="checkbox"/> mad           | 49. <input type="checkbox"/> warm-hearted  |
|   | 33. <input type="checkbox"/> mean          |  |

APPENDIX E

STATE EMPATHY PICTURES





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