

cognitions [Greitemeyer and Osswald, 2010; 2011], and promotes helping behavior [Gentile et al., 2009; Greitemeyer and Osswald, 2010]. Studies also suggest that playing nonviolent games with no explicit prosocial content can increase prosocial and decrease aggressive thoughts [Sestir and Bartholow, 2010].

However, the social-cognitive learning models [e.g., Buckley and Anderson, 2006] propose two additional routes (affect and arousal) through which media exposure may instigate corresponding behaviors. Research examining the effects of prosocial video games on affect or arousal is almost nonexistent. Greitemeyer and Osswald (2010) tested the effects of prosocial, neutral, and violent video games on positive and negative affect as well as helping behavior. Although prosocial, relative to neutral and violent, video games increased helping behavior, no significant effects of game type were found on mood. In other studies, although prosocial, relative to neutral, video games reduced aggressive cognitions, no effects of game content were found on positive and negative affect assessed through the Positive and Negative Affect Schedule (PANAS) [Greitemeyer and Osswald, 2009]. There are several explanations for why this nonsignificant effect may have been found. First, the PANAS assesses global positive and negative affect, much of which is not specifically related to prosocial and antisocial behaviors. For example, although feelings of nervousness and shame fall under the negative affect dimension, they do not necessarily influence prosocial or antisocial behaviors. Second, the small sample size ($N = 32$) in these studies can lead to low statistical power to detect small to medium size effects. Finally, the PANAS was not administered immediately after game play but instead was measured after the pencil picking up task aimed to assess prosocial behaviors. This delay between video game play and assessment of affect further convolutes the interpretation of nonsignificant effects. Of course, it also is possible that prosocial games (relative to neutral games) do not reliably influence current affective states.

Other affect-related concepts have received some empirical attention. In two studies, Greitemeyer et al. (2010) found that prosocial video games, relative to neutral, increased empathy and reduced *schadenfreude*¹. Although important, these findings do not

directly address the positive and negative affect questions. Assessments of empathy and *schadenfreude* cannot be easily interpreted to reflect positive and negative affect exclusively as they both contain some aspect of positive and negative affect.

In sum, several important questions remain unanswered. Do prosocial video games increase positive affect or decrease state hostility? Do violent video games influence positive affect in any way? How do prosocial and violent game effects compare to games with neither prosocial nor violent content? The present study fills this gap by testing the effects of prosocial, neutral, and violent video games on state hostility and positive affect.

Social-cognitive learning models also suggest that person variables (e.g., trait aggression, trait prosocialness) may directly or indirectly influence prosocial and antisocial outcomes. For example, individual differences in aggressiveness might interact with the presence of violent stimuli in the elicitation of aggression-related thoughts, emotional states, action tendencies, and behavioral responses. More specifically, high trait aggressive individuals might manifest all of these responses to aggressive cues more than individuals low on trait aggression, because they have more extensive aggressive cognitive-associative networks. Indeed, Bushman (1995) found that media violence was more likely to evoke aggressive affect and behavior in high rather than low trait aggressive individuals. Similarly, Gentile et al. (2009) found trait aggression to be positively related to hurting and negatively related to helping behavior. These findings are important in understanding the complicated interactions between habitual personality variables (e.g., trait aggression) and situational variables (e.g., media violence exposure). The potential moderating effects of trait prosocialness, however, have not been studied in previous prosocial video game studies. It is possible that trait prosocialness moderates the effects of prosocial or aggressive content on prosocial and antisocial outcomes. Furthermore, it is conceivable that helping others for egoistic reasons (e.g., looking good in front of others) influences prosocial and antisocial outcomes differently than helping others for altruistic reasons. For example, studies show that individuals motivated to help because of egoistic reasons are more concerned about the cost of escaping from the given situation than individuals motivated to help

¹There has been considerable debate regarding the definition of empathy in the literature. For example, empathy has been identified by some as primarily an affective phenomenon [e.g., Allport, 1961; Stotland, 1969] referring to the immediate experience of the emotions of another person. Others, however, view empathy as primarily a cognitive construct [e.g., Katz, 1963; Woodall and Kogler-Hill, 1982] referring

to the intellectual understanding of another's experience. A third view holds that empathy contains both cognitive and affective components [e.g., Brems, 1989]. In contrast, *Schadenfreude*, an emotional reaction defined as taking pleasure in another's misfortune [Heider, 1958], has primarily been identified as an affective phenomenon.

because of altruistic reasons [e.g., Batson Duncan et al., 1981]. The present study included measures of trait aggression, trait egoistic helping, and trait altruistic helping to better understand the combined influence of person and situation variables on state hostility and positive affect.

METHODS

Participants

Three hundred thirty participants (223 Male; 96 Female; 11 unidentified) were recruited from introductory psychology courses at a large Midwestern university. They received one course credit for 50 min of participation. The mean age was 19.57 ($SD = 1.71$)².

Experimental Materials and Measures

Video games. Six video games were used: two violent (*Ty2*, $n = 53$, *Crash Twin sanity*, $n = 57$); two prosocial (*Chibi Robo*, $n = 60$, *Super Mario Sunshine*, $n = 50$); and two neutral (*Pure Pinball*, $n = 55$, *Super Monkey Ball Deluxe*, $n = 55$). All video games were played for 20 min (see appendix for game descriptions).

State affect. We used a modified version of the State Hostility Scale [Anderson et al., 1995]. We added five new positive affect items (peaceful, caring, joyful, hopeful, happy) to the original 35-item questionnaire. Participants responded on a 1 (*strongly disagree*) to 5 (*strongly agree*) Likert Scale. Based on prior research [Anderson and Carnagey, 2009], four subscales were created: feeling unsociable ($\alpha = .32$), feeling mean ($\alpha = .95$), feeling aggravated ($\alpha = .86$), and positive affect ($\alpha = .95$). Because of its low reliability, the unsociable subscale was dropped. The final total state hostility scale included 37 items (with positive affect items reverse scored $\alpha = .97$).

Pre-Experimental Questionnaire

Given time limitations in the experimental context, we chose what appeared to be the best brief measures of aggressive behavioral tendencies and of prosocial behavioral tendencies.

Trait aggression. The nine-item physical aggression subscale from the Aggression Questionnaire assessed trait aggression [AQ: Buss and Perry, 1992].

Participants rated their agreement with statements on a five-point scale (1 = "Extremely uncharacteristic of me," 5 = "Extremely characteristic of me"), $\alpha = 0.86$. Sample items included, "If somebody hits me, I hit them back" and "If I have to resort to violence to protect my rights, I will."

Prosocial tendencies. The 25-item Prosocial Tendencies measure consists of six subscales assessing public, anonymous, dire, emotional, compliant, and altruistic helping tendencies [Carlo and Randall, 2002]. Participants indicated agreement using a five-point scale (1 = "Does not describe me at all," 5 = "Describes me greatly"). One item, "I feel that if I help someone, they should help me in the future" was negatively correlated with the total scale and thus was dropped. The public helping subscale (four items, $\alpha = .71$) did not correlate well with the others (r s from $+.10$ to $-.52$), and so was kept as measure of egoistic helping. Sample items included "I can help others best when people are watching me" and "I get the most out of helping others when it is done in front of other people." The remaining 20 items were combined ($\alpha = 0.93$) to form a 20-item measure of altruistic helping. Sample items included "I prefer to donate money without anyone knowing" and "I often help even if I don't think I will get anything out of helping." The two subscales were negatively correlated, $r = -0.12$, $P < .05$.

Postexperimental Questionnaire

Experimental game evaluations. Participants rated how much the game they had played was: action-packed, absorbing, enjoyable, fun, involving, stimulating, addicting, arousing, boring, exciting, entertaining, frustrating, and difficult on a ten-point scale (1 = "Strongly disagree," 10 = "Strongly agree"). Participants also rated their ability on the video game on seven-point scale (1 = "Well below average," 7 = "Well above average"). As in prior work [Anderson and Dill, 2000], these individual ratings were combined into two scales. After reverse scoring the appropriate items, the first 11 listed items were averaged to form a "fun" scale ($\alpha = .92$). The remaining items (frustrating, difficulty, ability) formed a "difficulty" scale ($\alpha = .65$) that was positively correlated with the fun scale ($r = 0.16$, $P < .05$). Participants also rated how helpful or violent each game was on the above scale; these ratings were used to assess perceptions of the game content.

Demographics. Participant sex, age, and parental income were assessed. The latter two did not significantly affect the dependent variables in preliminary analyses and thus are not considered further.

²Thirteen participants were identified as highly suspicious during the structured funnel debriefing process. These participants were suspicious of the validity of the cover story and had correctly identified the study's main hypotheses. Removing these participants in preliminary analyses did not significantly change the results and thus they were kept in final analyses.

PROCEDURE

Participants first read and signed an informed consent document. They were told that the objective of the study is to observe the relationship between screen time and cognitive tasks. Next, they answered questions assessing their trait aggression, and trait prosocialness. Then, participants were randomly assigned to play one of the six video games. Participants received standardized instructions on how to play the game and practiced basic controls in front of the experimenter. When participants demonstrated that they understood how to play the game, the experimenter left the cubicle for 20 minutes of uninterrupted play. Participants then completed a questionnaire that included state affect, video game evaluations, and demographic items. Finally, participants were probed for suspicion, debriefed, and dismissed.

RESULTS

Preliminary Analyses

Participant perceptions of game content. To examine each game category's level of helpful and violent ratings, a 3 (game type: prosocial, neutral, or violent) \times 2 (rating type: helping or violent) analysis of variance was conducted. As expected, there was a significant game type by game evaluation interaction, $F(2,282) = 146.78$, $P < .001$. Prosocial games were rated significantly higher on helpfulness than neutral and violent games, $M_s = 7.86, 1.37, 3.66$, respectively, $F_s(1,282) = 406.25$ and 177.73 , $p_s < .01$, respectively. The latter two also differed significantly, $F(1,282) = 49.42$, $P < .001$. The violent games were significantly higher on violence than neutral and prosocial games, $F_s(1,282) = 153.84$ and 124.71 , $P_s < .001$, respectively. The latter two were not significantly different, $F(1,282) = 2.48$, $P > .10$. The mean violence ratings for prosocial, neutral, and violent games were, $M_s = 1.81, 1.42, 4.55$, respectively.

A one-way ANOVA was conducted separately on the fun and difficulty scales. There was a marginal main effect of game type on the difficulty scale, $F(2,327) = 2.48$, $P = .09$. Contrasts revealed that the violent games were rated as significantly more difficult than the neutral games, $F(1,327) = 4.96$, $P < .05$. None of the other contrasts were significant. The means for difficulty ratings for prosocial, neutral, and violent games were, $M_s = 3.83, 3.61, 4.09$, respectively. Neither the main effect of game type, nor any of the game contrasts were significant for the fun ratings, $F_s < 3.00$, $P_s > 0.05$.

Three separate repeated measures analyses (each including one of the three covariates), with the three

state hostility subscales (with positive affect reversed) as the repeated factor, game type as an experimental factor, revealed that the effects of trait aggression, altruistic helping, and egoistic helping differed across the three state hostility subscales, interaction $F_s(2,630) = 4.31, 3.32, 7.66$, $p_s < .05$, respectively. Therefore, we present separate analyses for each of the affect subscales as well as the total state hostility scale. Additional preliminary analyses were conducted with each of the six individual difference variables (sex, game fun and difficulty ratings, trait aggression, altruistic helping, and egoistic helping) and game type; only variables with significant main or interactive effects were included in the main analyses.³

Main Analyses

Total state hostility. A one-way ANCOVA was conducted with game difficulty, trait altruistic helping, and trait aggression as covariates. Game type yielded a significant main effect, $F(2,308) = 12.62$, $P < .01$. Standardized adjusted means for the prosocial, neutral, and violent games were $M = -0.31, 0.00, 0.32$, respectively, with positive scores reflecting greater total state hostility. As expected, participants who played violent games had significantly greater state hostility than participants who played neutral or prosocial games, $F_s(1,308) = 6.42, 25.23$, $p_s < .05, .01$, $d_s = 0.29, 0.57$, respectively. The latter two groups were also significantly different, $F(1,308) = 5.81$, $P < .05$, $d = 0.27$.⁴

Trait physical aggression yielded both a significant main effect and a significant interaction with game

³Participant sex did not yield a significant or interactive effect with game type on any of the state hostility subscales or the total score: both female and male participants alike were positively affected by playing a prosocial video game to an equal degree. This is consistent with other studies that reveal that exposure to prosocial television content increases prosocial behavior in both female and male participants [e.g., Mares and Woodard,], or violent video games led to increased aggression in both genders [e.g., Anderson et al., 2010].

⁴Based on previous studies [Gentile et al., 2009], an alternative analysis was done using trained research assistants' ratings of helpful and harmful behaviors encountered in each of the games as independent variables predicting total state hostility. By including both types of game content simultaneously in the regression model, we tested for the unique effect of each content dimension while controlling for the other. Preliminary analyses yielded no hint of a two-way game content interaction, so that term was dropped. Both types of content yielded significant unique effects on total state hostility. As expected, amount of prosocial content in the assigned game was negatively related to total state hostility, $F(1, 309) = 7.94$, $P < .05$, $b = -0.15$, $r = -.16$. Conversely, amount of violent content in the assigned game was positively related to total state hostility, $F(1, 309) = 13.63$, $P < .01$, $b = 0.20$, $r = .21$. Similar analyses of the state hostility subscales (feeling mean, aggravated, positive affect) yielded very similar results as reported in the results section.

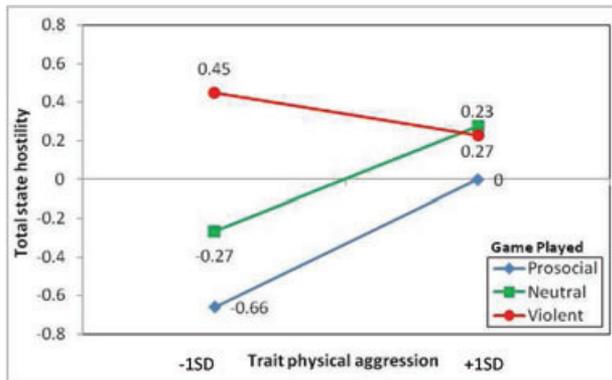


Fig. 1. Total state hostility as a function of trait physical aggression and game played.

type, $F(1,308) = 6.74$, $P < .05$, $d = 0.30$, $F(2,308) = 5.59$, $P < .01$, respectively. As shown in Figure 1, for participants in the neutral ($b = 0.27$) and prosocial conditions ($b = 0.33$), higher trait physical aggression was associated with higher state hostility ($ps < .01$). The slope was nonsignificant for the violent condition ($P > .10$). Additional tests revealed that the game type effect was significant for those who scored low (-1 SD) on trait physical aggression ($F[2,308] = 16.17$, $P < .01$), but was not significant for those who scored high ($+1$ SD) on trait physical aggression ($F[2,308] = 1.41$, $P > .20$). In other words, the video game effect on state hostility was quite strong for participants who normally are not physically aggressive, whereas it was quite weak on those who typically are aggressive.

Both altruistic helping and game difficulty ratings yielded significant main effects, $F_s(1,308) = 12.31$, 9.92 , $ps < .01$, $ds = 0.40$, 0.36 , respectively. More altruistic participants reported less state hostility ($b = -0.18$). Participants who found their game more difficult reported more state hostility ($b = 0.10$).

Positive affect. Game type yielded a significant main effect on positive affect, $F(2,307) = 11.81$, $P < .01$. Standardized adjusted means for the prosocial, neutral, and violent games were $M = 0.28$, 0.06 , -0.33 , respectively. As expected, participants who played violent games reported significantly less positive affect than participants who played neutral or prosocial games, $F_s(1,307) = 9.10$, 23.12 , $ps < .01$, $ds = 0.34$, 0.55 , respectively. The difference between the latter two was marginally significant, $F(1,307) = 2.93$, $P = .09$, $d = 0.20$.

There was a significant interaction between game type and trait aggression, $F(2,307) = 3.75$, $P < .05$, $.01$. As shown in Figure 2, for participants in the prosocial condition ($b = 0.29$, $P < .01$), higher trait physical aggression was associated with less positive

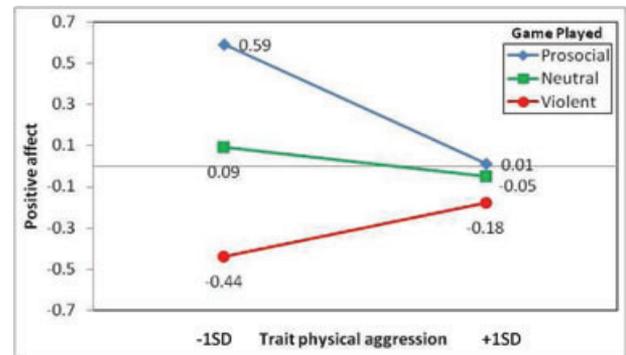


Fig. 2. Positive affect as a function of trait physical aggression and game played.

affect. The neutral and violent condition slopes were not significantly different from zero ($ps > .10$). The game type effect was significant at -1 SD trait physical aggression [$F(2,307) = 13.95$, $P < .01$], but was not significant at $+1$ SD trait physical aggression [$F(2,307) = 1.22$, $P > .20$].

Altruistic helping and game fun ratings yielded significant main effects, $F_s(1,307) = 14.25$, 7.09 , $ps < .01$, $.05$, $ds = 0.43$, 0.30 , respectively. Both were positively related to positive affect ($bs = 0.20$ and 0.08 , respectively). Game difficulty did not yield a significant effect on positive affect, $F < 2$.

Aggravated feelings. Game type yielded the expected main effect on aggravation, $F(2,305) = 9.20$, $P < .01$. Standardized adjusted means for the prosocial, neutral, and violent games were $M = -0.29$, 0.03 , 0.26 , respectively. Participants who played a violent game reported significantly higher aggravation than those who played a prosocial game, $F(1,305) = 18.15$, $P < .01$, $d = 0.49$. The contrast between the violent and neutral game conditions was marginally significant, $F(1,305) = 3.01$, $P = .08$, $d = 0.20$. Prosocial and neutral games were also significantly different, $F(1,305) = 6.31$, $P < .05$, $d = 0.29$.

Trait physical aggression yielded both a significant main effect, $F(1,305) = 5.59$, $P < .05$, $d = 0.27$, and a significant interaction with game type $F(2,305) = 5.77$, $P < .01$ (see Fig. 3). For participants in the prosocial ($b = 0.21$) and neutral conditions ($b = 0.35$), higher trait physical aggression was associated with higher aggravation ($ps < .01$). The violent condition slope was not significantly different from zero ($P > .10$). Further tests revealed that the game type effect was significant at both -1 and $+1$ SD on trait physical aggression ($F_s[2,305] = 10.88$, 3.44 , $ps < .01$, $.05$, respectively). In other words, the video game effect on aggravation was significant for participants who scored high or low on trait physical aggression.

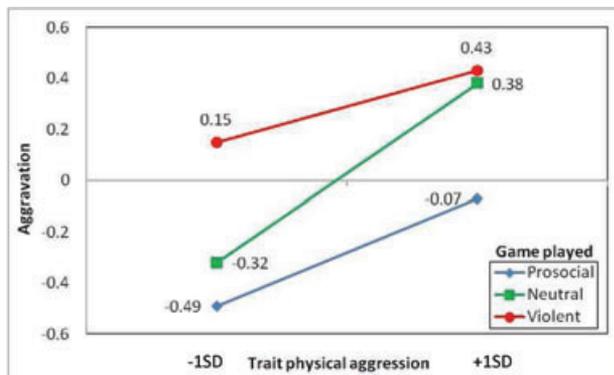


Fig. 3. Aggravation as a function of trait physical aggression and game played.

However, as Figure 3 shows, violent games appeared to have the biggest impact (relative to neutral) on low aggressive individuals, whereas the prosocial games appeared to have the biggest impact on high aggressive individuals.

Trait egoistic helping and game difficulty ratings yielded significant main effects, $F_s(1,305) = 3.24, 21.89, p_s = .05, <.01, d_s = 0.21, 0.54$, respectively. Both were positively related to aggravation, ($b_s = 0.10$ and 0.16). Trait altruistic helping was not significantly related to aggravation.

Mean feelings. Game type yielded the predicted significant main effect, $F(2,304) = 8.40, P < .01$. Standardized adjusted means for the prosocial, neutral, and violent games were $M = -0.27, 0, 0.26$, respectively. Participants who played violent games reported significantly greater mean feelings than participants who played prosocial or neutral games, $F_s(1,304) = 16.80, 4.01, p_s < .01, = .05, d_s = 0.47, 0.23$. The latter two were also significantly different from each other, $F(1,304) = 4.34, P < .05, d = 0.24$.

Trait physical aggression yielded significant main and interactive effects, $F(1,304) = 11.33, P < .01, d = 0.39, F(2,304) = 3.31, P < .05$, respectively (see Fig. 4). For participants in the prosocial ($b = 0.30$) and neutral conditions ($b = 0.37$), higher trait physical aggression was associated with higher mean feelings ($p_s < .01$). The violent condition slope did not differ significantly from zero ($P > .10$). The game type effect was significant at -1 SD trait physical aggression ($F[2,304] = 8.82, P < .01$), but was not at $+1$ SD trait physical aggression [$F(2,304) = 2.32, P > .05$].

Game difficulty ratings, egoistic helping, and altruistic helping all yielded significant main effects, $F_s(1,304) = 13.26, 5.33, 5.64, p_s < .01, .05, .05, d_s = 0.42, 0.26, 0.27$, respectively. Whereas egoistic helping was positively related to mean feelings ($b = 0.12$), altruistic helping was negatively related to mean feelings

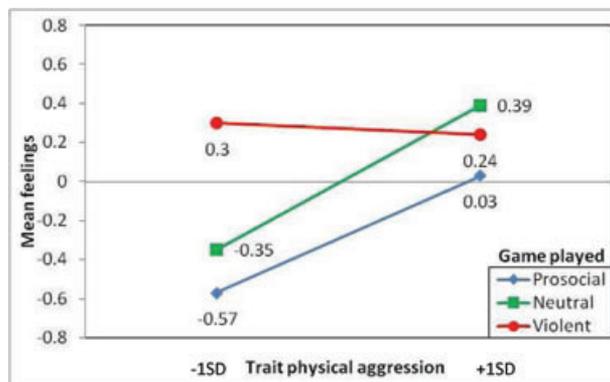


Fig. 4. Mean feelings as a function of trait physical aggression and game played.

($b = -0.12$). Game difficulty was positively associated with mean feelings ($b = 0.12$).

DISCUSSION

There were three main goals for this study: (1) testing the effects of prosocial, neutral, and violent video games on state hostility and positive affect; (2) examining the direct and moderating influence of person variables (e.g., trait aggression, trait helping); and (3) examining potential differential effects of helping for egoistic, as opposed to altruistic motivations. Several interesting results were found. First, prosocial video games reduced total state hostility, aggravation, and mean feelings, and simultaneously increased positive affect compared to either neutral or violent games. This is the first experimental study to show such effects. Second, violent video games increased total state hostility, aggravation, and mean feelings, while reducing positive affect compared to neutral or prosocial video games. To our knowledge the effects on positive affect and the comparison to neutral games are the first to be reported in the video game effects literature. In contrast to previous studies examining prosocial game effects on affect, our use of more specific affect measures, multiple games of each game type, and a large sample size contribute to the sensitivity of our tests and the generalizability of the results.

A third important set of findings is the consistent moderation of game effects by trait physical aggression. The overall pattern suggests that the effect of video game content on total state hostility, aggravated, mean, and positive feelings appears stronger for participants who normally are not very physically aggressive. Again, this is the first study to examine these moderating effects with a sufficiently large sample size to detect small to medium size effects. These results also contradict the prevailing belief that

media violence has its greatest effects on those who are most aggressive [e.g., Bushman, 1995]. In fact, for the aggravated and mean feelings measures, the violent games appeared to exert relatively more impact on low aggressive individuals. It is possible that high trait aggressive individuals are generally more likely to report aggravated feelings in which case the added influence of a situational variable (violent content) could lead to a ceiling effect. The positive main effect of trait aggression on aggravated feelings further supports this claim. The interesting finding is that high trait aggression individuals who played prosocial games actually reported lower aggravated feelings than the other two game conditions. This suggests the potential for prosocial games to have a positive influence on even those who are high on trait aggression. Additional research will be needed to test these moderation findings, both to replicate them and to see how specific they are to different types of affect.

The fourth set of novel findings concerns the differential effects of trait helping based on whether helping is done for egoistic, as opposed to altruistic motivations. Trait altruistic helping was negatively related to total state hostility and mean feelings but was positively related to positive feelings. Trait egoistic helping, however, was positively related to aggravated and mean feelings. Although not specifically related to our main experimental hypothesis, it is interesting that we found differential state affect patterns for individuals who help based on egoistic vs. altruistic motivations. It is possible that egoistic helpers, who help others to reduce their *own personal distress*, are more likely to experience, notice, or report *self-experienced* state hostility. Conversely, altruistic helpers, who help others to reduce the *other's distress*, are less likely to experience, notice, or report *self-experienced* state hostility because of their concern for others. Of course, these possibilities should be tested empirically in future research. In any case, these results suggest that standard measures of trait prosociality need to carefully distinguish these two types of motivation for helping. Additionally, the consistent lack of moderation effects of the two trait helping measures suggests that the obtained game type effects generalize across these individual difference measures.

Finally, even after controlling for a host of theoretically important dimensions we still found that prosocial content in video games decreases total state hostility, aggravated, and mean feelings, and increases positive feelings relative to both violent and neutral games.⁵

To our knowledge these studies are the first to document the effects of prosocial video game content on state hostility and positive feelings. Greitemeyer and Osswald suggested that "it appears that the effect of playing video games on social behavior works primarily through the cognitive route." (2010, p. 219), because they did not find a significant game type effect (comparing prosocial and neutral games) on affective measures. However, our results suggest that prosocial content in video games *can* increase positive and decrease hostility-related negative affect in the short term. Future research with large sample sizes could profitably examine simultaneously the potential mediating roles of cognitive and affective states in understanding the effects of prosocial video games on prosocial and antisocial behaviors, using our more specific affect measures.

Of course, the present study examined only short-term effects. However, as hypothesized by social-cognitive learning models, repeated encounters with prosocial media may yield long-term changes in personality by increasing the probability of prosocial and reducing the probability of antisocial behavior. The only longitudinal study of this hypothesis found such long-term effects [Gentile et al., 2009, Study 2].

Repeated and habitual exposure to media with violent content can have serious consequences, such as increased aggressive and bullying behavior [e.g., Anderson and Dill, 2000; Gentile et al. 2011; Huesmann et al., 2003]. This has led some to suggest that children should be prevented from viewing such content. Yet the media also have the potential to be part of the solution (see Saleem & Anderson, 2012). As pointed out by Mares and Woodard (), prosocial content in television increases prosocial behavior, reduces aggression, and encourages viewers to be more tolerant. Likewise, the present research suggests that video games with prosocial content could lead to positive outcomes. However, content analyses of video games reveal that 70–85% of video games involve some type of violence [Dietz, 1998], and children often prefer to play violent video games [Bushman and Funk, 1996]. Hence, there is clearly a need for prosocial video games that are highly attractive to consumers. One additional question in need of research is whether combining prosocial content in a violent video game can reduce the antisocial consequences of the violent content. The GLM as well as the General Aggression Model [Anderson

⁵For total state hostility, $d_s = .57$ and $.27$, $p_s < .01$ and $.05$, for the violent and neutral contrasts. For aggravated feelings, $d_s = .49$ & $.29$,

$p_s < .01$ & $.05$, for the violent and neutral contrasts. For mean feelings, $d_s = .47$ and $.24$, $p_s < .01$ and $.05$, for the violent and neutral contrasts. For positive affect, $d_s = .55$ and $.20$, $p_s < .01$ and $.10$, for the violent and neutral contrasts.

and Bushman, 2002] on which it is based suggests that this might well be true. Further, theoretical and empirical advances on how media affect important social emotions, cognitions, and behaviors will prove useful to parents, game designers, and public policy makers.

APPENDIX VIDEO GAME DESCRIPTIONS

Violent Games

Ty2 and *Crash Twin Sanity* are action adventure games in which the goal is to complete various stages by defeating the enemies and bosses, while overcoming any obstacles on the way.

Neutral Games

The goal of *Pinball* is to keep the ball on the table using the left and right triggers. *Super Monkey Ball* requires the player to guide a monkey through various puzzles toward the goal within the time limit.

Prosocial Games

Chibi Robo lets the player control a robot whose job is to make its family happy by cleaning up, helping them out in their chores, and everyday tasks. As the player cleans up throughout the house, they earn Happy Points that improve their robot's ranking. The player can do several things to get happy points (e.g., picking up trash and throwing it in a trashcan, scrubbing stain marks with a toothbrush.). In *Super Mario Sunshine*, players take the role of Mario who is stuck on a polluted island. The natives of the island request Mario to clean up the island using his water-cleaning device in order to revive the tourism industry of the island.

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