A Test of Bounded Generalized Reciprocity and Social Identity Theory in a Social Video Game Play Context

Dissertation

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By

John Anthony Velez, B. A.

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Dissertation Committee:

David R. Ewoldsen, Advisor

Brad J. Bushman

Brandon Van Der Heide

Abstract

Little is known about why cooperative video game play can have beneficial effects for players' subsequent pro-social behaviors. The current experiment provides a formal test of two competing theories of social behaviors (i.e., Social Identity Theory and Bounded Generalized Reciprocity) in the context of social video game play. This study employed a 3 (*Teammate: Helpful vs. Minimal vs. Unhelpful*) x 2 (*Prisoner's Dilemma Game: Simultaneous vs. Sequential*) x 2 (*Donation Recipient: In-group and Out-group*) mixed experimental design. Participants played a basketball video game with a helpful or unhelpful teammate against an ostensible opposing team. Participants then engaged in a one-shot simultaneous or sequential prisoner's dilemma game with their teammate and an opposing team member. Participants in the control condition were assigned to teams but did not play a video game until after engaging in the prisoner's dilemma game (i.e., minimal groups). The results indicated that participants with helpful teammates were more pro-social to teammates in the simultaneous prisoner's dilemma game compared to participants with unhelpful teammates. As predicted by Bounded Generalized Reciprocity, participants' donations in the prisoner's dilemma games were mediated by their expectations of teammates to reciprocate pro-social behaviors. Participants with helpful teammates did not demonstrate in-group favoritism (i.e., donating more money to teammates compared to opposing team members) by donating substantial amounts to teammates *and* opposing team members. Participants with unhelpful teammates also did not engage in in-group favoritism by donating low amounts of money to teammates *and*

opposing team members. Overall, the results support predictions of Bounded Generalized Reciprocity compared to Social Identity Theory. Implications for social video game research are discussed.

Dedication

I dedicate my dissertation to my friends, family, and fiancé.

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Vita

2008……...University of Alabama

2010 to present……..Graduate Teaching Associate, School of Communication, The Ohio State University

Publications

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Fields of Study

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Chapter 1: Literature Review

Approximately 30 years of research has examined the effects of playing violent video games since their introduction in the early 1980s. The extant research has primarily focused on the negative effects of playing violent video games such as increases in players' aggression and decreases in pro-social behaviors (Anderson et al., 2010). This research has focused on players who are exposed to violent video game content in social isolation. However, in recent years there has been an increase in multiplayer video games that are popular with video game players (ESA, 2013; Papagiannidis, Bourlakis, & Li, 2008; Yee, 2006). Furthermore, violent video games appear to provide the most multiplayer options which suggest that players are no longer socially isolated when engaging in violent game play (Velez, Ewoldsen, Mahood, & Moyer-Guse, 2012).

Researchers are beginning to switch from studying isolated video game players to the diverse social contexts in which video games are currently played (Durkin & Barber, 2002; Kerr, 2006; Kutner & Olson, 2008; Southwell & Doyle, 2004). Still, little is known about how the introduction of social interactions during violent video game play can influence the link between violent video game content and their negative effects. Research suggests that playing violent video games cooperatively can reduce players' subsequent aggressive behaviors and increase cooperative behaviors towards video game partners. Research has also demonstrated that the benefits of cooperative game play extend beyond teammates and can lead players to behave more positively towards non-video game partners as well.

Although previous video game research examining individual players has utilized several theories (i.e., GAM; Bushman & Anderson, 2002), *social* video game research is lacking an overarching theoretical framework suitable to predict the effects of complex social interactions during violent video game play. Two competing theories of social behavior (i.e., Social Identity Theory [Billig & Tajfel, 1973] and the theory of Bounded Generalized Reciprocity [Yamagishi, Jin, & Kiyonari, 1999]) provide potential explanations of players' behaviors when playing with others. However, these two theories have not been extensively tested within virtual environments (i.e., video games) and it is unknown if their basic tenets are applicable to social video game play. The current study will provide the first examination of these theories within the context of social video game play. In an effort to provide a clear test of the two theories, the current study will utilize a non-violent video game to remove any confounding explanations of players' subsequent social interactions that could be explained by exposure to violent content.

Social Identity Theory

Previous research within the Minimal Group Paradigm (MGP) has demonstrated that merely categorizing people into arbitrary groups is enough to increase in-group favoritism and out-group discrimination (Tajfel, Billig, Bundy & Flament, 1971). MGP research was originally interested in the critical factors that lead to in-group and out-group biases. Tajfel and colleagues (1971) created "minimal" groups that were devoid of any factors that may contribute to the emergence of such biases (i.e., communication, prior history, similarities, conflicts of interests, and shared fate). In essence, members of

minimal groups only shared a social category derived from trivial criterion (i.e., preference of painters or estimation of dots on a screen; Tajfel, Billig, Bundy and Flament 1971). Tajfel and colleagues (1971) planned to determine which extra factors lead to in-group and out-group biases compared to these minimal groups where such biases were not expected to emerge. However, even in minimal groups, researchers found that people donated more money to in-group members than out-group members (i.e., in-group favoritism). Furthermore, when deciding how much to donate to in-group and out-group members people maximized the difference as much as possible in favor of in-group members (Tajfel et al., 1971). These results were interpreted to suggest social categorization was sufficient to foster in-group biases and favoritism.

Social Identity Theory (Billig & Tajfel, 1973) was proposed to explain why minimal groups will engage in in-group favoritism and out-group discrimination. SIT suggests that positively evaluating our group identity compared to relevant out-groups can have beneficial effects on our self-esteem. In an effort to evaluate our groups positively, SIT proposes that we engage in behaviors that make our groups favorably distinct from out-groups (i.e., donate more money to in-group members than out-group members; Billig & Tajfel, 1973; Tajfel et al., 1971). In regards to social video game play, SIT predicts that teammates who are grouped arbitrarily will form an in-group in relation to other teams (i.e., out-groups) and therefore, engage in behaviors during and after game play that positively reflects upon their team while discriminating against out-groups. Previous research has corroborated this SIT prediction by demonstrating that cooperative game partners (i.e., in-group members) behave more pro-socially and less aggressively towards each other than competitive game partners (i.e., out-group members; Eastin,

2007; Ewoldsen et al., 2012; Velez et al., 2012; Velez, Greitemeyer, Whitaker, Ewoldsen, & Bushman, under review). SIT also predicts that people will favor in-group members and discriminate more against out-group members than someone with no relevant group affiliations (i.e., people who are neither in-group nor out-group members). However, previous social video game research has not found evidence of this in-group bias or out-group discrimination. Cooperative violent video game partners do not treat each other more pro-socially (Ewoldsen et al., 2012) or less aggressively than two people who have not played a violent video game nor have any group affiliations (i.e., neutral partners; Velez et al., under review; Study 1). Furthermore, competitive violent video game partners do not treat each other less pro-socially (Ewoldsen et al., 2012) or more aggressively than neutral partners (Velez et al., under review; Study 2). This suggests that social video game play does not result in the in-group favoritism and out-group discrimination indicative of social identity processes predicted by SIT.

Velez and colleagues (2012) directly tested whether social video game play leads people to promote their social identities as predicted by SIT by having participants play a violent video game cooperatively or competitively with a confederate who was either an in-group member (i.e., a student from the same university) or an out-group member (i.e., a student from a rival university). SIT predicted that, regardless of social video game play, in-group members should have behaved more pro-socially towards each other than out-group members. However, the results demonstrated that social video game play influenced participants' subsequent pro-social behaviors such that cooperative partners were more pro-social towards each other than competitive partners while the confederates' group identity did not have any influence.

The extant research suggests the benefits of cooperative video game play on players' pro-social and aggressive behaviors are not driven by players' social identities. Another theoretical perspective is needed to explain why cooperative game play can have beneficial effects on players.

Bounded Generalized Reciprocity

Researchers not convinced by SIT revisited the experiments that led to its creation – research on the MGP (Rabbie et al., 1989). Critics argue that minimal groups are "not as minimal" as Tajfel and colleagues thought (1971). During the original MGP studies participants were asked to allocate money to in-group and out-group members. However, participants were fully aware that the money allocated to them was determined by other in-group or out-group members. Therefore, participants had "multilateral fate control" in that each participant's outcome (i.e., money accumulated at the end of the experiment) was dependent on other in-group and out-group member's allocations. Researchers have criticized Tajfel and colleagues for overlooking this aspect of interdependency in their original minimal group procedure and have called into question whether social categorization is sufficient to cause in-group biases. Therefore, Karp et al. (1993) conducted a study in which in-group favoritism was examined using a *more minimal* group. The researchers utilized the same procedure of categorizing participants in arbitrary groups and then provided them with a set amount of money to allocate to an in-group and out-group member. However, interdependency was completely removed from group members' interactions by guaranteeing to pay half the participants a fixed amount of money at the end of the experiment. Thus, these participants' outcomes were not

dependent on other in-group and out-group members. The results indicated that the *true* minimal group (e.g., participants guaranteed a set payout) did not show in-group biases while those whose outcomes were dependent on allocations of money from in-group and out-group members demonstrated the in-group favoritism.

These results suggest that social categorization is not sufficient to evoke in-group favoritism. At least in the original MGP experiments, it seems that being dependent on in-group and out-group members' monetary donations (i.e., multilateral fate) drives in-group favoritism. However, this is incongruent with SIT. If participants were only interested in creating a positive social identity then the promise of a set payoff at the end of the experiment should not have influenced their behaviors. If SIT processes cannot explain in-group favoritism in the original MGP experiments then why do in-group members allocate more money to other in-group members compared to out-group members? A series of studies supporting another theory of inter-group behavior named Bounded Generalized Reciprocity (Yamagishi, Jin, & Kiyonari, 1999) suggest that people's behaviors in in the MGP experiments are determined by self-interest and not their social identity as predicted by SIT. That is, people will behave in a manner that maximizes their own outcome as compared to the overall outcome of their group. BGR proposes that during inter-group situations people will behave positively towards those who are expected to reciprocate such behaviors which effectively protects and furthers one's self-interests. In the context of the original MGP experiments in which people are subject to donations from in-group and out-group members, BGR proposes that people expect in-group members to reciprocate positive behaviors but out-group members were not. This proposed normative belief about in-group and out-group members' behaviors is

called the “Group Heuristic”. Consequently, people will favor in-group members when given the opportunity to donate money between an in-group and an out-group member because of this Group Heuristic (Yamagishi, Jin, & Kiyonari, 1999).

Previous research has shown that in-group favoritism in the MGP disappears when statistically controlling for people’s expectations of in-group and out-group members’ to reciprocate monetary donations (reported in Yamagishi, Jin, & Kiyonari, 1999; study 5). Further evidence of people’s self-interest motivations in inter-group situations can be found in a study where researchers told participants that only in-group members or out-group members were allowed to allocate money to them (Rabbie et al., 1989). That is, the participants believed that their outcome was completely dependent on money allocations from all in-group members or all out-group members. When participants were given money to allocate to an in-group member and an out-group member, those whose outcome was completely dependent on out-group members allocated more money to out-group members than in-group members. Likewise, those whose outcome was completely dependent on in-group members allocated more money to in-group members compared to out-group members. The results suggest that a positive out-group bias can form when it better serves one’s self-interest as predicted by BGR.

BGR succeeds in predicting social video game players’ behaviors where SIT has failed (Greitemeyer & Cox, 2013; Greitemeyer, Traut-Mattausch, & Osswald, 2012; Velez et al., under review; Velez et al., 2012; Velez & Ewoldsen, 2013). Specifically, in comparison to SIT’s prediction of increased out-group discrimination between competitive partners, BGR predicts that competitive partners will simply refrain from behaving positively towards each other. This is because one does not need to behave

aggressively towards out-group members in order to maximize her/his return from inter-group interactions which BGR suggests is people's major motivation during inter-group situations. Therefore, people are primarily concerned with whether they should provide others with positive behaviors that may or may not yield a positive return and help maximize their outcome. This is congruent with previous research demonstrating that competitive game play does not influence players' subsequent aggressive behaviors (Velez et al., under review) but possibly leads competitive partners to be less pro-social (Velez et al., 2012).

SIT predicts that, regardless of violent video game exposure, cooperative partners should be more pro-social towards each other than neutral partners while BGR predicts that cooperative game play should counteract the negative effects of violent video games (i.e., increases in aggression and decreases in pro-socialness; Anderson et al., 2010) by increasing players' expectations for reciprocal positive behaviors. Previous research has corroborated BGR's prediction of increased expectations of reciprocal positive behaviors between cooperative game partners (Greitemeyer & Cox, 2013; Greitemeyer, Traut-Mattausch, & Osswald, 2012). Furthermore, it has been shown that cooperative game partners and neutral partners were similarly pro-social towards each other (Ewoldsen et al. 2012). This suggests that cooperative game play effectively counteracts the negative effects of violent video games as suggested by BGR but does not lead to in-group biases.

Social Video Game Play and BGR

Although previous research suggests that BGR is a suitable theoretical framework for predicting social video game players' behaviors there is still a need for a formal test

of the theory. This warrants a closer look at BGR and its predictions on how social video game play may lead players to become more or less pro-social.

As discussed above, BGR predicts that people's expectations for reciprocal positive behaviors determine their positive behaviors in inter-group interactions (Yamagishi et al., 1999). This leads to the current study's first hypothesis.

> H1: Participants who have higher expectations for reciprocal positive behaviors from their partners will behave more pro-socially than participants with lower expectations.

BGR proposes that these expectations for pro-social reciprocity are generalized to all in-group members such that all members of a group are expected to reciprocate positive behaviors from another in-group member even if there is no prior contact between them. Group members who have demonstrated their adherence to the group heuristic are more likely to receive positive behaviors from other in-group members because they demonstrated their willingness to reciprocate such behaviors (Yamagishi et al., 1999; Yamagishi & Kiyonari, 2000; Yamagishi, Mifune, Lie, & Pauling, 2008). In regards to cooperative video game play, there are many opportunities to give, receive, and reciprocate positive behaviors during game play. For example, research has identified several ways players can help each other during cooperative game play such as pointing out special items other players have missed or informing others of the correct buttons to push in order to accomplish a task (Velez & Ewoldsen, 2013). Therefore, players who demonstrate their willingness to behave pro-socially and reciprocate pro-social behaviors from an in-group member (i.e., a helpful partner) during game play are more likely to

subsequently receive positive behaviors. Furthermore, these positive behaviors should be mediated by higher expectations of helpful partners to reciprocate such behaviors compared to partners who are unhelpful or minimal in-group partners (i.e., partners who have no previous interactions). This leads to the current study's next set of hypotheses.

H2a: Participants with helpful partners during cooperative game play will behave more pro-socially towards that partner than participants with unhelpful game partners.

H2b: Participants with helpful partners during cooperative game play will expect more reciprocal pro-social behaviors from that partner and therefore behave more pro-socially towards that partner than participants with unhelpful game partners.

H3a: Participants with helpful partners during cooperative game play will behave more pro-socially towards that partner than participants with a minimal in-group partner.

H3b: Participants with helpful partners during cooperative game play will expect more reciprocal pro-social behaviors from that partner and therefore behave more pro-socially towards that partner than participants with a minimal in-group partner.

BGR also proposes that in-group members who do not adhere to the Group Heuristic (i.e., receives positive behaviors from in-group members but does not reciprocate) run the risk of being ousted from the group and no longer being eligible to receive positive behaviors from the group in the future (Yamagishi et al., 1999;

Yamagishi et al., 2008; Yamagishi & Kiyonari, 2000). If the Group Heuristic is activated during inter-group situations then in-group partners with no prior interactions (i.e., minimal in-group partners) should behave more positively towards each other than in-group partners who have violated the expectations of the Group Heuristic during video game play (i.e., unhelpful video game partners). Again, these pro-social behaviors should be mediated by higher expectations of minimal in-group partners to reciprocate positive behaviors than unhelpful partners. This leads to the current study's next set of hypotheses.

H4a: Participants with a minimal in-group partner will behave more pro-socially toward that partner than participants with an unhelpful partner during cooperative game play.

H4b: Participants with a minimal in-group partner will expect more reciprocal pro-social behaviors from that partner and therefore behave more pro-socially toward that partner than participants with an unhelpful partner during cooperative game play.

Simultaneous versus Sequential Prisoner's Dilemma Game

The Minimal Group Paradigm has demonstrated in-group favoritism by letting in-group and out-group partners simultaneously decide how much money to donate to each other (i.e., a simultaneous prisoner's dilemma game; Tajfel et al., 1971). In this scenario, participants decide how much money to donate to an in-group and out-group partner without knowing their partners' donation decisions beforehand. As discussed above,

Billig and Turner (1973) interpreted participants' tendency to donate more money to in-group members than out-group members as support for SIT. However, BGR predicts that in-group favoritism in the simultaneous prisoner's dilemma game is caused by people's expectations of in-group members to reciprocate higher donations compared to out-group members. According to BGR, if people expect out-group members to reciprocate positive behaviors then in-group favoritism and out-group discrimination will not occur. Previous research has corroborated this prediction by demonstrating that people will donate equal amounts to in-group and out-group members when their expectations of both groups to reciprocate positive behaviors are also equal. Specifically, Yamagishi and Kiyonari (2000) increased people's expectations of out-group members to reciprocate positive behaviors by changing the format of the simultaneous prisoner's dilemma game to a sequential game. In the sequential prisoner's dilemma game people are told they are going to donate money to their partner first and their partner will receive this donation before making a donation decision. In other words, people believe that their partner will know how much money was donated to them before their partner decides how much they want to donate in return. Research has shown that people believe their partner in the sequential prisoner's dilemma game will reciprocate a positive behavior (i.e., a high donation) regardless of group membership. This is because people believe they can induce their partner to behave positively by directly giving them a favor (i.e., a high donation) which effectively increases expectations of reciprocal behaviors from any group member (i.e., in-group or out-group; Hayashi, Ostrom, Walker, & Yamagishi, 1999; Watabe, Terai, Hayashi, & Yamagishi, 1996.). Indeed, in a replication of the original MGP experiments in which half the participants played a simultaneous prisoner's

dilemma game but the other half played a sequential prisoner's dilemma game, in-group favoritism appeared in the simultaneous game but not in the sequential game (Yamagishi and Kiyonari, 2000). This leads to the current study's fifth hypothesis.

> H5: Participants in minimal groups will donate significantly more money to an in-group member than to an out-group member in a simultaneous prisoner's dilemma game compared to a sequential prisoner's dilemma game.

The current study is interested in how social video game play might influence players' in-group favoritism and out-group discrimination in the simultaneous and sequential prisoner's dilemma games. The effect of cooperative video game play on players' pro-social behaviors and expectations of reciprocal pro-social behaviors has been shown to extend beyond video game partners. For example, cooperative video game players seem to expect non-video game partners to reciprocate pro-social behaviors, despite never interacting with them before, and consequently, behave pro-socially towards them (Greitemeyer & Cox, 2013; Greitemeyer et al., 2012). Research suggests that cooperating in a task can form normative beliefs about how others will behave in similar situations (Bettenhausen & Murnighan, 1991; Greitemeyer & Cox, 2013; Yamagishi et al., 1999; Yamagishi & Kiyonari, 2000; Yamagishi, Mifune, Lie, & Pauling, 2008). In terms of social video game play, cooperating with other players seems to set a precedent or norm for how others (i.e., video game partners and non-video game partners) may behave in future interactions leading to positive social interactions. Although previous research has examined how cooperating during a task can influence

behaviors towards partners and non-partners, no research to date has examined if norms formed by cooperation influence people's behaviors towards out-group members.

As discussed above, research on BGR has demonstrated that in-group favoritism and out-group discrimination will disappear if one has similar expectations of reciprocal pro-social behaviors from in-group *and* out-group members. Researchers have established that the sequential prisoner's dilemma game is one method of accomplishing this (Yamagishi and Kiyonari, 2000). However, it is possible that playing a video game with a helpful teammate may be another effective method of increasing players' pro-social reciprocity expectations of both in-group and out-group members. For example, it is possible that playing with a helpful teammate will lead players to expect all others, including opposing team members, to reciprocate pro-social behaviors and consequently lead players to behave pro-socially towards the opposing team. However, actually playing a video game against an opposing team may only strengthen expectations of out-group members to *not* reciprocate pro-social behaviors later on. In order to explore the possible relationship between pro-social reciprocity expectations formed by playing with a helpful teammate and players' behaviors towards opposing team members, the current study proposes the following two research questions about players with helpful teammates.

> RQ 1: Will participants with helpful partners favor in-group members over out-group members in the simultaneous prisoner's dilemma game compared to the sequential prisoner's dilemma game?

RQ 2: Will pro-social reciprocity expectations mediate players' donations to out-group members after playing a video game with a helpful teammate?

In the sequential game, players should have similarly high expectations of reciprocal behaviors from both in-group and out-group members regardless if their teammate was unhelpful during video game play. However, players who have unhelpful partners should not have high expectations of in-group members' reciprocal behaviors in the simultaneous prisoner's dilemma game because such partners have shown their unwillingness to cooperate. It is possible that having an unhelpful teammate will lead players to donate low amounts of money to out-group *and* in-group members such that in-group favoritism does not occur in the simultaneous prisoner's dilemma game compared to the sequential game. This leads to the third research question.

RQ3: Will participants with unhelpful partners donate significantly more money to in-group members than out-group members in the simultaneous compared to the sequential prisoner's dilemma game.

If the sequential prisoner's dilemma game can increase originally low expectations of out-group members' behaviors then the format of the sequential game should also increase expectations and, subsequent monetary donations, towards in-group members whom other people do not expect to behave pro-socially. For example, playing a video game with an unhelpful teammate should lead to lower expectations and subsequent lower pro-social behaviors. However, engaging in a sequential prisoner's dilemma game with an unhelpful video game teammate should increase expectations of

reciprocal pro-social behaviors regardless of previous interactions. This leads to the seventh hypothesis.

> H6a: Participants will donate significantly more to unhelpful partners in the sequential prisoner's dilemma game compared to the simultaneous game.
>
> H6b: Participants with an unhelpful teammate will expect more reciprocal pro-social behaviors from that partner in the sequential prisoner's dilemma game compared to the simultaneous game and therefore, will behave more pro-socially toward that partner in the sequential game.

Overall, the pattern of participants' donations to their teammates should differ when they engage in a simultaneous prisoner's dilemma game compared to a sequential game. As discussed above, participants' donations to teammates in the simultaneous prisoner's dilemma game should be determined by the teammates' behaviors during video game play. However, the format of the sequential prisoner's dilemma game should have a stronger impact on participants' donations than their teammates' previous video game behaviors by increasing pro-social reciprocity expectations (Yamagishi and Kiyonari, 2000). This leads to the eighth hypothesis.

> H7: There will be an interaction between the type of teammate participants play a video game with (i.e., helpful, minimal, or unhelpful) and the type of prisoner's dilemma game played subsequently (i.e., simultaneous or sequential).

Social Video Game Play and SIT

Although the reviewed literature does not support a SIT explanation of social video game play effects there is a need for research directly examining the basic theoretical processes proposed by SIT. For instance, the main assumption is that people's pro-social behaviors in inter-group contexts will be determined by their social identification with an in-group. SIT predicts the following hypothesis in contradiction to the first hypothesis discussed above.

> H8: Participants who have higher social identification with their in-group will behave more pro-socially than participants with lower social identification with their in-group.

Another main assumption of SIT is that successfully distinguishing an in-group as superior to a relevant out-group should enhance one's identification with the in-group (Hogg & Abrams, 1990). In social video game play, in which teams of players compete, there is a clear winning team and losing team(s). It is likely that members of a winning team view their team (i.e., in-group) as superior to a defeated opposing team (i.e., out-group) which should enhance the winning members' identification with their team identity. As discussed above, a major assumption of SIT is that in-group favoritism is a result of identifying with an in-group (Billig & Tajfel, 1973). Therefore, SIT predicts the following.

> H9: Participants on a winning video game team will identify with their team identity and therefore, behave more pro-socially towards an in-group member than an out-group member compared to participants who did not play a video game with their team.

Similar to the distinction between a personal identity and a social identity, SIT proposes that people can have a personal self-esteem and a social self-esteem which is associated with their membership in a group (Luhtanen & Crocker, 1992). The "self-esteem hypothesis" proposed by SIT suggests that successfully distinguishing an in-group as superior to a relevant out-group should also have a positive influence on one's social self-esteem. Specifically, after viewing an in-group as positively distinct from an out-group people should evaluate their membership to the in-group more positively (Rubin & Hewstone, 1998). Therefore, winning a team competition in social video game play should lead players of the winning team to have higher team self-esteem.

H10: Participants on a winning video game team will identify more with their team identity and therefore, have a higher team self-esteem compared to participants who did not play a video game with their team.

Chapter 2: Methods

Participants: There were 156 participants (*Female*: 22.6%) from the Communication and Psychology subject pools of a large mid-western university.

Design and Procedure: This study employed a 3 (*Teammate: Helpful vs. Minimal vs. Unhelpful*) x 2 (*Prisoner's Dilemma Game: Simultaneous vs. Sequential*) x 2 (*Donation Recipient: In-group and Out-group*) mixed experimental design. Participants entered the lab in groups of two accompanied by two male confederates and were placed in individual cubicles where they completed a consent form and an online pre-test questionnaire measuring their video game habits, trait aggression, greed avoidance and pro-social tendencies. Participants were told each participant would be assigned to either "Team 1" or "Team A" team such that each team has two players. However, all participants were assigned to "Team 1" when it came time to play the video game. Participants then played a basketball video game (i.e., NBA Street Homecourt) for 15 minutes. Each participant's team consisted of one teammate who was a confederate and one computer-controlled character. Participants ostensibly played against an opposing team consisting of the two other participants and one computer-controlled character. However, the opposing team was actually controlled by the computer. Participants were also told that the team with the highest number of points compared to all the teams who participated in the study would win an iPad Mini.

Participants were assigned to play with a confederate played in the same cubicle with the participant and who was either helpful or unhelpful during game play. In both conditions the confederate stated that he "use to play this game a lot" at the very beginning of the game. In the helpful partner condition the confederate then stated "Let's use some teamwork". At 5 minutes into the game the helpful confederate suggested doing a cooperative trick move in the game by saying "You want to try an alley-oop? I will pass it up to you". After the participant performed the cooperative trick move or attempted to perform the move the confederate then asked "Do you want me to pass the ball more?" At 10 minutes into the game the helpful confederate suggested doing another cooperative trick move by saying "Do you want to do the move where you jump of my back to slam dunk?" (see Stimulus section for more information about cooperative trick moves). After the participant performed the cooperative trick move or attempted to perform the trick move the confederate then stated "Do you want me to set more screens for you?" The helpful confederate was also instructed to pass the ball as much as possible to the participant throughout the game. In the non-helpful partner condition the confederate, after stating that he use to play this video game a lot, stated "Looks like we are on the same team". At 5 minutes into the game the unhelpful confederate stated "I think we are playing for 15 minutes. If so then we have 10 minutes left to play". At 10 minutes into the game the unhelpful confederate stated "I think we have about 5 minutes left to play". The unhelpful confederate was also instructed to not pass the ball to the participant. Confederates in the helpful and unhelpful teammate conditions completed ratings of participants' behaviors during video game play after the video game had concluded. After being assigned to a team, participants in the control condition were told the video game

console was not working properly and therefore, they could not play the video game until near the end of the study. Participants in the control conditions played the video game only after completing all measures and tasks in the study.

After playing the video game, participants were told they would engage in money transactions using dimes with their teammate and one opposing team member. Participants were informed the dimes they donated to the other transaction participant would double in value but any dimes they did not donate would not double. Likewise, participants were told the dimes donated to them by the other transaction participant would double in value. Participants were informed that any money they earned would be transferred over to dollar bills and they could keep the money at the end of the study. All participants then played a simultaneous or sequential prisoner's dilemma game (PDG) with an in-group member (i.e., teammate) and an out-group member (i.e., an opposing team member). The order in which participants transacted with in-group and out-group members was counter-balanced. Participants were given a manila envelope (see appendix B) containing the materials for the first PDG and were told to follow the instructions given inside. Each manila envelope contained an instruction page, a measure of expectations of reciprocal pro-social behaviors, and a donation decision sheet page. The instructions page was the first page in each manila envelope and contained instructions for the simultaneous/sequential PDG and identified whether the other transaction participant was an in-group or out-group member. Participants were told that an opposing team member was randomly chosen for the game when engaging in the money transaction game with an out-group member.[1] Participants were instructed on the instructions page to complete the measure of expectations of reciprocal pro-social

behaviors before completing the donation decision sheet. The materials in the manila envelope were stapled in the order indicated on the instructions page as well.

In the simultaneous PD game participants were informed by the experimenter and on the instructions page that the other transaction participant was making the same decision to donate money at the same time as the participant. In the sequential PD game the experimenter and the instruction page informed participants that the other transaction participant was waiting to receive their dimes from the participant before making their donation decision (See Appendix B for prisoner's dilemma game materials). Participants were instructed to put all the materials back into the manila envelope after completing the donation decision sheet and to notify the experimenter when they were done. The experimenter then collected the manila envelope and provided another manila envelope to the participant which contained the materials for the PDG with a member on the opposite team of the first PDG transaction participant. The order in which participants engage in the PD game with an in-group and out-group member was counterbalanced such that some participants engaged in the PDG with their teammate first while other participants engaged in the PDG with an opposing team member first. Participants completed online measures of social identification, aggressive affect, enjoyment of the video game, perceptions of their team mate and opposing team members, aggressive cognitions and collective self-esteem either before or after engaging in the PD games (i.e., counterbalanced). Last, participants rated the video game, the characters they played with, and provided demographic information.

Stimulus Materials

The game used in this study has been rated by the ESRB (Entertainment Software Ratings Board) as "E" for "Everyone" due to the lack of violent content and is suggested for players of all ages. NBA Street Homecourt is a basketball video game in which players control realistically-rendered human characters while playing a game of basketball. The setting of the game was placed on an open-air basketball court next to a beach (Venice Beach). The players used for the participants' team and their opposing team consisted of three basketball players from the Charlotte Bobcats in 2007. However, all the characters on the participants' team and the opposing team did not have shirts on and did not have any apparel indicating their membership to the Bobcats. NBA Street Homecourt features street style basketball in which players can perform trick moves including passing the ball by kicking it and performing high flying dunks. Players can perform two trick moves that require the cooperation of another player. The first is an alley-oop in which one player passes the ball to another player who is mid-air for a dunk. The other cooperative trick move is when one player jumps off the back of another player to perform a dunk. These two cooperative trick moves were utilized by the confederates assigned to be helpful during the video game. The computer controlled characters on the opposing team were on the medium difficulty setting in an effort to reduce participant's frustration levels during the game. The confederate also ensured the participant's team always won the game to ensure each participant has a similar experience.

Measures (see Appendix A)

Reciprocal Expectations: One item will be used to assess participants' expectations of pro-social behaviors from their prisoner's dilemma game partners (i.e.,

"Out of the 11 dimes possible to donate, how many dimes do you think your teammate/opposing team member will choose to donate to you?"; Response options range from 0 - 11; Greitemeyer et al., 2012; Greitemeyer & Cox, 2013; Rothmund, Gollwitzer, & Klimmt, 2011; Yamagishi & Kiyonair, 2000).

Social Identification: The 9 item[2] Group Identification Scale was adapted for the current study. The scale originally was meant to measure people's identification to groups they have belonged to for an extended period of time ("l am a person who sees myself as belonging to the _____ group"; 1 = Never, 5 = Very Often). However, in the current study, participants' membership to their team is new and therefore, the scale was adapted to reflect the short amount of time participants have belonged to their team ("I see myself as belonging to my team"; 1=strongly disagree, 5=strongly agree).This scale has been shown to be a valid and reliable measure of how much people categorize and identify themselves as a member of certain groups (alpha = .77; Brown, Condor, Mathews, Wade, & Williams, 1986).

Team Self-Esteem: The Collective Self-Esteem Scale (Alpha = .89) measures five aspects of people's self-esteem as it relates to their membership in a group with 16 items: "I am a worthy member of the my team", "In general, I'm glad to be a member of the my team", "Most people would consider my team, on the average, to be more ineffective than other teams", and "In general, belonging to my team is an important part of my self-image". Response options ranged from strongly disagree (1) to strongly agree (7) (Luhtanen & Crocker, 1992).

Control variables (see below for details of measures). The seven control variables were trait aggression (Buss-Perry aggression questionnaire), pro-social

tendencies (The Prosocial Tendencies Measure), greed avoidance (Lee & Ashton, 2004), perceived video game expertise ("Rate your overall ability level at playing video games"; 1 = Rookie, 7 = Expert), perceptions of teammate and opposing team members, and liking of teammate and opposing team members.

Trait Aggression: The short version of the Buss-Perry aggression questionnaire (Bryant & Smith, 2001) includes 12 items that measure four areas of trait aggression: physical aggression (e.g., "Given enough provocation, I may hit another person."), verbal aggression (e.g., "I can't help getting into arguments when people disagree with me."), anger (e.g., "Sometimes I fly off the handle for no good reason."), and hostility (e.g., "At times I feel I have gotten a raw deal out of life."). All 12 items were on a 7-point scale (1 = "extremely uncharacteristic of me," 7 = "extremely characteristic of me"). These 12 items will be averaged into a single scale (Alpha = .85; Bryant & Smith, 2001).

Pro-social Tendencies*:* The Prosocial Tendencies Measure (PTM; Carlo, Hausmann, Christiansen, & Randall, 2003) measures six types of pro-social behaviors with 23 items including altruistic (i.e., I think that one of the best things about helping others is that it makes me look good; reverse coded), emotional (i.e., I tend to help others particularly when they are emotionally distressed), compliant (i.e., I never hesitate to help others when they ask for it), dire (i.e., It is easy for me to help others when they are in a dire situation), anonymous (i.e., Most of the time, I help others when they do not know who helped them), and public (i.e., When other people are around, it is easier for me to help needy others). The 23 items were averaged to create a measure of participants pro-social tendencies (Alpha = .82).

Greed Avoidance: The Greed Avoidance scale includes 10 item that measure how much people are interested and motivated by money, wealth, and social status (i.e., I am mainly interested in money; alpha = .80; Lee & Ashton, 2004).

Perceptions of Teammate and Opposing Team Members*:* Participants completed a set of 11 bipolar items for their team mate and the same set again to represent their general perceptions of the opposing team (Teammate Alpha = .90; Opposing Team Alpha = .81). There were 3 competence based ratings that previous research has used in competition settings (competent, intelligent, and motivated) along with 3 other dimensions (honest, critical, and rational; Ellemers, Kortekaas, & Ouwerkerk, 1999). Participants' perceptions of their teammate's and opposing team's video game skills was measured as a bipolar item to ensure participants' pro-social behaviors are not influenced by frustration. Two additional bipolar items were included (e.g., "Niceness-Meanness" and "Talkative-Not Talkative) because the current study's aim is to manipulate participants' pro-social behaviors through expectations for reciprocal pro-social behaviors and not dislike for one's partner. Although, liking/disliking a partner and one's expectation that a partner will reciprocate pro-social behaviors are most likely related, the current study wants to avoid confounding these two possible explanations of players' pro-social behaviors. Finally, participants rated their teammate and the opposing team on bi-polar items measuring cooperativeness and selfishness.

Teammate and Opposing Team Liking: Participants' liking of their teammate and the opposing team were assessed using 5 items ("How much would you like to see your teammate again?" 1=very much; 5=not very much; Teammate Alpha = .85; Opposing Team Alpha = .79; Anderson & Morrow, 1995).

Chapter 3: Results

Manipulation Check: Participants answered six items on a 7-point scale ranging from strongly agree/disagree regarding their teammates helpful behaviors during the game (i.e., My teammate was very helpful during the video game"; see Appendix A). An independent samples T test analysis indicates that participants rated confederates in the helpful teammate condition (M = 4.30, SD = .49) significantly more helpful than confederates in the unhelpful teammate condition (M = 3.63, SD = .66), $t(102) = 5.88$, $p < .001$, $d = 1.15$. Additionally, a one sample T test analysis indicated that participants rated their helpful teammates substantially higher than the mid-point of the scale emphasizing the effectiveness of the current study's manipulation, $t(51) = 63.76$, $p < .001$, $d = 17.86$.

Confederate Ratings of Participants: In order to ensure participants did not differ between conditions in regards to how they interacted with confederates and how they played the video game, confederates rated participants on a series of bi-polar items after playing the video game (see Appendix A). An independent T test analysis indicates that confederates' ratings of participants did not differ between the helpful (M = 4.64, SD = 1.15) and unhelpful (M = 4.38, SD = 1.46) teammate conditions, $t(102) = 1.03$, $p > .05$, $d = .20$ (see Appendix B).

Social Video Game Play and BGR: The first hypothesis predicted that participants' pro-social reciprocity expectations will predict their donations to teammates

and opposing team members. Hierarchal linear regression analyses were used to test the first hypothesis. The eight control variables (i.e., expertise, trait aggression, avoidance of greed, pro-social tendencies, teammate liking and ratings, and opposing team liking and ratings) were regressed on the participants' average donation (i.e., the mean of participants' donations to in-group and out-group members). Only participants' trait aggression ($\beta = -.30$; $t = -3.68$, $p < .001$) significantly predicted their donations, $R^2 = .16$, $F(8, 154) = 3.59$, $p < .01$. Next, the eight control variables along with participants' averaged expectations of other's donations were regressed on their average donation to determine if participants' expectations significantly predicted their donations beyond the eight control variables. Participants' average expectations ($\beta = .56$; $t = 8.04$, $p < .001$) significantly predicted their donations beyond the control variables which supports the first hypothesis, $R^2 = .40$, $\Delta R^2 = .28$, $F(9, 156) = 12.35$, $p < .001$ (see Table 1). Only participants' trait aggression was used as a covariate in the subsequent analyses in this section because it was the only significant covariate to predict their averaged donations to teammates and opposing team members.

Hypothesis 2a, 3a, and 4a dealt with the differences between participants' donations to helpful, unhelpful, and minimal teammates in the simultaneous prisoner's dilemma game. Dummy variables representing the difference between participants' donations in the helpful versus unhelpful teammate conditions (i.e., hypothesis 2a), the helpful versus minimal teammate conditions (i.e., hypothesis 3a), and the minimal versus unhelpful teammate condition (i.e., 3a) were created and entered into separate ANCOVAs while controlling for participants' trait aggression and the other relevant dummy variables. The analyses support hypothesis 2a by demonstrating that players with

helpful teammates (M = 9.39, SD = 1.88) donated significantly more to their teammate than players with unhelpful teammates (M = 8.13, SD = 2.88), $F(1, 156) = 7.00$, $p < .05$, $\eta_p^2 = .05$. Players with helpful teammates did not donate significantly more to players with minimal in-group teammates (M = 8.88, SD = 2.73), $F(1, 156) = 2.05$, $p > .05$, $\eta_p^2 = .01$. Likewise, players with minimal in-group teammates did not donate significantly more than players with unhelpful teammates, $F(1, 156) = 1.55$, $p > .05$, $\eta_p^2 = .01$. Therefore, hypotheses 3a and 4a were not supported (see Figure 2).

Hypothesis 2b, 3b, and 4b predicted that pro-social reciprocity expectations will mediate the differences between donations to helpful compared to unhelpful teammates (i.e., hypothesis 2b), helpful compared to minimal teammates (i.e., 3b), and minimal compared to unhelpful teammates in the simultaneous prisoner's dilemma game. These hypotheses were tested using the statistical macro PROCESS in SPSS. The first mediation analysis supported hypothesis 2b. Specifically, players' with helpful teammates expected their teammates to reciprocate pro-social behaviors and therefore, donated more money than participants with unhelpful teammates, β = .89, LLCI = .30 and ULCI = 1.71 (LLCI = Lower Level Confidence Interval; ULCI = Upper Level Confidence Interval).[3] However, players' expectations for reciprocal pro-social behaviors did not significantly mediate the differences between players with helpful teammates and those with minimal in-group teammates, β = .47, LLCI = -.15 and ULCI = 1.19. Players' expectations also did not mediate the difference between players with minimal in-group teammates and players with unhelpful teammates (β = .42, LLCI = -.133 and ULCI = 1.10) and therefore, hypotheses 3b and 4b were not supported (see Figure 1).

The fifth hypothesis along with the three research questions in the current study focused on the difference between participants' donations to in-group and out-group members in the simultaneous and sequential prisoner's dilemma game depending on the type of their teammate (i.e., helpful, unhelpful, or minimal teammate). According to BGR, the sequential prisoner's dilemma game should increase pro-social reciprocity expectations of others and lead to higher donations compared to the simultaneous prisoner's dilemma game. Three separate interactions were tested for hypothesis 5 and the first and third research questions. Dummy variables comparing participants' donations in the simultaneous and sequential prisoner's dilemma games were created for participants with helpful, minimal in-group, and unhelpful partners. Each dummy variable was entered into a repeated measure analysis to examine participants' donations to teammates and opposing team members while controlling for players' trait aggression and the other relevant dummy variables.

The fifth hypothesis predicted that participants should donate more to minimal teammates than minimal opposing team members in the simultaneous prisoner's dilemma game but not in the sequential prisoner's dilemma game. The results support the fifth hypothesis. A significant interaction indicated that participants with minimal teammates donated significantly more to their teammates (M = 8.88, SD = 2.73) than opposing team members (M = 6.36, SD = 3.94) in the simultaneous prisoner's dilemma game compared to the sequential prisoner's dilemma game (teammates: M = 9.51, SD = 2.93; opposing team members: M = 8.80, SD = 3.22), $F(1, 149) = 7.20$, $p < .01$, $\eta_p^2 = .05$ (see Figure 4).

The first research question asked whether playing with a helpful teammate would reduce in-group favoritism in the simultaneous prisoner's dilemma game compared to the

sequential game by increasing participants' donations to teammates *and* opposing team members. The interaction between player's donations to teammates and opposing team members in the simultaneous and sequential prisoner's dilemma games after playing with a helpful teammate was tested to answer the first research question. The results demonstrate that participants with helpful partners did not significantly donate more to their teammates (M = 9.74, SD = 1.88) than opposing team members (M = 8.25, SD = 3.17) in the simultaneous prisoner's dilemma game compared to the sequential prisoner's dilemma game (teammates: M = 9.58, SD = 2.16; opposing team members: M = 8.69, SD = 2.87), $F(1, 149) = .77$, $p > .05$, $\eta_p^2 = .005$ (see Figure 5). The analysis indicates that playing with a helpful teammate decreases in-group favoritism in the simultaneous prisoner's dilemma game.

The second research question was proposed to determine if participants' donations to opposing team members might be influenced by high pro-social reciprocity expectations formed by playing a video game with a helpful teammate. The SPSS macro PROCESS was used to conduct mediation analyses to answer the second research question. Utilizing dummy variables, players' donations to opposing team members after playing with a helpful teammates were compared to players with minimal or unhelpful teammates. The results suggest the difference between donations to opposing team members from players with helpful and minimal teammates were not mediated by their pro-social reciprocity expectations, (β = .50, LLCI = -.40 and ULCI = 1.53). Moreover, the difference between donations to opposing team members from players with helpful and unhelpful teammates were not mediated by their pro-social reciprocity expectations, (β = .07, LLCI = -.89 and ULCI = .99).

The third research question asked whether playing with an unhelpful teammate will discourage participants from donating more to teammates than to opposing team members in the simultaneous prisoner's dilemma game compared to the sequential game. The interaction between player's donations to teammates and opposing team members in the simultaneous and sequential prisoner's dilemma games after playing with an unhelpful teammate was tested for the third research question. Participants with unhelpful partners did not donate significantly more to their teammates (M = 8.13, SD = 2.88) than opposing team members (M = 6.67, SD = 3.65) in the simultaneous prisoner's dilemma game compared to the sequential prisoner's dilemma game (teammates: M = 10.28, SD = 1.79; opposing team members: M = 8.47, SD = 3.06), $F(1, 149) = .27$, $p > .05$, $\eta_p^2 = .002$ (see Figure 6). The analysis for the third research question suggests players do not favor unhelpful teammates over opposing team members in the simultaneous prisoner's dilemma game compared to the sequential game.

Hypothesis 6a predicted that participants with unhelpful teammates will donate more to their teammate in the sequential prisoner's dilemma game compared to the simultaneous prisoner's dilemma game. This hypothesis was tested by creating a dummy variable that compared players' donations towards unhelpful teammates in the simultaneous and sequential prisoner's dilemma game and entering it into an ANCOVA while controlling for players' trait aggression and the other relevant dummy variables. The analyses supported hypothesis 6a by demonstrating that players with unhelpful teammates donated significantly more to teammates in the sequential (M = 10.28, SD = 1.79) compared to the simultaneous prisoner's dilemma game (M = 8.13, SD = 2.88), $F(1, 156) = 11.19$, $p = .001$, $\eta_p^2 = .07$. Hypothesis 6b predicted that the sequential

prisoner's dilemma game will increase players' donations to unhelpful teammates compared to donations in the simultaneous prisoner's dilemma game by increasing players' pro-social reciprocity expectations. The macro PROCESS in SPSS was used to test hypothesis 6b. A dummy variable comparing donations by players with unhelpful teammates in the simultaneous and sequential prisoner's dilemma game was created and entered as the independent variable while controlling for players' trait aggression and the other relevant dummy variables. The mediation analysis supports hypothesis 6b by demonstrating the difference in players' donations to unhelpful teammates in the simultaneous and sequential prisoner's dilemma game was significantly mediated by expectations of reciprocal pro-social behaviors, $\beta = .89$, LLCI = .18 and ULCI = 1.66 (see Figure 7).

The seventh hypothesis predicted that the pattern of participants' donations to helpful, minimal, and unhelpful teammates in the simultaneous prisoner's dilemma game will be different than the pattern of participants' donations to teammates in the sequential prisoner's dilemma game. An ANCOVA examining participants' donations to teammates was conducted to test the seventh hypothesis. The type of teammate participants' played with and the type of prisoner's dilemma game participants engaged in were entered as fixed factors while controlling for participants' trait aggression. The interaction predicted by the seventh hypothesis was supported, $F(2, 149) = 3.32$, $p < .05$, $\eta_p^2 = .04$ (see Figure 2). This suggests that participants' donations in the simultaneous prisoner's dilemma game were subject to their teammates' behaviors in the video game whereas donations in the sequential prisoner's dilemma game were influenced by the format of the prisoner's dilemma game.

Social Video Game Play and SIT:

The eighth, ninth, and tenth hypotheses pertain to predictions proposed by SIT. The eighth hypothesis predicted that participants' identification with their teams will predict their donations to in-group and out-group members. The eighth hypotheses was tested using hierarchal linear regression analyses in order to determine if social identification can predict participants' donations beyond the proposed covariates. The eight covariates were regressed on players' average donations. As with the analyses for the first hypothesis, players' trait aggression ($\beta = -.30$; $t = -3.68$, $p < .001$) was the only significant covariate and therefore, was included as a covariate for the remaining analyses pertaining to participants' donations, $R^2 = .16$, $F(8, 154) = 3.59$, $p < .01$. The eight covariates were regressed on players' donations along with how much players reported socially identifying with their team. Players' social identification ($\beta = .07$; $t = .78$, $p > .05$) did not significantly predict their donations, $R^2 = .10$, $\Delta R^2 = .003$, $F(9, 154) = 3.25$, $p < .01$. Therefore, the ninth hypothesis was not supported (see Table 2).

The ninth hypothesis predicted that participants will identify more strongly to a winning team compared to a team that did not play a video game (i.e., a minimal team) and therefore, donate more money to in-group members over out-group members. SIT predicts that regardless of the type of prisoner's dilemma game (i.e., simultaneous or sequential prisoner's dilemma game) players should donate more to in-group members than out-group members. Therefore, the dependent variable for the analysis testing the ninth hypothesis should encompass players' donations in both types of prisoner's dilemma games. However, because prior analyses in the current study have already established that in-group favoritism does not occur in the sequential prisoner's dilemma

game, the analysis for the ninth hypothesis will only examine donations in the simultaneous prisoner's dilemma game. This is in an effort to detect SIT processes if they are present. The ninth hypothesis was tested using the macro PROCESS in SPSS. A dummy variable compared players with helpful and unhelpful teammates against players with minimal in-group teammates was created and entered as the independent variables in a mediation analysis. Players' social identification with their team was entered as the mediator and the difference between players' donations to in-group and out-group members in the simultaneous prisoner's dilemma game was entered as the dependent variable. The results did not support the ninth hypothesis that social identification was a mediator, $\beta = .05$, LLCI = -.04 and ULCI = .21.

The tenth hypothesis predicted that participants will identify more strongly to a winning team compared to a minimal team and therefore, have a higher team self-esteem. The tenth hypothesis was also tested using the macro PROCESS. A dummy variable compared players with helpful and unhelpful teammates against players with minimal in-group teammates was created and entered as the independent variables in a mediation analysis. Players' social identification with their team was entered as the mediator and their team self-esteem was entered as the dependent variables. The results did not support the tenth hypothesis that players' social identification was a mediator, $\beta = .04$, LLCI = -.03 and ULCI = .12.

Chapter 4: Discussion

Previous research examining the effects of video games has mainly focused on the ways video game content may negatively influence players' subsequent perceptions and reactions to others (Anderson et al., 2010). Researchers suggest video games can have deleterious effects on players because they engage in virtual interactions with video game characters that are aggressive and anti-social. Theories have been proposed and tested demonstrating that such virtual interactions can have profound effects on players' subsequent behaviors in the real world. For example, the General Aggression Model (Bushman & Anderson, 2002) and the General Learning Model (Buckley & Anderson, 2006) have been used to account for violent video game players' increased likelihood to behave aggressively and less pro-socially towards others. These theories suggests that the violent and anti-social behaviors players engage in with virtual characters teach and encode players with learned behaviors that are likely to propagate to real world social interactions (Buckley & Anderson, 2006; Bushman & Anderson, 2002; Carnagey & Anderson, 2005).

The extant research has relied heavily on the preconception of video games as a solitary hobby. Consequently, the majority of previous research has examined the effects of a single player interacting with video game content without any extraneous influence from others (Anderson et al., 2010). This, however, does not reflect how the majority of people experience contemporary video games (ESA, 2013). A growing number of studies

have begun to emphasize the social contexts in which video games are being played (Cole & Griffiths, 2007; Lim & Lee, 2009; Peña & Hancock, 2006; Yee, 2006).

The previous theories used in violent video game research are well suited to understanding how engaging in violent and anti-social behaviors with virtual characters while playing alone can have implications for later real social interactions (Buckley & Anderson, 2006; Bushman & Anderson, 2002; Carnagey & Anderson, 2005). However, when playing a video game simultaneously with other players, each behavior enacted within the video game has implications for the ongoing relationships with these teammates and opposing team members. The shifting of players' focus to real social interactions while playing violent video games seems to drastically change the relationship between violent video game content and players' subsequent behaviors. For example, researchers have found that playing a violent video game cooperatively with others can reduce players' aggressive feeling (Eastin, 2007), cognitions (Schmierbach, 2010; Velez et al., 2012), and behaviors (Velez et al., under review) while increasing pro-social behaviors (Ewoldsen, et al., 2012; Greitemeyer & Cox, 2013; Greitemeyer et al., 2012; Velez et al., 2012) and empathy (Greitemeyer, 2013) compared to playing such video games alone. It seems cooperating and helping other players has a positive influence on players' subsequent social interactions despite engaging in aggressive behaviors during game play and being exposed to violent content within the games.

There is little research examining why cooperating with other players in violent contexts can still lead to pro-social and positive outcomes. Researchers must take advantage of theories capable of explaining how social interactions can influence subsequent behaviors in order to begin understanding why social video game play has

such substantial effects on players' pro-social and aggressive behaviors. The current study examines the applicability of two competing theories of social behavior (i.e., Social Identity Theory and Bounded Generalized Reciprocity) in the context of social video game play. Social Identity Theory (Billig & Tajfel, 1973) proposes the effects of social video game play are caused by players attempting to promote their team identity over opposing teams. Specifically, SIT predicts that players form in-groups with teammates and will behave in ways during and after video game play that ensure their in-group or team is superior to out-groups. According to SIT, players will try to accomplish this by behaving more pro-socially and less aggressively towards teammates over anyone else. On the other hand, the theory of Bounded Generalized Reciprocity (Yamagishi, Jin, & Kiyonari, 1999) proposes that social video game play influences players' behaviors during and after video game play by affecting their expectations of others to reciprocate pro-social behaviors. BGR predicts that reciprocating pro-social behaviors with other players during video game play leads them to form normative beliefs about how others (i.e., video game partners and non-video game partners) will behave in similar future situations. Although previous research supports a BGR explanation of social video game play effects over a SIT explanation (Greitemeyer & Cox, 2013; Greitemeyer, Traut-Mattausch, & Osswald, 2012; Velez et al., under review; Velez et al., 2012; Velez & Ewoldsen, 2013), the current study provides the first formal test of these theories in a video game context.

Social Identity Theory Versus Bounded Generalized Reciprocity

The results support the predictions of the theory of Bounded Generalized Reciprocity. As predicted by BGR (Hypothesis 1), players' average donations to

teammates and opposing team members were reliably predicted by their expectations of pro-social behaviors from others. Expectations of pro-social reciprocity also led players' with helpful teammates to donate more money to their teammate in the simultaneous prisoner's dilemma game than players with unhelpful teammates (Hypotheses 2a and 2b). Additionally, the sequential prisoner's dilemma game increased players' expectations of unhelpful teammates to reciprocate pro-social behaviors which led players to donate more to unhelpful teammates in the sequential versus the simultaneous prisoner's dilemma game (Hypotheses 6a and 6b). The results also support BGR's prediction that participants' donations in the simultaneous prisoner's dilemma game were influenced by the expectations formed with teammates during video game play whereas donations in the sequential prisoner's dilemma game were influenced by expectations formed by the format of the sequential game (Hypotheses 7).

The current study did not support SIT predictions that social video game play leads players to behave in ways that promote their teammates (i.e., in-group) over opposing team members (i.e., out-group). Participants' identification with their team did not predict their donations to teammates and opposing team members (Hypothesis 8). Additionally, playing on a winning team did not lead players' to favor teammates over opposing team members in their donations due to increases in social identification (Hypothesis 9). Belonging to a winning team also did not increase players' team self-esteem by increasing their social identification (Hypothesis 10).[4]

The results clearly indicate that players' pro-social reciprocity expectations played a pivotal role in their behaviors after video game play as predicted by BGR while players' identification with their teams did not influence players' subsequent behaviors.

This provides evidence for BGR's main tenet that people's behaviors in inter-group situations are determined by their expectations of others' behaviors and not by their social identities (Yamagishi, Jin, & Kiyonari, 1999). Indeed, the current study replicated previous research (Yamagishi and Kiyonari, 2000) supporting BGR over SIT by demonstrating that in-group favoritism that occurs in the simultaneous prisoner's dilemma game disappears in the sequential game (Hypothesis 5). If in-group favoritism is caused by social identification then participants should still favor their in-group over the out-group in the sequential prisoner's dilemma game. However, the current results corroborate previous research that suggests participants have similar expectations of in-group and out-group members in the sequential prisoner's dilemma game which eliminates in-group favoritism according to BGR predictions (Hayashi, Ostrom, Walker, & Yamagishi, 1999; Watabe, Terai, Hayashi, & Yamagishi, 1996; Yamagishi and Kiyonari, 2000). Overall, the current study emphasizes the utility of BGR in predicting social video game players' subsequent pro-social behaviors while, simultaneously, providing evidence that SIT is not an appropriate theory for examining social video game effects.

The current study examined the effects of social video game play for players who were physically present with each other. Although many people play video games with other players in the same room, many video games allow players to play with others from around the world online. Proponents of Social Identity Theory have applied the theory to online social interactions in the Social Identity Model of Deindividuation (SIDE; Reicher, Spears, & Postmes, 1995). Researchers suggest the anonymity of online social interactions deindividuates people which leads them to rely on social identities and

processes to guide their behaviors towards others. It is possible social video game play occurring online may be more subject to Social Identity Theory processes than playing with others in person. However, previous research suggests that BGR provides a better explanation of social video game players' behaviors in person *and* online. Indeed, the previous research discussed above as supporting BGR predictions were conducted in online contexts (Ewoldsen et al., 2012; Velez et al., 2012; Velez et al., under review). Players in these studies were only able to communicate during video game play through headsets (Velez et al., 2012) or not at all (Ewoldsen et al., 2012; Velez et al., under review) and were not able to see their video game partners. This suggests BGR provides a robust theoretical framework for social video game play effects when played online or in person with others.

Social Video Game Play and In-Group Favoritism

The current study corroborates previous research suggesting that cooperative video game play has beneficial effects on in-group favoritism and out-group discrimination (Velez et al., 2012). Previous research has demonstrated that players' behaviors during social video game play have a substantial influence on their later behaviors despite violent content and any possible in-group biases. Specifically, cooperative game play increases pro-social behaviors between video game partners even when partners are from rival universities (i.e., out-group members; Velez et al., 2012). The current study expands on this research by demonstrating that playing a video game with a helpful teammate can increase players' pro-social behaviors towards in-group *and* out-group members in the simultaneous prisoner's dilemma game (Research Question 1). Indeed, post-hoc analyses demonstrate that players with helpful teammates donated more

money to opposing team members compared to players with unhelpful and minimal teammates.[5]

Research on BGR suggests that engaging with helpful partners during a task can form norms of pro-social behaviors that are applicable to future interactions with others (Bettenhausen & Murnighan, 1991; Greitemeyer & Cox, 2013; Yamagishi et al., 1999; Yamagishi & Kiyonari, 2000; Yamagishi, Mifune, Lie, & Pauling, 2008). Although previous research suggests that cooperative game play can form pro-social norms that apply to future interactions with strangers (Greitemeyer & Cox, 2013; Greitemeyer et al., 2012; Velez et al., under review), it is unknown whether these norms are applicable to out-group members. It is possible the norm of pro-social reciprocity formed by playing with a helpful teammate is strong enough to overcome players' distrust of out-group members. However, in the current study, players spent 15 minutes competing against out-group members which may have only further solidified their expectations of out-group members to not reciprocate pro-social behaviors. The results suggest that players' donations to the opposing team after playing with a helpful teammate were not mediated by pro-social reciprocity expectations (Research Question 2). It seems that players are still motivated to donate money to out-group members after playing with a helpful teammate although they do not expect opposing team members to reciprocate pro-social behaviors.

This emphasizes the complexity of social video game play and the myriad of benefits and possible mechanisms behind such benefits. Thus far, BGR has aptly explained players' behaviors but players' donations to out-group members after playing with a helpful teammate suggest another mechanism is also influencing players –

specifically towards out-group members. The results suggest that players are behaving pro-socially towards out-group members without any expectation of anything in return. This resembles altruism in which people's pro-social behaviors are not predicated on favors or rewards in return (Batson, 1991, 1998). Perhaps the helpfulness of teammates inspired players to behave pro-socially towards out-group members even though the out-group members may not reciprocate. Future research should examine whether helpful teammates can promote others to behave altruistically. Indeed, it is possible that players who have helpful teammates donate more to opposing team members because they assume or expect their teammate to be very pro-social towards opposing team members as well.

The current study also suggests that playing with an unhelpful partner can influence players' in-group favoritism. Players with an unhelpful partner were not motivated to donate more money to their teammate compared to the opposing team in the simultaneous prisoner's dilemma game compared to the sequential game (Research Question 3). However, while players with a helpful teammate gave higher donations to both in-group and out-group members in the simultaneous prisoner's dilemma game, players with an unhelpful teammate donated much smaller amounts of money to both in-group and out-group members. This suggests that, regardless of being on the same team, unhelpful behaviors during social video game play leads players to have similar expectations of pro-social reciprocity from their teammate and opposing team members. This, again, highlights how powerful the behaviors of others can be when playing video games with others.

Limitations and Future Directions

A limitation of the current study is the lack of a true manipulation of reciprocal behaviors between participants and confederates in the video game. In other words, confederates' behaviors during video game play implied their willingness or unwillingness to reciprocate pro-social behaviors but we were unable to experimentally manipulate whether participants attempted to help confederates and the subsequent reciprocation or non-reciprocation by confederates. Although it is likely that participants attempted to help confederates during video game play given the type of video game used (i.e., a team sport video game) and confederates in the helpful and unhelpful conditions subsequently reciprocated or not, we could not exert experimental control over participants' behaviors. We believed instructing participants to behave pro-socially towards confederates would violate the generalizability of the current findings.

It is possible that participants with a helpful teammate did not donate more to teammates compared to players with a minimal teammate in the simultaneous prisoner's dilemma game (Hypothesis 3a and 3b) because both types of teammates instill high levels of pro-social reciprocity expectations. Indeed, helpful teammates are only verifying what players with minimal teammates expect of their teammate. On the other hand, the lack of a significant difference between players with minimal and unhelpful teammates (Hypothesis 4a and 4b) may be caused by the manipulations of unhelpful confederates' behaviors. Compared to helpful confederates who had many opportunities to cooperate with participants through cooperative trick moves available in the game (i.e., see the Procedure section), unhelpful confederates were only able to demonstrate their unwillingness to cooperate by not passing the ball. Although participants rated unhelpful confederates as less helpful and cooperative, it is possible the manipulation of unhelpful

confederates was not strong enough to decrease players' pro-social reciprocity expectations below participants with minimal teammates. However, as predicted by BGR, a post-hoc analysis demonstrates a significant linear decrease in participants' donations to teammates in the simultaneous prisoner's dilemma game when comparing players with a helpful, minimal, or unhelpful teammate (in order from highest to lowest donations). Furthermore, players' expectations of teammates to reciprocate pro-social behaviors mediated this linear trend in players' donations to teammates who were helpful, minimal, or unhelpful.[6]

In the current study, confederates were instructed to win every game and therefore, played well throughout the game. Future research should examine if the findings of the current study hold true if participants lose a competition. It is possible participants may not behave pro-socially towards out-group members despite having a helpful teammate if the opposing team wins the game. Perhaps playing with a teammate who does not play well but still attempts to be helpful will not lead to the same findings of the current study. However, previous research suggests that winning a competition leads people to behave more aggressively (Muller, Bushman, Subra, & Ceaux, 2012) and therefore, it is possible players may become more generous after losing a competition.

Future research should examine if teammates' helpful behaviors still have the same influence on players' pro-social reciprocity expectations and subsequent behaviors when playing a violent video game. Perhaps the previous findings regarding cooperative video game play's beneficial effects on players of violent video games can be explained through the processes found in the current study. For example, previous research suggests the social aspects of playing violent video games with others have more of an influence

on players' subsequent behaviors than the violent content. It is possible, as suggested by the current study, that helpful teammates in violent video games increase players' pro-social reciprocity expectation which has a stronger influence on their subsequent behaviors than the violent behaviors and content of the video game.

Previous research has conceptualized cooperative video game play as players who are on the same team working together against a common opponent (Ewoldsen et al., 2012; Greitemeyer et al., 2012; Schmierbach, 2010; Schmierbach, Xu, Oeldorf-Hirsch, & Dardis, 2012; Velez et al., 2012). The current study has demonstrated that players' behaviors during video game play, regardless of being on the same team, have a substantial impact on their subsequent behaviors. For example, despite being on the same team, players with unhelpful teammates donated fewer dimes to their teammates than players with helpful teammates. The results also suggest that players with unhelpful teammates were not motivated to donate more dimes to their teammate than opposing team members. This suggests that future research should begin to conceptualize cooperative video game play as the reciprocation of helpful behaviors and not simply belonging to the same team.

Chapter 5: Conclusion

Video games have become a social activity for people to come together and play with friends and others from around the world (ESA, 2013; Papagiannidis, Bourlakis, & Li, 2008; Yee, 2006). The range of social behaviors players can engage in with others during video game play are only limited by what video game designers can imagine. The culture surrounding the current video game landscape seems to be focusing on the social and cooperative environment social video game play offers players (Durkin & Barber, 2002; Kerr, 2006; Kutner & Olson, 2008; Southwell & Doyle, 2004). Indeed, new video games and the next generation of video game consoles seem to advertise their ability to allow players to interact with others in new imaginative ways that emphasize sharing experiences and working together with others. In order for researchers to understand this new social and cooperative environment of video game players we must begin to utilize theories adept at explaining complicated and dynamic social interactions.

The current study demonstrates that the theory of Bounded Generalized Reciprocity (Yamagishi et al., 1999) can provide valuable insights into how social video game play can influence players' subsequent behaviors. In particular, the current findings suggest that players' behaviors during social video game play can affect their pro-social reciprocity expectations which influences their subsequent behaviors. Furthermore, the current study emphasizes how players' behaviors during social video game play have major implications for the social relationships being forged with other players. For example, although unhelpful confederates were on the same team as participants their

behaviors led participants to behave less pro-socially towards them. This suggests that players' behaviors during social video game play are being used and interpreted by players as meaningful contributions to the social relationships with the other players. In terms of violent video games, the current results suggests that players' behaviors during cooperative game play, despite being violent and aggressive, are being processed and interpreted as social behaviors. Future research should focus on demonstrating how social video game play can influence the link between violent content and players' subsequent behaviors through the lens of Bounded Generalized Reciprocity.

Notes:

1. Participants were not told which out-group member they were transacting with because the current study cannot consistently control the behaviors of the computer controlled characters and therefore, would not be able to account for the error variance introduced to the analyses if participants thought they were transacting with a specific opposing team member.
2. One item from the Group Identification Scale (Brown, Condor, Mathews, Wade, & Williams, 1986) was removed because the same question appears in the Collective Self-Esteem Scale (Luhtanen & Crocker, 1992). The question assesses how "glad" one is to belong to a group. Considering this is an affective evaluation of one's group membership compared to a cognitive evaluation this question will be removed from the Group Identification Scale but remain in the Collective Self-Esteem Scale.
3. The macro PROCESS does not yet provide effect size estimates for analyses that involve covariates.

4. The Black Sheep hypothesis (Marques, Yzerbyt, & Leyens, 1988) proposed by proponents of SIT suggests that disliked in-group members threaten the positive connotation of people's social identity and therefore, are ejected from the group and poorly regarded even in comparison to out-group members. The manipulation of confederates' helpful or unhelpful behaviors in the current study may be construed as manipulations commonly found in the literature pertaining to the Black Sheep hypothesis (Marques, Abrams, & Serodio, 2001; Marques, Robalo, & Rocha, 1992; Marques & Yzerbyt, 1988). However, the current study's manipulations of confederates' behaviors were not manipulations of in-group liking or disliking which is contrary to the research testing the Black Sheep hypothesis. Although helpful teammates are more likely to be liked than unhelpful teammates, confederates in the current study were not instructed to act more or less friendly towards participants depending on the condition. Post-hoc analyses indicate that even though participants liked helpful teammates (M = 4.20, SD = .54) more than unhelpful teammates (M = 3.93, SD = .53; $t(102) = p < .05$), participants still rated unhelpful teammates significantly higher than the mid-point suggesting that participants actually liked their teammate regardless of the condition, $t(51) = 56.07$, $p < .001$. Furthermore, participants liked unhelpful teammates (M = 3.93, SD = .54) more than the opposing team (M = 3.57, SD = .59) which is also inconsistent with the Black Sheep hypothesis (Marques, Yzerbyt, & Leyens, 1988; $F(1, 51) = 28.13$, $p < .001$, $\eta_p^2 = .36$. This suggests that Black Sheep processes are not applicable to the current study.

5. Post-hoc analyses were conducted to determine whether players who had a helpful teammate donated more to more opposing team members than players who had a minimal or unhelpful teammates. The donations of players who had helpful, minimal, or unhelpful teammate in the simultaneous prisoner's dilemma game were entered into an ANCOVA while controlling for players' trait aggression. Players' trait aggression was not a significant covariate and therefore, was removed from the analysis, $F(1, 88) = 3.54$, $p > .05.$, $\eta_p^2 = 04$. The simpler analysis indicated a significant effect for the type of teammate for players, $F(2, 88) = 3.37$, $p < .05$, $\eta_p^2 = 07$. Post-hoc analyses, conducted using the Least Significant Difference procedure, indicated that players who had a helpful teammate ($M = 8.53$, $SD = 3.17$) donated more to opposing team members than players with minimal teammates ($M = 6.30$, $SD = 3.94$, $p < .05$) and unhelpful teammates ($M = 6.61$, $SD = 3.65$, $p < .05$). Players with minimal and unhelpful teammates did not differ in their donations to opposing team members ($p > .05$).
6. A regression analysis examining the linear decrease in donations from players who had a helpful, minimal, or unhelpful teammate (from highest to lowest donations) was conducted. The linear aggression analysis demonstrates a significant linear decrease in players' donations to teammates in the simultaneous prisoner's dilemma game ($\beta = -.25$; $t = -2.52$, $p < .05$) while controlling for players' trait aggression ($\beta = -.29$; $t = -2.87$, $p < .05$; $R^2 = .15$, $F(2, 87) = 8.77$, $p < .001$). A mediation analysis in PROCESS also indicates the decrease in players' donations to teammates who were helpful, minimal, or unhelpful (from highest to

lowest donations) was mediated by expectations of teammates to reciprocate pro-social behaviors, β = -.22, LLCI = -.39 and ULCI = -.07.

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Appendix A: Tables, Figures, and Questionnaires

Predictor	Donations	
	B	ΔR^2
Step 1		.16**
Expertise	.09	
Trait Aggression	-.30***	
Avoidance of Greed	-.04	
Pro-Social Tendencies	.02	
Teammate Liking	.14	
Teammate Ratings	.02	
Opposing Team Liking	.07	
Opposing Team Ratings	-.002	
Step 2		.26***
Expertise	.03	
Trait Aggression	-.17*	
Avoidance of Greed	-.01	
Pro-Social Tendencies	.03	
Teammate Liking	-.04	
Teammate Ratings	.04	
Opposing Team Liking	.15	
Opposing Team Ratings	.01	
Expectations	.56***	

Table 1. Hierarchical Multiple Regression Analyses Predicting Averaged From Averaged Expectations of Reciprocal Pro-Social Behaviors; Notes: *p < .05, **p < .01, ***p < .001.

Predictor	Donations	
	B	ΔR^2
Step 1		.16**
Expertise	.09	
Trait Aggression	-.30***	
Avoidance of Greed	-.04	
Pro-Social Tendencies	.02	
Teammate Liking	.14	
Teammate Ratings	.02	
Opposing Team Liking	.07	
Opposing Team Ratings	-.002	
Step 2		.003**
Expertise	.09	
Trait Aggression	-.30***	
Avoidance of Greed	-.04	
Pro-Social Tendencies	.01	
Teammate Liking	.12	
Teammate Ratings	.02	
Opposing Team Liking	..06	
Opposing Team Ratings	.01	
Social Identification	.07	

Table 2. Hierarchical Multiple Regression Analyses Predicting Averaged Donations From Participants Social Identification; Notes: *p < .05, **p < .01, ***p < .001

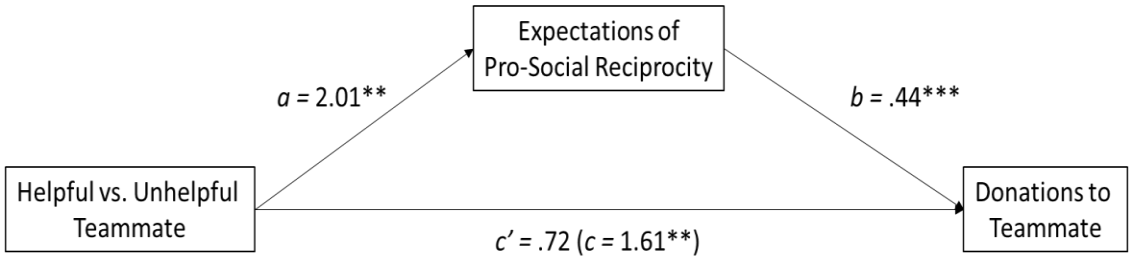

Figure 1.Mediation Analysis Examining Differences in Donations of Participants with a Helpful Compared to and Unhelpful Teammate in the Simultaneous Prisoner's Dilemma Game; Note: * = p < .05, ** = p < .01; *** = p < .001.

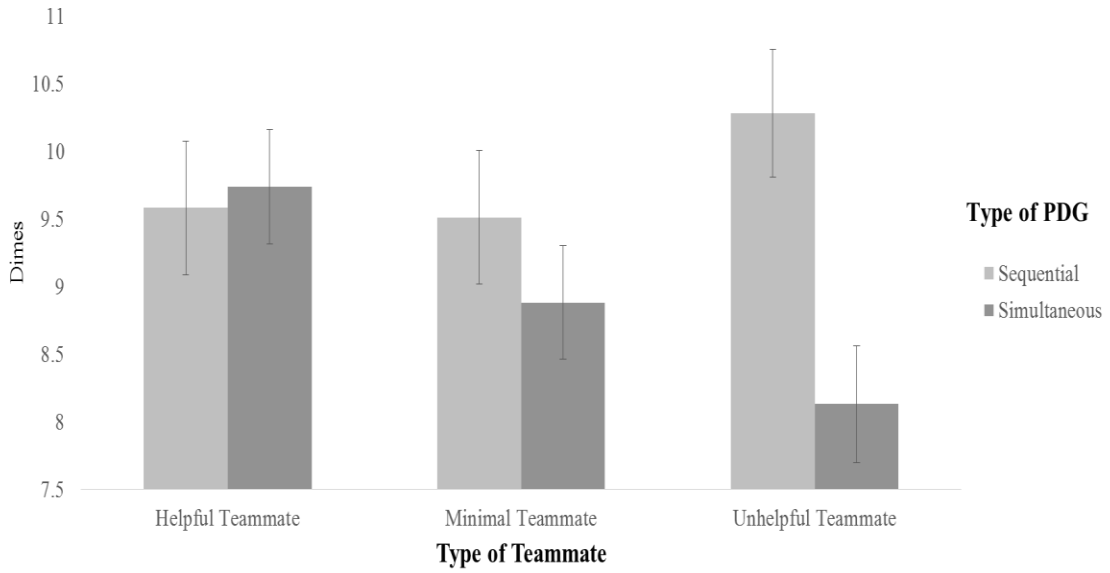

Figure 2. Participants Donations to Teammates in the Sequential and Simultaneous Prisoner's Dilemma Game; The covariate appearing in the model is evaluated at the following value: Trait Aggression = 2.24

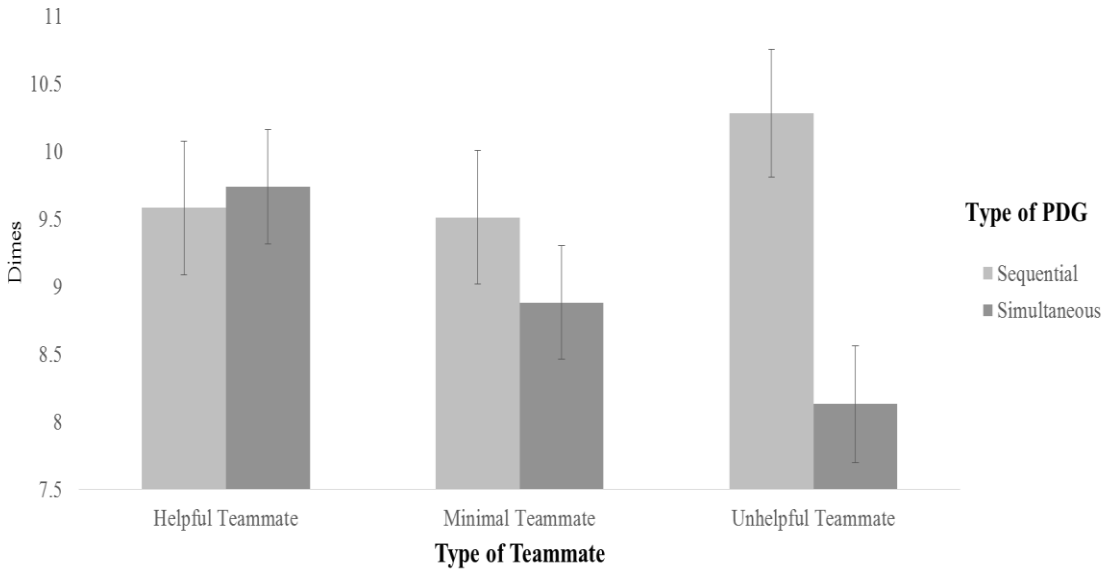

Figure 3. Participants' Donations to In-Group and Out-Group Members in the Simultaneous Prisoner's Dilemma Game; The covariate appearing in the model is evaluated at the following value: Trait Aggression = 2.24

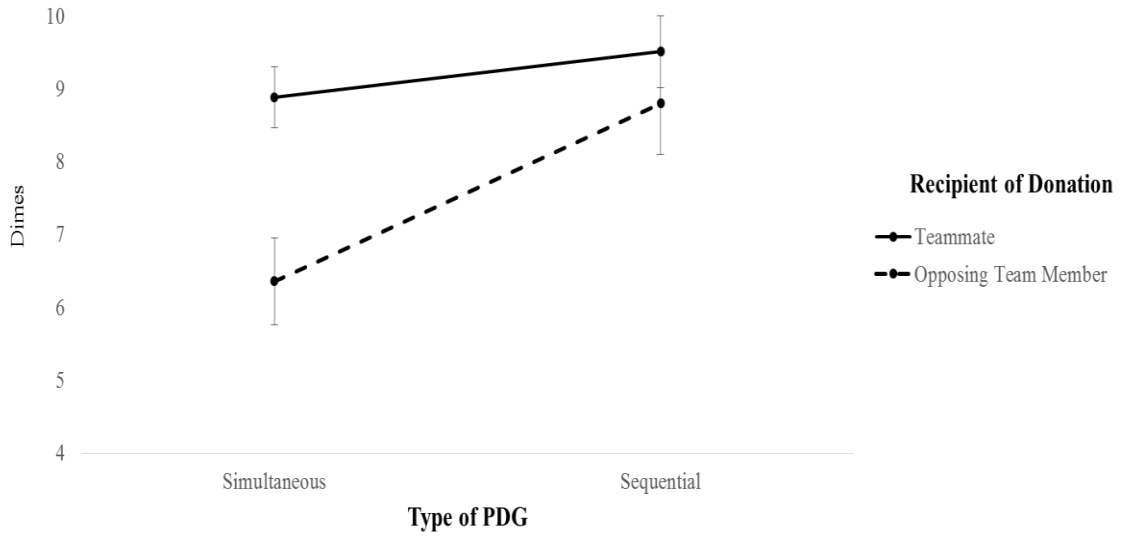

Figure 4.Donations of Participants with a Minimal Teammate to In-Group and Out-Group Members in the Sequential and Simultaneous Prisoner's Dilemma Game; The covariate appearing in the model is evaluated at the following value: Trait Aggression = 2.24

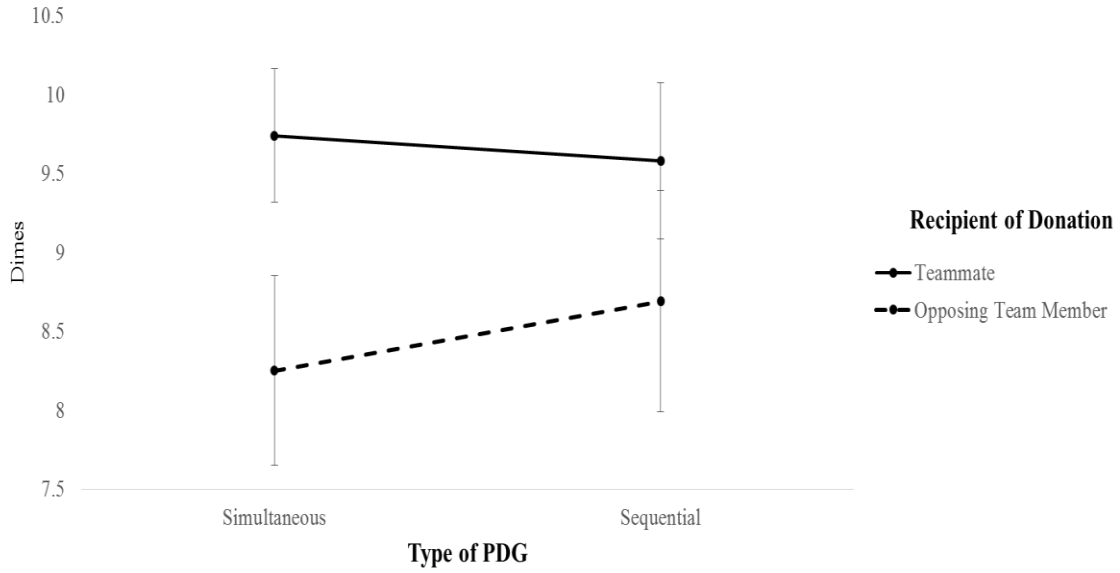

Figure 5. Donations of Participants with a Helpful Teammate to In-Group and Out-Group Members in the Sequential and Simultaneous Prisoner's Dilemma Game; The covariate appearing in the model is evaluated at the following value: Trait Aggression = 2.24

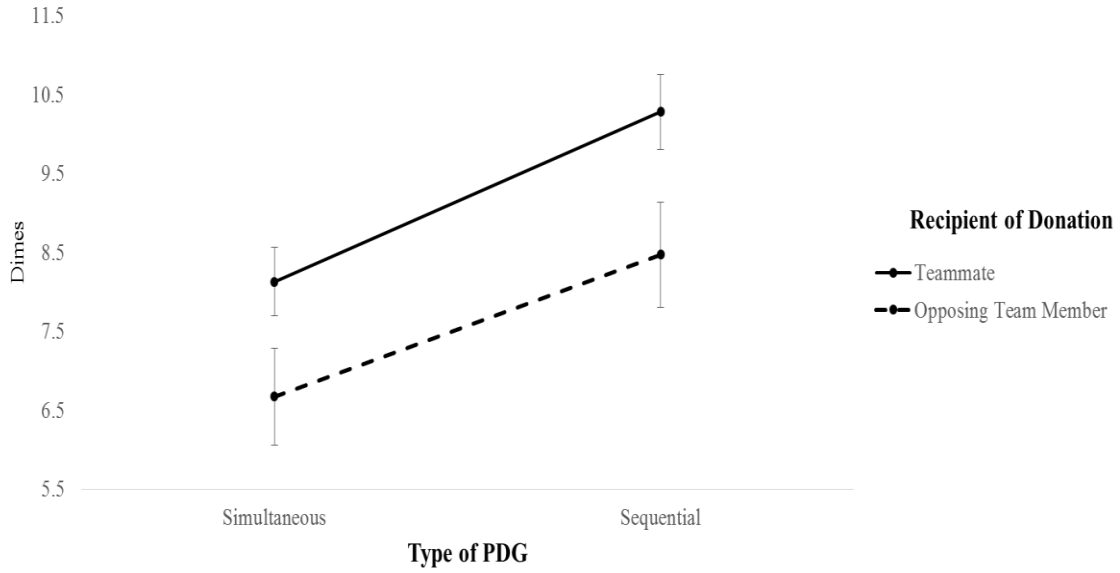

Figure 6. Donations of Participants with an Unhelpful Teammate to In-Group and Out-Group Members in the Sequential and Simultaneous Prisoner's Dilemma Game; The covariate appearing in the model is evaluated at the following value: Trait Aggression = 2.24

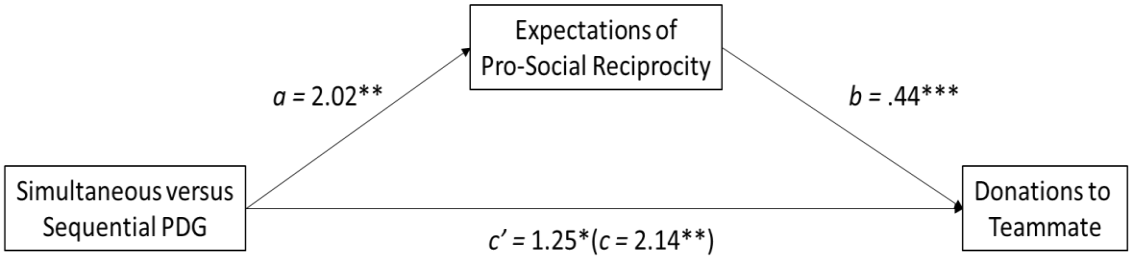

Figure 7. Mediation Analysis Examining Differences in Donations of Participants with an Unhelpful Teammate in the Simultaneous and Sequential Prisoner's Dilemma Game; Note: * = p < .05, ** = p < .01; *** = p < .001.

(Pre-Test Questionnaire)

Please indicate the following:

a.) Your Age _____

b.) Your Gender _____

c.) # of years spent in College _____

Please use the rating scale below to indicate how often you play video games in your regular daily life. Video games include electronic games you can play on a home console (such as a Playstation 2), a hand-held console (such as a Nintendo DS), and on a computer.

Response Options
1 = Not at all (Never play video games)
2 = Rarely (Once every few months)
3 = A little (Once or twice a month)
4 = Sometimes (More than twice a month)
5 = Often (Once or twice a week)
6 = A lot (More than twice a week)
7 = All the time (More than once or twice a day)

I play video games _____ (Write in the number of the response you feel best fits you.)

I have played video games for the past _____ years. (Write in the number of years you have been playing video games.

How many hours do you spend with each of the following items on an average day?

(simply round to the nearest hour)

a.) Television:

Weekday _____ hours per day

Weekend _____ hours per day

b.) Internet:

Weekday _____ hours per day

Weekend _____ hours per day

c.) Video games (e.g., PS3, Xbox 360, Nintendo Wii, etc.):

Weekday _____ hours per day

Weekend _____ hours per day

Rate your overall ability level at playing video games…

Rookie	Veteran	Expert
1.....2.....3.....4.....5.....6.....7		

Please circle the number that best describes how often you <u>currently play or have played</u> each of the following types of <u>digital video games</u>:

	Never Play(ed)	Play(ed) all the time
a. Sports Games (e.g., Football, Basketball, etc.)	1.....2.....3.....4.....5.....6.....7	
b. Strategy Games (e.g., games that include long-term strategic planning)	1.....2.....3.....4.....5.....6.....7	
c. Puzzle Games (e.g., games that include puzzle solving like Tetris)	1.....2.....3.....4.....5.....6.....7	
d. Fighting Games (e.g., games with two opposing fighters in an arena)	1.....2.....3.....4.....5.....6.....7	
e. Flight Simulation Games (e.g., games that involve using a flight simulator)	1.....2.....3.....4.....5.....6.....7	
f. Shooting Games (e.g., games that involve shooting other characters)	1.....2.....3.....4.....5.....6.....7	

g. Driving Games (e.g., games that involving racing automobiles)	1.....2.....3.....4.....5.....6.....7
h. Platform Games (e.g., games with cartoon characters like Super Mario)	1.....2.....3.....4.....5.....6.....7
i. LAN Games (any game played on a local area network, e.g. Halo or Quake)	1.....2.....3.....4.....5.....6.....7
j. Massively Multi-Player Online Role-Playing Games (e.g., EverQuest)	1.....2.....3.....4.....5.....6.....7
k. Offline Role Playing Games (e.g., games that build character attributes, such as Elder Scrolls IV: Oblivion)	1.....2.....3.....4.....5.....6.....7
l. Action/Adventure (e.g. games that combine elements from the action and adventure genres, such as Assassin's Creed and Fallout	1.....2.....3.....4.....5.....6.....7

(Buss-Perry Aggression Questionnaire)

Using the five point scale shown below, indicate how uncharacteristic or characteristic each of the following statements is in describing you. Circle your answer under each statement.

1 = extremely uncharacteristic of me
2 = somewhat uncharacteristic of me
3 = neither uncharacteristic nor characteristic of me
4 = somewhat characteristic of me
5 = extremely characteristic of me

1. I have trouble controlling my temper
2. At times I feel I have gotten a raw deal out of life
3. I wonder why sometimes I feel so bitter about things
4. My friends say that I'm somewhat argumentative
5. I have threatened people I know
6. I flare up quickly but get over it quickly
7. I can't help getting into arguments when people disagree with me

8. I often find myself disagreeing with people
9. Other people always seem to get the breaks
10. Sometimes I fly off the handle for no good reason
11. There are people who pushed me so far that we came to blows
12. Given enough provocation, I may hit another person

(Prosocial Tendencies Measure)

Below are sentences that might or might not describe you. Please indicate how much each statement describes you by using the scale below.

Does Not Describe Me At All	Describes Me A Little	Somewhat Describes Me	Describes Me Well	Describes Me Greatly
1	2	3	4	5

1. I can help others best when people are watching me.
2. It makes me feel good when I can comfort someone who is very upset.
3. When other people are around, it is easier for me to help others in need.
4. I think that one of the best things about helping others is that it makes me look good.
5. I get the most out of helping others when it is done in front of other people.
6. I tend to help people who are in a real crisis or need.
7. When people ask me to help them, I don't hesitate.
8. I prefer to donate money without anyone knowing.
9. I tend to help people who are hurt badly.
10. I believe that donating goods or money works best when I get some benefit.
11. I tend to help others in need when they do not know who helped them.
12. I tend to help others especially when they are really emotional.
13. Helping others when I am being watched is when I work best.
14. It is easy for me to help others when they are in a bad situation.
15. Most of the time, I help others when they do not know who helped them.
16. I believe I should receive more rewards for the time and energy I spend on volunteer service.
17. I respond to helping others best when the situation is highly emotional.
18. I never wait to help others when they ask for it.
19. I think that helping others without them knowing is the best type of situation.
20. One of the best things about doing charity work is that it looks good on my resume.
21. Emotional situations make me want to help others in need.
22. I often make donations without anyone knowing because they make me feel good.
23. I feel that if I help someone, they should help me in the future.
24. I often help even if I don't think I will get anything out of helping.
25. I usually help others when they are very upset.

(Measures to be Presented Before or After PD Games)

(Social Identification)

Please indicate how much you agree or disagree with each of the following statements.

Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
1	2	3	4	5

1. I consider the Red/Blue Team important.
2. I identify with the Red/Blue Team.
3. I feel strong ties with the Red/Blue Team.
4. I see myself as belonging to the Red/Blue Team.
5. I would make excuses for belonging to the Red/Team.
6. I would try to hide belonging to the Red/Blue Team.
7. I feel held back by the Red/Blue Team.
8. I am annoyed to say I'm a member of the Red/Blue Team.
9. I would criticize the Red/Blue Team.

(Aggressive Affect)

Please indicate the extent to which you agree or disagree with each of the following mood statements by circling the number that best describes how you feel right now:

	Strongly Disagree Strongly Agree
I feel aggravated.	1.....2.....3.....4.....5.....6.....7
I feel agreeable.	1.....2.....3.....4.....5.....6.....7
I feel furious.	1.....2.....3.....4.....5.....6.....7
I feel irritated.	1.....2.....3.....4.....5.....6.....7
I feel frustrated.	1.....2.....3.....4.....5.....6.....7
I feel kindly.	1.....2.....3.....4.....5.....6.....7

I feel outraged.	1.....2.....3.....4.....5.....6.....7
I feel angry.	1.....2.....3.....4.....5.....6.....7
I feel like yelling at somebody.	1.....2.....3.....4.....5.....6.....7
I feel friendly.	1.....2.....3.....4.....5.....6.....7
I feel amiable.	1.....2.....3.....4.....5.....6.....7
I feel mad.	1.....2.....3.....4.....5.....6.....7
I feel mean.	1.....2.....3.....4.....5.....6.....7
I feel bitter.	1.....2.....3.....4.....5.....6.....7
I feel like banging on a table.	1.....2.....3.....4.....5.....6.....7
I feel like swearing.	1.....2.....3.....4.....5.....6.....7
I feel cruel.	1.....2.....3.....4.....5.....6.....7
I feel good-natured.	1.....2.....3.....4.....5.....6.....7
I feel disagreeable.	1.....2.....3.....4.....5.....6.....7
I feel enraged.	1.....2.....3.....4.....5.....6.....7

(Team Self-Esteem)

Please indicate how much you agree or disagree with each of the following statements.

Strongly Disagree Neither Agree Strongly
Disagree Disagree or Agree Agree

1 2 3 4 5

1. I am a worthy member of the Red/Blue Team.
2. I feel I don't have much to offer to the Red/Blue Team.
3. I am a cooperative participant in the Red/Blue Team.
4. I often feel I'm a useless member of the Red/Blue Team.
5. I often regret that I belong to the Red/Blue Team.
6. In general, I'm glad to be a member of the Red/Blue Team.
7. Overall, I often feel that the Red/Blue Team of which I am a member is not worthwhile.
8. I feel good about belonging to the Red/Blue Team.
9. Overall, the Red/Blue Team would be considered good by others.
10. Most people would consider the Red/Blue Team, on the average, to be more ineffective than other teams.
11. In general, others would respect the Red/Blue Team that I am a member of.
12. In general, others would think that the Red/Blue Team that I am a member of is unworthy.
13. Overall, belonging to the Red/Blue Team has very little to do with how I feel about myself.
14. The Red/Blue Team is an important reflection of who I am.
15. The Red/Blue Team is unimportant to my sense of what kind of a person I am.
16. In general, belonging to the Red/Blue Team is an unimportant part of my self-image.

(Aggressive Cognition)

You are looking at a list of words with letters missing. Please fill in the blanks to make complete words.

1. a _ u s e
2. c h o _ e
3. c _ t
4. e x p l _ _ e
5. h a _ e
6. h _ r _
7. h _ t
8. k i _ _
9. p _ _ s o n
10. r _ p _

(Perceptions of Teammate and Opposing Team Members)

Please rate your teammate on the following dimensions/Please rate the other team as a whole on the following dimensions.

a. Competent	1.....2.....3.....4.....5.....6.....7	Incompetent
b. Intelligent	1.....2.....3.....4.....5.....6.....7	Unintelligent
c. Honest	1.....2.....3.....4.....5.....6.....7	Dishonest
d. Nice	1.....2.....3.....4.....5.....6.....7	Mean
e. Very Skilled Player	1.....2.....3.....4.....5.....6.....7	Not a skilled Player
f. Motivated	1.....2.....3.....4.....5.....6.....7	Not Motivated
g. Critical	1.....2.....3.....4.....5.....6.....7	Not Critical
h. Rational	1.....2.....3.....4.....5.....6.....7	Irrational

Please answer the following questions regarding your teammate/Please answer the following questions regarding the opposing team as a whole.

Very Much Uncertain Not Very Much

1 2 3 4 5

1. How much did you enjoy participation with your teammate/the opposing team?
2. How much would you like to play the video game with your teammate/the opposing team again?
3. How much did you like your teammate/the opposing team?
4. How much would you like to see your teammate/the opposing team again?
5. How much did you get along with your teammate/the opposing team while playing the video game?

(Post-Test Questionnaire)

(Reactions to Video Game)

Please rate your overall reactions to the video game you just played by circling a number on the following scales.

a. Not Creative	1.....2.....3.....4.....5.....6.....7	Creative
b. Not Inventive	1.....2.....3.....4.....5.....6.....7	Inventive
c. Not Enjoyable	1.....2.....3.....4.....5.....6.....7	Enjoyable
d. Boring	1.....2.....3.....4.....5.....6.....7	Intense
e. Not Violent	1.....2.....3.....4.....5.....6.....7	Violent
f. Realistic	1.....2.....3.....4.....5.....6.....7	Unrealistic
g. Exciting	1.....2.....3.....4.....5.....6.....7	Dull
h. Serious	1.....2.....3.....4.....5.....6.....7	Humorous
i. Frustrating	1.....2.....3.....4.....5.....6.....7	Not Frustrating
j. Irritating	1.....2.....3.....4.....5.....6.....7	Not Irritating
j. Not Difficult	1.....2.....3.....4.....5.....6.....7	Difficult

The following questions are in reference to the game you just played or any other version of this game. Please circle "yes" or "no" where appropriate.

a. Have you ever heard of this game before? Yes No

b. Have you ever played this game before? Yes No

c. Do you own this game? Yes No

d. Do you know someone who owns this game? Yes No

e. If you have played this game, have you beaten / completed it? Yes

No

f. Did you want to quit playing this game at any point today? Yes

No

g. If the answer to the question above was "yes" and you did want to quit playing at some point, then please write down the approximate number of minutes into game play that you wanted to quit playing: _____ minutes.

h. If you have played this game before, how good of a Halo: Reach player do you consider yourself to be?

1 2 3 4 5 6 7

Rookie Veteran Expert

(Manipulation Check)

Please indicate how much you agree or disagree with the following statements regarding your partner.

Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
1	2	3	4	5

1. My teammate was very helpful during the game.
2. My teammate helped me when I needed help during the game.
3. My teammate and I worked together well when fighting the other team.
4. My teammate was always by my side during the game.
5. Without my teammate I would have died many more times in the game.
6. Without my teammate I would have scored a lot fewer points.

(Enjoyment)

For each of the following statements, please indicate how true it is for you.

Not at all True	1.....2.....3.....4.....5.....6.....7	Very True

1. I enjoyed this video game very much.

2. This video game was fun to play.
3. I thought this was a boring video game.
4. The video game did not hold my attention at all.
5. I would describe this video game as very interesting.
6. I thought this video game was quite enjoyable.
7. While I was playing this video game, I was thinking about how much I enjoyed it.

(Confederate Ratings)

Please rate the player on the following scales:

a. Not Talkative	1.....2.....3.....4.....5.....6.....7	Talkative
b. Uncooperative	1.....2.....3.....4.....5.....6.....7	Cooperative
c. Not Competitive	1.....2.....3.....4.....5.....6.....7	Competitive
d. Not a Skilled Player	1.....2.....3.....4.....5.....6.....7	Skilled Player
e. Not Frustrated	1.....2.....3.....4.....5.....6.....7	Frustrated
f. Not Friendly	1.....2.....3.....4.....5.....6.....7	Friendly

Appendix B: Prisoner's Dilemma Game Materials

(Simultaneous Prisoner's Dilemma Game Information Sheet)

General Information Sheet

Your Team: **Team 1**

Other Transaction Participant: **Team 1**

Number of Transactions: **1**

This manila envelope contains all the materials you need for this transaction. You will be deciding how many dimes you would like to donate to **your teammate** at the same time as **your teammate** will be deciding how many dimes to donate to you. Any number of dimes you donate will double in value for **your teammate** but any dimes you keep will not. For example, if you donate 5 dimes **your teammate** will receive 1 dollar and if you keep 5 dimes you will only receive 50 cents. Likewise, the number of dimes **your teammate** donates to you will double in value for you but the dimes **your teammate** keeps will not.

Please complete the materials in this manila envelope in the order they are stapled.

General Information Sheet

Your Team: **Team 1**

Other Transaction Participant: **Team A**

Number of Transactions: **1**

This manila envelope contains all the materials you need for this transaction. You will be deciding how many dimes you would like to donate to **an opposing team member** at the same time as **an opposing team member** will be deciding how many dimes to donate to you. Any number of dimes you donate will double in value for **the opposing team member** but any dimes you keep will not. For example, if you donate 5 dimes **the opposing team member** will receive 1 dollar and if you keep 5 dimes you will only receive 50 cents. Likewise, the number of dimes **the opposing team member** donates to you will double in value for you but the dimes **the opposing team member** keeps will not.

Please complete the materials in this manila envelope in the order they are stapled.

(Sequential Prisoner's Dilemma Game Information Sheet)

General Information Sheet

Your Team: **Team 1**

Other Transaction Participant: **Team 1**

Number of Transactions: **1**

This manila envelope contains all the materials you need for your first/second transaction. You will deciding how many dimes you would like to donate to **your teammate. Your teammate** is waiting to receive the dimes you have donated to her/him before s/he decides how many dimes to donate to you. Any number of dimes you donate will double in value for **your teammate** but any dimes you keep will not. For example, if you donate 5 dimes **your teammate** will receive 1 dollar and if you keep 5 dimes you will only receive 50 cents. After **your teammate** receives the dimes you have donated to him/her **your teammate** will decide how many dimes to donate to you. The dimes **your teammate** donates to you will also double in value.

Please complete the materials in this manila envelope in the order they are stapled.

General Information Sheet

Your Team: **Team 1**

Other Transaction Participant: **Team A**

Number of Transactions: **1**

This manila envelope contains all the materials you need for your first/second transaction. You will deciding how many dimes you would like to donate to **an opposing team member. The opposing team member** is waiting to receive the dimes you have donated to her/him before s/he decides how many dimes to donate to you. Any number of dimes you donate will double in value for **the opposing team member** but any dimes you keep will not. For example, if you donate 5 dimes **the opposing team member** will receive 1 dollar and if you keep 5 dimes you will only receive 50 cents. After **the opposing team member** receives the dimes you have donated to him/her **the opposing team member** will decide how many dimes to donate to you. The dimes **the opposing team member** donates to you will also double in value.

Please complete the materials in this manila envelope in the order they are stapled.

(Expectations of Pro-Social Reciprocity)

Please answer the following question by circling your answer.

1. Out of the 11 dimes possible to donate, how many dimes do you think **your teammate** will donate to you?

   0……1……2……3……4……5……6……7……8……9……10……11 dimes

Please answer the following question by circling your answer.

1. Out of the 11 dimes possible to donate, how many dimes do you think **the opposing team member** will donate to you?

   0……1……2……3……4……5……6……7……8……9……10……11 dimes

Decision Sheet

You have 11 dimes to do with as you please. You can donate any number of the dimes to **your teammate** and keep as many dimes as you like. Any number of dimes you donate will double in value for **your teammate** but any dimes you keep will not. Likewise, the number of dimes **your teammate** donates to you will double in value for you but the dimes **your teammate** keeps will not.

1. Please circle the number of dimes you would like to donate to **your teammate**.

   0……1……2……3……4……5……6……7……8……9……10……11 dimes

Decision Sheet

You have 11 dimes to do with as you please. You can donate any number of the dimes to **the opposing team member** and keep as many dimes as you like. Any number of dimes you donate will double in value for **the opposing team member** but any dimes you keep will not. Likewise, the number of dimes **the opposing team number** donates to you will double in value for you but the dimes **the opposing team member** keeps will not.

1. Please circle the number of dimes you would like to donate to **the opposing team member.**

   0……1……2……3……4……5……6……7……8……9……10……11 dimes