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# The No-Effect of Player Role in Digital Games on Prosocial Behavior

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## Abstract

In the past few years, several studies addressed the relation between game content and prosocial behavior. Although several evidences were found, the relation between those variables is not fully understood. The aim of this study is to investigate the effect of different roles played on prosocial behavior. In experiment 1, participants played either a violent or a prosocial role on the same game, and helping behavior and intention were measured. Results did not show the expected relation based on the evidence of the literature. In order to further investigate the evidence found, a second experiment was designed to test the effect of role played on both prosocial behavior and accessibility to prosocial thoughts. Again, results were not consistent with previous studies. Both experiments suggest the consideration of alternative interpretations, and raise questions about the relevance of the role played, game content and moderation variables on the explanation of this effect.

**Keywords**: Prosocial behavior, video games, General Learning Model.

# Ausência de Efeito do Papel do Jogador de Jogos Digitais no Comportamento Prosocial

## Resumo

Nos últimos anos, diversos estudos enfocaram a relação entre o conteúdo de jogos e o comportamento prosocial. Apesar de várias evidências terem sido encontradas, a relação entre tais variáveis não é completamente compreendida. O objetivo deste estudo é investigar o efeito de diferentes papéis jogados no comportamento prosocial. No experimento 1, participantes jogaram ou um papel violento ou um prosocial em um mesmo jogo, e comportamento e intenção de ajuda foram mensurados. Os resultados não evidenciaram a relação esperada em função das evidências da literatura. Com o intuito de investigar mais a fundo as evidências encontradas, um segundo experimento foi concebido para testar o efeito do papel jogado tanto no comportamento prosocial quanto na acessibilidade a cognições prosociais. Nova-

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mente, os resultados não foram consistentes com estudos anteriores. Ambos os experimentos sugerem a consideração de explicações alternativas, e levantam questões acerca da relevância do papel jogado, do conteúdo do jogo e de variáveis de moderação na explicação deste efeito.

**Palavras-chave**: Comportamento prosocial, vídeo games, Modelo Geral de Aprendizagem.

## La Ausencia de Efecto de la Función del Jugador de Videojuegos en el Comportamiento Prosocial

### Resumen

En los últimos años, muchos estudios se centran en la relación entre el contenido de los juegos y el comportamiento prosocial. Aunque se han encontrado varias evidencias, la relación entre estas variables no se entiende por completo. El objetivo de este estudio es investigar el efecto de diferentes funciones que desempeñan en el comportamiento prosocial. En el Experimento 1, los participantes desempeñan un papel o violento o prosocial en el mismo juego, y se midieron el comportamiento y la intención de ayudar. Los resultados no muestran la relación esperada sobre la base de evidencia de la literatura. Experimento 2 fue diseñado para investigar el efecto de la función que desempeña tanto en la conducta prosocial y la accesibilidad de las cogniciones prosociales. Una vez más, los resultados no fueron consistentes con estudios previos. Ambos experimentos sugieren la consideración de explicaciones alternativas, y plantean preguntas sobre la relevancia del papel que desempeñan, el contenido del juego y las variables moderadoras en la explicación de este efecto.

**Palabras clave**: Comportamiento prosocial, videojuegos, Modelo General de Aprendizaje.

The effect of several kinds of media has been object of inquiry for decades in an attempt to discover the impact of radio, TV, cinema, and video game stimulation on human behavior. The latter has been in the center of the spotlight due to significant growth of the gaming industry and its attractiveness to children and adolescents (Mäyrä, 2008). The president of the United States, for example, suggested that Congress should allocate resources to study the massive effects of digital games on human behavior to better guide the creation of public policies related to violence prevention (Molina, 2013).

In psychology, the main focus of research has been on the negative aspects of video game playing, because of its possible influence on real life situations (Anderson & Bushman, 2001; Anderson et al., 2010; Gentile & Anderson, 2006). In past years, however, several studies extended the scope of video game research, including behavior like donating and helping (Gentile et al., 2009; Greitemeyer & Osswald, 2010; Greitemeyer, 2011; Prot et al., 2013; Saleem, Anderson, & Gentile, 2012). Even though a constant growth of research has been considering the association between video games and behavior (Anderson et al., 2010), several studies present distinct evidence, suggesting that this relationship is not fully understood (Ferguson, Garza, Jerabeck, Ramos, & Galindo, 2013; Ferguson, 2010).

Studies about the influence of video games raise several questions: Can digital games elicit prosocial behavior instead of aggressive ones? Does the role played in the game variably influence the player's behavior? Recent research shows that this association indeed occurs, but the incipient nature of this line of research still raises more questions than answers. The present research focuses the impact of gaming on *prosocial behavior*, defined as a set of behaviors executed by one individual for the benefit of others (Mikulincer & Shaver, 2010; Penner, Dovidio, Piliavin, & Schroeder, 2005), and aims to investigate the association between the role played in a digital game and prosocial behavior.

### *Digital Games and Prosocial Behavior, Cognition, and Affect*

Several studies were developed to test if the nature of the digital game – whether violent, neutral, or prosocial – could affect the occurrence of prosocial outcomes. Considering the effect of digital games, previous studies support the conclusion that violent games (in which the gamer is asked to kill, hurt, or harm another character) tend to reduce prosocial behavior (Anderson & Bushman, 2001; Anderson et al., 2010; Chambers & Ascione, 2001). In opposition to this, the exposure to a prosocial game (in which the goal is to protect or benefit another character) is also associated with the intention to help another person in a situation outside the game (Greitemeyer & Osswald, 2010; Jin, 2011; Peng, Lee, & Heeter, 2010), select easier puzzles for another participant (Gentile et al., 2009; Saleem, Anderson, & Gentile, 2012), help a research confederate to pick up fallen pencils, or help a harassed woman in a conflict situation (Greitemeyer & Osswald, 2010). Based on evidence of experimental studies, even a short exposition to video game would be sufficient to elicit congruent behavior in a proximal situation, even with game exposition varying from 5 to 30 minutes (e.g., Ewoldsen et al., 2012; Greitemeyer, Agthe, Turner, & Gschwendtner, 2011; Greitemeyer, Traut-Mattausch, & Osswald, 2012; Greitemeyer & Osswald, 2010; Happ, Melzer, & Steffgen, 2014; Rosenberg, Baughman, & Bailenson, 2013; Velez, Mahood, Ewoldsen, & Moyer-gusé, 2014; Whitaker & Bushman, 2012). More important, the continuous exposition of prosocial or violent games could strengthen this effect: cross-cultural and longitudinal studies suggest the existence of a relation between amount and quality of game consumption and prosocial behavior (Anderson et al., 2010; Gentile et al., 2009; Prot et al., 2013).

Likewise, exposure to a prosocial game tends to reduce aggressive cognitions and increase accessibility to prosocial ones. Participants tend, for example, to complete word fragments that feature ambiguous stories with prosocial contents (Greitemeyer et al., 2011; Greitemeyer & Osswald, 2009, 2010, 2011). Considering the affective outcome, research results also suggests that violent and prosocial content affects the increase of negative and positive affects, respectively (Carnagey & Anderson, 2005; Greitemeyer, 2011).

In an attempt to summarize evidence, meta-analytic studies have supported the existence of prosocial gaming effects when considering prosocial behavior, prosocial cognition, as well as positive affects. Although the amount of experimental studies considered was relatively small (19 experimental studies concerning prosocial outcomes), authors have considered results convincing enough to support the existence of these effects (Greitemeyer & Mügge, 2014, with a corrigendum by Greitemeyer and Mügge, 2015). In this meta-analysis, the authors reviewed only published studies found in PsycINFO, Scopus and Google Scholar as source databases, and no unpublished studies were included. In an attempt to check for publication bias effects, the authors computed Rosenthal's fail-safe *N* and Orwin's fail-safe *N* and concluded that no publication bias were found for studies that addressed the influence of prosocial gaming on prosocial outcomes.

This conclusion, however, is not consensual among researchers. Some authors suggest that the use of fail-safe procedures do not attenuate another effects that could be associated with publication bias, such as questionable research practices known as p-hacking (Simmons, Nelson, & Simonsohn, 2011; Simonsohn, Nelson, & Simmons, 2013). Other researchers, specifically concerned with the influence of digital games, have also stated that the observed effect of video games (especially violent games) on behavior is actually due to other variables, such as dispositional traits (Ferguson, San Miguel, Garza, & Jerabeck, 2012) and player goals (Denzler, Häfner, & Förster, 2011). Others fail to find the expected effects (Gunter & Daly, 2012; Tear & Nielsen, 2013) and question the evidence from the literature arguing about the validity of the measures used, the effect sizes (Malte Elson &

Ferguson, 2014; Malte Elson, Mohseni, Breuer, Scharkow, & Quandt, 2014), and the possibility of a publication bias on studies concerning violent video game effects (Ferguson, 2007). Although most of the criticisms focus on the effect of violent video games, it is reasonable to argue that studies of prosocial games could also be affected by those limitations. For example, several studies failed to find the expected effect of games on prosocial outcomes (Sestir & Bartholow, 2010; Tear & Nielsen, 2013, 2014; Valadez & Ferguson, 2012). This contradictory set of evidence suggests there are still unresolved obstacles to address before assuming a causal relationship between video game content and prosocial (or aggressive) outcomes.

One challenge in studying the influence of digital games is the choice of stimuli used to prime the intended concept, especially because digital games have several characteristics that differentiate themselves: soundtrack and audio effects, narrative, game mechanics, reward and punishment systems, and so on. All those differences should be taken into account when selecting different games to be used on experimental conditions and when pairing the game stimuli with the psychological process of interest (Järvelä, Ekman, Kivikangas, & Ravaja, 2014). However, the interaction between those characteristics was not fully considered in previous studies, and the question about how much they are used to help the researcher on stimuli selection remains. Researchers commonly use the strategy to investigate the desirable effect using several different games, arguing that if the effect is found, the relevance of a game-specific attribute would be diminished.

A remaining question is, because different games are used, several unpredicted variables could interfere with the relation between the independent and dependent variables, resulting in unintended moderation and mediation effects. Barlett, Anderson and Swing (2009), for example, summarized evidence from different previous studies, showing that the graphic quality, interface characteristics (i.e., joysticks or keyboards), the amount of blood in the game, the kind of rewarded behavior, the game point of view, and level of realism could be somehow associated to observed changes in cognition, affect, and behavior. Other studies show that variables like difficulty, pace of action and competitiveness could be more important than game content to explain the common outcomes (Adachi & Willoughby, 2011; Elson, Breuer, Looy, Kneer, & Quandt, 2013; Kneer, Elson, & Knapp, 2016).

Besides that, different context variables could moderate or mediate the effect investigated. Studies suggest, for example, that playing in a competitive or collaborative way could modify the chances of prosocial or antisocial behaviors to occur. Cooperation games, in this sense, could be associated with more prosocial behaviors (Ewoldsen et al., 2012b; Greitemeyer & Cox, 2013; Greitemeyer et al., 2012). Other studies shows that contextual characteristics of the avatar played (Dolgov, Graves, Nearents, Schwark, & Volkman, 2014) and character motivation (Gitter, Ewell, Guadagno, Stillman, & Baumeister, 2013) also could play a significant role on the occurrence of prosocial behavior outside the game. Those evidences suggest that the context of play could be an important variable for understanding the influence of video games on behavior.

Considering the possible effects of game characteristics on this research field would help to clarify the relationships between the type of game and their impact on players. Several studies about prosocial and aggressive behavior evaluate the player's perceptions of game characteristics (level of violence, excitement, pleasure and difficulty, for example) as a strategy to evaluate possible game differences. However, we argue that players do not consciously assess some of the dimensions of the digital game or could not precisely evaluate them. Furthermore, if one experiment finds a statistically significant difference between violent or prosocial games on prosocial behavior, does this difference occur because of the nature of the game (either violent or prosocial) or because one of the many characteristics that distinguish the two games? It

is not clear, considering previous studies, if the related effect would be found in a single game in which it is possible to play different roles.

To investigate this research gap, two ex-periments were done. In the first one, we manipulated the role of the participants (violent or prosocial) on a single game and assessed its impact on prosocial behavior towards a confederate. Based on the results of this experiment, we conducted a second experiment, adding a measure of accessibility to prosocial cognitions.

## Experiment 1

The first experiment was designed to test the hypothesis that the role played would influence both the occurrence of prosocial behavior and the intention to help. More specifically, it was expected that players who were asked to engage in a prosocial role inside the game would show more prosocial behavior than those who played the violent role. To exclusively investigate the impact of the condition (prosocial or violent) on participants' behavior, we used the same game in both conditions. We also expected that intention to help would show a similar pattern.

## Method

### *Participants*

Sixty-one university students participated in this experiment. However, six became suspicious of the manipulation used and were excluded from the final sample. This data was collected in the debriefing stage, a strategy that is consistent with previous studies (e.g., Rosenberg et al., 2013). The remaining 55 (24 women) averaged 20.4 years in age (*SD* = 1.90 years) and, although previous experience with digital games were not required, 29 of them declared they played some kind of game regularly (none had any previous experience with the game used as stimuli). All participants signed the informed consent document, and were clarified about ethical issues concerning confidentiality, right to withdraw at any time, and potential risks, before the beginning of the experiment. None of them received any compensation or reward to participate in the study.

### *Materials and Measures*

*Game Stimuli*. To insure uniform aspects of the game, except for the role assigned to the participant, the game *Fat Princess* (Titan Studios) for PlayStation® 3 was used for both conditions. This game consists of a competition between the armies of two castles. The main objective is to rescue the team's princess while making it difficult for the enemy to carry their captured princess back to the home castle. The game allows the player to assume different roles, such as wizards, warriors, clerics, and workers, which all have power to harm enemies, heal allies, or improve the castle's defenses. In this experiment, the configuration used for the off-line game consisted of 31 characters (all controlled by the game, except for the participant's avatar) using the default game map.

*Prosocial Personality Battery* (Penner, Fritzsche, Craiger, & Freifeld, 1995). In order to keep the questionnaires as short as possible, and considering the nature of all the factors, participants answered only the Helpfulness dimension (eight items) composed of two factors: Personal Distress (three items, $\alpha = .44$) and Self-Reported Altruism (five items, $\alpha = .45$) adapted for Brazilian Portuguese speakers. On the adaptation study (Rabelo & Pilati, 2013), alphas for those factors were .75 and .74, respectively.

*Positive and Negative Affect Schedule* (PANAS). After playing the game, and immediately after the dependent variable was measured, participants used a Portuguese version (Galinha & Pais-Ribeiro, 2005) of the PANAS 20-item scale to rate their specific emotional state at that moment. The scores were compiled into two factors for affect, positive (10 items, $\alpha = .87$) and negative (10 items, $\alpha = .82$).

*Game Evaluation Questionnaire*. Together with PANAS, participants were asked to evaluate how difficult, frustrating, arousing, violent, and pleasant the game was, using a 7-item scale.

*Profile Questionnaire*. This questionnaire consisted of questions related to demographic characteristics and questions regarding partici-

pant's gaming habits (if they play regularly or not, how much they play on a weekly basis, and which games they played most frequently). Also, participants were asked to reveal if they intended to participate in other studies and how many hours they could dedicate to that activity. This was used as a measure of helping intention because no compensation or reward (like course credits or money) was promised for the participation. This measure is similar with those used in previous studies (Greitemeyer & Osswald, 2010; Stenico & Greitemeyer, 2014).

*Prosocial Behavior Measure*. As a measure of prosocial behavior, whether the participant helped or not (opening the door for the confederate leave the room) was recorded. For a more detailed description, see the Procedure below.

## Procedure

In this experimental design, participants believed they would be participating in an experiment about the impact of new technologies in daily activities. The first task was described as a motor coordination task using a digital game. Data were collected individually, and each participant was randomly assigned to one of two conditions: a violent condition, in which the participants were requested to play the role of a warrior killing as many enemies as possible, or a prosocial condition, in which the participants were given the role of a worker, collecting materials to upgrade the castle and their teammate's skills. These two roles were selected to put the participants in a role closer from antisocial and prosocial behaviors in game, respectively, but maintaining the same visual and auditory stimuli in both conditions because both roles were played in the same map of the game where all the other roles were been acted (by the others characters controlled by the Artificial Intelligence of the game).

After the assignment of the condition, the researcher gave the participants general instruction about the commands necessary to play the selected role in the game. It is important to note that participants were given only information about the role they were about to play; no additional information concerning the game main objectives or other roles were given. After the participant declared they were ready the game began. All the participants played for a 10-minute period and their performance was recorded. In that period, if the participants deviated from the selected role, the researcher asked them to continue to pursue the goal consistent with the role.

Following this task, the researcher informed that it was necessary to fill out a game evaluation questionnaire, which he would have to get from another room because he had forgotten to bring it. In this moment, a confederate knocked on the door, asking to enter the room to get some materials. After the researcher gave permission, the confederate crossed the room and got two document boxes. Then the confederate tried to open the exit door (without success). We evaluated the dependent variable, prosocial behavior, at this time by observing whether the participant would help the confederate open the door. Four additional pieces of information are worthy to mention:

1. The researcher's exit to the other room was made in an attempt to minimize influence on the participant behavior as well as the confederate's. We believed that the presence of the researcher could elicit the participant to behave properly (within social norms) creating a social desirability effect;
2. The confederate, when trying to open the door, did not establish any kind of visual contact or verbal communication with the participant;
3. If the participant did not help the confederate within five seconds, the confederate would put the boxes on the ground, open the door, get the boxes again, and leave. Assistance attempts after this procedure were not computed as a prosocial behavior; and
4. Both the confederate and the participant were blind to the experimental condition assigned to the participant to minimize possible demand effects.

After this procedure, the participants were asked to fill out the game assessment, PANAS,

demographic and BPP questionnaires. Then, participants were debriefed for suspicion and thanked.

### *Statistical Analysis*

The main analysis consisted of chi-square and one-way ANOVAs. All assumptions were tested prior to hypothesis testing. In the case of chi-squares, all conditions were satisfied. The assumption of normality was not met for all continuous variables. To investigate the best analysis solution, we also performed Mann-Whitney tests to check if the results of the non-parametric tests would have a similar direction and significance to the ANOVAs. Considering that non-parametric tests showed similar results, and considering that ANOVA is robust to normality violation when sample sizes are similar (Field, 2009), only the results for ANOVAs were presented.

## Results

A chi-square test was conducted to evaluate the relation between the experimental conditions and the occurrence of prosocial behavior. As Figure 1 suggests, there was a significant difference between conditions, $\chi^2(1) = 5.35$, $p = .021$, O*R* = 3.75, 95% CI [1.19, 11.77]. However, this difference did not occur in the expected direction: the odds for participants who played the violent role (warrior) to help the confederate was 3.75 higher than for those who played the prosocial role (worker).

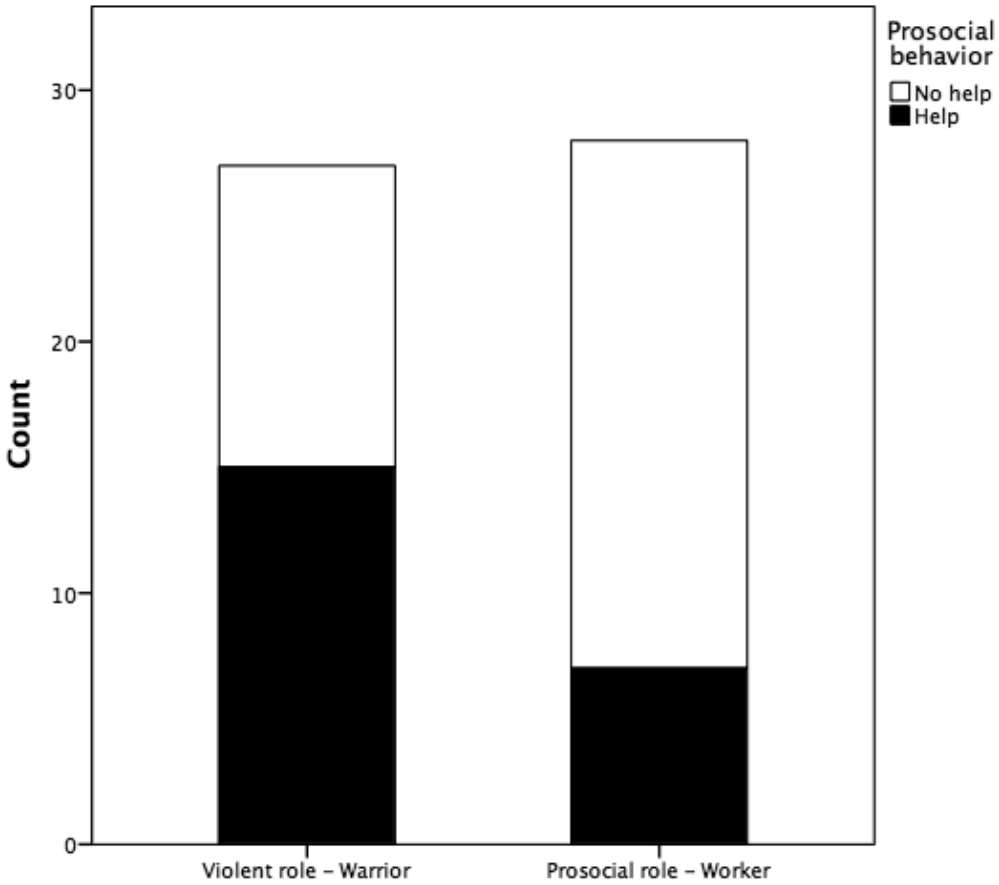


**Figure 1. Distribution of prosocial behavior between violent (*N* = 27) and prosocial (*N* = 28) conditions.**

When comparing the intention to help between both groups, the chi-square test did not reach statistical significance, $\chi^2(1) = .46$, $p = .50$, OR = .67, 95% CI [0.21, 2.15]. Both groups tended to indicate they would participate in another research study in the future. Considering

situations in which participants declared intention to help (and considering a negative declaration as a value of 0 hours), analysis of variance did not show significant results, $F(1, 53) = .83$, $p = .366$, $r = 0.12$, 95% CI [-0.15, 0.38].

To test the existence of different game evaluations between conditions, one-way ANOVAs were conducted for level of perceived violence, difficulty, arousal, frustration, and pleasure. Significant results were found for (a) difficulty, in which players perceived the violent role as more difficult ($M = 3.93$, $SD = 1.27$) than the prosocial role ($M = 2.79$, $SD = .92$), $F(1, 53) = 14.67$, $p < .001$, $r = .49$, 95% CI [0.24, 0.67], and (b) frustration, in which participants declared being more frustrated with the violent role ($M = 3.85$, $SD = 1.70$) than the prosocial one ($M = 2.14$, $SD = 1.27$,), $F(1, 53) = 17.91$, $p < .001$, $r = .49$, 95% CI [0.25, 0.68]. Analysis of the effect of the condition on positive and negative affect showed no significant results, $F(1, 53) = .18$, $p = .723$, $r = -.05$, 95% CI [-0.30, 0.21] and $F(1, 53) = 0.01$, $p = .906$, $r = -.02$, 95% CI [-0.27, 0.24], respectively.

Moderation analysis were made in order to check if variables antecedent to the experimental study could influence the results. The amount of time participants usually spend playing video game could influence how the exposure to a violent or prosocial in-game role affect his or her helping behavior. A dispositional prosocial tendency could also be relevant; participants with a more prosocial personality could be more affected by the video game content. However, no significant results were found considering both variables.

## Discussion

The results from Experiment 1 did not support our initial prediction that a prosocial role in the game could be related to the occurrence of prosocial behavior, nor the hypothesis that there would be an evident relationship between prosocial role and intention to help. These results contradict previous evidence regarding the influence of digital games on behavior and affect (Anderson & Bushman, 2001; Anderson et al., 2010; Gentile & Anderson, 2006; Gentile et al., 2009; Greitemeyer et al., 2011; Greitemeyer & Mügge, 2014; Greitemeyer & Osswald, 2009, 2010; Swing, Gentile, & Anderson, 2009).

A possible explanation involves the impact of the violent game on a participant's self-evaluation. In this sense, prosocial behavior could be elicited as a reaction to the violent behavior manifested in the game as an attempt to balance individual's self-concept (Gollwitzer & Melzer, 2012; Jin, 2011) and to compensate for the eventual negative state elicited by those violent behaviors in-game. Also, the differences found regarding participant evaluation of game frustration and difficulty could also negatively influence how participants perceive themselves; the prosocial behavior could be a reactive attempt to restore a positive perspective. If this explanation is true, it is reasonable to expect that dispositional traits associated with the concern with other's well-being and how others judge one's behavior could be relevant to understand the impact of video game content on participant's behavior.

## Experiment 2

To better investigate those effects, we designed a second experiment in an attempt to address some limitations from Experiment 1. First, we suspected that the role chosen for the prosocial condition could not be adequate, although the worker could be seen as a prosocial role, it did not directly affect another teammate. The act of improving the castle's defenses and structures could be seen not as a prosocial role but just as an auxiliary one. Furthermore, this role could have put the participant outside the "real action", creating more of a neutral role than a prosocial one. If it is the case, the role used in the conditions of Experiment 1 could not activate the cognitions, affects, and arousal consistent with a prosocial role, affecting the odds to help the confederate. To solve this issue, we selected a more direct prosocial role to implement in Experiment 2, in which the participant was asked to heal and keep alive other teammates during the battle.

Another modification was the addition of a lexical decision task as an attempt to measure the impact of the role played on a cognitive level. Cognition is viewed as an important mediator between video game content and prosocial behavior (Greitemeyer & Mügge, 2014; Greitemeyer & Osswald, 2010). We expected, together with the previous hypothesis, that the prosocial role would activate more prosocial cognitions than the violent one.

We continued to investigate the impact of prosocial and violent role on prosocial behavior. The design used was similar to Experiment 1. Furthermore, accessibility to prosocial or violent cognitions was included as another dependent variable, consistent with previous research that related the influence of different digital games on violent and prosocial cognitions (Anderson & Bushman, 2001; Anderson et al., 2010; Greitemeyer & Mügge, 2014). In sum, we expected that:

1. When playing in a prosocial condition, participants would show more prosocial behavior than in the violent condition;
2. The prosocial condition would lead to more intention to help than the violent condition; and
3. Participants within the prosocial condition would show more accessibility to prosocial cognitions than those in the violent condition.

## Method

### Participants

Seventy-seven university students were invited to participate. Due to hardware problems during the experiment, five cases were excluded, resulting in a final sample of 72 cases. The sample consisted of 40 males, with ages ranging from 17 to 30 years, with a mean of 20.35 (*SD* = 2.50). Considering previous gaming experience, fifty-eight of them (80.6%) declared they played some kind of digital game regularly on different artifacts (cell phones, game consoles, or personal computers).

### Material and Measures

As mentioned before, this experiment used the same game stimuli as Experiment 1; we changed only the prosocial role participants could take (from worker to cleric, whose role consisted the use of healing powers that kept other team members, controlled by the computer, alive). The measures for prosociality, positive and negative affect, game evaluation, prosocial behavior and profile questionnaire were the same of Experiment 1. The measure of intention to help was recorded on a 7-point Likert scale.

*Cognitive Accessibility*. Measured while involved in a lexical decision task, participants had to judge – as fast as possible – whether each stimulus presented was a word. Twenty-four stimuli were divided into three categories: target words (prosocial words), neutral words (names of office equipment), and nonwords (strings of letters that, although constructed respecting Brazilian Portuguese grammar rules, were not words). Responses were presented and registered within Inquisit software. Before the analysis, both errors and outliers were excluded (which resulted in an exclusion of responses beyond 2.5 *SD* from the mean). Participants' accuracy was also checked, and no case was excluded, considering that all participants' rates were above 80% accuracy. At last, a 1/RT transformation was computed to eliminate the positive skew and better fit the data on a normal distribution pattern (Bösche, 2010).

*Big Five's Agreeableness Scale*. A 5-item questionnaire adapted for Brazilian Portuguese speakers (Andrade, 2008). Participants were asked to rate how closely the sentences resembled them using a 5-point Likert scale ($\alpha = .62$). Agreeableness is related to one's perception of others and concern for their well-being, and is frequently related to empathy, cooperation, and several types of prosocial behavior.

### Procedure

The initial procedures regarding invitation and basic information were similar to Experiment 1. Participants were assigned to one of the

two experimental conditions: In the violent condition, participants played the role of the warrior and had to kill as many enemies as possible. In the prosocial condition, participants were asked to play as a cleric and heal allies, keeping them alive. After the gaming period, participants were asked to evaluate the game, and the prosocial behavior measure was collected. After the game evaluation, participants were informed that they would play another game, one testing reaction time, on the computer. After the equipment set-up, participants received instructions and played the lexical decision task. Upon finishing it, they were asked to fill out the other measures, debriefed and thanked.

### *Statistical Analysis*

Similarly to Experiment 1, and considering that all assumptions were tested and met for all variables, one-way ANOVAs and chi-square tests were used in the main analysis. In the exploratory analysis, we performed logistic regressions in order to test for moderation.

## Results

### *Main Analysis*

A one-way ANOVA showed no significant effect of experimental conditions on the evaluation of difficulty, pleasantness, frustration, arousal, or violence level, neither did the mean scores of Prosociality and Agreeableness show any effect of sex, age, and gaming habits (all $p > .05$). Therefore, we can suppose that the experimental conditions had similar groups regarding dispositional traits of interest, and that the only difference in game conditions was the role participants had to play. Debriefing analysis showed the participants were not suspicions regarding experiment design, relation between measures or confederate association with the research.

In contrast to Experiment 1, the role played in the game did not seem to be related to a more frequent prosocial behavior, $\chi^2(1) = 0.0$, $p = .984$. Analysis of helping intention also did not show significant differences between groups, neither for the intention itself, $F(1, 69) = 2.48$, $p = .120$, $r = .19$, 95% CI [-0.05, 0.41], nor the amount of time dedicated to help, $F(1, 69) = 0.19$, $p = .666$, $r = .05$, 95% CI [-0.19, 0.28]. For the affective dimension, one-way ANOVAs did not show the existence of statistical differences between conditions considering positive or negative affects, $F(1, 70) = 2.13$, $p = .149$, $r = .17$, 95% CI [-0.06, 0.39] and $F(1, 70) = .21$, $p = .650$, $r = .06$, 95% CI [-0.17, 0.29], respectively.

For the cognitive accessibility measure, we executed a mixed repeated measures analysis, considering response times for prosocial, neutral and nonwords as a within-subject factor, and the role played as a between-subject factor. Considering the comparison of latency between word type alone (prosocial words, neutral words and nonwords), results showed a significant difference between word categories, $F(2, 140) = 312.04$, $p < .001$, $r = .83$, 95% CI [0.77, 0.87], in which words (prosocial or neutral) were classified faster than nonwords. However, analysis of between-subject effects showed no significant results, $F(1, 70) = 0.2$, $p = .656$, $r = .005$, 95% CI [-.23, .24].

### *Exploratory Analysis*

Based on the findings of Experiment 1, moderation analyses were conducted considering Prosociality and Agreeableness as possible moderators for the relationship between video game content and prosocial behavior. For each dispositional trait, both latter variables were entered in the first step of the regression, and the interaction between each trait and experimental condition were added. When prosociality was examined, the logistic regression – considering the interaction between predictions – showed no significant results for prosociality (all $p_s > .05$). However, when considering the relationships between the experimental conditions, Agreeableness and Prosociality, analyses suggest a moderation effect of Agreeableness. When considering only the experimental condition and Agreeableness as predictors, the model was not

**Table 1**
**Summary of Logistic Regression Analysis Predicting Prosocial Behavior**

| | | | | | | | 95% C.I. for EXP(*B*) | |
|---|---|---|---|---|---|---|---|---|
| Predictor | *B* | S.E. | Wald | *df* | Sig. | Exp(*B*) | Lower | Upper |
| Exp_condition | -11.193 | 4.801 | 5.434 | 1 | .020 | .000 | .000 | .168 |
| Agreeableness | -2.346 | 1.084 | 4.689 | 1 | .030 | .096 | .011 | .800 |
| Exp_condition by Agreeableness | 2.874 | 1.225 | 5.509 | 1 | .019 | 17.713 | 1.607 | 195.274 |
| Constant | 9.069 | 4.264 | 4.522 | 1 | .033 | 8679.972 | | |

*Note*. Nagelkerke R square: 0.128.

significant, $\chi^2(2) = 0.34$, $p = .844$, as well as with the insertion of the interaction, $\chi^2(3) = 7.14$, $p = .068$ (Table 1).

For participants high in this trait, results suggest that the role played had a different effect on prosocial behavior: In the violent condition, prosocial behavior was more frequent when the Agreeableness score was high. In the prosocial condition, prosocial behavior was more closely associated with lower scores of Agreeableness.

## Discussion

Experiment 2 showed no significant results concerning the influence of roles played on prosocial behavior, intention to help, positive and negative affect or accessibility of prosocial cognition, which did not support our hypothesis. As a matter of fact, results showed almost identical results between conditions. These findings contradict previous evidence regarding the existence of the effect (Greitemeyer & Mügge, 2014; Greitemeyer & Osswald, 2010, 2011). When taking into account game evaluation and prosociality, we found no influence that could provide an alternative explanation for our results. Furthermore, a careful analysis of the research design showed no evidence of problems regarding the measure of the dependent variables (i.e., prosocial behavior, intention to help, and accessibility to prosocial cognitions).

We found evidence of dispositional traits regarding the moderation effect of Agreeableness, suggesting that the tendency to care for another's well-being could play an important role in the comprehension of the influence of the role played on a video game on prosocial behavior. As a matter of fact, studies have shown that empathy (a construct related to both prosocial behavior and agreeableness) could be an important mediator on this phenomenon (Greitemeyer, 2013; Prot et al., 2013). Furthermore, the fact that higher scores on this trait were related to prosocial behavior only in the violent conditions tends to support the relation between actions in-game and threats to self-concept (Gollwitzer & Melzer, 2012; Jin, 2011): when the behavior in-game tends to harm another character, participants with a more agreeableness tendency tend to "compensate" in subsequent actions.

## General Discussion

There are a large number of variables that could account for the effects of games on behavior. The general learning model, one of the most frequently used explanatory model for the effect of media, predicts that both individual and situational aspects could influence, within cognitive, affective and arousal routes, the interpretation and judgment of situations experienced in the game, resulting in specific behaviors manifested by participants (Buckley & Anderson, 2006). The present study investigated the influence of some individual (age, sex, gaming habits, prosociality and agreeableness) and situational aspects (violent or prosocial role played) on behavioral, affective, and cognitive dimensions,

finding mixed results. Considering individual aspects, participants showed, in general, no difference when comparing violent and prosocial conditions, and this evidence could be viewed as positive consequence of the random assignment procedure. The moderation effect of Agreeableness found is coherent with evidence of the importance of empathy-related constructs on the comprehension of this phenomenon, and more studies are needed to better test this hypothesis. This moderation effect stresses the importance of new studies in which the moderator effect of individual difference variables has to be fully explored to comprehend the conjoined effects of video games on human behavior, instead of looking only on direct effects of video game play on behavior, affect, and cognition.

Considering game characteristics (as situational variables), Experiments 1 and 2 showed contradictory evidence regarding prosocial behavior. In the first experiment, playing a violent role led to more frequent prosocial behavior, when compared to a supposed prosocial role. Although the effect found opposed the expected direction, its size is far from trivial, especially considering evidence from meta-analytic studies (Greitemeyer & Mügge, 2014). In Experiment 2, prosocial behavior was not associated with either of the roles played. One possible explanation was that the effect was found not because of the influence of the violent role but because of the prosocial role chosen in Experiment 1.

When comparing all experimental conditions, one possible interpretation is that the worker's role could have had an inhibitory effect, as the other roles showed a similar help/no help ratio. In other words, the warrior's role did not elicit more prosocial behavior; it was the worker's role that could have elicited less of it.

The analysis of prosocial behavior in both experiments allows us to infer that the effects from various video game attributes, and not only its violent or prosocial content, are not well understood. In our study, we used the same game in both conditions, varying only the role played, but we could not control other game variables in an experimental design. For this reason, we cannot guarantee that our study is free from the same criticism we made for studies that use different games as experimental stimuli. However, we strongly encourage this procedure, or better, the development of games especially planned for experimental designs, which could bring some light for the questions posed.

Another limitation associated with game characteristics and context can be related to the cooperative nature of the game chosen in both experiments. A possible explanation is that, once the participants played as a team member (even as a warrior), it could increase the occurrence of prosocial behaviors (Ewoldsen et al., 2012a; Greitemeyer & Cox, 2013; Greitemeyer et al., 2012). Therefore, we think that further studies are necessary to investigate this alternative hypothesis, including comparing violent and prosocial roles in competitive and cooperative games.

Social psychology is today in a context of criticism and reflection about several effects reported in the literature. The discussion about publication bias and the existence of the social priming effect is especially important because of their relationship with studies of the effect of media on behavior. Criticism about the strategies used to state the existence of the effect (Pashler & Harris, 2012) and problems with the use of fail-safe procedures to check for publication bias (Nelson, Simonsohn, & Simmons, 2014; Simonsohn, Nelson, & Simmons, 2014; van Assen, van Aert, & Wicherts, 2015) calls researchers to reexamine previous available evidence. Not to disprove it, but to reconsider the examination of alternative hypothesis and the interpretation of nonsignificant results. For example, when considering evidence of social priming, nonsignificant results could be due to non-expected moderator or mediator variables (Dijksterhuis, van Knippenberg, & Holland, 2014). The present study, we believe, contributes to this discussion providing evidence of the influence of variables other than game content on prosocial behavior and cognition.

In the literature about media effects, there appears to be a consensus about the existence of the effect of violent and prosocial video games on behavior. Some researchers claim that it is safe to accept the existence of a causal relation-

ship between them, and that the next step for the field is to study the processual elements associated with it (Bushman & Huesmann, 2014). We think, however, that there are still unknown direct effects that have to be well understood to make that claim. The existence of mixed results in several studies –some of which were unable to find significant results – has to be taken into account (Bösche, 2010; Ferguson & Garza, 2011; Ferguson et al., 2012; Gunter & Daly, 2012; Tear & Nielsen, 2013, 2014), and this work is another piece of evidence that there is still room for skepticism about the existence of the effect. Considering this body of evidence of null effects and the increased urge to have these null effects studies published, it is at least hasty to consider that the video game effect exists in a broad variety of situations. To the best of our knowledge, it should be more advantageous to keep a positive agenda in future research looking to replicate the effects in different contexts and cultures and aim to comprehend the processes driving the effect.

However, a productive perspective on the field is essential. The criticism and opposition to this point of view (that the effect truly exists), is generally mixed with personal attacks that do not contribute to the field (Bushman & Huesmann, 2013; Elson & Ferguson, 2013, for an example). To better comprehend it, it is necessary that we reinstate the concept of fair play (Krahé, 2014) on this discussion, confident that the analysis of the available evidence, concerning present and alternative explanations and with open dialog, will bring more relevant contributions and comprehension of the effects of violent and prosocial media on people's behavior.

## References


Adachi, P. J. C., & Willoughby, T. (2011). The effect of violent video games on aggression: Is it more than just the violence? *Aggression and Violent Behavior*, *16*(1), 55-62. doi:10.1016/j.avb.2010.12.002

Anderson, C. A., & Bushman, B. J. (2001). Effects of violent video games on aggressive behavior, aggressive cognition, aggressive affect, physiological arousal, and prosocial behavior: a meta-analytic review of the scientific literature. *Psychological Science*, *12*(5), 353-359. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/11554666

Anderson, C. A., Shibuya, A., Ihori, N., Swing, E. L., Bushman, B. J., Sakamoto, A., …Saleem, M. (2010). Violent video game effects on aggression, empathy, and prosocial behavior in eastern and western countries: A meta-analytic review. *Psychological Bulletin*, *136*(2), 151-73. doi:10.1037/a0018251

Andrade, J. M. de. (2008). *Evidências de validade do Inventário dos Cinco Grandes Fatores de Personalidade para o Brasil*. Brasília, DF: Universidade de Brasília.

Barlett, C. P., Anderson, C. A., & Swing, E. L. (2009). Video game effects--Confirmed, Suspected, and speculative: A review of the evidence. *Simulation & Gaming*, *40*(3), 377-403. doi:10.1177/1046878108327539

Bösche, W. (2010). Violent video games prime both aggressive and positive cognitions. *Journal of Media Psychology: Theories, Methods, and Applications*, *22*(4), 139-146. doi:10.1027/1864-1105/a000019

Buckley, K. E., & Anderson, C. A. (2006). A Theoretical Model of the Effects and Consequences of Playing Video Games. In P. Vorderer & J. Bryant (Eds.), *Playing Video Games - Motives, responses, and consequences* (pp. 363-378). Mahwah, NJ: LEA.

Bushman, B. J., & Huesmann, L. R. (2014). Twenty-five years of Research on Violence in Digital Games and Aggression Revisited. *European Psychologist*, *19*(1), 47-55. doi:10.1027/1016-9040/a000164

Carnagey, N. L., & Anderson, C. a. (2005). The effects of reward and punishment in violent video games on aggressive affect, cognition, and behavior. *Psychological Science*, *16*(11), 882-889. doi:10.1111/j.1467-9280.2005.01632.x

Chambers, J. H., & Ascione, F. R. (2001). The effects of prosocial and aggressive videogames on children's donating and helping. *Journal of Genetic Psychology*, *148*(4), 499-505.

Denzler, M., Häfner, M., & Förster, J. (2011). He just wants to play: How goals determine the influence of violent computer games on aggression. *Personality & Social Psychology Bulletin*, *37*(12), 1644-1654. doi:10.1177/0146167211421176

Dijksterhuis, A., van Knippenberg, A., & Holland, R. W. (2014). Evaluating behavior priming re-

search: Three observations and a recommendation. *Social Cognition*, *32*(Supplement), 196-208. doi:10.1521/soco.2014.32.supp.196

Dolgov, I., Graves, W. J., Nearents, M. R., Schwark, J. D., & Volkman, C. B. (2014). Effects of cooperative gaming and avatar customization on subsequent spontaneous helping behavior. *Computers in Human Behavior*, *33*, 49-55. doi:10.1016/j.chb.2013.12.028

Elson, M., Breuer, J., Looy, J. Van, Kneer, J., & Quandt, T. (2013). Comparing Apples and Oranges? Evidence for pace of action as a confound in research on digital games and aggression. *Psychology of Popular Media Culture*, *4*(2), 1-14. doi:10.1037/ppm0000010

Elson, M., & Ferguson, C. J. (2014). Twenty-five years of Research on Violence in Digital Games and Aggression. *European Psychologist*, *19*(1), 33-46. doi:10.1027/1016-9040/a000147

Elson, M., Mohseni, M. R., Breuer, J., Scharkow, M., & Quandt, T. (2014). Press CRTT to measure aggressive behavior: The unstandardized use of the competitive reaction time task in aggression research. *Psychological Assessment*, *26*(2), 419-432. doi:10.1037/a0035569

Ewoldsen, D. R., Eno, C. A., Okdie, B. M., Velez, J. A., Guadagno, R. E., & DeCoster, J. (2012a). Effect of playing violent video games cooperatively or competitively on subsequent cooperative behavior. *Cyberpsychology, Behavior, and Social Networking*, *15*(5), 277-281. doi:10.1089/cyber.2011.0308

Ewoldsen, D. R., Eno, C. a., Okdie, B. M., Velez, J. a., Guadagno, R. E., & DeCoster, J. (2012b). Effect of playing violent video games cooperatively or competitively on subsequent cooperative behavior. *Cyberpsychology, Behavior, and Social Networking*, *15*(5), 277-280. doi:10.1089/cyber.2011.0308

Ferguson, C. J. (2007). Evidence for publication bias in video game violence effects literature: A meta-analytic review. *Aggression and Violent Behavior*, *12*, 470-482. doi:10.1016/j.avb.2007.01.001

Ferguson, C. J. (2010). Blazing angels or resident evil? Can violent video games be a force for good? *Review of General Psychology*, *14*(2), 68-81. doi:10.1037/a0018941

Ferguson, C. J., & Garza, A. (2011). Call of (civic) duty: Action games and civic behavior in a large sample of youth. *Computers in Human Behavior*, *27*(2), 770-775. doi:10.1016/j.chb.2010.10.026

Ferguson, C. J., Garza, A., Jerabeck, J., Ramos, R., & Galindo, M. (2013). Not worth the fuss after all? cross-sectional and prospective data on violent video game influences on aggression, visuospatial cognition and mathematics ability in a sample of youth. *Journal of Youth and Adolescence*, *42*(1), 109-122. doi:10.1007/s10964-012-9803-6

Ferguson, C. J., San Miguel, C., Garza, A., & Jerabeck, J. M. (2012). A longitudinal test of video game violence influences on dating and aggression: A 3-year longitudinal study of adolescents. *Journal of Psychiatric Research*, *46*(2), 141-146. doi:10.1016/j.jpsychires.2011.10.014

Galinha, I. C., & Pais-Ribeiro, J. L. (2005). Contribuição para o estudo da versão portuguesa da Positive and Negative Affect Schedule ( PANAS ): II – Estudo psicométrico (*). *Análise Psicológica*, *2*, 219-227.

Gentile, D. A. (2011). The multiple dimensions of video game effects. *Child Development Perspectives*, *5*(2), 75-81. doi:10.1111/j.1750-8606.2011.00159.x

Gentile, D. A., Anderson, C. a, Yukawa, S., Ihori, N., Saleem, M., Ming, L. K., …Sakamoto, A. (2009). The effects of prosocial video games on prosocial behaviors: International evidence from correlational, longitudinal, and experimental studies. *Personality & Social Psychology Bulletin*, *35*(6), 752-763. doi:10.1177/0146167209333045

Gentile, D. A., & Anderson, C. A. (2006). Video games: Origin and growth of the video game industry. In N. J. Salkind (Ed.), *Encyclopedia of Human Development* (Vol. 3, pp. 1303-1307). Thousand Oaks, CA: Sage.

Gitter, S. a., Ewell, P. J., Guadagno, R. E., Stillman, T. F., & Baumeister, R. F. (2013). Virtually justifiable homicide: The effects of prosocial contexts on the link between violent video games, aggression, and prosocial and hostile cognition. *Aggressive Behavior*, *39*(5), 346-354. doi:10.1002/ab.21487

Gollwitzer, M., & Melzer, A. (2012). Macbeth and the Joystick: Evidence for moral cleansing after playing a violent video game. *Journal of Experimental Social Psychology*, *48*(6), 1356-1360. doi:10.1016/j.jesp.2012.07.001

Greitemeyer, T. (2011). Effects of prosocial media on social behavior: When and why does media exposure affect helping and aggression? *Current Directions in Psychological Science*, *20*(4), 251-255. doi:10.1177/0963721411415229

Greitemeyer, T. (2013). Playing video games cooperatively increases empathic concern. *Social Psychology*, *44*(6), 408-413. doi:10.1027/1864-9335/a000154

Greitemeyer, T., Agthe, M., Turner, R., & Gschwendtner, C. (2011). Acting prosocially reduces retaliation: Effects of prosocial video games on aggressive behavior. *European Journal of Social Psychology*, 235-242. doi:10.1002/ejsp.1837

Greitemeyer, T., & Cox, C. (2013, February). There's no " I " in team : Effects of cooperative video games on cooperative behavior †. *European Journal of Social Psychology*, *43*, 224-228. doi:10.1002/ejsp.1940

Greitemeyer, T., & Mügge, D. O. (2014). Video games do affect social outcomes: A meta-analytic review of the effects of violent and prosocial video game play. *Personality & Social Psychology Bulletin*, 1-12. doi:10.1177/0146167213520459

Greitemeyer, T., & Mügge, D. O. (2015). Corrigendum. *Personality and Social Psychology Bulletin*, *41*(8), 1164-1164. doi:10.1177/0146167215591992

Greitemeyer, T., & Osswald, S. (2009). Prosocial video games reduce aggressive cognitions. *Journal of Experimental Social Psychology*, *45*, 896-900. doi:10.1016/j.jesp.2009.04.005

Greitemeyer, T., & Osswald, S. (2010). Effects of prosocial video games on prosocial behavior. *Journal of Personality and Social Psychology*, *98*(2), 211-221. doi:10.1037/a0016997

Greitemeyer, T., & Osswald, S. (2011). Playing prosocial video games increases the accessibility of prosocial thoughts. *The Journal of Social Psychology*, *151*, 121-128.

Greitemeyer, T., Traut-Mattausch, E., & Osswald, S. (2012). How to ameliorate negative effects of violent video games on cooperation: Play it cooperatively in a team. *Computers in Human Behavior*, *28*(4), 1465-1470. doi:10.1016/j.chb.2012.03.009

Gunter, W. D., & Daly, K. (2012). Causal or spurious: Using propensity score matching to detangle the relationship between violent video games and violent behavior. *Computers in Human Behavior*, *28*(4), 1348-1355. doi:10.1016/j.chb.2012.02.020

Happ, C., Melzer, A., & Steffgen, G. (2014). Like the Good or Bad Guy – Empathy in antisocial and prosocial games. *Psychology of Popular Media Culture*, *4*(2), 80-96. doi:10.1037/ppm0000021

Järvelä, S., Ekman, I., Kivikangas, J. M., & Ravaja, N. (2014). A practical guide to using digital games as an experiment stimulus. *... of the Digital Games ...*, (1960), 85-115. Retrieved from http://press.etc.cmu.edu/files/ToDiGRA-v1n2-web.pdf#page=98

Jin, S.-A. A. (2011). "My avatar behaves well and this feels right": Ideal and ought selves in video gaming. *Social Behavior and Personality*, *39*(9), 1175-1182.

Kneer, J., Elson, M., & Knapp, F. (2016). Fight fire with rainbows: The effects of displayed violence, difficulty, and performance in digital games on affect, aggression, and physiological arousal. *Computers in Human Behavior*, *54*, 142-148. doi:10.1016/j.chb.2015.07.034

Krahé, B. (2014). Restoring the spirit of fair play in the debate about violent video games. *European Psychologist*, *19*(1), 56-59. doi:10.1027/1016-9040/a000165

Mäyrä, F. (2008). *An introduction to game studies*. Thousand Oaks, CA: Sage.

Mikulincer, M., & Shaver, P. R. (2010). Does gratitude promote prosocial behavior? The moderating role of attachment security. In M. Mikulincer & P. R. Shaver (Eds.), *Prosocial motives, emotions, and behavior. The better angels of our nature* (pp. 267-283). Washington, DC: American Psychological Association.

Molina, B. (2013). Obama seeks research into violent video games. *USA Today*. Retrieved from http://www.usatoday.com/story/tech/gaming/2013/01/16/obama-gun-violence-video-games/1839879/

Nelson, L. D., Simonsohn, U., & Simmons, J. P. (2014). P-Curve Fixes Publication Bias: Obtaining unbiased effect size estimates from published studies alone. *SSRN Electronic Journal*, 1-17. doi:10.2139/ssrn.2377290

Pashler, H., & Harris, C. R. (2012). Is the replicability crisis overblown? Three arguments examined. *Perspectives on Psychological Science*, *7*(6), 531-536. doi:10.1177/1745691612463401

Peng, W., Lee, M., & Heeter, C. (2010). The effects of a serious game on role-taking and willingness to help. *Journal of Communication*, *60*, 723-742. doi:10.1111/j.1460-2466.2010.01511.x

Penner, L. a, Dovidio, J. F., Piliavin, J. a, & Schroeder, D. a. (2005). Prosocial behavior: Multilevel perspectives. *Annual Review of Psychology*, *56*, 365-392. doi:10.1146/annurev.psych.56.091103.070141

Prot, S., Gentile, D. A., Anderson, C. a., Suzuki, K., Swing, E., Lim, K. M., …Lam, B. C. P. (2013). Long-term relations among prosocial-media use, empathy, and prosocial behavior. *Psychological Science*. doi:10.1177/0956797613503854

Rabelo, A. L. A., & Pilati, R. (2013). Adaptação e evidências de validade da Bateria de Personalidade Prosocial no Brasil. *Psico-USF*, *18*(3), 455-468.

Rosenberg, R. S., Baughman, S. L., & Bailenson, J. N. (2013). Virtual superheroes: Using superpowers in virtual reality to encourage prosocial behavior. *PLoS ONE*, *8*(1), 1-9. doi:10.1371/journal.pone.0055003

Saleem, M., Anderson, C. a., & Gentile, D. a. (2012). Effects of prosocial, neutral, and violent video games on children's helpful and hurtful behaviors. *Aggressive Behavior*, *38*(4), 281-287. doi:10.1002/ab.21428

Sestir, M. A., & Bartholow, B. D. (2010). Violent and nonviolent video games produce opposing effects on aggressive and prosocial outcomes. *Journal of Experimental Social Psychology*, *46*, 934-942. doi:10.1016/j.jesp.2010.06.005

Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-positive psychology: undisclosed flexibility in data collection and analysis allows presenting anything as significant. *Psychological Science*, *22*(11), 1359-1366. doi:10.1177/0956797611417632

Simonsohn, U., Nelson, L. D., & Simmons, J. P. (2013). P-Curve: A key to the file-drawer. *Journal of Experimental Psychology. General*, 1-40. doi:10.1037/a0033242

Simonsohn, U., Nelson, L. D., & Simmons, J. P. (2014). P- Curve and Effect Size : Correcting for publication Bias using only significant results. *Perspectives on Psychological Science*, *9*(6), 666-681. doi:10.1177/1745691614553988

Stenico, C., & Greitemeyer, T. (2014). The others will help: The Presence of multiple video game characters reduces helping after the game is over. *The Journal of Social Psychology*, *154*(2), 101-104. doi:10.1080/00224545.2013.864595

Swing, E. L., Gentile, D. A., & Anderson, C. A. (2009). Learning processes and violent video games. In R. E. Ferdig (Ed.), *Handbook of Research on Effective Electronic Gaming in Education* (Vol. II, pp. 876-892). New York: Information Science Reference.

Tear, M. J., & Nielsen, M. (2013). Failure to demonstrate that playing violent video games diminishes prosocial behavior. *PLoS ONE*, *8*(7), e68382. doi:10.1371/journal.pone.0068382

Tear, M. J., & Nielsen, M. (2014). Video games and prosocial behavior: A study of the effects of non-violent, violent and ultra-violent gameplay. *Computers in Human Behavior*, *41*, 8-13. doi:10.1016/j.chb.2014.09.002

Valadez, J. J., & Ferguson, C. J. (2012). Just a game after all: Violent video game exposure and time spent playing effects on hostile feelings, depression, and visuospatial cognition. *Computers in Human Behavior*, *28*, 608-616. doi:10.1016/j.chb.2011.11.006

van Assen, M. A. L. M., van Aert, R. C. M., & Wicherts, J. M. (2015). Meta-analysis using effect size distributions of only statistically significant studies. *Psychological Methods*, *20*(3), 293-309. doi:http://dx.doi.org/10.1037/met0000025

Velez, J. A., Mahood, C., Ewoldsen, D. R., & Moyer-gusé, E. (2014). Ingroup versus Outgroup Conflict in the context of violent video game play : The effect of cooperation on increased helping and decreased aggression. *Communication Research*. doi:10.1177/0093650212456202

Whitaker, J. L., & Bushman, B. J. (2012). "Remain Calm. Be Kind." Effects of relaxing video games on aggressive and prosocial behavior. *Social Psychological and Personality Science*, *3*(1), 88-92. doi:10.1177/1948550611409760

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