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Virtual into Verisimilitude: Videogames' Ability to Induce Empathy

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CLAREMONT McKENNA COLLEGE

**VIRTUAL INTO VERISIMILITUDE:
VIDEOGAMES' ABILITY TO INDUCE EMPATHY**

SUBMITTED TO

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AND

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Abstract

The current study seeks to link traditional forms of empathy induction with new research that suggests videogames can be used as an experiential method of induction. One hundred-nine college students, sixty-four females and forty-six males, were used in a 2x2x2 design, the independent variables being prosocial/neutral videogame, empathic/neutral instructions, and gender. Dependent variables were both questionnaire responses to a fictional story and an opportunity to be realistically altruistic. Participants played either a prosocial or neutral videogame, received either empathic or neutral reading instructions, and then read a vignette depicting a difficult situation faced by the writer. They then rated their reactions on a 7-point Likert scale before being asked to donate time to a local charity. A marginally significant result of gender was found in that females generally responded more strongly than males, and no other results were significant. These findings were different than previous research.

Virtual into Verisimilitude:
Videogames' Ability to Induce Empathy

As a society we have grown to understand the power various forms of media have over us. We understand and accept that our favorite movies, books, and even music can bring us to tears, drive us to anger, and lift us to happiness. We do not doubt that such forms can powerfully affect our mood, and even, in extreme cases, our behavior. Within the last decade, however, a new form of media has risen to prominence and pervasiveness: videogames. Like most forms of media early in their lifespan, videogames have been met with much criticism and denunciation, and although many studies have been launched in an attempt to determine what effects, adverse or positive, these videogames can have upon those who consume them, only the very beginnings of understanding have been revealed. A study by the Entertainment Software Association found that roughly 72% of American households play videogames, while a study by the Pew Internet and American Life study found that an astonishing 97% of all children play games. Given that the videogame industry surged to over \$25 billion worth of sales in 2010 alone, surpassing the film industry, the prominence of this media form in American culture, and worldwide, seems likely to continue to increase. With this rise has come more and more demand to regulate and/or control the industry, with various claims made on both sides. Given the current state of affairs, it becomes paramount to truly understand what kinds of effects videogames can have, and this study seeks to expand that base of knowledge, particularly in regards to empathy.

Modern Videogame Research

To begin with, studies on videogames in the past decade have been overwhelmingly focused on establishing correlations between violent behaviors and playing videogames (both violent and non-violent). Even with the large number of studies focused on this particular facet of videogames, no clear results have been found. A meta-analytical review of the literature by Ferguson in 2007 found a publication bias for both experimental and non-experimental studies of violent behavior, although this bias was less prevalent for studies involving other foci, such as violent thoughts or prosocial behavior. This study suggests that research looking at violent videogames and violent behavior needs to be further standardized, particularly in unifying measures of aggression and other such methodological issues, and, despite the plethora of past research, more is still required.

With that said, some studies have found that videogames can have a demonstrable effect on those who play them, to the point where it can be physically measured. Carnagey, Anderson, and Bushman's 2007 study found that videogame violence could desensitize participants to real-life violence to the extent where it was noticeable in terms of both heart rate and galvanic skin response. That videogames can not only have a mental effect on those who play them, but also a measurable physical response, suggests that the ability of videogames to potentially affect various behaviors and emotions is powerful and very real.

However, other research suggests that, while that potential power exists, the conditions under which this is true vary to a wide degree. For instance, one study by Klimmt, Hartmann, and Frey in 2007 researched the relationship between level of control

in a videogame world, how much influence the player has on the videogame world, and how much the videogame was enjoyed. Because enjoyment often correlates with how much attention a person is giving to the game (and potentially how invested they are in the product) this aspect may be more important than it initially appears. Although level of influence was clearly correlated with enjoyment, the authors found the relationship between control and enjoyment to be more complex. Similarly, a study by Trepte and Reinecke in 2010 examined the ability to customize avatars (in-game representations of the player) in relation to enjoyment. This study found that players who were satisfied with their lives tended to create avatars that resembled their creators, whereas unsatisfied players tended to create avatars dissimilar to themselves. Overall, this effect was stronger for non-competitive games—an important finding considering similarity was found to be related to identification, which in turn was related to enjoyment of the game. Given that identification with others is an important element of empathy, the importance of these findings suggests that any future research involving videogames keep factors such as enjoyment and avatar similarity in mind while designing studies.

Further evidence for this point can be found in a 2011 study by Jin, who looked at prosocial behavior in conjunction with empathy toward avatars. The study found a significant main effect for the participant's empathy depending on their avatar, and also found significance regarding willingness to donate time to a charity depending on the game type (prosocial vs. violent). Also, at odds with previous findings, the study suggested that playing prosocial videogames increased empathy, whereas playing a violent game increased the amount of money participants were willing to donate. Clearly,

factors such as avatar and focus of the game can drastically change how the game affects a given participant.

Another factor that has been examined in attempting to understand the effects of videogames has been on how enemies or opponents in such games are portrayed and labeled. One such study by Tamura and Ohbuchi in 2006 manipulated the labels assigned to opponents in a fighting game, specifically including a condition where the opponent was given a dehumanizing label. The findings did not support a direct increase in aggression as a result of such a label, however it was found that it indirectly increased aggression by lowering empathy for the opponent. This fits with what research has found in the realm of applying dehumanizing labels to actual people and situations, resulting in less concern and empathy for an individual.

Other studies suggest that such results may be generalizable to the global population rather than being culturally limited. For instance, a study by Anderson, Sakamoto, Gentile, Ihori, Shibuya, Yukawa, Naito, and Kobayashi in 2008 examined longitudinal effects of violent videogames and performed a cross-cultural comparison between US and Japanese citizens. In addition to finding links between early and regular exposure to violent videogames and later aggressive behavior, the study also found similar magnitude of results when comparing the Japanese and American populations. Although more research is obviously required, these findings at least offer some support that results of studies on videogames need not necessarily be limited to the population used in the study.

Finally, a study by Lee, Peng, and Klein in 2010 had participants commit virtual crimes in a videogame setting, and then read and respond to similar real-life crimes. The

study found that virtually committing such crimes resulted in participants suggesting shorter sentences for the real-life examples, rating the crimes as less heinous, and so on. Rather than necessarily implying that this suggests violent videogames reduce empathy, it seems possible that, instead, playing a violent videogame may cause the participant to have increased empathy with the *perpetrator* of a crime, rather than the victim.

Traditional Empathy Research

For understandable reasons, empathy research extends much farther back than videogame research does, and the matching body of research is correspondingly more expansive. One of the biggest and more influential names in the field of empathy and altruism research is Daniel Batson, who has conducted studies in this area for more than 30 years. His theories and models of research are widely accepted and often cited in textbooks examining the subject, and thus form the basis of the empathic theories the present study uses.

His empathy-altruism hypothesis states that “empathic concern produces altruistic motive,” where altruism is defined as “a motivational state with the ultimate goal of increasing another’s welfare,” in contrast with egoism, where the ultimate goal is increasing “one’s own welfare” (Batson, 2010, p. 16). Support for the empathy-altruism hypothesis has been widespread, with over 30 studies showing support for this hypothesis over egoistic alternative models (Batson, 2010). This by itself suggests that people will act selflessly if they feel empathy towards a person in need, as opposed to many models that suggest humans are inherently selfish and would never perform true “altruistic” responses.

Of course, the question then becomes how and when people feel empathy towards others. Batson has also researched this, and performed one such study in an attempt to determine which factors influence the creation of empathy for someone in need. His study manipulated similarity between a story-subject and the participants, and measured responses of how empathic the reader felt towards the fictional subject's plight. Results from this study supported the idea that perceived similarity will help increase empathy (Batson, 2005). A follow-up study also supports the older model that nurturance tendencies are activated and that this need to care and protect progeny also influences empathy (Batson, 2005). These findings lend some weight to the traditional model of inducing empathy, namely having participants engage in perspective-taking exercises. By attempting to put oneself in the same mindframe as another, participants increase similarity to the target, which in turn leads to greater empathy. Given how widely used this method of empathy induction is, support for this model is important for validating such studies on empathy.

Another key researcher in the empathy field, and who builds on research performed by Batson, is Nancy Eisenberg. Whereas research by Batson has sought to establish a generalizable theory to approach empathy and altruistic responses, Eisenberg has instead focused on individual differences and the key factors that can affect how a person reacts empathically as compared to the general population. For instance, her studies support the idea that "individual differences in sympathy and personal distress are related to a wide range of prosocial and moral reactions, including having real concern for others' welfare and offering altruistic help when others need or request it" (Eisenberg, 2010, p. 143). Various specific factors that have been researched include self-regulation

in the context of both children's and adult's sympathy, personal distress, or some combination thereof. Research results support the idea that individual differences in self-regulation are correlated with differences in dispositional sympathy and personal distress, which in turn correlates with empathy-related responding. Various studies on children have also found they respond differently than adults in regards to their self-regulation, and, in turn, their empathic responses (Eisenberg, 2010). In another article, Eisenberg argued that "individual differences in people's emotional arousability and in their ability to regulate and cope with emotion are important factors affecting whether a perceiver responds empathically, and whether he or she then experiences sympathy or personal distress (Eisenberg, 1991, p. 130). Although more research naturally needs to be performed, there appears to be strong evidence that, although some generalizable trends seem to be present in empathy research, individual differences still play a very strong role in differentiating how people respond.

Although widespread support exists for the above results, the hypotheses and evidence are naturally not without detractors. For instance, one study by Neuberg, Cialdini, Brown, Luce, and Sagarin critiqued perceived problems with Batson's studies, pointing to effects such as social desirability, self-other overlap, and various egoistic concerns (Neuberg et al, 1997). This study sparked a reply from Batson himself, which in turn led to a counter-counter response from the original authors. Regardless, such counter-studies are important to remind us that the empathy-altruism hypothesis is indeed a hypothesis, and deserves research designed to generate support and seek alternative explanations.

Gender and Empathy

Modern neuroimaging technology has made it possible to explore empathy and its related phenomena in a way that was previously unattainable. One such study by Schulte-Rüther, Marksowitsch, Shah, Fink, and Piefke in 2008 utilized an MR scanner to monitor brain activity while performing self versus other tasks. The results supported the idea that, from a neurological perspective, males and females use different strategies when assessing their own emotional response to other people, and more specifically that females exhibit a higher level of emotional expressivity and arousal in response to others' emotions compared to males. When attempting a task involving an "other" rather than "self," female brains showed increased activation in the inferior frontal cortex whereas males displayed no such activation (Schulte-Rüther et al, 2008).

In a similar vein, a study by Derntl, Finkelmeyer, Eickhoff, Kellermann, Falkenberg, Schneider, and Habel in 2010 also examined neural networks during empathic tasks, in this case using an MRI. Although no significant gender difference was found in behavioral performance, females once again showed much stronger neural activation during the tasks compared to males. This further supported the idea that males and females handle empathic processing in biologically different ways, with the researchers concluding that females rely on emotion and self-related regions whereas males tend to use relatively higher-level cognitive processing.

Although this area of research is relatively new and still being explored, it is obviously a key area for future research and will hopefully allow us to better understand the biological and neurological underpinnings of phenomena that psychologists have been studying the past few decades.

The Present Research

Traditional empathy research and modern videogame research are beginning to overlap, and one such study covering both areas is “Playing Prosocial Video Games Increases Empathy and Decreases Schadenfreude” by Greitemeyer, Osswald, and Brauer in 2010. This particular study utilized two videogames, a neutral control videogame called “Tetris” and a prosocial videogame called “Lemmings” to see whether such games can affect empathy. They found that playing a prosocial videogame actually increased participants’ interpersonal empathy and decreased reported pleasure at negative things happening to other people (Greitemeyer, Osswald, Brauer, 2010). These results seem to follow what previous research suggests.

If videogames can influence empathic response, the question arises of how such empathic induction compares to traditional methods used by Batson and other researchers, usually in the form of perspective-taking exercises. The present study was created to explore this issue. Three purposes were intended: to replicate the experiment of Greitemeyer, Osswald, and Brauer; to compare results to traditional empathy induction models; and, finally, to examine if any gender differences exist.

A 2x2x2 design was created, involving gender (male versus female), game type (control in the form of Tetris and prosocial in the form of Lemmings), and a story with different reading instruction methods (control instructions versus perspective-taking empathic instructions). The design naturally draws much inspiration from the above-cited study, adding the key comparison to traditional induction methods.

Based on the research cited, four hypotheses were created. First, a main effect of game was expected, with stronger empathic responses from the prosocial game. Second,

a main effect of instruction type was expected, with stronger empathic responses from the empathic instructions. Third, it was predicted the prosocial videogame would induce stronger responses than the empathic instructions, and the two combined would achieve stronger responses than either alone. Finally, an interaction effect of (Game x Gender) was expected such that when a prosocial videogame was played, men would respond more strongly than women, given that men seem to process empathy more cognitively, and playing a videogame is a very cognitively engaging task.

Method

Participants

The participant group was composed of 109 individuals, including 46 males and 63 females. All participants were students currently enrolled in Liberal Arts colleges in southern California, with a mean age of $M = 19.94$, $SD = 2.66$ and a minimum age of 18. Participants were obtained in one of two methods. They were either signed-up through the Sona-Systems research sign-up system and awarded introductory-level psychology class credit as compensation, or they were recruited individually and entered into a raffle for a chance of winning one of two \$20 gift certificates as compensation.

Procedure

Although the design of the study was a $2 \times 2 \times 2$, for ease of running participants the study was run in four conditions, with participants randomly assigned to a condition. The first was a control condition, which utilized the neutral game Tetris and neutral instructions for reading the vignette. The second was a traditional induction condition,

with the neutral game and empathic instructions for reading the vignette. The third condition was the experiential induction method and used the prosocial game Lemmings and the neutral instructions. The fourth condition was the mixed condition, using both the prosocial videogame and empathic instructions.

Participants were run one at a time. Upon entering the lab participants were greeted by the researcher and informed that the study would in fact consist of two separate, unrelated studies with the second one being run on behalf of another researcher. Both of these facts were false, as both tasks were part of the same study. Participants were asked if it was acceptable if they took part in “both” studies, and all participants agreed to this. Participants were then given the informed consent form, and, after signing, told they would be playing a videogame and evaluating it afterwards to judge people’s perceptions of different games. In conditions 1 and 2, this game was Tetris and in condition 3 and 4 this game was Lemmings. Studies by Greitemeyer and Osswald (2009, 2010) found that Lemmings was perceived as significantly more prosocial, thus Tetris served as a control task.

The researcher explained the game’s purpose and gave instructions on how to play, and participants were told to do their best. The participants were allowed to play for 10 minutes, with the instructor only intervening in the case of a problem or if the participant raised a question. They were then given a short questionnaire about their experience.

The researcher then informed the participants that the current study was over, and they were moving to the next one which would be examining reactions to various articles. In actuality all participants received the same article. They were given the short vignette

and asked to read it, but the instructions on how to read it varied based on condition. In conditions 1 and 3, the participants were told to read the vignette closely and analyze it in terms of style and clarity. In conditions 2 and 4, the participants were asked to read the vignette closely and try to imagine exactly how the writer must have been feeling. After finishing reading the story, participants were given a questionnaire to measure their response to the story.

After they completed the questionnaire, participants were told they were finished, but then the researcher brought up a last point. The researcher stated that the (imaginary) researcher of the second study had been trying to obtain volunteers for the local Boys and Girls Club of America charity, and participants were shown a sheet with information about the group. The researcher inquired whether the participants would be willing to donate any time to help the charity. The researcher recorded whether and how many hours the participants were willing to donate.

After the participants answered the donation inquiry, the researcher revealed the deception and gave the participants a full debriefing. It was also stressed that although they were not obligated to actually volunteer any hours as they stated, they were still free to do so if they wished. Any questions were answered, and if the participants had any concerns they were directed towards the appropriate authority. The researcher also recorded any noteworthy comments or remarks from the participants.

Materials

Tetris is a puzzle game in which players must rotate falling blocks of various shapes and sizes to make solid lines. Lemmings is also a puzzle game, but the player

must assist small person-like “Lemmings” attempting to get from one end of the map to the other while navigating obstacles and avoiding death. Screenshots of both games can be found in Appendix A.

The videogame questionnaire contained a number of filler questions regarding aspects such as entertainment and graphics, but also contained two questions designed as a manipulation check to ensure Lemmings was seen as more prosocial than Tetris. The two items were “I felt an emotional connection to the game” and “The game was anti-social in nature.” All items were assessed on a 7-point Likert scale, with 1 = not at all and 7 = absolutely. The anti-social item was reverse-scored. The full questionnaire can be found in Appendix B.

The vignette was adapted and expanded from a study by DeWall and Baumeister (2006). The original vignette simply described someone who broke his or her leg at an intramural sports game, and was having difficulty with adjusting. This version also extended the idea that the person was also a volunteer for a local youth group, and that the injury caused him to temporarily lose track of some of his charges. This addition was meant to subtly link the story to those participants who played Lemmings, connecting them with the thematic link of guiding small beings in need of guidance. It can be found in Appendix C.

The vignette questionnaire was adapted from Maner and Galilliot (2007) and has items regarding how compassionate, pathetic or sympathetic the participants felt toward the author of the vignette. The responses were assessed using a 7-point Likert scale, with 1 = not at all and 7 = absolutely. The first 5 items were to lend credence to the reading instructions given to the participants in conditions 1 and 3, whose instructions told them

to evaluate the style and clarity of the story, and were disregarded in the analysis. This can be found in Appendix D.

The information about the Boys and Girls Club of America was obtained via a screenshot of the webpage <http://www.bgca.org/whoweare/Pages/Mission.aspx> as it appeared on November 14, 2011, and can be found in Appendix E. This particular charity was chosen because it goes along with the theme of helping and guiding young beings in need of assistance, in the hopes that the connection would strengthen any possible empathic response.

Measures

Three participants were excluded from all analyses, two already volunteered for the charity used in the study and thus did not give responses to the altruism opportunity, while the third guessed the purpose of the study and also did not give a response to the altruistic response. In all other cases, participants seemed unaware of the connection, given that most tried to leave the laboratory after hearing the altruism opportunity and before receiving the debriefing.

While for the purposes of the study participants were broken into four conditions, for purposes of analysis the data was reassembled into the 2(Gender) x 2(Game) x 2(Instruction) design. In sum, this meant a total of 46 males and 63 females; 54 in the Tetris condition, 55 in the Lemmings condition; 57 in the control instruction condition, and 52 in the empathic instruction condition.

The items for the empathic response questionnaire had an overall $\alpha = .874$. The average SD for the empathic items was 1.127. A new variable was created after the

completion of data collection using the arithmetic mean of the responses for each participant.

Results

A manipulation was performed to see if, as predicted, Lemmings was viewed as more prosocial than Tetris. In reality Tetris ($M = 3.33$, $SD = 1.67$) was viewed as more prosocial than Lemmings ($M = 2.44$, $SD = 1.81$), $t(107) = 2.684$, $p = .008$. This was contrary to the assumption made during the design process.

The primary hypotheses tests included two dependent variables, one being the empathic questionnaire responses, which were recomputed into a new variable using the arithmetic mean of 9 items for each participant, and the other being the altruistic response, in the form of hours donated.

A 2(Gender: male vs. female) x 2(Game: Lemmings vs. Tetris) x 2(Instruction: control vs. empathic) ANOVA was performed on altruistic response. There was homogeneity of variance between groups using Levene's test. However, all main effects for this test were non-significant, including Gender, $F(1, 101) = 2.686$, $p = .104$, Game, $F(1, 101) = 1.867$, $p = .175$, and Instruction, $F(1, 101) = 1.307$, $p = .256$. Likewise all interactions were non-significant at the $p < .05$ level. It seems participants' willingness to donate hours was not affected by gender, the game played, or the type of instructions they received for reading the vignette.

The same type of 2x2x2 ANOVA was also performed using the empathic response (see Figure 1). Homogeneity of variance was also found. Main effects were non-significant for both Game, $F(1, 101) = .005$, $p = .944$, and for Instruction, $F(1, 101)$

= 1.370, $p = .245$. The main effect of Gender was marginally significant at the $p > .05$ level, $F(1, 101) = 2.907, p = .091$.

Simple main effect analysis showed that females ($M = 4.488, SD = 1.109$) responded more highly on the empathic response than males ($M = 4.115, SD = 1.128$) (See Figure 2). The other simple main effect analysis were non-significant; neither Lemmings ($M = 4.337, SD = 1.190$) nor Tetris ($M = 4.325, SD = 1.071$) were significantly higher, and neither the control instructions ($M = 4.187, SD = 1.160$) nor the empathic instructions ($M = 4.489, SD = 1.080$) affected empathic response. All interaction effects were non-significant. Gender seemed to play a role in how empathic the participant felt towards the figure in the vignette, but neither the story nor the instruction type seemed to influence their empathy.

The results were not as hypothesized, although the gender effect was predicted by the current literature.

Discussion

None of the four hypotheses of the study were supported based on the results, given that almost all of them were non-significant with the exception of the marginally significant result of gender.

The most interesting and important result from the study was the manipulation check, which was exactly the opposite of what was expected. The design assumed that like Greitemeyer, Osswald, and Brauer's 2010 study, Lemmings would be viewed as more prosocial than Tetris, yet exactly the opposite was found to be the case. This fundamental problem explains why no main effect of videogame was found, and likewise

no interaction involving the videogame played produced significance results; if the prosocial game where one helps small creatures was viewed as less prosocial than the neutral game where you manipulate featureless blocks, it cannot be expected that empathy would have been affected.

This unexpected result has a number of possible explanations. First, a cultural and/or language difference could be the cause, given the Greitemeyer, Osswald, and Brauer study used German participants and presumably used questionnaire items in German. Further research would be required, but it seems plausible that either a translation issue occurred, or some cultural difference between Germany and the United States meant that participants approached this set of videogames in a fundamentally different manner. Finally, the majority of the participants were already familiar with Tetris, while only one had previously played Lemmings, so it is possible that some effect of familiarity with the game might have been at work.

The actual numbers also support the idea that participants responded very differently, not just in terms of which videogame they identified as more prosocial. Both studies used the same 7-point Likert scale question, but whereas the present study found a mean response to Lemmings of $M = 2.44$, $SD = 1.81$ and a mean response to Tetris of $M = 3.33$, $SD = 1.67$, Greitemeyer, Osswald, and Brauer's study found a mean response to Lemmings of $M = 2.29$, $SD = 1.90$, and a mean response to Tetris of $M = 1.21$, $SD = 1.48$. The less prosocial rated videogame in the present study was still rated almost as highly as the more prosocial rated game in the Greitemeyer, Osswald, and Brauer study, whereas the more prosocial rated videogame in the present study was much higher than the more prosocial rated videogame in the Greitemeyer, Osswald, and Brauer study. No

real conclusions can be drawn from this data alone, but it is an interesting point and worthy of pursuit in the future.

Another option is that, despite attempts to replicate the Greitemeyer, Osswald, and Brauer study as closely as possible, some differences still occurred. Language differences aside, because exact details were not given in the journal article, it is possible that the instructions on how to play each game were different enough in the present study to cause the difference in perceived prosocial levels. Likewise, many different versions of Tetris exist, and it was not specific in the article which exact version was used. Perhaps some peripheral factor in the version of Tetris used had an unforeseen effect. Finally, Lemmings has several dozen different levels, and whereas this study used the first and easiest set, it is possible that the Greitemeyer, Osswald, and Brauer study used a different set of levels, which may have had a different effect on the participants.

It is also curious that the instruction type seemed to have no effect on empathic responses given that perspective-taking exercises have been shown in many different studies to be an effective form of inducing empathy. One possibility is that participants did in fact read the instructions carefully, but nonetheless did not make the required cognitive effort to truly engage in perspective taking, which would result in a lack of increased empathy. An alternative possibility is that because only one vignette was used, perhaps some inherent quality of the story made it more difficult to empathize with, resulting in a lack of difference in how participants reacted.

The marginally significant gender effect is also interesting. Although it was the opposite of what was hypothesized, it does fit with what some of the research suggests, namely that females may have a greater natural capacity for empathy. The hypothesis

assumed, given that males tend to use higher cognitive processes when engaging in empathy, that the more cognitively demanding task of playing a videogame would result in higher empathic response. Again, it is possible that the participants were not involved in the videogame as much as could be expected, and this resulted in the lack of difference. Given that past research has found a significant difference between female and male empathic reactions and this study only found marginally significant differences, it is also possible that playing the videogame did in fact increase male empathy and brought it closer to females', and this move towards equality is what caused marginal significance rather than true significance.

With these things said, a number of issues still remain in the original design and execution of the study that could be improved were it replicated. To begin with, it turned out that the altruistic response did not produce any kind of significant results, in a large part because 68 out of the 109 participants responded with a "zero" answer. Many of these responses are understandable given the participants were all drawn from rigorous colleges, and most had busy schedules, and additionally many already volunteered for other charities. Likewise, many participants were graduating seniors who would be leaving the campus in 2-3 months from the time of their participation, which meant they had little interest in engaging in a brand new activity so late in their school career. Finally, abstractly stating they would be willing to volunteer time is far removed from actually pledging time, which makes the measure more variable.

A second problem is the potential that participants were not fully engaging in either the videogame or the vignette, which may have accounted for the unexpected results.

Several solutions to these problems present themselves. First would be using a much broader and more varied participant pool, hopefully from the general population instead of exclusively college students. A second solution was what the original design was intended to be, but was dropped due to restrictions outside of the experimenter's control. The idea was to tell participants that they would be rated on their videogame performance and, based on their performance they could potentially earn real-world money. Regardless of actual performance, participants would be told they performed well and rewarded with \$5-10. Then, instead of being asked to donate time, participants would be asked if they would like to donate money to charity and, thanks to the earlier portion of the study, they would always have some amount of cash on them with which to potentially donate. This would give both a potentially more varied response for the altruism scale as opposed to theoretically donating hours, and provide incentive to focus and engage fully with the videogame. A simple solution to the engagement with the vignette would be to provide some reading comprehension questions after the initial reading and warn participants of the short quiz in order to ensure they read closely and accurately. All of these solutions would be relatively easy to implement and could produce stronger and more varied results.

Additionally, both games used in the study are relatively old for the videogame realm. Just like showing an older black and white film to the youngest generation might not produce the same effects as showing a modern film, it seems possible that utilizing more recent videogames might produce stronger results. Although such new games would have to be carefully selected and pretested to ensure they are viewed appropriately,

i.e. neutral or prosocial, it might be worth the effort to secure a modern and up-to-date videogame choice.

Overall, despite not finding significant results, the research still seems worthy of follow-up, especially considering the number of design elements that could be tweaked or refined. Given the current body of research suggesting videogames' ability to induce both empathy and other emotions, it seems anomalous that the present study did not find the same kind of effect, and this anomaly suggests further replication or studies along the same line. If nothing else, the present study suggests that, in addition to demographics, culture and perhaps language differences are important factors to be considered in any future research. Given the limitations imposed by the constraints surrounding this study, the author feels the questions and issues raised by the lack of significance are just as important as any significant results would have been. Given that the videogame industry does not seem likely to disappear or wane anytime in the near future, but rather likely increase in prominence and prevalence, studies such as the present one are fundamental to truly understanding what role this form of media plays in our day to day life.

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Figure 1. Empathic Response ANOVA Results

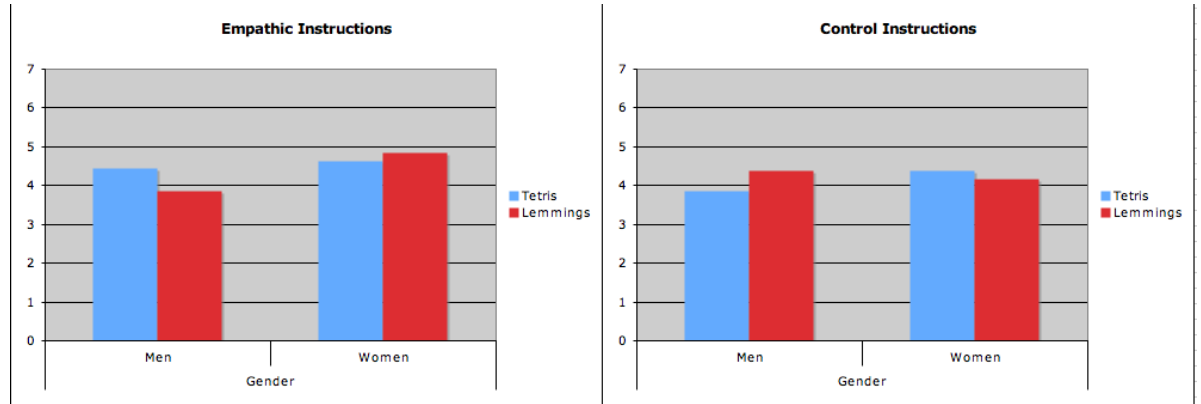
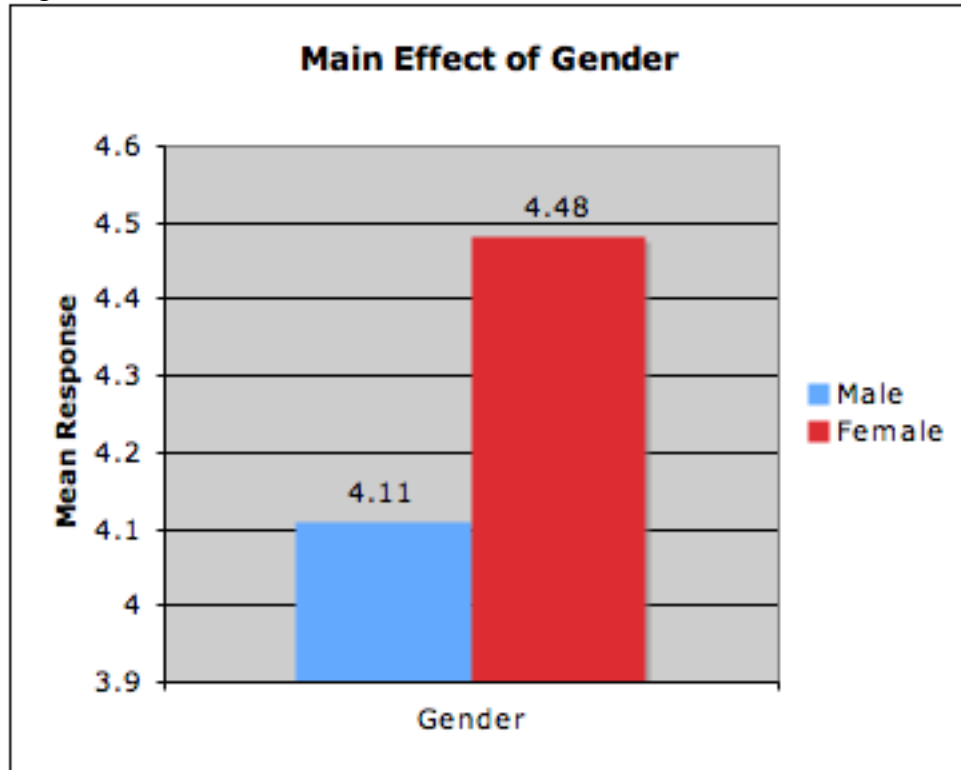
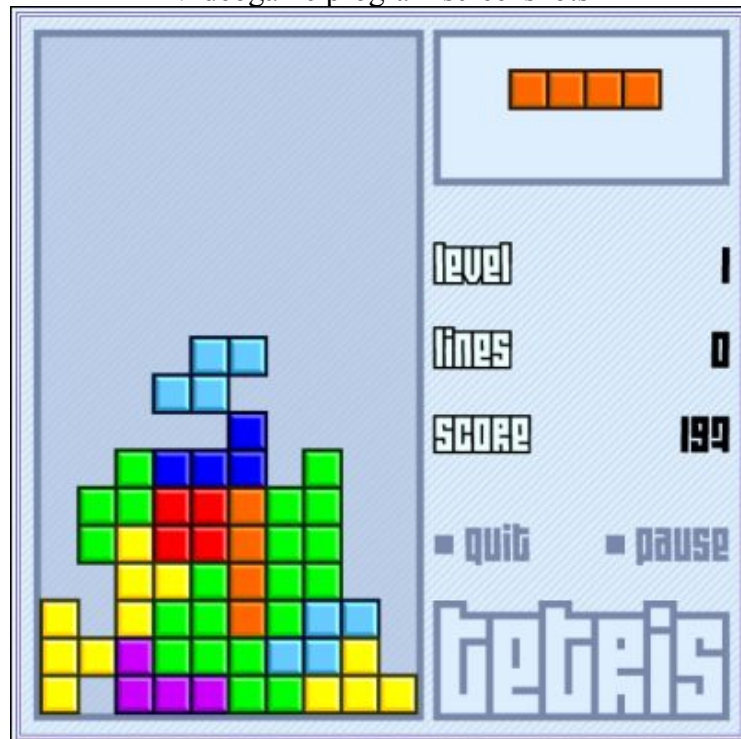


Figure 2.



Appendix A

Videogame program screenshots



Tetris: Video of game being played: <http://www.youtube.com/watch?v=keeSEJG4XzU>
 Players attempt to fit various blocks to make solid lines; a timed puzzle game



Lemmings: Video of game being played:
http://www.youtube.com/watch?v=6IG3VUV_M2E
 Players attempt to guide small “Lemmings” to safety amongst hazards.

Appendix B

Videogame Questionnaire

Age:

Gender: Male / Female

All following items assessed using the following scale:

1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7
Not at all _____ Absolutely

The game was enjoyable

The game was difficult

The controls were easy to learn

The game's graphics (visuals) were pleasant

I felt an emotional connection to the game

The game was violent

The game was anti-social in nature

I would play this game again

I would consider purchasing this game

Appendix C

Vignette

“Five days ago I broke my leg playing intramural sports. I’ve been playing on the same intramural team for the past three years and I’m upset that my season has been cut short. I’m experiencing pain because of my injury. I’m also having a tough time getting around campus, as there are lots of hills and stairs that make it hard to use my crutches on. The parking people won’t let me get a handicapped permit because they said my injury was only temporary. I’ve been real down. It’s all I think about.

It’s also really been bothering me that in addition to the physical difficulties of getting around, the injury has really changed how I interact with my friends. I’ve noticed a drastic change in their behavior, and I almost feel like they’re viewing me as overall less able. It’s a really uncomfortable feeling, but I’m not really sure how to bring it up without sounding weird.

If all this wasn’t enough, the injury indirectly led to a huge emergency today. I volunteer at the local YMCA, and this weekend I got to accompany the kids on a trip out to the nearby mountains, where we all went on a hike. I was supposed to be in charge of a group of 10 of them, and even though the other leaders insisted I didn’t have to come, I felt like I needed to prove myself. About halfway through the hike, though, two of the younger children wandered off. As soon as I realized they were gone, I panicked, but naturally I couldn’t exactly search for them very fast. I alerted the other chaperones, and luckily we were able to find them not too long after. I don’t think I’ve ever felt that afraid or guilty in my entire life, though, and it’s a moment I think is going to haunt me for a long time to come. I never expected something as simple as an intramural game could ever indirectly cause this many problems in my life.”

Appendix D

Vignette Questionnaire

Age:

Gender: Male / Female

All following items assessed using the following scale:

1	2	3	4	5	6	7
Not at all						Absolutely

I feel the author thoroughly conveys his situation

I feel the author uses very clear speech

I feel the author's word choices are appropriate to the story

I feel the story was easy to read

I feel the story does not need major corrections or changes

I feel sadness regarding the author's situation

I feel low-spirited regarding the author's situation

I feel heavy-hearted regarding the author's situation

I feel sorrowful regarding the author's situation

I feel sympathetic regarding the author's situation

I feel compassionate regarding the author's situation

I feel soft-hearted regarding the author's situation

I would give time to help the author if I could

I can perfectly imagine being in the same situation as the author

Appendix E

Boys and Girls Club of America

The screenshot shows the website for the Boys & Girls Clubs of America. At the top left is the logo with the text "BOYS & GIRLS CLUBS OF AMERICA". To the right is a navigation menu with links: "WHO WE ARE", "WHAT WE DO", "WHY WE CARE", "MEET OUR PARTNERS", and "NEWS & EVI". A red banner on the right says "AMERICA'S KIDS ARE IN CRISIS" with a "LEARN MORE" link. Below the navigation, the breadcrumb "BGCA.org :: Who We Are :: Mission" is visible. The main heading is "OUR MISSION", followed by the mission statement: "To enable all young people, especially those who need us most, to reach their full potential as productive, caring, responsible citizens." Below this is the "Core Beliefs" section, which lists: "A Boys & Girls Club Provides:", "A safe place to learn and grow...", "Ongoing relationships with caring, adult professionals...", "Life-enhancing programs and character development experiences...", and "Hope and opportunity." At the bottom, there is a call to action: "Like our mission? Then like our fan page and join thousands of others who support what Boys & Girls Clubs do." On the far right, there is a vertical sidebar with the "AR Nat" logo.

Appendix F

Informed Consent Form

You have been invited to participate in a research study conducted by Blake Bennett of Claremont McKenna College, under the supervision of Dr. Craig Bowman of the Psychology Department. We hope to investigate the differing perceptions of different videogames and how people react to them. You were selected as a possible participant because you are an undergraduate college student of at least 18 years of age in the United States.

If you decide to participate, you will play a video game for ten (10) minutes and then fill out a questionnaire with questions about your perceptions of the game. It will take no more than thirty (30) minutes. You may also be asked to read some pieces of writing and fill out additional questionnaires. You will receive .5 course credit towards the Psychology participation requirement or be entered into a raffle to win one of two \$20 gift certificates as compensation for taking part in the study. There are not anticipated risks beyond what you might encounter in any academic or testing setting, or those associated with a playing a computer game rated as suitable for all ages. Beyond monetary compensation no personal benefits are anticipated, although the information obtained in this study will be beneficial to scientific understanding of videogames and their effects.

No information that is obtained during this study can be personally connected to you. Your decision whether or not to participate will not affect your compensation, and if you decide to participate, you are free to withdraw at any point with no penalties. A refusal to participate or a withdrawal from participation will not affect your standing as a student or research participant.

The Institutional Review Board of Claremont McKenna College has reviewed and approved the present research. If you have any questions or concerns, please ask the experimenter at any point during the study. If you have questions later, you can contact the primary investigator, Blake Bennett (bbennett12@cmc.edu, 831.214.9442, Story House Box #190) or his faculty supervisor, Dr. Craig Bowman (craig.bowman@cmc.edu, 909.607.3361, Seaman Hall 226). Any additional concerns can be addressed to Mike O'Neill, chair of the CMC Institutional Review Board (moneill@cmc.edu, 909.607.8336, Adams Hall 214)

Name: _____

Signature: _____

Date: _____

Appendix G

Debriefing Form (PLEASE READ AND INITIAL)

Thank you very much for participating in this study. We would now like to tell you a little more of what we were studying today.

We are interesting in examining videogame's ability to promote positive empathy and prosocial behavior & altruism, specifically its ability compared to more traditional methods of encouraging empathy and prosocial behavior. In order to disguise this fact to ensure realistic results you were told you were to take part in two separate studies, when in fact you have participated in one connected study.

Please initial here if you understand you have participated in one unified study: _____

In addition to measuring responses to the vignette you were asked to read, we also wanted to give you a chance to be genuinely altruistic by donating time to a charity. Although the question was purely for research purposes, you are still naturally free to volunteer at the charity; however you are by no means required to, nor will we track whether you choose to, although we have recorded whether you stated you would, and if so how many hours.

Please initial here if you understand why you were asked if you wanted to donate time and the consequences thereof: _____

Because there was deception involved in this study, it is important to us to know you still consent to us using your data. Again, you will not be connected to any of your responses and you are completely anonymous. If you still agree to allowing us to use your data, please sign below.

Name: _____

Signature: _____ Date: _____

Also because the study involved deception, it is important that you not share the true purposes of the study with any potential participants. If someone came in knowing the true structure or purpose of the study, we not be able to use the data from their participation. By signing below, you are agreeing not to share the true purpose of the study or discuss it in any detail with other students until May, 2012.

Signature: _____ Date: _____

If you have any further questions or concerns, please voice them now to the investigator or email us. We thank you very much again for your help with this study!