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Violent video games and forgiveness

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Violent video games and forgiveness

by

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ABSTRACT

The effect of playing a violent video game on forgiveness was investigated. A transgression context was created in an experimental setting and video game violence was manipulated in two levels (violence or no violence). Subsequent measures of empathy, hostility, and forgiveness were made. No evidence was found of an effect of video game violence on forgiveness or hostility. Empathy was not affected by video game violence. No evidence of a correlation between empathy and forgiveness, or hostility and forgiveness was found. The findings are incongruent with forgiveness theory that posits that empathy predicts forgiveness, and inconclusive as to whether violent video game playing causes a decrease in forgiveness or an increase in hostility. Suggestions for future research are discussed.

CHAPTER 1: INTRODUCTION

Trait forgiveness, the characteristic of an individual to forgive interpersonal transgressions in different situations and over time, has been found to be positively correlated with prosocial personality traits such as trait empathy and agreeableness, and negatively correlated with trait anger and trait hostility (Berry et al., 2005). Violent video game exposure is associated with lower empathy (Funk et al., 2004), as well as a number of negative outcomes, identified through correlational and experimental research (Barlett, Anderson, & Swing, 2009). For example, playing a violent video game causes an increase in aggressive cognitions, hostile mood, and leads to aggressive behavior in experimental studies, and correlational studies have found that higher amounts of violent video game exposure predict greater trait aggression. Although numerous studies have investigated the relation between violent video game playing and aggression, no study has yet investigated the possible causal relation between violent video game playing and forgiveness.

Forgiveness

Forgiveness can be defined at two different levels of analysis. Forgiveness that occurs when an individual forgives a transgressor for a transgression is forgiveness at the offense-specific level of analysis (Berry et al., 2005). Trait forgiveness is the situation and time invariant tendency of individuals to forgive at the offense-specific level. Offense-specific forgiveness can be understood as the displacement of negative emotions directed towards a transgressor (e.g., revenge, hostility) for positive emotions (e.g., empathy, beneficence) (Berry et al., 2005; Worthington & Wade, 1999).

However, at the offense-specific level, forgiveness towards a transgressor is distinguishable from merely an increase in empathy felt toward a transgressor or a decrease in hostility felt toward a transgressor. Indeed, the theoretical causal model of forgiveness posits that empathy is the mediating variable between environmental factors, such as an apology, and forgiveness. Two studies have shown that empathy mediates the relation between an environmental factor, such as an apology or intervention, and offense-specific forgiveness (McCullough, Worthington Jr., & Rachal, 1997; McCullough et al., 1998). On the premise that forgiveness is a prosocial behavior, similar to other prosocial behaviors such as cooperation and altruism that are also facilitated by empathy, McCullough, Worthington Jr. and Rachal (1997) investigated the role of empathy in forgiveness by conducting both a correlational and experimental study. In the correlational study, 239 participants completed a survey where they were asked to think about a specific individual who had transgressed against them while completing measures about how empathetic they felt toward the transgressor, the extent to which they forgave the transgressor, perceived degree of apology from transgressor, and their behaviors toward the transgressor, such as avoidance and conciliation. Empathy was found to mediate the relation between apology and forgiveness; a structural equation model where apology caused an increase in empathy toward the transgressor, and increased empathy caused greater forgiveness, fit the data best.

In the experimental study, 134 participants were assigned to one of three forgiveness seminar conditions. Participants signed up to participate in a seminar to learn more about forgiveness. Participants were assigned to either attend a seminar where empathy was emphasized to facilitate forgiveness, a seminar where empathy was not emphasized, or to

remain on the waiting list and not participate in either seminar. All participants completed measures of empathy and a measure of forgiveness at three time points: before the seminars were conducted, at the end of the seminars, and 6 weeks after the seminars were conducted. The empathy emphasized intervention caused an increase in empathy as well as forgiveness; participants that attended the empathy seminar were more empathetic and more forgiving than those that attended the comparison seminar, showing that increasing empathy can cause greater forgiveness.

Violent Video Games and Empathy

Just as McCullough, Worthington Jr., and Rachal (1997) were able to show that environmental factors that positively influence empathy, such as an apology or an intervention that emphasizes empathy, facilitate forgiveness, it is likely that an environmental factor that negatively influences empathy would have a negative effect on forgiveness. At least one study has found possible evidence of violent video game exposure influencing empathy. Funk, Baldacci, Pasold, and Baumgardner (2004) conducted a survey of 150 fourth and fifth grade students to investigate the relation between violent media exposure and affective desensitization. Violent video game exposure was found to be related with lower trait empathy.

Of course, finding that violent video game exposure is negatively related with trait empathy does not directly imply that a specific episode of violent video game playing causes an immediate decrease in empathy. However, it is possible to posit a mechanism through which an episode of violent video game playing could cause a decrease in empathy based on a comparative model of short term effects of violent video game exposure. The General

Aggression Model (GAM) explains how the long-term positive relation that is observed between violent video game exposure and trait aggression is an accumulated result of repeated increases in aggressive emotions (hostility) during episodes of violent video game playing. The GAM predicts that playing a violent video game causes changes in the present internal state of an individual, affecting aggression related cognitions, arousal, and affect; e.g., aggressive cognitions are activated, as well as aggressive scripts and schemas, and the player will be more likely to be in a hostile mood (Carnagey & Anderson, 2003). Over time, repeated exposures to video game violence and subsequent repeated short term changes to a hostile internal state cause the player to have a more hostile personality.

Just as the GAM explains the positive relation between violent video game exposure and trait aggression as an accumulated effect of repeated short-term increases in aggression caused by violent video game play, the long-term negative relation between violent video game exposure and trait empathy could also be explained as an accumulated effect of repeated short-term decreases in empathy caused by episodes of violent video game play. State empathy may decrease during violent video game playing as a response to the violent content. In many violent video games, the target of a violent act committed by a player exhibits a response that cues the player to the suffering that the target is experiencing. Responses range from visual cues such as bleeding and the loss of limbs to sounds of painful cries, that are then followed by death. In order to succeed at the game, the player may need to practice ignoring these repeated images of pain, suffering, and death, which results in the player learning to decrease empathy towards the targets of violence in the game. It is likely

that repeated decreases of empathy during video game play could lead to a less empathetic personality in general.

Violent Video Games and Forgiveness

As an environmental factor that could negatively influence empathy, violent video game playing would be predicted to cause a decrease in forgiveness. Theoretically, a long-term negative relation between violent video game exposure and trait forgiveness could be an accumulated result of repeated decreases in empathy caused by episodes of violent video game playing. There is currently only one published empirical study on the long-term relation between violent video game exposure and trait forgiveness. Anderson, Gentile, and Buckley (2007) conducted a survey of 189 high school students from the state of Iowa that included measures of violent video game exposure and trait forgiveness. The correlation between violent video game exposure and trait forgiveness was -.14, 95 per cent CI: [-.28, .003]. Although the correlation is not statistically significant, the sign of the sample correlation is in the predicted negative direction, and the confidence interval indicates that there is a large amount of uncertainty due to the low sample size. Even though the lower limit of -.28 is too small of a correlation to describe a meaningful relation between violent video game exposure and trait forgiveness in the study population of state of Iowa high school students, it is possible that the correlation in a different study population could be meaningful.

Although the most theoretically plausible explanation for a negative relation between violent video game exposure and trait forgiveness has been posited, it is also possible that the influence of violent video game playing on forgiveness may extend beyond a mechanism for

decreasing empathy. There may be some unknown effect of violent video game playing that influences forgiveness directly, independent of or greater than the effect on empathy. Indeed, the effect of violent video game playing to increase hostility and aggression is the most well understood and investigated effect of violent video game playing. Although the theoretical model of forgiveness emphasizes the role of empathy as facilitating forgiveness, it is possible that a negative emotion, such as hostility, could also mediate offense-specific forgiveness. This would also explain the negative correlation between trait forgiveness and trait hostility (Berry et al., 2005). Perhaps, in the context of violent video game play, hostility influences forgiveness more than empathy.

Therefore, it is theoretically important to investigate the effect of playing a violent video game on forgiveness experimentally. By creating a transgression context in an experimental setting and manipulating video game violence, the theoretically predicted relation between empathy and forgiveness as well as the extrapolated relation between hostility and forgiveness could be tested. The theoretically predicted effect of video game violence on empathy and hostility could be tested. Also, the effect on video game violence on forgiveness in the short term could be tested. Furthermore, should the results of such an experiment show that video game violence failed to affect empathy and hostility, yet did affect forgiveness, then evidence could be found in support of an as-yet unknown factor of video game game violence that affects forgiveness in ways not predicted theoretically.

Hypotheses

In the present study, video game violence was manipulated experimentally in order to test these claims. An experiment was conducted to compare forgiveness shortly after playing

a video game with either violent content or no violent content. It was predicted that participants who played a violent game would be less forgiving than participants who played a non-violent game. Also, it was predicted that those who played a violent game would be less empathetic and more hostile than those who played a non-violent game. Furthermore, it was predicted that empathy would correlate positively and hostility would correlate negatively with forgiveness.

Before describing the Method used to test the hypotheses, it should be mentioned that measuring forgiveness in the laboratory introduces challenges that frame the methodology for the present study. In order to create a context for a participant to forgive, there must be a transgressor to be forgiven. Experimental procedures used in other research areas that involve creating a conflict context for the participant could serve as a model. A common procedure for provocation in experiments of aggression is to have the participant write an essay on a topic of personal importance (e.g., opinion on abortion; see Carnagey & Anderson, 2005, Experiment 3). The participant is then led to believe that a "partner" (who they are told is another participant that they will not interact with directly) has read and critiqued their essay by completing an Essay Evaluation Form. The participant then reads the Essay Evaluation Form written by their partner. However, no one read the essay, and the Essay Evaluation Form was created beforehand to be very insulting to the participant. This insult then provokes the participant and makes them more willing to aggress towards their bogus partner. This procedure was used in the present study to create a transgression context (insult from essay evaluation) and a transgressor for the participant (the participant's partner).

CHAPTER 2: METHOD

Participants and Design

One-hundred-ten students enrolled in introductory psychology courses at Iowa State University (ISU), a public university of the state of Iowa in the midwest United States, participated in the study in the Fall semester of 2009. Of the 22,521 undergraduate students enrolled at ISU in the Fall semester of 2009, 57% were male (Iowa State University, 2010). The majority of students were White (91% White, 3% Asian, 3% Hispanic/Latino of any race, 2.5% Black, 0.6% Two or more races, 0.2% American Indian or Alaskan Native, 0.03% Native Hawaiian or Pacific Islander). The majority of students are residents of the state of Iowa (72%). Inferences made from the data collected from the experiment sample apply to the study population of introductory psychology students at ISU. Introductory psychology students at ISU consist of students taking Introduction to Psychology, Developmental Psychology, or Social Psychology. Students in these courses are required to either engage in research as a participant or complete quizzes about published psychology studies in order to satisfy a research participation component of their course grade. Because the introductory psychology courses satisfy a general education requirement for social science, students enrolled in these courses are typically representative of freshman and sophomore undergraduate students at ISU.

Participants chose to participate in the present study by contacting the experimenters and arranging an experiment appointment. Upon arriving to the experiment laboratory, each participant was randomly assigned to play either a violent or non-violent video game.

Materials

Video Games.   Two games with violent content and two games without violent content of different genres (e.g., fighting, first-person shooter; adventure, puzzle) were selected so that conclusions drawn from the experiment would be more applicable to games with violent content in general rather than one specific violent game or game genre.

Insulting Essay Evaluation.   The essay evaluation form critiquing the participant's essay consisted of six ratings of qualities of the essay, such as "Organization", "Originality", and "Writing style", on a 21-point scale, ranging from "Unacceptable" (-10) to "Excellent" (+10). There was also a section for written comments. In order to maintain verisimilitude, the evaluation form was printed on a small sheet of white paper and the ratings and comments were written by hand in pencil. The experimenter filled out the evaluation form in the same way for every participant. Every participant received the following ratings and comment: organization was rated as "-10", originality was rated as "-9", writing style was rated as "-9", clarity of expression was rated as "-8", persuasiveness of arguments was rated as "-9", overall quality of essay was rated as "-9", and the written comment was "One of the worst essays I've ever read!".

Tangram Puzzles.   In order to compensate for confounding behaviors, such as behaving in a socially acceptable way, and to provide evidence in support or against forgiveness, a measure of helpful and hurtful behavior was also included that is based upon tangram puzzles (Gentile et. al, 2009). A tangram puzzle is solved by arranging up to seven different basic shapes, such as rectangles and parallelograms, in a non-overlapping way to form a more complicated shape, such as the silhouette of a boat. There is a range of

difficulty between tangram puzzles. Gentile et al. (2009) created a set of 30 tangram puzzles categorized into three difficulty levels (easy, medium, and hard; ten tangrams puzzles per difficulty level). The same 30 tangram puzzles categorized into the same three difficulty levels were used in the present study.

Measures

Video Game Evaluation.   In order to control for differences between non-violent and violent video games in dimensions other than violence, participants evaluated the video game that they played using a video game evaluation form. The form consisted of 18 questions about different aspects of the video game, as well as a question asking whether or not the evaluator has played the game before. Agreement with statements such as, "The game was action packed" were made using a nine-point Likert-type scale, ranging from "Strongly disagree" to "Strongly agree". Statements included evaluations of how exciting, frustrating, absorbing, arousing, violent, or boring the game was, among others. The Video Game Evaluation is composed of a single item scale for violence, and two factors: fun and difficulty (Gentile et al., 2009).

Partner Interaction Questionnaire.   A Partner Interaction questionnaire was used to determine if a transgression context had been created. The questionnaire was completed on a computer, which allowed for subsequent questions to be dependent on responses to previous questions. Question 1 was "Earlier in the study, your partner evaluated your essay. How would you describe the tone of their evaluation? Negative, neutral, or positive." This was a basic manipulation check to see if the participant read the Essay Evaluation Form. If the participant responded 'neutral' or 'positive', the questionnaire ended.   If the participant

responded 'negative', Question 2 was presented. Question 2 was "How fair do you feel that

the critique of your essay was? Unfair, somewhat unfair, somewhat fair, fair." If the

participant responded either 'somewhat fair' or 'fair', then the survey ended. If the

participant responded 'unfair' or 'somewhat unfair' it was considered that the participant

detected the negative tone of the essay evaluation and that they felt that the negativity was

undeserved. This attitude was interpreted as evidence that the participant felt that they had

been insulted by their partner and that the insult had created a transgression context.

Transgression Related Questions.   If evidence of a transgression context was found,

the participant continued the partner interaction survey by responding to Question 1 of the

Transgression Related Questions. Responses to the Transgression Related Questions were

scored on a nine-point scale, from -4 to "Indifferent" (0), to 4. Question 1 was *Because you*

answered that the evaluation made by your partner was unfair... How upset were you

<u>immediately</u> after reading the unfair critique?" Response options were anchored by "Not

Upset at All" (-4) and "Very Upset" (4). Question 2 was "How upset are you <u>now</u> about your

partner making an unfair critique?" Response options were anchored by "Not Upset at

All" (-4) and "Very Upset" (4).   Question 3 was "How positively do you feel towards your

partner?" Response options were anchored by "Not Positive at All" (-4) and "Very

Positive" (4).   Question 4 was "Given that you feel your partner's critique was unfair, how

likely are you to rate their essay more harshly?" Response options were anchored by "Not

Likely at All" (-4) and "Very Likely" (4).

Direct Forgiveness Question.   Forgiveness was measured by score on the Direct

Forgiveness Question, higher Direct Forgiveness Question scores were understood to mean

greater forgiveness. The format of the Direct Forgiveness Question followed that of the Single-Item Forgiveness Scale (McCullough et al., 1998; Wade & Worthington, 2003). The Direct Forgiveness Question was presented after Question 6 of the Partner Interaction Questionnaire. The Direct Forgiveness Question was "To what degree do you forgive your partner for making an unfair critique of your essay?" Responses to the Direct Forgiveness Question were scored on a nine-point scale, from "Not At All" (-4), to "Indifferent" (0), to "Completely" (4).

Current Mood Measure. State empathy was measured based on Batson's Empathy Adjectives scale (Batson, Bolen, Cross, & Neuringer-Benefiel, 1986). Higher scores on Batson's Empathy Adjectives (BEA) items imply greater state empathy. In the BEA, the current degree of feeling towards a transgressor is described by eight adjectives such as, "sympathetic", "empathic", and "concerned" using a six-point scale, ranging from "Not at all" to "Extremely". In order to increase verisimilitude, the BEA items were adjusted to reflect statements of current mood, e.g., "I feel sympathetic." In the present study, the participant was asked to respond to each item by writing down the extent to which they believe the statement to be characteristic of their current mood on a 5 item scale, from "Strongly disagree" to "Strongly agree". State hostility was measured with the State Hostility Scale (Anderson, Deuser, & DeNeve, 1995). Higher SHS scores imply greater state hostility. The SHS consists of 35 items that are presented as statements of current mood, e.g., "I feel furious." The participant was asked to respond to each item by writing down the extent to which they believe the statement to be characteristic of their current mood on a 5 item scale, from "Strongly disagree" to "Strongly agree". For the present study, it was necessary to

shorten the SHS. Because the primary dependent measure is the Direct Forgiveness

Question, it was important that there was as little delay as feasible between video game play

and Direct Forgiveness Question response. Therefore, ten items were randomly selected

from the scale for inclusion. Because of the consistency of format, the SHS items and

adjusted BEA items were combined into a single Current Mood measure.

Tangram Game Evaluation.   In order to control for differences in ability to solve

tangram puzzles, tangram puzzles were evaluated using a form similar to the video game

evaluation form. Non-relevant questions from the video game evaluation form, such as, "The

game was action packed", were removed to construct the tangram puzzle evaluation form.

Tangram Assignment Task.   Helping and hurting behavior were operationalized as

the number of tangrams of easy and hard difficulty, respectively, that the participant assigned

to their partner. The participant was told that their partner could win a $10 gift certificate if

he or she could solve 10 of 11 tangram puzzles in 10 minutes. The participant was presented

with the 30 pretested tangrams, categorized and labeled by difficulty category (easy, medium,

and hard), and was asked to choose 11 tangrams for their partner to try to solve. The

participant was instructed to choose tangrams from more than one difficulty level. Helpful

behavior was determined by the number of easy tangrams greater than three chosen by the

participant for their partner to complete. Hurtful behavior was determined by the number of

hard tangrams greater than two chosen by the participant for their partner to complete.

Procedure

Each participant completed the experiment alone. Upon arrival to the research

laboratory, the participant was greeted by the experimenter and directed to a small room

containing a desk with computer monitor, computer tower, and video game console. The participant was provided an informed consent document to read and sign if they agreed to participate. The informed consent document explained that the purpose of the experiment was to investigate how playing recreational games such as puzzles, board games, and video games affects analytical abilities. The participant was also told that they would work with a partner, another participant in a separate room, to complete portions of the study that required two people.

After providing consent to participate, the participant was told that in order to complete the analytical portion of the study, both the participant and their partner would each write a persuasive essay that the other will critique. The participant was told that they would write their essay first and play games second. The participant was instructed to write a persuasive essay on the issue of abortion, arguing in favor of either a pro-choice or pro-life position, whichever they wished. They were told to write only in favor of one position or the other and not to write the essay from a neutral opinion. The experimenter provided the participant with a sheet of ruled paper and a pencil, and told the participant that they had seven minutes to write the essay. They were instructed to title the essay clearly at the top of the paper by the position that they were arguing for, writing either "Pro-life" or "Pro-choice". The participant was provided an envelope to place the essay into once they finished. The experimenter left the participant alone in the experiment room to write the essay.

After the participant finished writing the essay, the experimenter returned and explained that the next task was to practice a puzzle game that they would play later in the experiment. The experimenter provided a tangram puzzle practice packet and explained how

to solve tangram puzzles in general. The participant was assisted through the practice tangram puzzles until they felt comfortable solving tangram puzzles. The experimenter then left the participant alone in the experiment room to practice tangram puzzles from the practice packet for five minutes. Once five minutes elapsed, the experimenter instructed the participant to complete the tangram puzzle evaluation form.

The participant was then told that while they were practicing the tangram puzzles, their partner read and evaluated their essay. The experimenter provided the participant an envelope containing the the essay that the participant had written along with the insulting pre-made essay evaluation form. The experimenter stepped out of the room while the participant read the critique.

After reading the critique of their essay, the participant played a video game. The participant was randomly assigned to play one of the four video games. Detailed instructions for playing the video game were provided. The participant was told to play the game for 20 minutes and to play the game at the best of their ability for the full time. They were instructed to restart the game if necessary. After ensuring that the participant understood the instructions, the experimenter left the participant alone in the experiment room to play the video game.

After playing the video game, the participant completed the dependent measures, including the measure of current mood, the partner interaction survey, the direct forgiveness question, and the tangram assignment task. The order that the dependent measures were administered was randomly determined beforehand in order to control for possible order effects in dependent measure completion.

To complete the measure of helping and hurting behavior, the participant was told that the researchers were interested in how monetary reward changes performance. The participant was told that the researchers wanted to see how the participant's partner performed on the tangram puzzles when given the chance to win a $10 gift certificate. The participant was told that their partner wold receive the $10 gift certificate if he or she could solve 10 of 11 tangram puzzles in 10 minutes. The experimenter then asked the participant to choose the 11 tangrams for their partner to solve from the set of 30 tangrams practiced earlier, clearly grouped into the three difficult levels of easy, medium, and hard. The participant was instructed to choose tangrams from more than one difficulty level.

After completing the dependent measures, the participant completed a video game evaluation form to assess their reaction to the video game that they played. The participant was debriefed using a funnel debriefing method to evaluate suspicion. The experimenter then disclosed the full purpose of study, and explained why it was necessary that the participant not be aware that their response to the video game violence was being assessed during the experiment. The experimenter also explained that the participant did not have a partner, and that no one read or evaluated the essay. Once the experimenter was sure that the participant had no further questions, the participant was thanked and dismissed.

CHAPTER 3: RESULTS

In order to frame the reported results, two points about the following analytical approach will be made. First, confidence intervals were used exclusively to test differences between groups and for parameter estimation. Second, careful attention was paid to the empirical distributions of the sample data. In situations where the empirical distributions were found to be highly skewed or nonnormal, tests of medians were conducted as opposed to test of means or use of transformation.

Hypothesis Testing Using Interval Estimation

American Psychological Association Style guidelines require that confidence intervals be reported for all parameters of interest and recommend their use based on their efficiency (APA Style, 5th edition, p. 22). As noted by Bonett and Wright (2007), reporting a confidence interval can make the report of an according significance test somewhat redundant. Indeed, confidence intervals contain the same statistical significance information of a significance test statistic and associated p-value, as well as more information. For example, a sample correlation of .40 may be statistically significant in the sense that the probability that the correlation in the study population is equal to zero is less than .05 ($p <$. 05). Computing a 95 per cent confidence interval for the correlation in the study population would show that the interval does not contain zero. Therefore, although it is common to test a sample correlation against the null hypothesis that the population correlation is zero and report a p-value, reporting that the confidence interval of the same alpha level does not include zero communicates the same information. However, conclusions that can be drawn from simply reporting a statistically significant p-value or simply reporting that a confidence

interval does not include zero are limited; in this case, all that has been shown is that the population correlation is not likely to be zero. Of course, failure to find a significant test statistic can not be interpreted as evidence of insignificance, just as failure to find supporting evidence for a hypothesis can not be interpreted as evidence against the hypothesis.

If a complete confidence interval is reported, more information than just the probability that the population statistic is different from zero has been provided. More information allows for a greater variety of conclusions to be made, principally of three types. Using confidence intervals, evidence of a meaningful difference can be found, evidence of no difference can be found, and inconclusive evidence that is inadequate for determination can be found. These conclusions are based in part on removing the importance of the value of zero from determinations of significance and instead interpreting what the limits of given confidence intervals actually mean within their context.

Recalling the previous example, suppose that the 95 per cent confidence interval for the population correlation of the sample correlation of .40 ranged from .10 to .75. It can be concluded as previously that this correlation is statistically significant in the sense that the population correlation is likely to not be zero ($p < .05$). However, it can be concluded from the limit points of the interval that there is a lot of uncertainty in the estimate. This conclusion is based on an understanding of how the relation between variables changes throughout the range of correlation coefficients. The lower limit of the interval is .10. The typical test for the significance of a correlation is based on the belief that a correlation that is not zero describes a meaningful predictive relation, however, a scatterplot of two variables with correlation .10 is indistinguishable from scatterplots of correlations of .00 up to .30; the

plotted points are evenly distributed throughout the plot, thus, knowing a value of one variable does not give you useful information in predicting what the associated value of the other variable would be. Thus, correlations within the range of .00 to .30 could be considered to imply as much useful information as a correlation of zero. Furthermore, the upper limit of the interval is .75. A scatterplot of two variables with correlation .75 shows a distinguishable linear pattern, such that higher values of one variable clearly associate with higher values of the other variable.

This is essentially contradictory evidence; a confidence interval for a correlation that ranges from .10 to .75 describes a range of equally likely population correlations that could be indistinguishable from zero (indicating independence) to a meaningful relation (knowing the value of one variable is useful information in determining the value of the other variable). Therefore, although the correlation is statistically significant, there is too much uncertainty to conclude whether the population correlation is inconsequential or meaningful. In situations where the confidence interval includes an inconsequential value as well as a value that is meaningful, the only statistically correct conclusion can be that the evidence provided is inconclusive and inadequate for determination. Confidence intervals reported in this study with the property that they contain within their range both inconsequential and meaningful information will be reported as not providing adequate evidence for determination.

If the 95 per cent confidence interval for the example correlation of .40 only includes correlation values that are interpretable as meaningfully predicting a relation between the variables, then it can be concluded that there is a meaningful correlation. In terms of differences of group parameters, such as means and medians, a meaningful difference is not

necessarily any difference greater than zero. As noted by Bonett & Wright (2007), the difference in population means or population medians for two groups is almost never expected to be literally equal to zero. Knowing that the true difference in population parameters is not zero implies that the researcher must make a determination of how much of a difference between the two groups would be meaningful.

Although a *t*-test may show that the difference in population means between two groups is not likely to be zero, this is different information than knowing how much of a difference there is. A 95 per cent confidence interval for the difference in the same means would have a lower limit that is not exactly equal to zero, yet it may be inconsequentially different from zero. What is inconsequential will depend on the variable of interest, the response scale, and the subjective judgment of the researcher. Ideally, validity information would also have been collected for the measure in question in order to assist in establishing meaning to values of the scale.

A confidence interval can provide evidence that two variables are not related, or that there is no difference between two parameters by containing only inconsequential estimations. For example, it could be interpreted that there is no difference between the means for two groups if a 95 per cent confidence interval for the difference ranged from an inconsequential negative value to an inconsequential positive value (arbitrarily, -0.10 to 0.10). Equivalently, the confidence interval could range from an inconsequential negative value to anther inconsequential negative value, yet not include zero (arbitrarily, -0.10 to -0.03). Although the latter example does not include zero in its range, it still only includes values that could be interpreted as inconsequential or meaningless. Similarly, in order to

show that two variables are not related, a 95 per cent confidence interval does not necessarily need to include zero, rather it must only include correlation values that are inconsequential.

In summary, the reported results for each dependent measure will be structured as a conclusion statement followed by the statistical information and reasoning used to reach the conclusion. First, a direct conclusion statement will be made that summarizes the interpretation of a confidence interval. Second, the empirical distributions of the sample will be described and appropriate descriptives of centrality, variation, and sample size will be given. As noted by Bonett and Seier (2003), the median is a more useful measure of central tendency when empirical distributions of the sample are skewed or nonnormal. Using non-linear transformations to try to push the sample distribution towards normality changes the meaning of the values in ways that are uninterpretable. Also, non-linear transformations turn responses made on an approximately interval scale into ordinal. This further limits the number of available inferential tools. Therefore, in the present analysis medians and mean absolute deviations (MAD) will be reported when appropriate. Then, the 95 per cent confidence interval for the estimation of interest will be reported. Finally, the limits of the confidence interval will be interpreted.

Preliminary Analyses

Twenty-five participants were highly suspicious. The most common reason given for being suspicious was that the participant did not believe that they actually had a partner. Without believing that there was a partner, there is not evidence of a transgression context, making the responses provided by the highly suspicious participants uninterpretable.

Therefore, the responses of the 25 highly suspicious participants were not included in the analysis.

Of the 86 participants who were not highly suspicious, 80 felt that the tone of the evaluation written about their essay was negative and one participant felt that the tone was neutral. No participant responded that the tone of the evaluation was positive, although the response of five participants were lost due to experimenter error. Of those that responded that the essay evaluation was negative in tone, 36 felt that the negative tone was unfair, 25 felt that it was somewhat unfair, 11 felt that it was somewhat fair, and 8 felt that it was fair. Although participants were not asked directly, it can be inferred that the intended insulting content of the essay evaluation was indeed insulting to the 61 participants that responded that the negative tone of the essay evaluation was unfair.

The analyses include only the responses of the 61 participants that felt that the tone of the essay evaluation was negative, and that the negative tone was unfair or somewhat unfair. As stated before, participants who did not believe that they had a partner should not be included in the analysis because it is necessary for the participant to believe that a transgression occurred in order for them to forgive. Of the remaining 61 participants, 32 had been assigned to the non-violent game condition and 29 had been assigned to the violent game condition. There were 13 females in the non-violent game condition and 16 females in the violent game condition.

Video Game Evaluations

The games played in the violent game condition were rated as considerably more violent than the games played in the non-violent game condition. Recall that responses to the

Video Game Evaluation form could range from Strongly Disagree (1) to Strongly Agree (9).

Violence ratings for games played in the non-violent game condition are distributed with

high positive skew (*Median* = 2, *SE(Median)* = 0.26, *Mean Absolute Deviation (MAD)* =

1.22, n = 32). Violence ratings for games played in the violent game condition are

distributed with high negative skew (*Median* = 9, *SE(Median)* = 0.06, *MAD* = 0.64, n = 28).

The 95 per cent confidence interval for the difference in median violence ratings between

games played in the non-violent game condition and games played in the violent game

condition (non-violent minus violent) ranges from -8.1 to -5.9. Both limits of the interval

describe a large difference in violence rating between the games.

Internal reliabilities of the fun factor and difficulty factor of the Video Game

Evaluation are .94, 95% CI [.91, .96] and .46, 95% CI [.09, .67], respectively. However,

narrower confidence intervals for these reliabilities can be found by combing the reliabilities

reported in similar studies with the results of the present study using a varying coefficient

meta-analytic method (Bonett, 2010). Gentile et al., (2009) reported reliabilities for the fun

factor and difficulty factor of the Video Game Evaluation of .95 and .75, respectively (n =

161). The average reliability for the fun factor of the Video Game Evaluation is .95, 95% CI

[.93, .96]. The average reliability for the difficulty factor of the Video Game Evaluation

is .61, 95% CI [.44, .73]. The fun factor component of the Video Game Evaluation is

satisfactorily reliable; the confidence interval for the average reliability of the fun factor only

contains values that could be interpreted as reliable. However, the difficulty factor of the

Video Game Evaluation is not found to be a satisfactorily reliable measure; the confidence

interval for reliability of the difficulty factor contains values that could be interpreted as

unreliable (.44), as well as values that could be interpreted as reliable (.73). Therefore, the

individual items of the difficulty factor (frustration and difficulty to play) were analyzed

separately.

The data are inconclusive for determining whether or not there is a difference in fun

factor rating between games played in the non-violent game condition and games played in

the violent game condition. Fun factor ratings for games played in the non-violent game

condition are distributed approximately normally ($M = 5.97$, $SD = 1.70$, n = 32). Fun factor

ratings for games played in the violent game condition are distributed approximately

normally ($M = 6.39$, $SD = 1.71$, n = 28). The 95 per cent confidence interval for the

difference in mean fun factor ratings between games played in the non-violent game

condition and games played in the violent game condition (non-violent minus violent) ranges

from -1.29 to 0.44. The interval includes zero, implying that the mean difference in fun

factor ratings could be inconsequentially small. However, the lower limit of -1.29 could be

interpreted as a meaningful difference in fun factor rating between groups. Because the

confidence interval includes values that could be meaningful as well as values that could be

inconsequential, it cannot be concluded whether there is or whether there is not a difference

in fun factor ratings in the population.

There is no difference in frustration rating between games played in the non-violent

game condition and games played in the violent game condition. Frustration ratings for

games played in the non-violent game condition are distributed with high negative skew

(*Median* = 7, *SE(Median)* = 0.07, *MAD* = 0.94, n = 32). Frustration ratings for games played

in the violent game condition are distributed with high negative skew (*Median* = 7,

SE(Median) = 0.06, *MAD* = 1.07, n = 28). The 95 per cent confidence interval for the difference in median frustration ratings between games played in the non-violent game condition and games played in the violent game condition (non-violent minus violent) ranges from -0.68 to 0.68. The interval includes zero, implying that the mean difference in frustration ratings could be inconsequentially small. Furthermore, both the lower limit of -0.68 as well as the upper limit of 0.68 could be interpreted as an inconsequential difference in frustration rating between groups. Because the confidence interval only includes values that could be inconsequential or not meaningful, it can be concluded that there is not a difference in frustration ratings in the population.

The games played in the violent game condition were rated as more difficult to play than the games played in the non-violent game condition. Ratings of game play difficulty for games played in the non-violent game condition are distributed approximately normally (*M* = 3.91, *SD* = 1.82, n = 32). Ratings of game play difficulty for games played in the violent game condition are distributed approximately normally (*M* = 5.86, *SD* = 1.43, n = 28). The 95 per cent confidence interval for the difference in mean difficulty ratings between games played in the non-violent game condition and games played in the violent game condition (non-violent minus violent) ranges from 1.13 to 2.78. Both the lower limit of 1.13 as well as the upper limit of 2.78 could be interpreted as a meaningful difference in difficulty to play rating between groups. Because the confidence interval only includes values that could be meaningful, it can be concluded that there is a difference in frustration ratings in the population.

In summary, games played in the violent game condition were rated as more violent than the games played in the non-violent game condition. Although the games in the violent game condition were rated as more difficult to play, there was no difference in frustration rating between the games. Therefore, for the purpose of the present study, the games played in the non-violent game condition effectively matched the games played in the violent game condition on relevant game factors other than violence.

Transgression Related Questions

The data are inconclusive for determining whether or not there is a difference in how upset participants were immediately after reading the insulting essay evaluation between those that played a non-violent game and those that played a violent game. Recall that responses to the Transgression Related Questions could range from -4 to 4, with varying anchor descriptions dependent on the specific question. The empirical distribution of how upset participants were immediately after reading the insulting essay evaluation in the non-violent game condition is negatively skewed (*Median* = 1, *SE(Median)* = 0.07, *MAD* = 1.16, n = 32). The empirical distribution of how upset participants were immediately after reading the insulting essay evaluation in the violent game condition is negatively skewed (*Median* = 1, *SE(Median)* = 0.27, *MAD* = 1.59, n = 28). The 95 per cent confidence interval for the difference in median responses of how upset participants were immediately after reading the insulting essay evaluation between those who played a non-violent game and those who played a violent game (non-violent minus violent) ranges from -1.16 to 1.16. The interval includes zero, implying that the median difference in upset could be inconsequentially small. However, both the lower limit of -1.16 as well as the upper limit of 1.16 could be interpreted

as a meaningful difference in upset between groups. Because the confidence interval includes values that could be meaningful as well as values that could be inconsequential, it cannot be concluded whether there is or whether there is not a difference in upset between groups.

The data are inconclusive for determining whether or not there is a difference in how upset participants were after game play about reading the insulting essay evaluation between those that played a non-violent game and those that played a violent game. The empirical distribution of how upset participants were after game play about reading the insulting essay evaluation in the non-violent game condition is approximately normal ($M = $ -1, $SD = $ 1.67, n $= 32$). The empirical distribution of how upset participants were after game play about reading the insulting essay evaluation in the violent game condition is approximately normal ($M = $ 0.17, $SD = $ 1.98, n $= 29$). The 95 per cent confidence interval for the difference in mean responses of how upset participants were about reading the insulting essay evaluation after game play between those who played a non-violent game and those who played a violent game (non-violent minus violent) ranges from -1.12 to 0.84. The interval includes zero, implying that the mean difference in upset could be inconsequentially small. However, the lower limit of -1.12 could be interpreted as a meaningful difference in upset between groups. Because the confidence interval includes values that could be meaningful as well as values that could be inconsequential, it cannot be concluded whether there is or whether there is not a difference in upset between groups.

The data are inconclusive for determining whether or not there is a difference in how positive participants felt towards their partner between those that played a non-violent game

and those that played a violent game. The empirical distribution of how positive participants felt towards their partner in the non-violent game condition is negatively skewed (*Median* = 0, *SE(Median)* = 0.07, *MAD* = 0.78, n = 32). The empirical distribution of how positive participants felt towards their partner in the violent game condition is negatively skewed (*Median* = -1, *SE(Median)* = 0.07, *MAD* = 0.93, n = 28). The 95 per cent confidence interval for the difference in median responses of how positive participants felt towards their partner between those who played a non-violent game and those who played a violent game (non-violent minus violent) ranges from 0.28 to 1.72. The interval does not include zero, however, the lower limit of 0.12 could be interpreted as an inconsequential difference in positive feelings between groups and the upper limit of 1.72 could be a meaningful difference in positive feelings between groups. Because the confidence interval includes values that could be meaningful as well as values that could be inconsequential, it cannot be concluded whether there is or whether there is not a difference in how positive participants felt towards their partner between groups.

The data are inconclusive for determining whether or not there is a difference in how likely participants felt they would be to evaluate their partner harshly between those that played a non-violent game and those that played a violent game. The empirical distribution of how likely participants felt they would be to evaluate their partner harshly in the non-violent game condition is negatively skewed (*Median* = 0, *SE(Median)* = 0.07, *MAD* = 1.06, n = 32). The empirical distribution of how likely participants felt they would be to evaluate their partner harshly in the violent game condition is negatively skewed (*Median* = 1, *SE(Median)* = 0.07, *MAD* = 1.55, n = 28). The 95 per cent confidence interval for the

difference in median responses of how likely participants felt they would be to evaluate their partner harshly between those who played a non-violent game and those who played a violent game (non-violent minus violent) ranges from -1.72 to -0.28. The interval does not include zero, however, the lower limit of -1.72 could be interpreted as a meaningful difference in likeliness to evaluate harshly between groups and the upper limit of -0.28 could be an inconsequential difference in likeliness to evaluate harshly between groups. Because the confidence interval includes values that could be meaningful as well as values that could be inconsequential, it cannot be concluded whether there is or whether there is not a difference in how likely participants felt they would be to rate their partner harshly between groups.

Main Analyses

Forgiveness

The data are inconclusive for determining whether or not there is a difference in forgiveness between those that played a non-violent game and those that played a violent game (Figure 1). The empirical distribution of forgiveness in the non-violent game condition is approximately normal ($M = 0.25$, $SD = 1.57$, n = 32). The empirical distribution of forgiveness in the violent game condition is approximately normal ($M = -0.03$, $SD = 1.86$, n = 29). The 95 per cent confidence interval for the difference in mean forgiveness between those who played a non-violent game and those who played a violent game (non-violent minus violent) ranges from -0.58 to 1.15. The interval includes zero, implying that the mean difference in upset could be inconsequentially small. However, the upper limit of 1.15 could be interpreted as a meaningful difference in forgiveness between groups. Because the confidence interval includes values that could be meaningful as well as values that could be

inconsequential, it cannot be concluded whether there is or whether there is not a difference
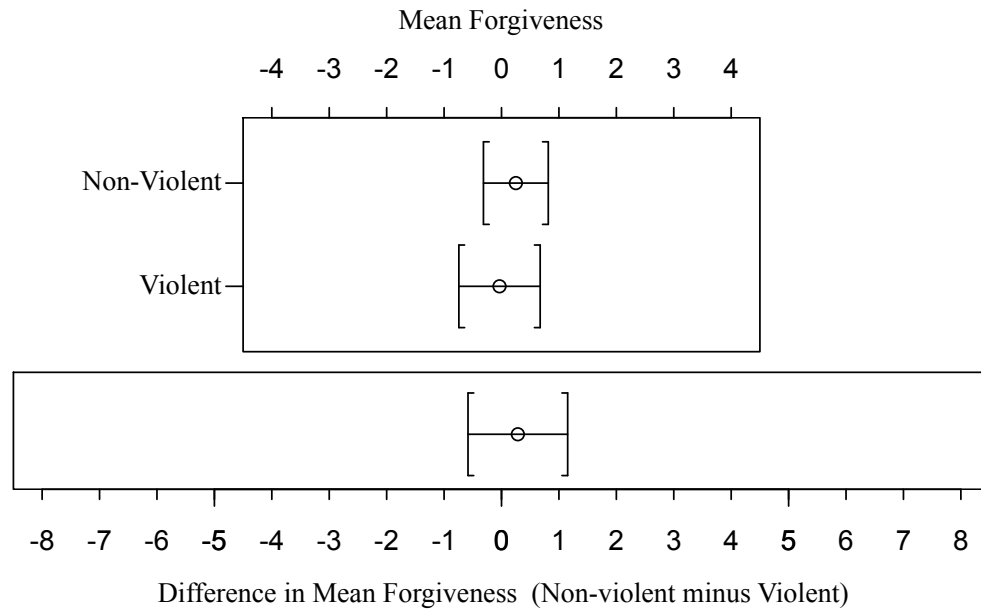
in forgiveness between groups.

Figure 1. Comparison of mean forgiveness between Non-Violent and Violent groups.

Sample means and the difference between sample means denoted by dashed lines; dark solid

boxes contain 95% confidence intervals for population means and difference in population

means. The data are inconclusive for determining the difference in population means

because the 95% confidence interval contains values that could be interpreted as a

meaningful difference between groups as well as values that would imply an inconsequential

difference between groups.

Empathy

There is no difference in empathy between participants that played a non-violent game and participants that played a violent game. Internal reliability of the empathy items of the Current Mood measure is .79, 95% CI [.70, .86]. The empirical distribution of empathy in the non-violent game condition is approximately normal ($M = 2.81$, $SD = 0.40$, n = 32). The empirical distribution of empathy in the violent game condition is approximately normal ($M = 2.91$, $SD = 0.62$, n = 29). The 95 per cent confidence interval for the difference in mean empathy between those who played a non-violent game and those who played a violent game (non-violent minus violent) ranges from -0.37 to 0.16. The interval includes zero, implying that the mean difference in empathy could be inconsequentially small. Furthermore, both the lower limit of -0.37 as well as the upper limit of 0.16 could be interpreted as an inconsequential difference in empathy between groups. Because the confidence interval only includes values that could be inconsequential or not meaningful, it can be concluded that there is not a difference in empathy between groups.

Hostility

The data are inconclusive for determining whether or not there is a difference in hostility between participants that played a non-violent game and participants that played a violent game. Internal reliability of the hostility items of the Current Mood measure is .85, 95% CI [.78, .90]. The empirical distribution of hostility in the non-violent game condition is approximately normal ($M = 2.46$, $SD = 0.39$, n = 32). The empirical distribution of hostility in the violent game condition is approximately normal ($M = 2.81$, $SD = 0.66$, n = 29). The 95 per cent confidence interval for the difference in mean empathy between those

who played a non-violent game and those who played a violent game (non-violent minus violent) ranges from -0.62 to -0.07. The interval does not include zero, however, the lower limit of -0.62 could be interpreted as a meaningful difference in hostility between groups and the upper limit of -0.07 could be an inconsequential difference in hostility between groups. Because the confidence interval includes values that could be meaningful as well as values that could be inconsequential, it cannot be concluded whether there is or whether there is not a difference in hostility between groups.

Relations Between Variables

The data are inconclusive for determining whether empathy is related with forgiveness. The 95 per cent confidence interval for the correlation between empathy and forgiveness ranges from .06 to .52. The lower limit of the interval describes an inconsequential relation, however the upper limit is meaningful. Because the confidence interval includes values that could be meaningful as well as values that could be inconsequential, it cannot be concluded whether there is or whether there is not a relation between empathy and forgiveness.

The data are inconclusive for determining whether hostility is related with forgiveness. The 95 per cent confidence interval for the correlation between hostility and forgiveness ranges from -.63 to -.23. The lower limit of the interval describes a meaningful relation, however the upper limit is inconsequential. Because the confidence interval includes values that could be meaningful as well as values that could be inconsequential, it cannot be concluded whether there is or whether there is not a relation between hostility and forgiveness.

Table 1. Sample correlations and 95% confidence intervals (n = 61).

	Forgiveness	Empathy
Empathy	.31 [.06, .52]	
Hostility	-.45 [-.63, -.23]	-.29 [-.50, -.04]

Ancillary Analyses

Helping and Hurting Behavior

The data are inconclusive for determining whether or not there is a difference in helping behavior between participants that played a non-violent game and participants that played a violent game. Only 31 per cent of participants that played a non-violent game (10 of 32) and 21 per cent of participants that played a violent game (6 of 28) chose more than four easy tangrams for their partner to complete. The 95 per cent confidence interval for the difference in proportion of participants that helped between those who played a non-violent game and those who played a violent game (non-violent minus violent) ranges from -.12 to .32. The interval includes zero, implying that the mean difference in helping could be inconsequentially small. However, both the lower limit of -.12 as well as the upper limit of .32 could be interpreted as a meaningful difference in helping between groups. Because the confidence interval includes values that could be meaningful as well as values that could be inconsequential, it cannot be concluded whether there is or whether there is not a difference in helping between groups.

The data are inconclusive for determining whether or not there is a difference in hurting behavior between participants that played a non-violent game and participants that played a violent game. Fifty per cent of participants that played a non-violent game (16 of 32) and 61 per cent of participants that played a violent game (17 of 28) chose more than three hard tangrams for their partner to complete. The 95 per cent confidence interval for the difference in proportion of participants that hurt between those who played a non-violent game and those who played a violent game (non-violent minus violent) ranges from -.36 to .14. The interval includes zero, implying that the mean difference in helping could be inconsequentially small. However, both the lower limit of -.36 as well as the upper limit of .14 could be interpreted as a meaningful difference in hurting between groups. Because the confidence interval includes values that could be meaningful as well as values that could be inconsequential, it cannot be concluded whether there is or whether there is not a difference in hurting between groups.

CHAPTER 4: DISCUSSION

In the present study, the effect of playing a violent video game on forgiveness was investigated. An experiment was conducted where a transgression context was created and video game violence was manipulated in two levels. Subsequent measures of empathy, hostility, and forgiveness were made. No evidence of a difference in forgiveness was found between those who played a non-violent game and those who played a violent game; the results of the experiment do not support the hypothesis that playing a violent video game causes a decrease in forgiveness in the short term. Empathy was not affected by playing a violent video game; the results of the experiment have provided evidence in contradiction to the hypothesis that playing a violent video game causes a decrease in empathy. No evidence of a difference in hostility was found between those that played a non-violent game and those that played a violent game; the results of the experiment do not support the hypothesis that playing a violent video game causes an increase in hostility. No evidence of a correlation between empathy and forgiveness was found; the results of the experiment do not support the hypothesis that empathy predicts forgiveness. No evidence of a correlation between hostility and forgiveness was found; the results of the experiment do not support the hypothesis that hostility predicts forgiveness.

In summary, the experiment did not provide evidence that playing a violent video game causes a decrease in forgiveness, a decrease in empathy, nor an increase in hostility in the short-term. Furthermore, contrary evidence was found to the current theoretical prediction that empathy predicts forgiveness. No evidence was found in support of the conjectured relation between hostility and forgiveness. Combined, it would appear that the

current theory of forgiveness does not apply to the context of video games. However, there are a number of limitations of the present study that restrict the aforementioned conclusions. For clarification, these limitations have be organized as methodological, procedural, and theoretical.

Methodological Limitations

Small sample size. Future studies that incorporate a similar item to the Direct Forgiveness Question will require larger sample sizes for satisfactorily narrow confidence intervals. Given that the response scale for the Direct Forgiveness Question ranged from -4 to 4, a 95 per cent confidence interval with a width of 0.95 should be sufficiently narrow to determine if there is or is not a difference in forgiveness between playing a non-violent or violent video game. However, using the sample variances from the present study as planning values leads to a requirement of at least 102 participants per group. Likewise, using sample variances for empathy and hostility as planning values and a desired 95 per cent confidence interval width of 0.30 shows that at least 101 participants would be required per group. Thus, future studies that incorporated the same measures as the present study would need to retain at least three times as many participants. Keeping in mind that nearly half of participants in the current sample were dropped from analysis due to either high suspicion or not interpreting the insulting essay evaluation as insulting, it would seem that an exact replication of the present study would require a total sample size of 400 for conclusive results. However, it is likely that future studies that address the following limitations could have significantly greater power.

Empathy measure.   Batson's Empathy Adjectives scale is designed to be administered to a respondent that is considering a specific individual who has committed a specific offense towards the respondent. Although reasonable justifications were made to modify the presentation of the empathy items in the present study for the purposes of verisimilitude, interpretability of results that involve the empathy scale items is limited. Therefore, any extrapolation outside of the immediate experimental group of the empathy related results of the are likely not warranted.

Hostility measure.   The measure of hostility was also a limitation in the present study. Although there were reasonable justifications for using a shortened form of the State Hostility Scale, not using the standard complete scale limited comparisons of the results of the present study with other violent video game studies that have used the same scale. Without more information on reliability, validity, or availability of a comparative data set, it is difficult to determine whether the 10-item hostility scale that was used was an appropriate measure of hostility. Therefore, any extrapolation outside of the immediate experimental group of the hostility related results of the present study are likely not warranted.

Target of emotion measures.   In the present study, the presentation format of Batson's Empathy Adjectives items was modified to align with the presentation format of the State Hostility Scale items. Both emotion measures were presented as general mood statements, implying that responses refer to general emotions. However, the emotion measures could have been directed at a target. By directing the emotion statements towards the bogus partner, just as Batson's Empathy Adjectives measure is designed, empathy and hostility could have been measured in reference to the partner. This would have likely

increased the power of these measures. Conceptually, measuring empathy and hostility emotions directed toward the partner would also align with measuring forgiveness of the partner. Similar future studies would likely benefit from defining all emotion based dependent variables in reference to the transgressor rather than in general.

    Tangram assignment task. The tangram assignment task was formally unsuccessful in this study. In this study, the distributions of tangram selection were not suitable for a comparison of means or medians between groups, so proportions of helping and hurting behavior were compared instead. However, in Gentile et al. (2009), comparisons of means were made, implying that the sample distributions for Gentile et al. were approximately normal. Either a much larger sample would be required to determine what the population distributions may be, or there may be an inherent problem using the tangram assignment task in this experimental context. Given that 50% and 60% of participants in the non-violent and violent game conditions, respectively, committed some amount of hurting behavior, perhaps selection of hard tangrams for the partner to complete is not a discriminatory measure of hurting behavior. Furthermore, so few participants committed any amount of helping behavior in either condition that the inclusion of the helping behavior measure may be irrelevant. In retrospect, the tangram assignment task was not the best method for corroborating the primary dependent measures of forgiveness, empathy, and hostility. Hopefully, future studies could incorporate measures of trait forgiveness, trait empathy, and trait hostility collected before the participation in the experiment.

Procedural Limitations

Suspicion.   Roughly 25% of participants were extremely suspicious about the intent of the study, and did not believe that they had a partner. Greater care should be taken in future studies to screen potential participants that could have been involved in research that also used a bogus partner procedure. Some participants also mentioned that they had learned through their Psychology courses that often times in Psychology experiments, the participant is misled to believe that they have a partner when they do not. Therefore, greater care should be taken to make sure that participants in future studies have limited experience in Psychology education.

However, there is one procedural change to the present design that may decrease suspicion. In the aggression research procedure that the insulting essay evaluation is based, the participant typically evaluates an essay as well. In order to increase agitation, the essay evaluated by the participant is written to be of their direct opposing viewpoint. It was decided not to have the participant evaluate an opposing essay because the participant may have simply dismissed the insulting essay evaluation due to their partner simply being a person that disagrees with them. However, if the participant had evaluated an essay that agreed with their persuasive position, the insult manipulation would likely have been stronger. Rather than a stranger simply saying that their essay was terrible for unknown reasons, the participant could then feel that they had been betrayed (insulted) by someone who agrees with them. Therefore, in future studies the participant should evaluate a pre-written essay of the same opinion. This change would likely increase verisimilitude and the insulting effect of the insulting essay evaluation.

Frustrating games.   Both violent and non-violent games were rated as frustrating. The overall mean frustration rating across games is 6.53, 95% CI [6.15, 6.92], on a nine-point scale. This may have added noise to the data, however, the games were also rated as being fun (M = 6.17, 95% CI [5.73, 6.61]). Although it may be difficult to find games that are less frustrating yet still fun, care should be taken when selecting games in future studies to try to select games with lower overall frustration ratings.

Order of dependent measures.   The order of the dependent measures should have been modified. It is possible that the random completion of the dependent measures increased measurement error, due to some participants having responded to the Direct Forgiveness Question before they assigned tangrams, while other assigned tangrams first and completed the Direct Forgiveness Question afterward. Perhaps complicated motives for revenge or retribution were satisfied through both the Direct Forgiveness Question and the tangram assignment task, leading to random variation in response to whichever dependent measure was presented second. Given the small effect sizes for the primary dependent variables and the large samples required to find conclusive evidence in future studies, every effort should be made to increase the power of the primary dependent measures. Therefore, the Partner Interaction Survey and Direct Forgiveness Question should have been completed immediately after game play. Then, the actual Batson's Empathy Adjectives could have been administered, using the bogus partner as the target of empathy. Then, the complete 35 item State Hostility Scale could have been used, which would likely have increased reliability of the hostility measure. The tangram assignment task should have been the last dependent measure completed given that it is a new and relatively non-established measure.

Theoretical Limitations

Relationship closeness.   Foremost, a critical predictor of forgiveness that was not addressed in the present study was relationship closeness (McCullough et al., 1998; McCullough et al., 1997). It is quite possible that the sort of forgiveness that occurs in the context of an emotional, interpersonal relationship is very different from the sort of forgiveness that occurs between strangers that have never met, as was the case between participants in the present study and their bogus partner.

This leads to a general point of concern about the effectiveness of the Direct Forgiveness Question as a measure of short term forgiveness in this study. Although the question is based upon an established Single Item Forgiveness Scale, the Single Item Forgiveness Scale is designed for situations where the transgressor is a clearly defined person who has committed a serious interpersonal transgression. In the experimental context of the present study, the sole interaction that the participant had with the transgressor was the transgression itself (reading the insulting essay evaluation). Perhaps the measure would better differentiate short-term forgiveness if the participant believed that the transgression came from a person that they knew, i.e., a "familiar" transgressor versus an "unknown" transgressor.

Indeed, in the present experimental context, the sort of forgiveness measured is probably similar to a general forgiveness attitude that a person has toward persons in general. This may be more akin to a "turn the other cheek" mentality than the sort of interpersonal forgiving measured by the Trait Forgiveness Scale. Therefore, it is possible that incorporating a familiar transgressor may increase short-term sensitivity of the Direct

Forgiveness Question. Of course, it would be difficult to control for the strength of the relationship between the participant and the "familiar" transgressor. One possible solution may be to try use persons that all participants will have essentially equivalent interpersonal experience at the time of the experiment. For example, the transgressor could be the experimenter, or perhaps a common professor.

Conclusion

Although evidence in support of the hypothesized effects was not found, given the aforementioned theoretical and methodological considerations that were illuminated through the development and execution of the present study, the next steps for research in this area are clear. The theoretical model of offense-specific forgiveness should be testable by manipulating participant empathy and hostility. According to the theoretical model of aggression, empathy and hostility should be manipulable through exposure to video game violence. By increasing sample size, using standardized measures, directing emotion measures toward the transgressor, including an essay evaluation task for the participant, and increasing relationship closeness between participant and transgressor, follow up studies should have both the power and validity to answer important questions about both violent video games and forgiveness.

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