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Research Report

Effects of cooperative gaming and avatar customization on subsequent spontaneous helping behavior

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Cooperative gaming is quickly becoming the preferred form of entertainment among children and teens. Although game content is typically violent, often producing negative social outcomes, cooperative game play ameliorates its anti-social impact in future formal instances of cooperation. The present study examined the influence of cooperative and competitive game play on subsequent spontaneous helping in a pair of experiments. The mitigating role of playing with a customized or generic avatar was also evaluated. In Experiment 1, participants played doubles tennis in Wii Sports either cooperatively or competitively with a confederate. Results revealed that participants who cooperated picked up significantly more pens spilled by the confederate after gameplay than those that competed, but only when they customized their avatars. In Experiment 2, cooperative game play in Wii Sports Resort canoeing engendered significantly more spontaneous helping regardless of avatar customization. These findings are generally consistent with recent gaming research and suggest that in-game cooperation and competition have more bearing on social outcomes than game content.

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1. Introduction

The Entertainment Retailers Association UK market analysis report for 2012 shows that video game titles accounted for 53% of online media sales and nearly 40% of the total media market, rivaling video sales (e.g., DVD, Blue-ray, digital downloads) for the first time (Redmond & Butler, n.d.). Nearly 90% of children and teens play video games with some regularity (Gentile, 2009) and have been devoting more time to this form of entertainment than to television since the turn of the century (Huston, Wright, Marquis, & Green, 1999). A common feature of many modern games is that they enable several people to play together by using multiple controllers connected to a gaming system or by playing with others over an Internet connection (or local area network). In fact, more than three quarters of all teen gamers are playing in this way (Lenhart et al., 2008) and engaging in both cooperative (collaborative) and competitive gaming scenarios.

While the typically violent content and negative social impact of such games has drawn much scholarly attention (e.g., Anderson et al., 2010; Dietz, 1998), there is a dearth of experiments examining the effect of cooperating or competing in a gaming environment. Two recent notable exceptions are studies by Greitemeyer, Traut-Mattausch, and Osswald (2012) and Ewoldsen et al. (2012), which illustrate that content-based negative social effects, particularly a decrease in subsequent cooperative tendencies typically associated with playing violent video games (Sheese & Graziano, 2005), can be ameliorated when people play cooperatively against another (computer-controlled) team. The present work extends the literature on cooperative gaming by examining the impact that playing a neutral game cooperatively or competitively, using a generic or customized avatar, has on spontaneous helping behavior in a future informal encounter between the players.

Gentile and colleagues have outlined five characteristics of a video game and its use that determine how it will affect someone: game content, context, structure, and mechanics, as well as the amount that it is played (Gentile & Stone, 2005; Kho & Gentile, 2007; Stone & Gentile, 2008). Game context and content arguably influence players most, with pro-social (Gentile et al., 2009; Greitemeyer, 2011) and anti-social (aggressive/violent) games (Anderson et al., 2010) engendering corresponding tendencies and behaviors in the players. This has also been observed in other forms of media, but aggressive video games have been shown to have the most extreme negative influence (Anderson & Dill, 2000). Game structure involves the nature of the digital environment (e.g., 2D vs. 3D) and the tasks that makes up the game, whereas game mechanics include methods with which the players control game action (e.g., joysticks, gamepads or motion sensitive gaming controllers like the Wiimote); both aspects can lead to beneficial cognitive gains for frequent gamers (e.g., attention: Green & Bavelier, 2003; motor coordination: Griffith, Voloschin, Gibb, & Bailey, 2003; motor coordination: Griffith, Voloschin, Gibb, & Bailey, 2003; motor coordination: Griffith, Voloschin, Gibb, & Bailey,
1983; Rosser et al., 2007). Increased gaming time generally amplifies the above effects.

One important aspect of a game’s structure is whether players attain milestones by cooperating, competing, or both. While this structural feature has largely been ignored by gaming scholars, cooperation and competition have characterized human interactions since the origin of our species and may have more profound social outcomes than game content and context.

Competition and cooperation are both effective strategies for improving one’s inclusive fitness (a measure of propensity to pass on genetic makeup) and are evolutionarily ubiquitous (Dawkins, 1976; Wynne-Edwards, 1986). While competition can be an effective tool in procuring assets or status, it can have devastating effects on social relationships and group function. When organisms engage in an evolutionary arms race and invest heavily in within-group competition, their ability to cooperate is reduced and negative consequences are experienced by all parties (Axelrod, 1984). Human competition typically has additional negative consequences for social interactions and often inspires negative tactics such as coercion, betrayal, and intimidation (Deutsch 1949a,b, 1973, 1985, 2006; Frank, 2007; Johnson & Johnson, 1989). On the other hand, competition can sometimes produce positive social consequences; people often compete to have fun and improve or test their skills. Wirt (2011) surveyed 635 past Science Olympiad participants to assess how team competition influenced various aspects of their lives and found that an overwhelming majority had been positively impacted in numerous different areas.

While competition is a straight-forward way to gain fitness and posed no quandary for evolutionary theory, altruistic and cooperative acts were somewhat puzzling until the contributions of Hamilton (1964a), Hamilton (1964b) and Trivers (1971), who provided mathematical models of kin and reciprocal altruism, respectively. Cooperation is a form of reciprocal altruism in which parties exchange goods or services to further their mutual goal(s). Although these exchanges are prone to cheating, social organisms have developed strategies to encourage cooperation and punish duplicitous behavior (defection). Two such strategies are tit-for-tat (Axelrod & Hamilton, 1981) and win-stay, lose-shift (Nowak & Sigmund, 1993). Both encourage cooperation between parties and are evolutionarily stable strategies (ESS, Maynard-Smith & Price, 1973) because they successfully guard against the proliferation of cheaters.

The benefits of cooperation for people are not limited to survival and reproductive success. Cooperating with others improves psychological health and self-esteem, increases group productivity, and results in more positive relationships (Johnson & Johnson, 1989). Cooperation in the context of a sports team increases performance and intrinsic motivation (Vallerand & Losier, 1999). When a team is successful, these benefits are amplified, whereas in the face of failure team members can help motivate others and lift their spirits (Tauer & Harackiewicz, 2004). In contrast, competition can inhibit intrinsic motivation to partake in an activity (Ntoumanis, 2001).

In the context of playing violent video games, Greitemeyer et al. (2012) found that team-play against a computer-controlled team resulted in increased cooperation in a following Decision Dilemma task relative to single-player gameplay. Mediation analyses in Experiment 4 illustrated that team-play promoted feelings of cohesion and activated trust norms that consequently increased cooperative behavior. Pearce and Amato’s (1980) taxonomy of helping (altruistic) behavior identified three pertinent help dimensions: (1) planned/formal vs. spontaneous/informal; (2) serious (high-cost) vs. non-serious (low-cost); and (3) indirect/giving vs. direct/doing. The Decision Dilemma scenario falls into the domain of planned, formal helping. While the aforementioned Greitemeyer et al. (2012) and Ewoldsen et al. (2012) studies elucidated the effect of cooperating in a planned setting on future formal interactions, the present work examined how formal interactions in the context of cooperative game play impacted helping behavior in a future spontaneous (informal) helping scenario.

The current pair of experiments are methodologically based on Greitemeyer and Osswald (2010), which showed that when participants played a game with pro-social content, they exhibited greater amounts of helping behavior in spontaneous helping tasks, including picking up spilled pens (Experiments 1 and 4), volunteering their time to help with research (Experiment 2) and intervening in a harassment scenario, relative to playing a neutral game (Experiment 3). Drawing on the methods of Greitemeyer et al. (2012) and Ewoldsen et al. (2012), rather than manipulating game content, we manipulated whether participants played cooperatively or competitively with a confederate. Also, rather than selecting a violent or prosocial game as in the above-mentioned studies, we utilized one that is neutral. We employed the pen dropping task used in the aforementioned Experiments 1 and 4 because it is an easy modified and relatively inexpensive way to measure spontaneous helping behavior (Pearce & Amato, 1980; Macrae and Johnston, 1998). Moreover, Greitemeyer and Osswald found that the cost of helping behavior was irrelevant to its production in their paradigm; therefore, we felt our findings with dropped pens would generalize to other more serious (high-cost) helping behaviors.

Another distinctive aspect of the current design is that we manipulated whether the participants played using customized or generic avatars (digital representations of the players in the game environment). While Gratch and colleagues (Gratch, Wang, Gerten, Fast, & Dully, 2007; Gratch et al., 2002; Von der Pütten, Krämer, Gratch, & Kang, 2010) have laid the foundation of an avatar research program for interactions in the digital world, the impact of avatar customization on real-world interaction has only been evaluated once to the best of our knowledge. Fischer, Kastenmüller, and Greitemeyer (2010) manipulated game content (neutral vs. aggressive) and avatar type (generic vs. customized) and found an interaction between these factors and a main effect of game content. Participants who played an aggressive game chose to give greater amounts of spicy chili sauce to another player than those in the neutral condition, and this difference was greatly amplified for those who customized their game characters. Thus, avatar customization amplified the negative social outcome of playing an aggressive video game.

For the following experiments, we hypothesized that playing a neutral video game cooperatively would lead to increased subsequent spontaneous helping behavior (measured by the number of picked up pens) as compared to playing competitively, and that the magnitude of this difference would be greater when participants played with a customized avatar. Thus, we expected a main effect of in-game cooperation/competition and that this factor would interact with whether players customized their avatars.

2. Experiment 1

We chose the Nintendo Wii gaming system for our experiments because of the extensive array of customization options for player avatars, or “Mii,” as well as its popularity and ease of use (Nintendo, n.d.a). We had hoped to attract players with various levels of expertise, thus we selected a widely-distributed title that was neither violent nor prosocial, Wii Sports (Nintendo, 2006). Nintendo reports that to date the game has sold nearly 82 million copies worldwide (Nintendo, n.d.b). Of the five sports that are included in the game, only tennis allowed for both cooperative (two human players against a computer-controlled doubles team) and competitive gameplay modes (human players against each other, controlling both avatars of a doubles team).
The design was between-subjects and fully-crossed. As mentioned above, we manipulated game structure (cooperative vs. competitive gameplay) and players’ avatars (custom vs. generic). We used the number of pens picked up by the participant in the first 5 s after the confederate spilled the pen cup as a continuous dependent measure of spontaneous helping behavior. In contrast, Greitemeyer and Osswald (2010) and Macrae and Johnston (1998) used the dichotomous (and less statistically powerful) version which simply records whether participants helped (or offered to help). Another difference in our methods from Greitemeyer and Osswald (2010) is that we recorded the number of games won by the participant as a potential contributor to spontaneous helping in a gaming context.

2.1. Method

2.1.1. Participants

Fifty-four undergraduate students (26 females; \( M_{age} = 21.2,\ SD_{age} = 4.0 \)) from a southwestern U.S. university participated in this study for course credit. All participants reported normal or corrected-to-normal vision.

2.1.2. Apparatus

Participants played doubles tennis in Wii Sports with a confederate in a 5 m × 8 m room. Participants stood approximately 3 m from the screen. Standard motion sensitive controllers, commonly referred to as Wiimotes, were used. Video was projected onto a 2.1 m by 2.7 m screen with a HD widescreen projector running at 480p, which is the native resolution for the Nintendo Wii. Audio was provided through stereo speakers flanking the display. A brief survey with three demographic items (age, gender, and handedness) was administered before playing the game and two Likert-scale items were assessed afterwards.

2.1.3. Procedure

Participants provided consent and filled out the demographic survey. They were told they would be playing with another participant (in reality a confederate) and the purpose of playing the game was to gauge the enjoyment and usability of modern video games employing motion sensitive controllers. Participants were randomly assigned to one of four experimental conditions that differed in whether the participants played competitively or cooperatively and with either a customized or generic avatar. Participants in the competitive condition \( (n = 27) \) were given 5 min to create a personalized Mii before playing the game. This was done using the Wii’s Mii (creation) Studio, which allowed the player to alter their avatar’s appearance (see Fig. 1). In the generic avatar condition \( (n = 27) \), participants used an existing generic gender-matched avatar (average settings across all customization parameters and no distinguishing features). Participants that were assigned generic avatar performed a 5-min directed weather searching distraction task using the Wiimote to equate the two conditions in regard to players’ familiarity with the controller.

Next, the participant was introduced to the other player who was a confederate and had been sitting on a couch behind the participant during the paperwork and avatar creation/distraction task. Participants were told that the other player’s consent form and avatar creation had been completed prior to their arrival. The confederates were previously trained to act like participants in the study and to “accidentally” spill a cup of pens when gameplay was finished. To reduce the impact of any given confederate, we recruited 3 female and 3 male undergraduates and trained them together to ensure that they acted similarly. They were never informed of the hypotheses and confederates were not preferentially assigned to specific conditions. Although it was impossible for them to be blind with respect to the manipulations, their behavior was carefully monitored by the experimenter for consistency, and confederate-participant gender pairing effects were also statistically evaluated once all the data had been collected.

After creating their avatar or finishing the distraction task and meeting the confederate, participants received some basic verbal instructions on doubles tennis and proceeded to play Wii Sports. Whether participants played cooperatively against the computer or competitively against each other depended on initial random assignment. In the cooperative condition \( (n = 28, 14 \) participants from each avatar condition), players controlled individual avatars on the same team and played against the team controlled by the computer. In the competitive condition \( (n = 26, 13 \) participants from each avatar condition), players controlled both avatars on one side of the screen (one of whom was their character) and the confederate controlled both characters on the other side. The confederate always served first. The game ended when one team won a total of 3 matches (best of 5), and a new match was started if the time allotted for game play had not yet passed. Participants played the game for 25 min; the number of games won was tallied for each match. After playing, participants were asked how much they enjoyed playing the video game on a Likert scale of 1 to 7 (1 not at all – 7 very much). To check the strength of our avatar manipulation, participants were also asked to rate how closely they identified with their game avatar by answering the following question, “I identified with my character (1 not at all – 7 very much).” Then they were told that the game playing portion of the experiment was over and there was a marketing questionnaire to complete. The participant and confederate were handed a contrived survey and instructed to sit at a nearby table. A cup with 18 pens was positioned on the edge of the table. The confederate pretended to accidently knock the cup off the table while reaching for a pen, spilling the entire contents of the cup onto the floor. The confederate acted exasperated and held the marketing survey in front of their face, vocally expressing dismay. The number of pens picked up in the 5 s after the spill was recorded by a research assistant (RA) that was standing in the background. Once the 5 s window expired participants were debriefed about the intent of the study to measure helping behavior after gaming. The hypotheses regarding game structure (cooperation/competition) and avatar customization were not revealed to the participants in an attempt to keep the confederates blind.

2.2. Results

2.2.1. Preliminary analyses

To rule out any unwanted influence from male–female interactions between the players and confederates (i.e., chivalrous behavior), we conducted a 2 (participant gender) × 2 (confederate gender) ANOVA of the number of pens that were picked up. There was no main effect of participant gender, \( F(1,50) = .54, p = .47 \), or confederate gender \( F(1,50) = 1.58, p = .21 \), nor an interaction \( F(1,50) = 2.46, p = .12 \). For this reason, gender was excluded from the remaining analyses.

A t-test confirmed the strength of the efficacy of the avatar manipulation and showed that those in the customized avatar condition \( (M = 3.85, SD = 2.0) \) identified more with their avatar than their counterparts in the generic condition \( (M = 5.85, SD = 9.8) \) identified more with their avatar than \( t(52) = 4.53, p < .0001 \). Cohen’s \( d = 1.26 \). Yet, player-avatar identification scores did not correlate significantly with the number of picked up pens \( (r(54) = .022, p = .11) \), nor did participants’ age \( (r(54) = -.01, p = .96) \), self-reported game enjoyment \( (r(54) = .012, p = .37) \). On the other hand, the percentage of games won by the participant was positively correlated with the number of pens that participants picked up \( (r(54) = .46, p < .001) \). Thus, this factor was included as a covariate in the following analyses.
2.2.2. Main analyses

A 2 (game structure: cooperative vs. competitive gameplay) × 2 (avatar type: generic vs. custom) ANCOVA of the number of pens picked up was conducted; the percentage of games won by the participants was included as a covariate. Our hypotheses were partially supported. There was a significant main effect of game structure; \( F(1,49) = 10.73, p = .002, \eta_p^2 = .18 \), in favor of cooperation (see Table 1 for means and standard deviations of the number of pens picked up by participants in each condition for each experiment). There was also an unpredicted significant main effect of avatar type, \( F(1,49) = 4.15, p < .05, \eta_p^2 = .08 \), in favor of customization. These main effects were qualified by their significant interaction, \( F(1,49) = 9.95, p = .003, \eta_p^2 = .17 \). Additionally, the percentage of games won by participants covaried significantly with the dependent measure, \( F(1,49) = 4.12, p = .05, \eta_p^2 = .08 \). One-way ANCOVAs were conducted at each level of the avatar manipulation to explore the interaction due to the potentially differential contribution of games won in each condition.

For those participants who customized their avatars, the main effect of game structure was large and significant, \( F(1,24) = 16.11, p = .001, \eta_p^2 = .40 \), again, favoring collaboration. Those that cooperated picked up 10 more pens, on average, than those that competed. Percentage of games won covaried marginally, \( F(1,24) = 2.97, p = .098, \eta_p^2 = .11 \). On the other hand, for those participants that played with a generic avatar, the main effect of game structure was not significant, \( F(1,24) = 20, p = .66 \), nor did the percentage of games covary significantly, \( F(1,24) = 1.14, p = .30 \).

Table 1

<table>
<thead>
<tr>
<th>Avatar type</th>
<th>Cooperative Gameplay</th>
<th>Competitive Gameplay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean # of pens picked up</td>
<td>SD</td>
</tr>
<tr>
<td><strong>Experiment 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generic</td>
<td>8.6</td>
<td>4.4</td>
</tr>
<tr>
<td>Customized by participant</td>
<td>15.4</td>
<td>3.3</td>
</tr>
<tr>
<td><strong>Experiment 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generic</td>
<td>8.8</td>
<td>3.0</td>
</tr>
<tr>
<td>Customized by participant</td>
<td>8.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Customized by RA</td>
<td>8.8</td>
<td>3.0</td>
</tr>
</tbody>
</table>

2.3. Discussion

Cooperative play had a positive impact on subsequent spontaneous helping behavior, but the difference was only significant for participants that customized their avatars. While our findings are novel, they are generally consistent with those of Fischer et al. (2010), who showed a similar pattern with aggressive behavior (administration of spicy chili sauce) towards another player when primed by aggressive video game play using custom avatars. The slight differences in the results may be due to the fact that we manipulated whether participants played competitively or cooperatively, whereas Fischer et al. (2010) manipulated game content. As with the findings of Greitemeyer et al. (2012) and Ewoldsen et al. (2012), the present work suggests that whether players cooperate or compete might have an even greater impact on subsequent prosocial behavior than game content. Additionally, we discovered that simply playing with a custom avatar buoyed helping behavior and that the win rate of the participants contributed to spontaneous helping behavior in this context.

3. Experiment 2

To confirm and extend our initial findings, we amended the prior design in the following four ways. (1) The PANAS (Watson, Clark, & Tellegen, 1988) was administered before and after gameplay in order to determine the role of affect in spontaneous helping. (2) To better understand the role of avatars, an additional level of customization was added where a research assistant created an avatar that resembled the participant, removing the active customization part of avatar creation. (3) Also, to further expound the impact of avatars, a more sensitive instrument replaced the lone participant-avatar identification question. (4) Finally, the game was changed from tennis in Wii Sports to canoeing in Wii Sports Resort (Nintendo, 2009). This change was prompted by the observation that in Experiment 1 above, and the aforementioned Greitemeyer et al. (2012) and Ewoldsen et al. (2012) studies, cooperative gaming occurred in the context of a team competing against a team of computer-controlled virtual agents. Thus, while participants cooperated they did so in the context of competition. In comparison, the collaborative mode of canoeing in Wii Sports Resort does not pit the team against a computer, but, rather, involves the team meeting navigational goals.
The present experiment used a fully-crossed between-subjects design. The independent variables were game structure (cooperative vs. competitive gameplay) and avatar type (generic avatar made by research assistant vs. avatar made by research assistant to resemble the player vs. player customized avatar). The dependent variable was, again, the number of spilled pens picked up by the participant in a subsequent interaction.

3.1. Methods

3.1.1. Participants

Twenty-five undergraduate students (12 females; $M_{\text{age}} = 23$, $SD_{\text{age}} = 2.4$) from a southwestern U.S. university participated in this study for course credit. All participants reported normal or corrected to normal vision. Three participants were excluded from the study due to the confederate’s inability to successfully or completely spill the cup of pens.

3.1.2. Apparatus

The gaming setup was identical to that used in Experiment 1 except that the game used in this study was Wii Sports Resort canoeing and the following measures were collected. To assess the impact of affect on spontaneous helping, the widely-used PANAS instrument was utilized. To assess participants’ identification with their avatar, we modified the Player Identification Scale (Van Looy, Courtois, & De Vocht, 2012) by removing 12 from its original 29 items that referred specifically to aspects of the game World of Warcraft (Blizzard, 2004). The adapted instrument contained 5-point Likert scale items examining three facets of player-avatar identification: similarity identification (6 items), embodied presence (6 items), and wishful identification (5 items). Win rate was not recorded as it was not meaningful in the cooperative condition.

3.1.3. Procedure

After providing informed consent, participants answered demographic questions and were then given the first PANAS. Next, participants were randomly assigned to one of the six conditions: 12 played cooperatively (5 with a generic RA-generated avatar, 4 with a RA-generated avatar that resembled the player, and 3 with a player customized avatar) and 10 played competitively (3 with a generic RA-generated avatar, 4 with a RA-generated avatar that resembled the player, and 3 with a player customized avatar). The custom avatar condition required participants to create their own custom Mii. They were given 5 min to complete the task and no other guidelines were given for avatar creation. In the generated avatar condition, the research assistant created a Mii without participant input that resembled the participant, whereas in the generic avatar conditions the research assistant created an average, non-descript avatar while the player watched. In the generic and made-to-resemble avatar conditions, the same 5-min distractor task from Experiment 1 was given in place of active avatar creation by the participant. Consequently, the participant was introduced to the confederate in a similar manner to Experiment 1. There were three confederates assisting with the study; all were female undergraduates and were trained in the same way as their counterparts in the first experiment.

For competitive gameplay, the participant and confederate competed against each other and navigated a course with checkpoints spread evenly throughout. The first player to hit a checkpoint gained a point and the first to five points won the match. In the cooperative condition, the participant and confederate played a speed challenge in which players worked together to navigate a single canoe through a course to reach the finish line before the time expires. As players complete courses, the distance of the course increases. When all distances have been achieved, the game simply requires the players to go as far as they can in the allotted time.

Participants were initially given five minutes to practice with the tutorial provided by the game. The confederate always played as first player and navigated the tutorial menus. After practicing, the players exited the learning tutorial and started the game. They were given 20 min to play with no further instructions as to how the game should be played. After 20 min, the confederate and participant were given a paper packet with the Player Identification Scale and the second PANAS. Finally, the same pen spilling procedure was employed as in Experiment 1, except that we used 15 pens in this design and did not debrief the participants until they completed the packet.

3.2. Results

3.2.1. Preliminary analyses

A one-way (avatar type: generic vs. made-to-resemble vs. custom) MANOVA of player-avatar identification scores confirmed the efficacy of the avatar manipulation (Wilks’ $\lambda = 0.42$, $F(6,40) = 3.69$, $p = 0.005$, $\eta^2_p = .32$). Univariate tests showed that avatar customization significantly impacted players’ similarity identification, $F(2,22) = 8.85$, $p = 0.002$, $\eta^2_p = .47$, and wishful identification, $F(2,22) = 4.73$, $p = 0.02$, $\eta^2_p = .30$, but not their embodied presence, $F(2,22) = 1.72$, $p = 0.20$. Pairwise comparisons showed that players identified significantly less with the generic avatars created by the research assistant than the ones that were created to resemble them or that they customized themselves, for which player-avatar identification scores did not differ.

The three player-avatar identification scales had high reliabilities: the Cronbach’s Alphas for similarity identification, embodied presence, and wishful identification were 0.90, 0.94, and 0.79, respectively. The number of spilled pens picked up by participants did not correlate with participants’ scores on any of the three player-avatar identification scales, nor participants’ positive and negative affect before and after gameplay, nor their affect change: all uncorrected $ps > 0.05$. Thus, none of these measures were used as covariates in the following analyses. Additionally, a $t$-test revealed no effect of participant gender, $t(20) = 1.41$, $p = 0.17$, Cohen’s $d = 0.17$, therefore it was not included in the following analysis.

3.2.2. Main analysis

A two-way (game structure and avatar type) ANOVA of the number of pens picked up by participants showed a significant main effect of game structure, $f(1,16) = 5.22$, $p = 0.04$, $\eta^2_p = .25$, again, favoring cooperation (see Table 1). In contrast to Experiment 1, the main effect of avatar type was not significant, $f(2,16) = .68$, $p = 0.52$, $\eta^2_p = .08$, nor was there an interaction between the factors, $f(1,16) = 0.17$, $p = 0.85$, $\eta^2_p = .02$. The positive impact of cooperation was not lessened when participants played with a generic avatar, so only our primary hypothesis was fully supported here. However, the trend in the means across avatar conditions did not follow our secondary prediction (see Table 1). Thus, our latter hypothesis was not supported in this context.

3.3. Discussion

Unlike the results of Experiment 1, the positive impact of cooperation on subsequent spontaneous helping remained significant regardless of avatar type. However, we failed to find an effect of avatar customization. The issue may be due to a lack of statistical power as a result of low sample size. Alternatively, the lack of an avatar effect may be an artifact of the canoeing game in Wii Sports Resort. The game is played from a third-person perspective, with the players viewing the canoe and avatars from behind. One aspect of the game interface is that the avatars are nearly invisible, which
gives players a clear line of sight in order to better direct the canoe. Because avatars are see-through, the players might have focused their attention on the canoe itself rather than the avatar, since successful navigation of the course with the canoe, and not the avatar, is required. Evidence in support of this comes from the finding that while our customization manipulation significantly impacted participant’s similarity identification with the avatar it did not impact their sense of embodied presence, potentially negating the impact of avatar customization in this experiment.

4. General discussion

Experiments 1 and 2 illustrate that cooperative gameplay in a formal context leads to an increase of spontaneous helping behavior between the players in a future informal context (picking up spilled pens). Our findings extend the extant literature on the pro-social impact of cooperative gameplay in several ways. This is the first demonstration of the social benefits of cooperation in a context other than subsequent cooperation, which has already been elegantly elucidated by Greitemeyer et al. (2012) and Ewoldsen et al. (2012). Additionally, this is the first demonstration of the pro-social impact of collaborative game play and avatar customization (observed only in the first experiment) in a non-aggressive context.

Cooperation engendered more helping across avatar types in Experiment 2, whereas in Experiment 1 there were main effects of avatar customization, cooperation/competition, and an interaction between these factors. In addition, comparing the size of the main effects of game structure (cooperation/competition) in Experiments 1 and 2 reveals a sizeable discrepancy. There is only a 2.5(16.7%) pen difference between cooperative and competitive conditions in Experiment 2 whereas this difference was 10 (55.6%) pens in Experiment 1. One of the more prominent structural differences between the two games used in the experiments lies in that team play occurred in a competitive setting in the first experiment, but not the second. Perhaps cooperation in the context of competition with another team (consisting of people or computer generated agents, as in Experiment 1) has a more significant, and potentially different, impact on factors which mediate prosocial behavior, like the accessibility of prosocial thoughts (Greitemeyer & Osswald, 2010) and feelings of cohesion (Greitemeyer et al., 2012).

Although the current pair of experiments only tested low-cost (non-serious) spontaneous helping behavior, the findings of Greitemeyer and Osswald (2010) suggest that our findings will generalize to demanding (serious) helping behaviors as well. Additionally, while the current methodology only evaluated spontaneous helping of the person with whom the participant had just played, Greitemeyer et al. (2012) found that the effects of cooperation generalized to later cooperation with a tertiary person. Therefore, we expect to see similar results in the context of spontaneous helping behaviors directed towards non-players, although propensity for helping may depend on whether cooperative play occurred in the context of cooperation against another team or solely with each other to meet goals. In future studies, we will empirically explore these ideas and examine other forms of helping behavior along the three dimensions identified by Pearce and Amato (1980). Participant win rate and mediation analyses will also be given additional attention.

The practical impact of the current and aforementioned findings exemplifying the prosocial benefit of cooperative gameplay has far-reaching social repercussions. Our findings support the few recent publications which suggest that game structure, particularly whether a game involves cooperation, has greater ramifications for future player behavior than game content. Despite the reality that most games are aggressive in nature and that exposure to this kind of media has serious negative societal outcomes, the worldwide emergence of multi-player gaming may have unexpected prosocial benefits.

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References


