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Generosity in Gaming: The Effect of Prosocial Video Games on Charitable Donation Behavior

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Abstract

Although the link between violent video games and aggressive behavior has received extensive coverage, there is growing evidence that prosocial video games can exert a positive influence as well. However, whether these effects generalize to costlier prosocial behaviors that help more distant recipients remains unclear. Here I propose an experimental study to examine whether prosocial video games can influence charitable donation behavior. College students will be randomly assigned to play 45 min of either a prosocial video game (*Lemmings*) or neutral video game (*Tetris*), followed by a 10 min filler task (mental calculation). Participants will then be asked to complete a payment form, indicating if they want to donate a portion of their experimental participation payment to a local nonprofit organization. Based on previous research, we predict that there will be a main effect of gender, with female participants more likely to donate than males. Additionally, we hypothesize a main effect of video game, where participants who play the prosocial video game will be likelier to donate than those who play the neutral game. If confirmed, these results would extend the existing literature on prosocial video games beyond informal face-to-face helping behaviors, potentially providing a psychological mechanism for costlier needs such as charitable appeals.

Introduction

In 2012, the now 45th president, President Donald Trump, tweeted "Video game violence & glorification must be stopped—it is creating monsters!" (Trump, 2012). President Trump is often accused of exaggeration, but in this instance his proclamation of alarm could be viewed as justifiable. From Nikolas Cruz, the gunman in the February 2018 shooting at Stoneman Douglas High School, who reportedly played as much as 15 hours of video games per day (History.com Editors, 2019), to David Katz, who killed two people during a video game tournament in August 2018 (Falvey, 2018), news coverage of recent acts of violence has emphasized the connection between video gameplay and antisocial behavior. Therefore, there has been growing interest at a psychological level in understanding the influence of video game play on other behaviors. This question is particularly relevant given the increasing prevalence of video games in people's lives: current estimates suggest that approximately 2.34 billion people—30% of the current world population—are active video game players ("Number of gamers worldwide 2021," 2019). If gaming can lead to changes in behavior, as commonly assumed, an important question is whether positive, helping *prosocial behaviors* can also be prompted by playing video games.

In the psychological literature, there is mixed evidence regarding the effect of violent content on real-world aggressive behavior. For example, research suggests that exposure to violent video games (e.g., fighting or shooting games) is significantly and causally linked to increases in aggressive behavior, cognition, and affect, presumably because aggressive behavior is modeled, rewarded, and quickly rehearsed (Anderson & Bushman, 2001; Anderson 2004; Barton, 1981; Anderson et al., 2010). Another study

found that children were more likely to associate themselves with aggressive traits on the Implicit Association Test after playing a violent video game (Uhlmann & Swanson, 2004). At the same time, however, other studies argue that there is solely a correlative relationship, or that the causal effects that do exist from violent video games are negligible (Ferguson et al., 2008; Hilgard, Engelhardt, & Rouder, 2017; Ferguson & Rueda, 2010; Markey, Markey, & French, 2015; Ferguson & Garza, 2011). Overall, while most researchers agree that there is at least some connection between video games and violence, the causality and strength of these effects are debated.

In contrast to the mixed literature on video gaming and aggression, growing evidence suggests that video games can encourage prosocial behavior, defined as "voluntary actions that are intended to help or benefit another individual or group of individuals" (p. 3, Eisenberg & Mussen, 1989). Studies on "prosocial games" typically take an existing commercial game that involves helping other non-player characters (NPCs) in game (e.g., *Lemmings*, in which the player must guide a group of creatures to safety past various dangers) and measure its effects on real-world prosocial behaviors. These effects are often contrasted with the effects of violent gameplay (e.g., *Lamers*, in which the player uses weapons to kill the creatures before they can reach the exit), as well as neutral puzzle games such as *Tetris* (in which various shaped blocks must be arranged in rows). These games have been specifically identified as containing different measurable and perceivable levels of prosocial content (Greitemeyer & Osswald, 2010).

Previous studies have found that prosocial games tend to increase one-on-one helping behavior. In one study, participants were asked to play either a prosocial or neutral game and then assign easy or hard puzzles to the next participant, knowing that

the next participant would receive $10 if they successfully completed the puzzles (Gentile et al., 2009). Participants who played the prosocial game were more likely to help subsequent participants by selecting a larger proportion of easy, as opposed to difficult, puzzles. Another study found that people who play video games that require helping in-game characters were more likely to pick up dropped pencils, assist in future experiments, and defend a harassed experimenter (Greitemeyer & Osswald, 2010). These studies controlled for mood and enjoyment of the video game, ensuring that prosocial behavior came from the game content itself. Finally, one study asked participants to read journals where it was apparent that the author suffered a predicament such as breaking a leg. The researchers discovered that after playing *Lemmings*, participants experienced a greater degree of self-reported compassion, indicating a link between prosocial gaming and empathy (Greitemeyer, Osswald, & Brauer, 2010).

Collectively, these results suggest that there is a significant connection between prosocial gameplay and subsequent real-world prosocial behavior. Building off the General Aggression Model (GAM) of violent gameplay and aggression (Bushman & Anderson, 2002; Anderson & Bushman, 2002) and the General Learning Model (GLM) (Buckley & Anderson, 2006), these effects are thought to depend on a cognitive route whereby gameplay increases access to specific types of thoughts. The GAM proposes the existence of knowledge structures shaped by the interplay of perception and affect, which are used to guide behavioral responses, and become automatized over repeated experience: thus, playing games with violent content can increase access to aggressive behaviors, both by triggering affective reactions associated with violence and priming cognitive representations related to violence, such as when and how aggression should be

displayed. Consistent with this idea, Greitemeyer and Osswald (2010) found that playing a prosocial video game primes prosocial knowledge structures, which in turn increases prosocial behavior. Prosocial actions that follow previously developed knowledge structures become automated, and behaviors with less developed knowledge structures require a greater amount of stimulus before they are elicited.

Yet, existing studies have only focused on a few types of helping behavior, such as helping another person face-to-face. When it comes to helping individual people, physical proximity has been shown to increase empathy and prosocial behavior (Mencl & May, 2008), and having a single individual to focus on is more effective than focusing on a group need (Kogut & Ritov, 2005). This literature suggests that a known recipient is more conducive to drawing out prosocial behavior, and conversely, behaviors pertaining to helping foreign or less known recipients are harder to elicit (Einolf, 2008). For example, in Gentile et al. (2009), participants made helping decisions for a "partner", i.e. another college student completing the same task immediately after them. Therefore, the target of the prosocial behavior was not only temporally proximate, but also similar in terms of social group affiliation. Also, in Greitemeyer and Osswald's study (2010), participants went from playing *City Crisis*, a game where the player is a rescue pilot saving civilians in danger, to being confronted with a situation where they could save a research assistant. In this study, the prosocial thoughts needed to motivate helping the assistant, such as courageousness, were previously stimulated by *City Crisis*. As such, one potential concern is that the prosocial behaviors demonstrated in previous studies may be relatively easy to elicit, even in non-game conditions.

Additionally, the measures of real-world prosocial behavior in previous studies have tended to focus on relatively non-costly, short-term behaviors. In these experiments, prosocial behaviors often come at little or no cost to the participant: for example, assigning puzzles to a "partner" (Gentile et al., 2009), or picking up spilled pencils (Greitemeyer & Osswald, 2010). Even helping the harassed assistant, arguably the most difficult task in prosocial behaviors studied thus far, was a low-cost action. The study was coded such that the participant asking the assistant if she was okay, a relatively low-commitment action, was considered intervention behavior. Furthermore, all the participants were asked if they suffered emotional harm, to which none replied that they did. These elements suggest that helping the harassed assistant was not as high cost in commitment or emotional danger as the action of "defending a research assistant" might initially suggest. Therefore, another concern is that costlier situations are less likely to motivate prosocial behavior (Dovidio, Piliavin, Gaertner, Schroeder, & Clark, 1981; Lee & Murnighan, 2001).

Overall, previous studies of prosocial gameplay have been largely restricted to demonstrating prosocial behaviors that are easily elicited and relatively low-cost in real life. Thus, the generalizability of prosocial behavior from video games to larger social needs is still unclear and needs to be explored. One such need is charitable giving, wherein individuals dedicate resources such as time or money to organizations promoting altruistic causes. In charitable donations, recipients are rarely in direct physical proximity and money is often directed toward a group need ("2018 Online Giving Statistics, Trends & Data: The Ultimate List of Giving Stats," 2019). Psychological theories of construal suggest that greater *psychological distance* is associated with more long-term or abstract

concepts and socially unfamiliar groups (Liberman & Trope, 2008), all of which would seem to apply to charitable donation. Consistent with this idea, experimental manipulation of the recipient's psychological distance along both time (soon vs. later) and social (in-group vs. out-group) dimensions can produce different patterns of donation towards individual needs compared to charitable organizations (Ein-Gar & Levontin, 2013). Whereas the beneficiaries of charitable donation are psychologically distant and abstract, donation behavior comes at a very tangible cost, as the lost value is easy to understand and is viewed as a loss rather than equal exchange for something else (Leclerc, Schmitt, & Dubé, 1995; Bateman, Kahneman, Munro, Starmer, & Sugden, 2005; Macdonnell & White, 2015).

With respect to prosocial gaming, the effect of in-game prosocial actions on later charitable donation has received little attention to date. One concern is that the connection between prosocial behavior in a video game and the help created by charitable donation is less immediate and harder to associate, compared to the low-cost, one-on-one prosocial behaviors previously studied in the laboratory. Consistent with this idea, a previous research study found that children (ages 8-15) do not display an increase in charitable giving behavior after playing prosocial video games (Chambers & Ascione, 1986).

That being said, charitable giving still remains closely tied with other prosocial behaviors. People donate for a variety of reasons, such as the personal warm feeling they receive, a sense of moral obligation, or for status, which ultimately are no different than reasons for other prosocial behaviors (Bekkers & Wiepking, 2011; Benabou & Tirole, 2006). Einolf (2008) found that empathy is correlated with charitable giving behavior on

a similar degree as it is with other behaviors such as volunteering (though neither of these were as strongly motivated by empathy as spontaneous and direct helping behaviors). Just as charitable giving and volunteerism are motivated by similar factors, the two behaviors themselves are strongly correlated (Jackson, Bachmeier, Wood, & Craft, 1995). In conclusion, charitable giving, while perhaps more difficult to prompt, is strongly tied to other prosocial behaviors which are known to be influenced by prosocial video games.

In this study, I propose to examine the link between prosocial video gameplay and subsequent charitable donation behavior. This study builds on Chambers and Ascione (1986) by examining college students and using more rigorous experimental methods. Although Chambers and Ascione (1986) previously failed to find a connection between prosocial gaming and charitable donation, their study had clear weaknesses. One concern is the video game used in the study (*Smurfs*) had relatively little focus on prosocial content, and, unlike the previously-cited games, was not assessed for perceived prosociality. Additionally, any prosociality of the video game may have been lost on children, as past literature suggests that adolescents have a stronger understanding of how social contexts should affect decision making (Güroğlu, Bos, & Crone, 2014). For example, Raviv, Bar-Tal, and Lewis-Levin (1980) found that male donation behavior increased in sophistication with age. Finally, children were only given $1.00 of nickels. Since their views of the value of the money were not directly assessed, it is fully possible that the money was so valuable that they did not view it as disposable (Snipes & Oswald, 2010).

There are a few ways in which the proposed study avoids Chambers and Ascione's pitfalls. One change is that the study will expose participants to the prosocial (or neutral) video game for a longer period than other studies do (Gentile et al., 2009; Greitemeyer & Osswald, 2010). In order to isolate increases in charitable giving behavior from potential experimenter demand effects, we will require that participants fill out multiple other assessments before their donation behavior can be measured. The increased delay between video game and measurement point necessitates a longer period of video game exposure to ensure lasting experimental effects. The second change made to the study is the sample demographics. Data will be collected from college students rather than children, as research suggests that college students would likely be more perceptive of the prosociality of the game and thus more likely to show changes in their behavior (Güroğlu, Bos, & Crone, 2014).

Introducing these changes will allow us to identify whether prosocial video games can influence charitable donation behavior. Specifically, if prosocial gameplay directly mediates more general prosocial thought content, as suggested by the GLM, we would predict that a prosocial game involving direct help to others would nonetheless increase the likelihood of costly charitable donation to a more distant cause. On the other hand, if the prosocial influence of video games is restricted to easily elicited, low-cost helping, we would expect no effect of prosocial games on donation behavior, as previously reported (Chambers & Ascione, 1986).

Methods

Subjects. 80 participants (ages 18-23, 50% female) will be recruited from the local college community via the campus experiment management system, targeted emails to

the student body, and flyers posted in popular locations on campus and in the surrounding area. The study request will ask students to participate in a one-hour psychology study on video games and math in exchange for a $15 Amazon gift card. Participant data will be excluded if they report having prior connections to Camp Kesem, the nonprofit donation recipient, or if they suspect a connection between video game gameplay and donation behavior. Additionally, participant data will be removed if participants fail to progress in the game disproportionately to the majority of other participants, as this suggests that they were not actually focused during the gameplay period and thus not experiencing the prosocial (or neutral) element of the game. Informed consent will be obtained from all participants, and the study will be approved by the college's Institutional Review Board.

Design. This study will examine the effect of video game gameplay (Prosocial, Neutral) on donation behavior. Condition will be randomly assigned such that there will be 40 subjects per condition, each with roughly equal numbers of male and female participants. The experiment will be run by one male and one female experimenter, with the two experimenters alternating between conducting the experiment. Because previous studies have found differences in charitable donation by gender, we will use a 2 x 2 between-groups design, with Game (Social/Neutral) and Gender (Male/Female) as factors.

Procedure. In this experiment, we will measure whether exposure to a prosocial game increases the likelihood of charitable donation. For our video game conditions, we will utilize *Lemmings* and *Tetris* as our prosocial and neutral video games, which have been commonly used in studies of prosocial gaming (Greitemeyer & Osswald, 2010).

Following gameplay, generosity will be assessed by giving participants the option to donate one-third of their experiment participation reimbursement ($5 out of $15) to a charitable cause. For the charity, we selected Camp Kesem, a local 5C nonprofit that supports children who have a parent affected by cancer. We chose this charity because the intended recipients are not closely tied to students, yet the charity maintains a strong physical and social presence on the 5C campuses, which may increase students' inclination to support this cause (Deb, Gazzale, & Kotchken, 2014).

The experimental procedure is shown in Figure 1. When a participant arrives at the laboratory, he or she will be informed that the aim of the study is to look at the effect of computer game play on math accuracy. The participant will then be asked to complete a consent form and provide demographic information including past gaming experience, age, gender, socioeconomic status, and race, which have previously been shown to be factors in charitable donation behavior (Gentile et al., 2009; Carlo & Randall, 2002; Andreoni & Esterline, 2011; Korndörfer, Egloff, & Schmukle, 2015; Mesch, Rooney, Steinberg, & Denton, 2006). Upon completion of the demographic form, the participant will be asked to go into a separate room to play the assigned video game for 45 minutes. After the participant finishes playing, the Researcher will come into the video game room and ask him or her to complete a set of questionnaires to control for other influences before math ability can be measured. Participants will be given the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), the Perceived Arousal scale (Anderson, Deuser, & DeNeve, 1995), and Reading the Mind in the Eyes (Baron-Cohen, 2001), in order to measure any potential changes in affect, arousal, and/or social cue sensitivity, respectively. Following completion of the questionnaires, the Researcher

will instruct the participant to complete a set of math equations (Figure 2), prioritizing accuracy over speed. The Researcher will then leave the room. The number of math questions is designed to take at least 10 minutes to finish; after 10 minutes, the Researcher will re-enter the room and inform the participant that he or she can stop. The Researcher will then provide a payment form (Figure 3) to the participant and instruct him or her to place the payment form in a locked, slotted box before exiting the test room. To ensure that experimenter demand or social proximity does not increase the likelihood of charitable donation, the Researcher will then once again exit the room.

The payment form will include questions asking for the participant's mailing address, as well as a checkbox that the participant can mark if he or she wants to instead receive a $10 gift card and donate $5 to Camp Kesem (Deb, Gazzale, & Kotchken, 2014). Once the participant places the form in the box and leaves the video game room, the Researcher will debrief the participant on the true nature of the experiment. During the debrief, the participant will also be asked about past involvement with Camp Kesem and if he or she suspected any connection between the video game and donation behavior.

Results

In this experiment, we will test the influence of prosocial game play on charitable donation behavior. Following 45 minutes of either prosocial or neutral gameplay, participants will be given an opportunity to donate part of their experiment participation payment to a local charitable organization. Generosity will be measured in terms of the number of participants opting to donate to the charity in each video game condition. Additionally, we hypothesize that gender may influence donation behavior, as previous

research has found that females outperform males in the likelihood of donating and amount given (Andreoni & Vesterlund, 2001; Mesch, Brown, Moore, & Hayat, 2011; Piper & Schnepf, 2008). While some studies have found that men give larger amounts than women, Piper and Schnepf (2008) and Einolf (2011) suggest that this difference is explained by disparities in income levels.

Statistical analyses will be conducted by entering the number of donations per group into a 2 x 2 between-subjects analysis of covariance (ANCOVA) with Game (Prosocial, Neutral) and Gender (Male, Female) as factors. Additionally, although demographic factors including age, race, and socioeconomic status have previously been found to influence charitable giving (Carlo & Randall, 2002; Andreoni & Esterline, 2011; Korndörfer, Egloff, & Schmukle, 2015; Mesch, Rooney, Steinberg, & Denton, 2006), we do not expect to have the statistical power to distinguish effects of these factors given the relative homogeneity of the student body at the Claremont Colleges along these dimensions. Therefore, age, race, and socioeconomic status will be entered into statistical analyses as covariates of no interest. Finally, past gaming experience, measured by hours played per week, will be controlled for since large amounts of previous gaming exposure could mask the influence of 45 minutes of gaming (Gentile et al., 2009).

Based on past studies on prosocial gaming (Gentile et al., 2009; Greitemeyer & Osswald, 2010), we predict that participants who play the prosocial video game will be more likely to make a donation (Figure 4). We also predict that female participants will be more likely to donate to male participants. However, we do not anticipate that male and female players will be differentially affected by the video game content (Greitemeyer

& Osswald, 2010). Therefore, we expect to find significant main effects of Game and Gender, but no interactions.

Finally, based on Greitemeyer and Osswald's study (2010), we predict that there will be no statistically significant effects of mood, arousal, or affect on the effect of prosocial video games on donation behavior. We will use independent-sample t tests to compare mood, arousal, and affect measures between the two groups. Additionally, if charitable donations arise from access to prosocial thoughts, rather than enhanced sensitivity to social cues, we would expect that there will be no difference between neutral and prosocial groups on the Reading the Mind in the Eyes test. We consider familiarity and past experience with the game as similar to enjoyment of the game, which was also previously found to be adequately accounted for by changes in affect.

Discussion

This study aims to examine the influence of prosocial video games on charitable giving behavior. Although previous studies have found a link between prosocial games and subsequent real-world helping behavior, it is unclear whether these effects would extend to costlier, less proximate types of prosocial behavior. Charitable donations provide a good test case for this question, since the prosocial outcomes of donation are often more abstract, both in time and in the observable effects on recipients, while the costs of donation may be more concrete (Ein-Gar & Levontin, 2013).

Yet charitable donation rates can be increased by direct individual appeals (Schlegelmilch, Love, & Diamantopoulos, 1997), raising concerns for the experimental design as to whether charitable giving behavior may be influenced by other social factors. One potential issue is experimenter demand effects, where participants engage in a

specific behavior based on cues as to what is appropriate from the experimenter (Rosenthal, 1966; Nichols & Maner, 2008), particularly when the gender of participants and experimenter differ (Levine & Lee De Simone, 1991). Also, the nature of the "ask" for donation has previously been shown to influence donation rates and amounts: while making physical avoidance difficult increased the occurrence and amount of charitable donations, verbal asks were seen as too confrontational and diminished the number of people who donated (Andreoni, 2017). For these reasons, in the current experiment the donation request is embedded within a payment form, thereby limiting the role of experimenter demand and the perceived coerciveness of the ask. One last methodological decision is to ask for demographic information early on in the study, far away from the donation request, to minimize demographic priming effects (Steele & Aronson, 1991; Schmader, 2001). However, future experiments could further explore the role of these social factors in charitable donation following prosocial gameplay. Having the donation solicited by an identifiable individual, or manipulating the perceived closeness of the experimenter (e.g., same race, gender, or ethnicity) could potentially interact with the prosocial content of the video game to produce higher donation rates.

The donation recipient, Camp Kesem, is also a notable factor to consider. We wanted to pick a nonprofit that participants would be familiar enough with to care for. At the same time, the nonprofit had to be one that people would not directly benefit from donating to. For this reason, people who volunteer for Camp Kesem or have had past affiliation will be excluded from our data sample. Outside of direct affiliation, there are a few ways in which the selection of Camp Kesem might influence the results. Kessler and Milkman (2016) found that priming identity as a local community member increases the

likelihood of donations, and Oppenheimer and Olivola (2018) found that perceived social distance dramatically influenced donation amounts. Another study found that people seem to donate more money to charities that support their own culture (Jonas, Schimel, Greenberg, & Pyszczynski, 2002). Given that Camp Kesem is an on-campus, annual event with wide publicity, its physical and social proximity to students means that donations will be elicited more easily than for a far-off nonprofit (Deb, Gazzale, & Kotchken, 2014). On the other hand, other recent data suggest that when the recipient is not a single, socially proximate victim, donations may be higher when framed in terms of the charitable organization itself (Ein-Gar & Levontin, 2013). Therefore, further research should manipulate not only the charity identity but also its perceived social and temporal distance to participants. For example, our donation prompt could highlight the case of a specific child who benefited from Camp Kesem, and/or emphasize that funds are needed for an upcoming event. These types of manipulations may further increase the rate of charitable donation, either across all participants or specifically in the prosocial gameplay condition.

We predict that prosocial video games will increase the percentage of people who donate. If we find a difference between prosocial and neutral video game conditions, then this suggests that the prosociality of video games can influence charitable donation behavior. This raises several further questions for future research. First, would these results extend to other costly prosocial behaviors? While charitable donation is costlier than the behaviors studied in past prosocial gaming research, there are still many other prosocial behaviors that require even more investment, such as recurring donations or extended service projects (e.g., international aid campaigns). Looking at prosocial

behaviors that require an extended action or one that occurs >24 hours after the stimulus also has the benefit of examining how long the prosocial effects of video games last. While the GLM suggests that playing video games will increase learning structures, which in turn facilitate prosocial behavior, past research has only focused on actions that immediately follow the prosocial game stimulus. Part of any increase in charitable giving may be due to the learned knowledge structure, as predicted by the GLM, but another factor is the short-term priming influence of the video game on immediate action.

Additionally, though the proposed experiment tests whether or not video games can elicit charitable giving behavior, it does not measure differences in the amount of money donated per person. Previous research has found that the degree of help (e.g., number of pencils picked up) following prosocial gameplay was correlated with the number of prosocial thoughts reported by the participant (Greitemeyer & Osswald, 2010). Thus, individuals who have greater access to prosocial learning structures may show both an increased likelihood of donation and higher monetary donation amounts. A future experiment could assess this by allowing multiple donation options, for example through a larger number of checkboxes (e.g., $2, $5, and $7).

If we fail to find a difference between the two gameplay conditions in terms of charitable donation behavior, this would raise further questions about the extent of prosocial behavior modification by prosocial video games. There are several theoretical and methodological reasons that we might fail to find a difference. First, it is possible that charitable donation behavior in the study is too different from the prosociality elicited by the video game. As discussed before, the GLM describes a process whereby prosocial stimuli develop people's access to prosocial thoughts. It is possible that the cognitive

route necessary for charitable donation behavior follows a different path than other prosocial actions. While actions such as picking up pencils or volunteering are correlated with charitable donation behavior (Jackson, Bachmeier, Wood, & Craft, 1995), the prosocial prompt in gaming may only be enough to trigger those actions and not charitable donation behavior. In particular, previous work has found that empathy may be a factor in providing direct assistance, but not charitable donations (Einolf, 2008; Ein-Gar & Levontin, 2013). If prosocial video games encourage prosocial behavior by increasing empathy (Greitemeyer, Osswald, & Brauer, 2010), it may not be reasonable to expect an effect on charitable donations. Future research should more fully test the role of empathy in charitable donation following prosocial gameplay, for example by correlating self-reported empathy with charitable donation rates.

Second, parting ways with money might come at too high at cost for participants. Past research suggests that costlier situations are less likely to motivate prosocial behavior (Dovidio, Piliavin, Gaertner, Schroeder, & Clark, 1981; Lee & Murnighan, 2001), so people's prosociality may be limited to actions requiring a lower commitment. One way to tease out this motivation is by allowing participants to write in an amount to donate rather than check a box. For example, the form could say "please indicate how much you would like to donate to Camp Kesem ($0-15). If the manifestation of prosocial thoughts was depressed by the costliness of donating, we would still suspect a difference in donation amounts between the prosocial condition and neutral condition. Another way to confirm this hypothesis is by including a follow-up survey for participants on why they chose to not donate. The survey can contain preset options drawing on both social motivations (e.g., I did not feel like it, the cause did not matter to me) and financial

constraints (e.g., donating was too costly). Participants would be encouraged to choose the option that best described their thought process. Those in the neutral condition might cite reasons related to a lack of social motivation, while those with the prosocial condition might be more likely to cite the cost.

Another set of reasons why we might have failed to find the hypothesized results is due to limitations in the experimental design. Following concerns over the cost of money, there are other ways in which participant perception of the money might limit their decision to donate. Charitable giving behavior was operationalized as checking a box to donate a preset $5. A preset amount is utilized so that it is as simple as possible for people to donate (Croson & Shang, 2007). While $5 is a small amount on its own, it could also be seen as too costly given that it is one third of the total income for the activity (Leviveld & Risselada, 2017). Another concern is the lack of physical ownership over the money might encourage higher donation rates across both groups (Bateman, Kahneman, Munro, Starmer, & Sugden, 2005). As participants have yet to actually receive any physical money when asked to donate, they might be more comfortable giving money away than if they were asked to donate after the money was in their hands.

Finally, we recommend extending the study to a wider demographic population. Particularly at the Claremont Colleges, many students have strong financial support networks, which may lead them to devalue the money relative to other groups (e.g., community sample) (Champ & Bishop, 2001). Likewise, race and socioeconomic status have also been shown to influence charitable donation, but could not be studied here due to the limited subject pool. Using a larger sample with more varied demographics could

reveal interactions between demographic factors and the effect of video game play on likelihood to donate.

Understanding how video games can be leveraged to instill charitable giving behavior in players may have important real-world implications, potentially facilitating access to a currently undertapped donor population. This is an urgent endeavor, as the number of donors to charity has been shrinking every year since 2008 (Osili & Zarins, 2018). Furthermore, the number of existing nonprofits increases year to year, resulting in an overall smaller percentage of money being donated per individual nonprofit (Erynn & Hyunseok, 1970). While overall donations have still been increasing due to larger sums of money from those who are donating, growing reliance on fewer numbers of people is antithetical to sustainable economic theory.

This is where prosocial video games can play a role. Although millennials compose 29% of the United States population, they only make up 11% of all donations ("2018 Online Giving Statistics, Trends & Data: The Ultimate List of Giving Stats," 2019). While the weaker financial status of this generation undoubtedly is a factor in their lower charitable donations, millennials are nonetheless the greatest source of revenue in terms of video game purchasing (Frank, 2016). Thus, out of the donor eligible population, meaning those older than 18, millennials are a generation that proportionally is not giving as much money yet is playing more video games. If prosocial game play can be shown to encourage charitable donation, prosocial games could potentially become a valuable new tool for charitable organizations to reach millennial consumers.

Conclusion

Despite the negative press associating video games and violence, video games can also encourage prosocial behaviors. However, previous work has not tested whether prosocial effects of gameplay extend to charitable donation, which is typically more costly and less proximate than other altruistic behaviors. Demonstrating a causal effect of prosocial video games on generosity would extend our understanding of how prosocial thoughts can be encouraged, with potential applications to tools for eliciting charitable donation behavior.

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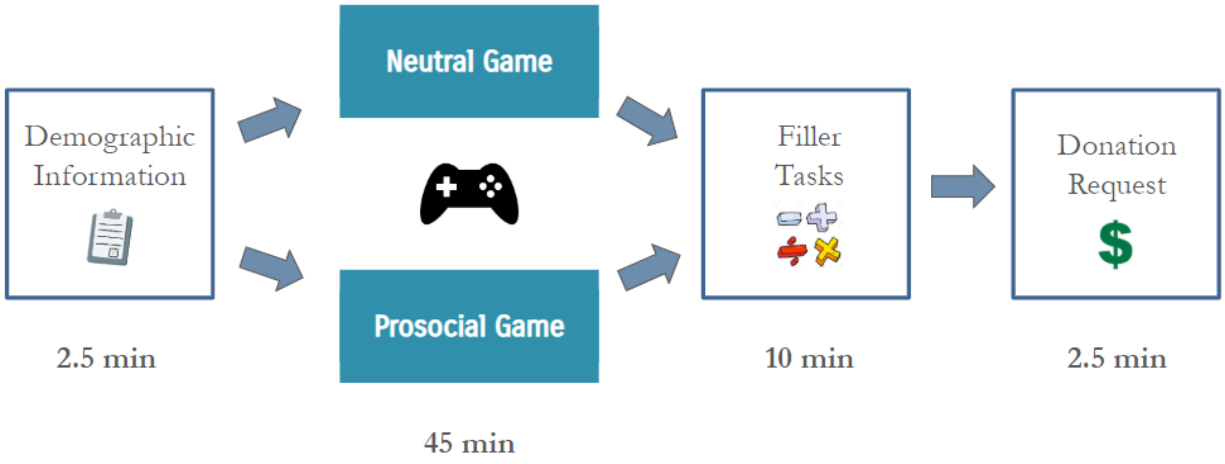

Figure 1. Timeline of experimental procedure. Participants will be randomly assigned to play a prosocial or neutral video game for 45 min. Following gameplay, they will complete a worksheet of math calculations for 10 min ("Filler tasks") in order to maintain the stated justification for the study, before completing the real experimental measure of interest by choosing whether to donate part of their experimental reimbursement to a local charity.

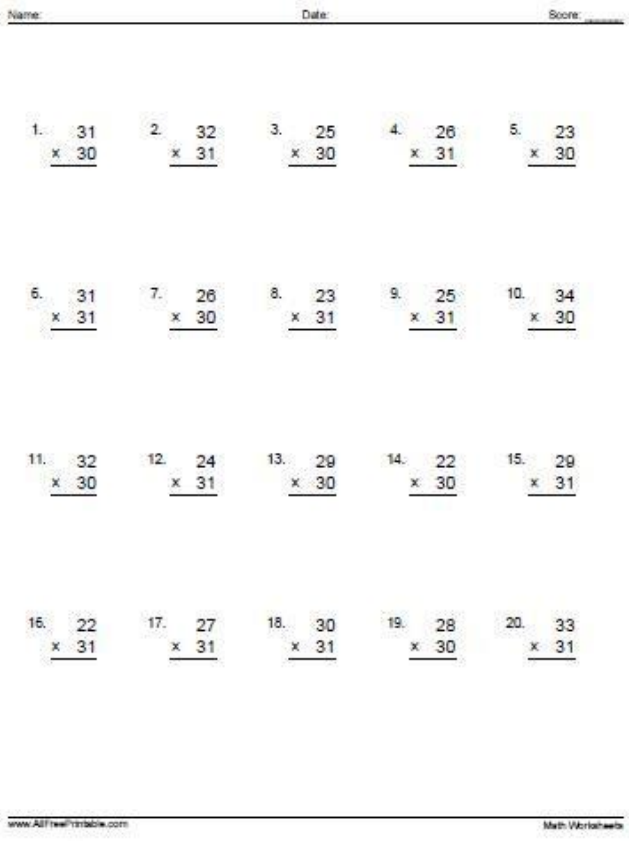
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Figure 2. Sample of the math equations used as the filler task.

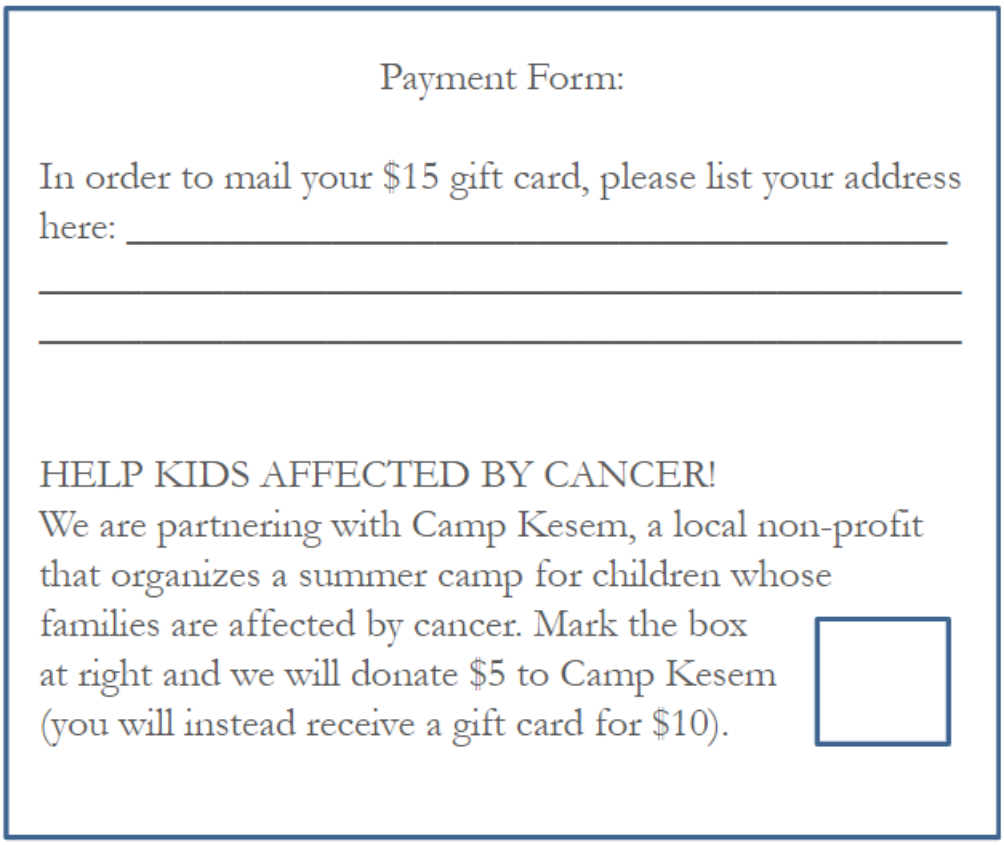

Figure 3. Sample payment form given to participants in order to measure willingness to make a charitable donation.

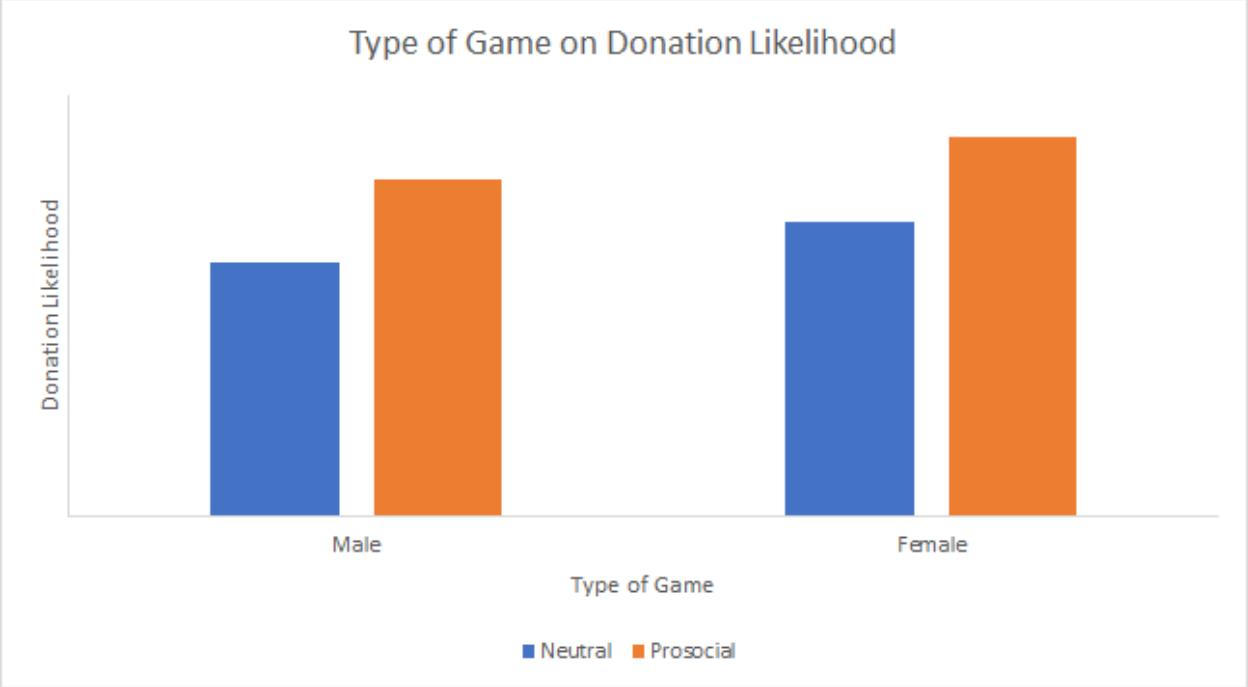

Figure 4. Projected study results, where there are main effects of type of game and of gender but no interaction between the two.