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ORIGINAL ARTICLE

Effect of Playing Violent Video Games Cooperatively or Competitively on Subsequent Cooperative Behavior

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Abstract

Research on video games has yielded consistent findings that violent video games increase aggression and decrease prosocial behavior. However, these studies typically examined single-player games. Of interest is the effect of cooperative play in a violent video game on subsequent cooperative or competitive behavior. Participants played Halo II (a first-person shooter game) cooperatively or competitively and then completed a modified prisoner's dilemma task to assess competitive and cooperative behavior. Compared with the competitive play conditions, players in the cooperative condition engaged in more tit-for-tat behaviors—a pattern of behavior that typically precedes cooperative behavior. The social context of game play influenced subsequent behavior more than the content of the game that was played.

Introduction

Meta-analyses of the research on playing violent video games indicate that playing these games increases aggressive thoughts, feelings, and behavior and is negatively correlated with instances of prosocial behavior.[1] However, most experimental studies of violent video games have involved single players though the majority of players self-report preferring to play video games in cooperative modes where they work with others against a common opponent.[2–6] Consequently, the existing research does not reflect the social context in which people play violent video games.[4] Research suggests that playing in groups may impact the effects of hostility—particularly when players are placed in a cooperative orientation.[7] Cooperative play of aggressive games has been found to decrease the level of aggressive cognitions[8] and arousal associated with playing violent games.[9] The goal of the current research is to ascertain the effect of cooperatively playing a violent video game with another human on subsequent behavior.

There is a lack of research on the effects of cooperative play in video games. In a direct test of the effects of cooperative play, Chambers and Ascione[10] had children play a prosocial game (Smurfs) or an aggressive game (Boxing). Each child controlled half of the movement of the on-screen character (e.g., one child controlled the forward progress and the other child controlled jumping and ducking). Playing the prosocial game had no effect on donating behavior, but playing the aggressive boxing game decreased donating. A limitation to the study is the unusual style of play where players worked together to control one character. In their study on violent video game play and cooperation, Sheese and Graziano[11] had two participants play simultaneously but independent of each other. The study found that playing a violent video game lessened prosocial behavior. However, the authors did note that cooperatively engaging in violent behavior against a common enemy could increase feelings of cohesion and promote subsequent cooperation.

Eliciting cooperation

Cooperation can be defined as behavior that maximizes the outcomes of a collective.[12] Cooperative behaviors usually result from the desire to continue working well with the other people.[13] Smeesters et al. found that priming cooperation can increase cooperative behavior.[14] Further, similar research found that situational primes can increase people's perception of themselves as helpful and the extent to which they engage in later helpful behavior.[15] Thus, when groups of two or more people playing a violent video game act cooperatively against a computer or other human players, the cooperative play may increase the accessibility of

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cooperation-related constructs in memory leading to an increase in later cooperative behavior. Conversely, direct competition while playing the game should decrease cooperation in the future.

In addition, if individuals see the other player as a member of their ingroup the likelihood of engaging in prosocial behaviors with that person will increase.[16–20] When individuals play on the same team and cooperate with one another while playing a violent video game it is likely that they will view their cooperation partner as a member of their ingroup which should increase the likelihood of cooperation with that individual.

In this study, we looked at the use of tit-for-tat strategies. Tit-for-tat strategies involve reciprocally mirroring an opponents' behavior by responding to cooperation with cooperation and competition with competition. Tit-for-tat strategies are among the best strategies for increasing cooperative behavior.[21,22] Specifically, tit-for-tat encourages reciprocal cooperation by punishing selfish behavior. Tit-for-tat is commonly used as a proxy for a person's desire for cooperative behavior between potential adversaries.[23,24]

The current study examined how playing a violent video game cooperatively influenced future cooperative behavior. It is possible that the violent game play could reduce cooperation regardless of whether a person is playing cooperatively with another person as the content of the game may overpower the social context of game play. Conversely, recent research suggests that the social context of game play can mitigate the effects of the content of the game.[7–9]

Methods

Participants

One hundred nineteen (96 men, 18 women, and 5 unspecified) students participated in the study. Participants received credit toward a class requirement. Participants were required by the IRB to have experience playing Halo.

Design

There were four between-subject conditions in this study: direct competition (82 percent men) versus indirect competition (82 percent men) versus cooperation (89 percent men) versus control (83 percent men). The dependent variable was a social dilemma task, designed as a behavioral measure of cooperation between participants.

Procedure and measures

In the first session participants completed an online survey about their video game history and the Buss-Perry 29-item measure of trait aggression.[25] The second session was completed in the lab, where participants played the violent video game Halo II on an Xbox 360. Halo II is a first-person shooter game. Game play involves using weapons to kill either alien or human opponents controlled by the computer or other human players. When an avatar is killed, it is regenerated after a short delay. Halo II provides options for either competitive or cooperative play.

Participants completed the second session in pairs. Each pair was randomly assigned to one of four game play conditions (direct competition, indirect competition, cooperation, or control). In all conditions, each partner was seated in a separate cubicle with their own television and Xbox 360 gaming system. Participants played in separate rooms to control for any effects of direct contact with the other participants. In all conditions except the control, participants were given instructions for how to play the game and 5 minutes to practice the game prior to playing with their partner.

In the *direct competition condition*, participants were told that their task was to kill their opponent more times than they were killed. They played in Halo II's multiplayer arena mode as this is the only game option that allows participants to direct violence solely toward their partner. Participants played directly against their partner but they were in separate rooms. In the *indirect competition condition*, participants were told that their task was to beat their opponent at the game by getting further through Halo II's single-player game than their opponent. The single-player mode places participants in maps similar to the multiplayer arena mode but includes computer-controlled enemies that participants can aggress toward. These participants each played separate, independent games of Halo II. The type of competition was varied to test whether there were different effects based on whether the participants were actively attempting to kill the other participants compared with competition framed as winning through superior independent performance on the game.

In the *cooperation condition*, participants were told to get as far through the game as they could by working together with their partner in Halo II's cooperative campaign mode. This mode contains the same content as the single-player mode and is the only game option that allows participants to cooperatively engage computer-controlled enemies. Therefore, across all conditions participants were placed in similar maps but the enemy participants were instructed to engage with varied between conditions (partner vs. computer-controlled enemies). The participants played together on the same game system against computer opponents. Each player viewed the same game from their own television in separate rooms without any means to communicate with each other.

Participants were told they had 15 minutes to play and to play for the entire time. Participants in the control condition were allowed to play Halo II after the outcome measures had been collected. Responses in the control condition represent behavioral tendencies without the influence of violent gaming.

The cooperation measures were based on participants' actions in a social dilemma task. In the three experimental conditions, participants completed the social dilemma task after playing the game. The social dilemma task was modified from the version used by Van Lange and Kuhlman[26] by shortening the number of trials from 25 to 10 and by using dimes. Participants completed this task in pairs. Participants in the direct competition, indirect competition, and cooperation conditions were paired with the person with whom they played Halo II. Participants were instructed that this task would consist of 10 trials. In each trial, each participant was given four dimes. They were instructed that they could either keep all of the dimes or give one or more of the dimes to their partner and those dimes given to the partner would double in value for the partner. The choice of how many dimes to give away was made privately each round and the results were revealed to each player after both partners had chosen the number of dimes to give away. Each player received the

money given to them by the other player at the end of each round. The payoff for each round to each player ranged from no money (if the player gives four dimes to partner and the partner keeps all four dimes) to $1.20 (if the player keeps all four dimes and partner gives all four dimes). Participants were allowed to keep all of the money they had received during this task.

The dependent measure is the level of tit-for-tat behavior exhibited during the set of trials. The tenth trial was not used in the analysis because the participants were unintentionally told that there were 10 trials that may have led participants to donate less dimes in order to maximizing personal gain on that trial.[21] After participants had completed all of the measures, they were debriefed, thanked, and dismissed.

Results

A series of correlations were run between partner's scores on the main dependent variable to determine whether partners could be independently analyzed. None of the partner's measures were significantly correlated—all p's > 0.05—so the individual player was used as the unit of analysis. Likewise, trait aggression and gender were not significant co-variates in any of the analyses.

Tit-for-tat

A one-way analysis of variance was conducted to determine whether there was a difference between game play conditions on tit-for-tat across the entire task. The analysis of variance revealed a significant difference between conditions, $F(3, 112) = 2.64$, $p = 0.05$, $\eta^2_p = 0.07$. A planned contrast demonstrated that participants in the cooperation condition showed significantly more use of the tit-for-tat strategy than did participants in the two competition conditions, $t(112) = 2.46$, $p < 0.05$. Participants in the cooperation condition seemed to use tit-for-tat strategies the most. A *post hoc* directional t test examining differences in tit-for-tat was conducted between cooperation and control condition participants and found that cooperation condition participants were using more tit-for-tat than participants in the control condition, $t(54) = -1.503$, $p = 0.07$ (See Table 1).

Discussion

The question the current study sought to answer is whether playing a game cooperatively with other humans mitigates the effects of violently killing virtual entities. The current study found that the style of game play influenced the use of tit-for-tat behaviors. When participants played a violent video game cooperatively with their partner, the use of tit-for-tat strategies in a subsequent postgame task increased compared with the conditions when participants competed with each other. Given previous findings that tit-for-tat behaviors are one of the best strategies for increasing long-term cooperation in a social dilemma task we believe this finding has important implications.[21,22] It should be noted that the sample was overwhelmingly men (over 80 percent), which may limit the generalizability of the study. However, sex was never a significant covariate in any of the analyses for this study.

Table 1. Mean and Standard Deviations for Tit-for-Tat Scores by Condition

Condition	*Mean*	*Standard deviation*
Indirect competition	7.68	3.51
Direct competition	9.39	5.54
Cooperation	5.93	4.03
Control	7.77	5.33

Note: Scores closer to zero mean more tit-for-tat.

Critically, this experiment builds on previous research that demonstrated that playing violent games cooperatively decreased arousal and violent cognitions.[8,9] Together, these findings suggest that video game research needs to consider not only the content of the game but also how video game players are playing the game. The reliance by participants in the cooperative conditions on tit-for-tat strategies is important because tit-for-tat strategies increase cooperative behavior in others. The result suggests that cooperative play in video games—whether violent or not—has the potential to improve cooperation in different circumstances. Thus, the cooperative behaviors that video game players may learn when playing cooperatively with others to kill fantasy creatures may, in turn, influence subsequent behavior.

Disclosure Statement

No competing financial interests exist.

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