COMPUTERS IN HUMAN BEHAVIOR

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The influence of solitary and cooperative violent video game play on aggressive and prosocial behavior

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ABSTRACT

Research examining the issue of video game violence influences on aggression continues to be debated within the scientific community. Thus far, no consensus has been reached regarding the influence of such games. This study adds to the prior literature by examining how violent video games may promote pro-social or aggressive behavior when played either cooperatively or alone. Results indicated that violent content in video games had no influence on prosocial behavior, aggressive behavior, or self-perceptions of empathy. Playing cooperatively was associated with less aggressive behavior, whether games were violent or not.

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1. Introduction

A heavily debated topic within psychological research continues to be the assumed negative effects that violent media, particularly violent video games, has on behavior. Even more specifically, debate remains how violent video games may affect aggression and prosocial behavior. The current article investigates the possibility that prosocial thoughts and behaviors could be influenced by playing violent video games through the facilitation of cooperative team play.

Over the past few decades, video games have become one of the largest and most popular industries, making over $20 billion in sales and reaching over 90% of American children (Lenhart et al., 2008; Olson et al., 2007). However, their popularity has been associated with social problems relevant to youth (e.g. American Academy of Pediatrics, 2009; American Psychological Association., 2005; AAP and APA respectively). Although groups such as the AAP and APA have released position statements expressing concern about potentially harmful violent game effects, some scholars (e.g. Kutner & Olson, 2008) argue they have become a scapegoat for societal problems despite relative lack of evidence for harm and that this tendency has become endemic not only in the general public but also scholarly community (Grimes, Anderson, & Bergen, 2008; Hall, Day, & Hall, 2011a).

2. Limitations and issues of current violent video game research

The recent Brown v. Entertainment Merchants Association (EMA) ruling (2011) made by the US Supreme Court, in which the majority decision expressed criticisms of current video game research (although minority decisions of other justices were more credulous) has resulted in calls for a more critical look into the state of video game research (e.g. Ferguson, 2013; Hall, Day, & Hall, 2011b). The ruling struck down a California law banning the sale of certain violent video games to children.

The Supreme Court ruling has sparked a much needed, more critical look into the field of video game research by calling attention to some significant weaknesses that have been endemic to the media violence field for decades (Freedman, 2002; Grimes et al., 2008; Kutner & Olson, 2008). One such limitation exists within the homogeneous nature of both violent and nonviolent video games. More specifically, much violent video game research fails to equate the violent and nonviolent games on other dimensions that may be related to aggression, such as competitiveness (Adachi & Willoughby, 2011a,b). Because of this, they have not controlled for other extraneous variables, and so cannot claim pure causation.

3. Measuring aggressive behavior

Despite the continuing controversy and large number of research studies, there has been a lack of strong systematic research. Griffiths (1999) reviewed the empirical studies and the various research methodologies used in this area of research. He argued that all the published studies on video game violence have methodological problems and that they only include possible

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short-term measures of aggressive consequences. This same argument was repeated twelve years later by the US Supreme Court in Brown v EMA (2011) suggesting a fundamental lack of progress in this area (see also Ferguson, 2013).

Another limitation related to this lies within the actual method of measurement for aggression in many studies (Adachi & Willoughby, 2011a,b). The Taylor Competitive Reaction Time Test (TCRTT) is used extensively throughout violent video game research despite increasing evidence that suggests its validity and utility is in question (Ferguson & Rueda, 2009). During administration of the TCRTT, a participant is told that he or she is competing with another participant, who in fact does not exist, to see who can push a button faster upon the appearance of a cue. After each trial the loser receives an aversive punishment, such as a loud noise blast, and the winner chooses the intensity of this punishment. The level of punishment intensity is indicative of aggressive behavior. Some scholars argue for the validity of this measure (e.g. Anderson, Lindsay, & Bushman, 1999; Giancola & Parrott, 2008) although it has also been controversial.

Adachi and Willoughby (2011a,b) point out three main problems with this measure. First, the motivation to behave aggressively is ambiguous as it is unclear whether participants view their behavior as aggressive or just as competing in a competitive game. Second, studies employing the modified TCRTT have not measured aggression uniformly, so it is difficult to compare and build upon previous research (Ferguson, 2013). This problem of unstandardization means that, in effect, researchers could select outcomes that support their hypotheses and ignore those that do not (even acting in good faith, see Simmons, Nelson, & Simonsohn, 2011 for discussion of methodological flexibility problems in psychological research). Ferguson and Kilburn (2009) found that studies using this measure tend to have spuriously high effect sizes relative to standardized, better validated measures. Third, the modified TCRTT has been shown to lack validity as a measure of aggressive behavior. When Ferguson and Rueda (2009) examined the convergent validity of the modified TCRTT, they found that neither intensity nor duration were related to trait aggression, domestic violence, nor violent criminal acts. Past attempts to "validate" the TCRTT have mainly relied on intercorrelations between social psychological measures, rather than predictive validity studies or convergence with well-validated clinical measures.

Given the weaknesses of the TCRTT, some recent studies employed a newer, and potentially more valid method of measurement for aggression: the Hot Sauce Paradigm (Adachi & Willoughby, 2011a,b). This measure involves informing participants that they are to create a hot sauce for a confederate to eat. The level and amount of sauce given is then seen indicative of aggressive behavior (Lieberman, Solomon, Greenberg, & McGregor, 1999).

4. Competition and cooperation

4.1. Competition, and motivations for video game play

One of the main concerns of violent video game research is the question of whether individual studies are actually measuring aggression, or rather, whether they are measuring competitiveness. According to a study done by Anderson and Morrow (1995), competition produces more aggressive thoughts than cooperation, and it is likely that video game competitiveness influences aggressive thoughts. Zhang, Liu, Wang, and Piao (2010) found that competition, as well as violent content, increased aggressive cognition and aggressive behavior. More recently, Adachi and Willoughby (2011a,b) using more careful matching of video game conditions found that competitiveness, but not violent content, was associated with increased aggression.

Along those lines, another direction in video game research looks at the emotional benefits of video game play, particularly in males. Jansz (2005) proposes a theoretical explanation for the continuous rise in popularity of violent video games in terms of their emotional appeal, particularly for adolescent male gamers. It is argued that the violent video game provides a safe place to experience a various array of emotions that may or may not be accepted wholly accepted by society. For example, the violent video game can evoke emotions inherent of both the dominant male identity (anger, aggression, etc.), as well as those at odds with that masculinity (fear, empathy, etc.). Because it is just a game, adolescent males are free to feel without discrimination, providing them with a valuable outlet for stable identity development.

As well as benefiting the individual, research has also found that video games, even violent games, can be useful in improving social ability and promoting prosocial behavior. Prosocial behavior is defined as voluntary behavior intended to benefit another (Eisenberg & Fabes, 1990). This line of video game research emphasizes the importance of context, not just content, when evaluating the effects video games on behavior. Lucas and Sherry (2004) looked into the interpersonal appeal of violent video games comparing both males and females. They found that males, more often than females, used video games as a communication tool to satisfy their social needs for inclusion, affection, and control. Jansz and Martens (2005) investigated the appeal of playing digital interactive games at a local area network (LAN) event. They found that the players were most highly motivated by social motives, followed by competition and interest. Past studies have differed whether violent video games contribute to or detract from prosocial behavior (e.g. Ferguson & Garza, 2011; Saleem, Anderson, & Gentile, 2012), although given many violent games include prosocial content, it may be difficult to differentiate them fully.

4.2. Empathy

Other constructs may also account for the effect of cooperative video game play on cooperative behavior. For example, it has been shown that empathy, the ability to take the emotional perspective of others, is an important precursor in the development of cooperative behavior in social dilemmas (Batson & Ahmad, 2001; Batson & Moran, 1999; Rumble, Van Lange, & Parks, 2010; Van Lange, 2008). Empathy has also been shown to be evoked by prosocial media exposure and to elicit helping behavior (Greitemeyer & Osswald, 2009) and so, may also mediate the effect of cooperative video game play on cooperative behavior.

Dispositional measures of empathy have frequently been positively linked to children and adults' prosocial behavior. There is substantive evidence positively relating empathy and prosocial behaviors, and negatively relating to aggressive behaviors (Eisenberg, Fabes, & Spinrad, 2006). Carlo et al. (2012) linked empathy and prosocial behaviors through the use of problem-focused coping. Using self-report measures, they found that empathy positively predicted problem-focused coping, which in turn, positively predicted prosocial behaviors and negatively predicted aggression.

4.3. The social context of video gameplay

Recent research suggests that the social context of game play can mitigate the effects of game content (Eastin, 2007; Ewoldsen, 2012; Ferguson & Garza, 2011; Lim & Lee, 2009). This suggests that cooperative gameplay, regardless of violent content, has the potential to improve future cooperation by facilitating cooperative behavior during gameplay. Cooperation can be defined as behavior that maximizes the collective over the individual (Kollock, 1998). Cooperative activities can help solve conflicts and reduce aggression (Deutsch, 1993). During cooperative game play, feelings of

cohesion and camaraderie are potentially promoted even during violent game play, thus decreasing the competitive nature of the game and subsequent hostility. However, the majority of existing studies tend to look solely at the cooperative benefits of nonviolent and prosocial games, while skipping over the prosocial potential of violent video games. Given that many violent games include prosocial themes and opportunities for cooperative play, creating a dichotomy of violent/prosocial games may have little value (Ferguson & Garza, 2011).

Using experimental data, Schmierbach (2010) considered the influence of context as well by looking at how game mode-cooperative, competitive, and solo-shapes aggressive cognition. They found evidence supporting the idea that cooperative play modes results in less aggressive cognition.

Ewoldsen et al. (2012) examined the effect of cooperative play in a violent video game on subsequent cooperative or competitive behavior by having participants complete a modified prisoner's dilemma task after playing the Halo II either cooperatively or competitively. Compared with participants in the competitive game conditions, participants that played cooperatively engaged in more tit-for-tat behaviors-a pattern of behavior typically preceding cooperative behavior. Their findings demonstrate that playing violent video games cooperatively decreases arousal and violent cognitions, further suggesting that research consider not only game content, but also social context in the evaluation of violent video games.

Lim and Lee (2009) looked into how different task types, violent and nonviolent, and social contexts, solo and collaborative, affect physiological arousal in multiplayer online gaming. Using skin conductance, a measure of activation in the sympathetic nervous system, they found that collaborative play with violent tasks led to significantly lower levels of arousal than that of solo play. Collaborative play with the nonviolent tasks led to only slightly lower levels of arousal than that of solo play. From this research we see that the contextual and social aspects of game play are as important, perhaps more so than is content.

4.4. The current study

The current study is chiefly concerned with the interaction of content and context, specifically violent (antisocial and prosocial) content played cooperatively as a team. The current study seeks to combine two defining, yet oppositional features within video game research to examine what results when a game combines antisocial content (violence) with prosocial context (co-op game mode). It was hypothesized that cooperative game play would diminish any negative influences of playing violent video games on aggressive behavior, cooperative behavior and empathy.

5. Method

5.1. Participants

100 participants were recruited from several classes at a mid-size university on the southern border of the United States. Because of the geocultural location of the university, the majority of the participants were Hispanic (95%). This ethnic composition is convenience related, not theoretically driven. However, historically most of the research on video game influences have been with Caucasian majority samples (and sometimes Asian samples from Eastern countries). Thus more research extending into the underserved Hispanic population would be valuable. The mean age of the participants was 21.21 (SD = 4.75) years old and participants had the mean education level of a college sophomore. Students were recruited through undergraduate classes where they signed up for one of the available appointment times. They were told to expect to be involved in the experiment for about an hour. Students, with the cooperation of their professor, received extra credit for their participation.

5.2. Materials and procedure

5.2.1. Video games and equipment

The Xbox 360 games console was used as the platform for all video gaming conditions. One additional Xbox 360 controller was purchased for each of the two Xboxes being used. Pairs of participants were randomly assigned to one of six conditions. Participants assigned to the violent (antisocial) conditions played the game, *Borderlands* a first-person shooter game in which players play as bounty hunters killing on contract. Participants assigned to the violent (prosocial) conditions played the game, *Lego Star Wars III* in which players fight bad guys and save the universe. Participants assigned to the nonviolent (control) conditions played the game, *Portal II* an adventure game involving the solving of puzzles without violent content. In order to maintain the cover story for the procedure related to the hot sauce paradigm, participants were asked if they had food allergies upon entering the lab. If they expressed having any food allergies consistent with the sauces used in the hot sauce paradigm, they were excused from participation (but still received extra credit). If they stated having no food allergies, they were continued in the experiment and given an informed consent form.

During each scheduled gaming session, lasting 45 min, pairs of participants were randomly assigned to one of six gaming modes. There were three game conditions as noted above and two cooperation conditions, making six conditions in total. For the cooperative mode conditions, the screen was split horizontally, meaning each of the two players played on half of the screen. In the cooperative mode conditions, pairs of players sat near to each other and viewed the game on the same TV, working toward the same goals cooperatively. In the solo mode conditions, two players played separately on their own system but in the same room. Participants in all six conditions were allowed to interact, but were not encouraged, nor discouraged from doing so.

5.2.2. Video game engagement

A one-page survey given to participants asking about their perceptions of the video games they had played and whether they found the games fun, exciting, challenging, frustrating; whether they had played the game before; how competent they felt playing the game; and whether they would want to play it again. Participants were asked to rate these factors according to a 5-point Likert scale.

5.2.3. Demographics

A one-page survey comprised of questions regarding the participant's age, sex, ethnicity, nationality, marital status, education level, parents' education level, and marital status of parents was administered.

5.2.4. Overt aggressive behavior

The Hot Sauce Paradigm (Lieberman et al., 1999) was used to measure aggressive behavior. Participants were asked to help select a hot sauce for the other participant to drink as part of the taste-test portion of the study. Participants were asked to choose an intensity of hot sauce for the other participant ranging from 1 (least hot) to 4 (most hot). Participants, however, were given the option of trying the hot sauces for themselves before making their decision. They were told to write down the sauce's corresponding number after they had decided which hot sauce the other participant would drink. Four hot sauces were purchased at a local

grocery store and ranked according to spiciness. Each hot sauce was placed on a number one (least hot) through four (most hot) according to its degree of spiciness. Spoons for tasting the sauces and bread as an option for eating with the sauce were used as well. Our approach has the benefit of salience in that, unlike an anonymous other individual or a confederate, the participants were assigning hot sauce to another actual participant. This makes the aggression more salient and also reduces suspiciousness about the "other" person being fictional (which is common in aggression research).

The hot sauces used in the Hot Sauce Paradigm are (from least hot to most hot) (1) Central Market Organics Teriyaki Marinade & Sauce, (2) Thai Kitchen Spicy Thai Chili, (3) Inglehoffer Wasabi Horseradish, and (4) Kabuto Ready-Mix Wasabi. Asian sauces were used instead of the traditional buffalo or Mexican hot sauces in other studies due to the Mexican culture of most of the participants. Mexican–American participants may have been particularly familiar with buffalo or Mexican sauces and regularly incorporate these into their cooking such that spicy sauces of this nature may not have had the same impact as with Caucasian samples. Thus, spicy Asian sauces with which this population would be less familiar and which have fewer cultural overtones for the current sample were used to prevent confounding the outcome with the culture of the participants.

5.2.5. Cooperative behavior

The Prisoner's Dilemma (Luce & Raifa, 1957) is a two-person social dilemma game used to measure prosocial or cooperative behavior. In this game, two people choose between two options: cooperation or defection. What defines the Prisoner's Dilemma game is the relative value of the four outcomes (Kollock, 1998). In each of the five rounds played, each of the two participants must choose in secret whether to defect, choosing to pursue their own self-interest at the expense of the other, or cooperate, choosing to pursue the interest of the collective group. The outcome is announced to the participants after each round once both participants have made each of their choices. The best possible outcome is defecting while one's partner cooperates, resulting in maximum number of coin rewards. The next best possible outcome is mutual cooperation (both participants win a lower number of coins), followed by mutual defection (no one wins coins), leaving the worst outcome cooperating while one's partner defects (no coins for the participant but maximal coins for the participant's opponent).

5.2.6. Self-perceived empathy

The 28-item Interpersonal Reactivity Index (IRI; Davis, 1980) measures empathy as related to the likelihood of understanding other people's views and feelings, the tendency to be immersed in the imagination of feelings and actions of fictional characters, other-oriented emotions such as experiencing others' feelings of warmth and compassion as well as having a positive regard for others and self-focused emotional responses (e.g., discomfort, anxiety) to others' negative emotional condition. Participants were asked to rate all the items on a 5-point Likert scale ranging from 1 (does not describe me well) to 5 (describes me very well).

5.3. Procedure

Participants signed up for a 90-min appointment time through recruitment in undergraduate classes. Each session necessitated two participants. Each participant was asked whether they had any food allergies and if not, are admitted into the study and given two copies of the consent form to read and sign. Afterwards, participants are either told to sit together in front of one TV (as in the cooperative mode conditions) or by themselves in front of two different TVs at opposite sides of the lab (as in the solo conditions)

depending on the randomization. They were informed that they would play a video game for 45 min, after which a timer went off and they were instructed to stop playing. Players were then moved to opposite sides of the lab. The time exposure (45 min) is longer than is common in most video game research. Previous research has suggested that longer exposure times are associated with lower effects (Sherry, 2001). This may be because the controls of violent games tend to be more complex than for non-violent games. Ending a testing session after a short period may result in frustration due to players never having mastered the controls rather than due to the violent content of the games. As such, short exposure sessions may inadvertently introduce frustration related confounds.

Participants were then given instructions for the Hot Sauce task. They were informed that part of the study involved a taste test of different kinds of sauce. Participants were informed that it was important that individuals not be aware of which sauce they were trying. Thus, each participant would choose the sauce for the other person. This was done outside of viewing of the other participant, and participants were informed the taste test would not actually occur until the other procedures were finished. Thus, neither participant knew of the other's choice in sauces at any point in the procedure.

Participants were then reunited for the Prisoner's Dilemma task described above. After the Prisoner's Dilemma task, the participants were separated once again and each participant was handed a manila folder containing the survey questions. Participants expected that the taste test would occur after the surveys were finished, but the taste test, in fact, did not occur. After all measures were completed, participants were, debriefed, thanked and released from the lab. These procedures were designed specifically so that one task would not prompt responses in the others.

6. Results

As noted, game matching is a critical issue, otherwise confounds may interfere with the interpretation of results. In our study we included measures of game difficulty, competitiveness and enjoyment. These were analyzed across the three game conditions using ANOVA analyses. Game difficulty was not found to differ across games. However, both game enjoyment $[F(2,97) = 11.13, p < .05)]$ and competitiveness$[F(2,97) = 6.21, p < .05)]$ significantly differed across game conditions. As such, these variables are used as covariates in subsequent analyses to control for potential confounding influences.

All analyses consisted of 3×2 (game type $\times$ cooperation) ANCOVA analyses with game competitiveness and enjoyment used as covariates. The first analysis considered the effects on aggressive behavior using the hot-sauce paradigm. The results indicated that individuals who played cooperatively were less likely ($M = 1.80$, SD = 0.73) to administer spicier sauces than were individuals who had played alone ($M = 2.16$, SD = 0.87) $[F(1,92) = 5.13; p < .05, r = .23, 95$ confidence interval (CI) = .04, .41]. The influence of violent content in video games was non-significant, nor was any trend noted. In fact, the means for antisocial video games were least aggressive ($M = 1.87$, SD = 0.61) compared to either the prosocial violent ($M = 2.15$, SD = 0.89) or non-violent ($M = 1.91$, SD = 0.90) games. Neither covariate was statistically significant, suggesting confounds were not at issue.

The second analysis considered the effects on cooperative behavior using the prisoner's dilemma paradigm. The results were non-significant for all variables. The influence of violent content in video games was non-significant, nor was any trend noted. Means for prosocial violent video games ($M = 7.82$, SD = 1.34) antisocial violent ($M = 7.65$, SD = 1.00) or non-violent ($M = 8.14$, SD = 1.58)

games were fairly comparable. Neither covariate was statistically significant, suggesting confounds were not at issue.

The third analysis considered the effects on self-perceptions of empathy. The results were non-significant for all variables. The influence of violent content in video games was non-significant, nor was any trend noted. In fact, the means for prosocial violent video games were most empathic ($M = 54.09$, SD = 7.13) compared to either the antisocial violent ($M = 52.82$, SD = 7.72) or non-violent ($M = 52.97$, SD = 6.62) games. Neither covariate was statistically significant, suggesting confounds were not at issue.

7. Discussion

The current study sought to answer the question of whether violence in video games promoted prosocial behaviors when played in a cooperative game mode. It found that when participants played cooperatively with their partner, aggressive behavior decreased for all three video games, regardless of violent content. The results from this experimental study build on previous research linking cooperative game playing with decreased aggression. As well, this study also adds to the increasing number of studies questioning violent video game content as directly causing aggressive behavior.

The current study is just a small part of current research moving towards a more multifaceted approach to understanding the various effects of video games from a social and contextual approach rather than merely content-based. The majority of past video game research has focused solely on content, specifically violence, while underestimating the potential importance of the others' direct and collaborative effects on the player experience. The present study offers an extension of the traditional emphasis on violent content by combining violent content with a cooperative social context in order to see how they may interact in creating a more realistic and multi-dimensional gaming experience.

The current study also builds on previous research supporting the importance of social context of game experience and the suggestion that how the game is played may play a larger role than what is actually in the game (Ewoldsen, 2012; Velez, Mahood, Ewoldsen, & Moyer-Gusé, 2012). As such, the current results also expand previous studies citing the protective effect cooperative game play has on aggression (Ewoldsen, 2012; Eastin, 2007; Schmierbach, 2010). Cooperative gameplay decreased aggressive behavior as evidenced by participants in each of the three co-op conditions choosing the less spicy sauce options for their partner to consume. Conversely, participants who played alone behaved more aggressively by choosing to administer the spiciest sauces for their partner to consume.

Although the cooperative game modes caused a significant decrease in aggressive behavior, they did not cause a significant increase in cooperative behavior. Contrary to some previous research (Ewoldsen, 2012; Velez et al., 2012), participants who played cooperatively were not more likely to engage in subsequent cooperative behaviors as determined by their actions in the Prisoner's Dilemma task.

In their work, Lim and Lee (2009) found that cooperative play even with violent video games appeared to be relaxing. Our findings appear to support this, particularly in relation to aggressive behavior. At present time reasons for this observation are speculative, but it may be that the social context of cooperative play is more crucial than the content of the game itself in regards to determining emotional state. Players may seek out action games to play together as a means of bonding and social bonding may, in turn, reduce stress. It is further possible that action games may present particular opportunities for players to work together against challenges and adversaries, fostering social bonding and, thus,

relaxation. Thus the opportunity for individuals to play together may be more crucial than objectionable content and efforts focused on removing objectionable content may be more unhelpful than constructive.

Overall these results suggest that context of game play rather than content, is more critical to behavioral outcomes. Particularly as games become an increasingly social activity (Quandt, Grueninger, & Wimmer, 2009) it would be valuable for future research to increasingly consider the social contexts of game play, including cooperative play. It may be particularly valuable, as well, for theory to move beyond the tradition "hypodermic needle" approach in which video games are something *done to* players, and rather consider the active and social participation and experience of the player within the game.

Previous research has found a positive relationship between empathy and cooperation (Rumble et al., 2010), as well as a negative relationship between empathy and aggression (Miller & Eisenberg, 1988; Richardson, Hammock, Smith, Gardner, & Signo, 1994). The current study examined the effects violent content and cooperative game mode affect players' self-perceptions of empathy. Neither violent content nor cooperative play were related to self-reported empathy in our study. Some other recent work (e.g. Ramos, Ferguson, Frailing, & Romero-Ramirez, 2013) has indicated that violent media effects on empathy for actual living persons is minimal. The current research supports this conclusion.

In addition to looking into the social context of game play, the current study also examined the possible influence of different types of violent content, specifically comparing a game with prosocial violence (violence to benefit others) with a game containing antisocial violence (violence to benefit self). Since few other studies have looked into the potential impact of different types of violent content, this study not only builds on current violent video game research, but also opens up a new area of potential interest. Our results suggested that violent content, no matter the context, had little impact on players' aggressive or prosocial behavior.

7.1. Limitations

The current study has certain limitations to consider. It is possible that cooperative gameplay could also result in hostility and aggression when players differ significantly in gaming ability and experience. For example, an experienced video game player may become annoyed when randomly partnered with an inexperienced player who drags down their team performance, causing a negative evaluation of the experience. This negative evaluation could then cause players to "get back at" the other during the aggression and cooperation task. Although the "getting back at" was not evident in our experiment, we did observe several occasions when gamers would become frustrated when paired with nongamer partners. At first, the gamer participants would usually try to tutor and wait for them. Eventually they would become impatient, play out the level with their character or get the farthest they could without the other participant. Then they would either wait for the other player to finish while telling them what to do, zone out, or on one occasion a gamer participant just ended up taking the controller and playing a certain part of the level for the nongamer participant. These behaviors could, of course, be an artifact of the random assignment of strangers to play together that may not apply to real-life partnerships of friends. Research should consider using a pilot study to match participants on their experience with video games to mitigate this effect. The emotional state of participants in response to their partners may also be worth examining in future research. We did not examine this in our current study. Further, measuring aggression in experimental designs is known to be difficult. Generalization to "public health" related issues is not warranted with typical laboratory-based aggression measures.

Finally, our sample consisted primarily of Hispanic participants and should not be generalized to other ethnic groups.

Of great value would be future research which gets deeper at examining user experiences while playing video games would be of great value. Until present, most of the literature has focused on content rather than user experiences and motivations with the implication that content could have global, unidirectional and predictable influences on players. To present, research data has not provided compelling evidence for this belief. Future research which examines motivations for playing video games, ascribing agency to game players in seeking out, shaping and processing media in idiosyncratic rather than global ways would likely new insights into the experience of gaming that reaches beyond the typical games are good/bad (pick one) debates of the past. Both quantitative and qualitative studies that get at such user experiences would be of great value.

The current study was designed to advance research into the effects of violent video games and playing styles for both aggressive and prosocial behavioral outcomes. Current results suggest that, overall, the effects of video game content are minimal, but that the effects for social context may have some influence. It is hoped that this study will be of value in promoting the discussion and debate regarding violent video game effects on behavior.

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