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Gaming Against Violence: An Exploratory Evaluation through Mechanical Turk of the Efficacy of Persuasive Digital Games in Improving Unhealthy Relationship Attitudes

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Abstract

Objective: The current article explores the general efficacy of digital games that aim to combat teen dating violence by looking at the effect they have on players' attitudes towards this topic.

Materials and Methods: An online experiment was performed on 86 workers of Amazon's Mechanical Turk. Participants either played one of five teen dating violence (TDV) games or one of two control games unrelated to the topic. The TDV games were all prior winners in the annual Life.Love. Game Design Challenge hosted by Jennifer Ann's Group, a charity organization focusing on reducing dating violence. Attitudes were measured through previously validated dating violence scales with a pre- and post-test to show the degree to which players change their views.

Results: Players of the TDV games showed greater increase on attitudes towards dating violence than players of unrelated games, with small to medium effect sizes on different comparisons.

Conclusion: The results of this exploratory study are promising, showing that overall, the TDV games have an effect on their players. The study is limited in the sample that was drawn and that its sample was not large enough to distinguish differential efficacy among the TDV games, although it lays the groundwork for future studies to further validate the viability of these games as persuasive tools.

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Introduction

The issue of teen dating violence is widespread. An estimated 40 percent of graduating college students have been in an abusive relationship at least once in the United States.[1] Despite its ubiquity, 16 million (of a population of approximately 21 million) students in United States schools are being educated in states that lack teen dating violence (TDV) education legislation.[2] It is therefore necessary to approach this issue in a way that does not rely on institutional education practices. Digital games are an ideal and novel method to confront the problem of TDV. Jennifer Ann's Group, a 501(c)(3) nonprofit charity, produces video games through the Live.Love. Game Design Challenge, an annual videogame competition it has run since 2008 that encourages developers to create games about TDV.[3] Jennifer Ann's Group (JAG) hosts many of the games that were awarded prizes in this challenge on its site,[4] allowing interested parties to experience this fraught topic (for free) in a safe way.[5]

The current article explores the influences teen dating violence games have on players. An exploratory online experiment was performed looking at attitude change in players of several JAG games and compared with games unrelated to TDV. After defining the issue of teen dating violence and positing that games about this topic can help to combat it, we discuss the study's methods and results.

The Problem: Teen Dating Violence

Teen dating violence is defined as any kind of physical, sexual, or emotional violence (including stalking behavior) by the Centers for Disease Control.[6] A 2013 estimate concluded that around 21 percent of high-school aged dating females had experienced a form of TDV in the past year, with a lower percentage (10%) of men being victimized.[7] TDV is a complex, nuanced problem. Although it shares many of the same traits as 'traditional' domestic violence, it is further complicated by lack of awareness, insufficient policy focus, and the relative naiveté of those most affected.

Essentially, healthy relationship behavior is learned over time. If adolescents do not witness healthy relationship modeling within their family they resort to learning those behaviors through their

peers[8] and via media. As a result, perpetrators and targets of abuse are less likely than adults to identify and engage in healthy relationship behaviors.

Efforts to curb teen dating violence are almost invariably rooted in educational practice. However, in a comprehensive meta-analysis of current literature on the evidence behind these programs, De La Rue et al.[9] noted that while they do affect attitudes and knowledge, their influence on subsequent behavior (victimization and perpetration of dating violence) cannot be proven. Apart from being due to a lack of evidence rather than a lack of effects, this finding should encourage creators to tackle this issue in novel ways.

Videogames Designed to Prevent Dating Violence

Approaching dating violence prevention through a video game allows creators to present their message in a wholly unique way. Although video games are still often seen as mere entertainment, their ability to effect both generally positive changes in players[10] as well as more specific changes in attitudes towards social issues[11] is being increasingly recognized. By offering simulated environments, TDV games can promote experiential learning in players, letting them safely but interactively experience the issue from different angles.[5,12] This flexibility lets players reach their own conclusions about the critical aspects of TDV.[13] They also learn about this topic in the context of biographical or fictional stories, rather than in an abstract way.[14] All these facets could be said to give game-based learning an advantage over traditional methods of instruction.

Using games to discuss this topic also allows creators to come closer to the target audience of students aged between 11 and 22: Teens prefer games over other media,[5,15] and see the use of computers in instruction as a more positive experience than other methods.[16] In some cases teens see video games as appropriate tools for their age group, appreciating that their preference was considered when selecting an approach for them.

Apart from their viability as a tool for change and their fit with the audience that would benefit most from efforts to curb TDV, games are also quite cost-effective as teaching tools. Digital products are much easier to scale up or tailor to specific circumstances than physical resources, which

are constrained by manufacturing and production processes. Newer technologies also allow these games to be played from teens' own smartphones or tablets, presenting more intimate experiences while not having to rely on special devices, infrastructure, or legislation.

All of this makes TDV games more than just tools for use in educational settings. The games offered by JAG[4] are available to students via the internet at home, in schools, or public libraries, allowing them to learn about abusive relationships at their own pace without feeling 'preached to' by adults. Schools and parents are then secondary beneficiaries: The games provide teachers and administration with a free educational resource, while parents can benefit by educating themselves and using the games as catalysts for conversations.

Like many other serious games, TDV games can affect knowledge, skills, and attitudes. On the level of knowledge, TDV games can inform players by, for instance, making them aware of warning signs of abuse. They can proffer skills onto players, teaching them how to react to abusive situations (also as a bystander) or how to reach out for help. Apart from these effects, the primary impact that a TDV game could have is by changing the attitudes of its players. Convincing individuals that certain behaviors constitute abuse and should not be condoned is a critical issue facing TDV interventions. This also makes TDV games so-called 'persuasive games', games that were developed with the intention to change players' attitudes about certain topics. While persuasive games have been shown to positively affect player-held beliefs on several topics,[11,17,18] evidence is still needed to support attitude-changing effects of TDV games.[19] Our study was therefore guided by the following research question: Do teen dating violence games change the attitudes of their players towards this topic when compared to games unrelated to the topic?

Materials and Methods

Procedure

To determine if playing a video game designed to prevent teen dating violence was effective in changing attitudes towards unacceptable dating behaviors, an exploratory online study was performed with a 2 (TDV and Control games) by 2 (pre- and post-test) mixed experimental design. Participants

were gathered through the Amazon Mechanical Turk service (mTurk)[20] between November 2015 and January 2016. Before participating, potential respondents were informed about the study with regards to its subject matter (relationship violence), apparatus required to participate, the identity and affiliation of the researcher, and time investment (between 45 – 75 minutes). After this briefing, respondents were free to give or withhold consent electronically by participating (or not participating) in the study. Using an online survey tool, participants were given a pre-test measuring dating violence attitudes. Next, participants were shown to one of 7 games that were either TDV or control games, and asked to come back to the survey after finishing the game. Afterwards, participants filled in a post-test questionnaire on the same attitudes. They also completed a manipulation check item that asked them to briefly summarize the game they played. Respondents were given the chance to comment (or pose questions) on the study and the stimulus materials before being compensated through the mTurk payment system.

As the study was conducted by an independent researcher (the second author), institutional review board (IRB) approval was not available. With only the exception of the IRB (point 23), the study conformed to the declaration of Helsinki[21] as well as the mTurk guidelines for academic requesters[22] and official terms of service.[23] The latter two include, among others, the availability of grievance procedures for participants and requirements on data security/privacy. As the game stimuli used were designed for younger audiences, they contain no harmful imagery or sounds. The transparent, sensitive design of this study and the comments of the participants afterwards indicate that this study carefully guarded against adverse effects on its participants. The benefits of the study therefore outweighed the negligible negative outcomes.

Measures

Apart from demographic items on gender, age, and game-playing experience, participants filled in two measures related to dating violence. The first was definitional, asking respondents to tick boxes to indicate what constitutes abuse (e.g. physical, sexual). One decoy item was included (‘allegorical’) to control for respondents simply checking all the boxes. This item was analyzed by looking at the change in the number of (real) elements of dating abuse reported, whereby an increase would show a

broader definition of what constitutes abuse. The second measure was an 11-item scale taken from the Attitudes Towards Dating Violence Scales.[24] Respondents indicated on a 5-point Likert scale their agreement with statements about abusive situations (e.g. 'a guy should not insult his girlfriend/boyfriend' and 'it is O.K. for a girl to slap her boyfriend/girlfriend if they deserve it'). Calculation of Cronbach's alpha showed that the reliability of this scale was acceptable (pre-test: α = .813, post-test α = .787), and so all items were included in an average scale variable. Lastly, the respondents rated the enjoyability of the game on a scale from 1 to 10.

Games

To get an overview of the generalized efficacy of the TDV games, 5 different JAG games were included. The games were: Another Chance, Grace's Diary, Little Things, Love in the Dumpster, and The Guardian. These games were all award winning games in different iterations of the Life.Love. Game Design Challenge produced by JAG, and all were accessible online at the time of writing,[4] with each game taking 30 – 60 minutes to complete. Two control games were included, both relatively popular browser-based games: Samorost,[25] and Today I Die.[26] Neither of these games contained any information or behaviors related to TDV, while the dexterity requirements and gameplay were broadly comparable to the TDV games.

Sample

The sampling procedure selected only participants living in the United States through address verification. To avoid repeat participants, sampling proceeded by state, drawing a small number of participants from each state for one game before opening the study with a different game to another state. States sampled for the TDV games were California, Florida, Georgia, New Mexico, New York, Texas, and Vermont. The control games were assigned to New Jersey and Virginia.

This sampling strategy yielded 86 participants. The majority (68%) were men, and more than half (56%) were aged between 25 and 34 (24% was younger than 25, and 20% was older than 35). 45% of the sample reported playing games daily, with only 13% playing less than once a week. 66

participants played one of the TDV games as part of the study, with 20 participants playing either of the two control games.

Results

A repeated measures ANOVA was performed to determine the influence of the teen dating violence games when compared to the control games on their responses to the Attitudes Towards Dating Violence scale. Significant main effects were found for the pre- and post-test difference ($F(1,84)=7.1$, $p=.009$, $\eta^2_p=.08$), as well as for the condition ($F(1,84)=6.7$, $p=.012$, $\eta^2_p=.07$). An interaction effect was also found, indicating that persons who played the TDV games changed their attitudes towards the topic more than people who played the control game (see figure 1). All three effect sizes were small. The differences between the pre- and post-tests between conditions were further tested through two-sample t-tests. These showed that the two conditions did not significantly differ at pre-test ($t(84)=1.8$, two-tailed-$p=0.082$, Hedges' $g_s=.45$), though they were different at post-test ($t(84)=3.3$, two-tailed-$p=0.002$, Hedges' $g_s=.83$), with means indicating that the TDV players ($M=4.6$, $SD=0.5$) had greater scores than the control players ($M=4.2$, $SD=0.6$). When looking at the difference scores between the two observations, the increase was largest for players of the TDV games (Control $M=.2$, $SD=0.3$, TDV $M=.0$, $SD=0.2$, $t(84)=2.5$, two-tailed-$p=0.013$, Hedges' $g_s=.64$). Overall, the TDV games incited greater attitude change in their players than the control games did.

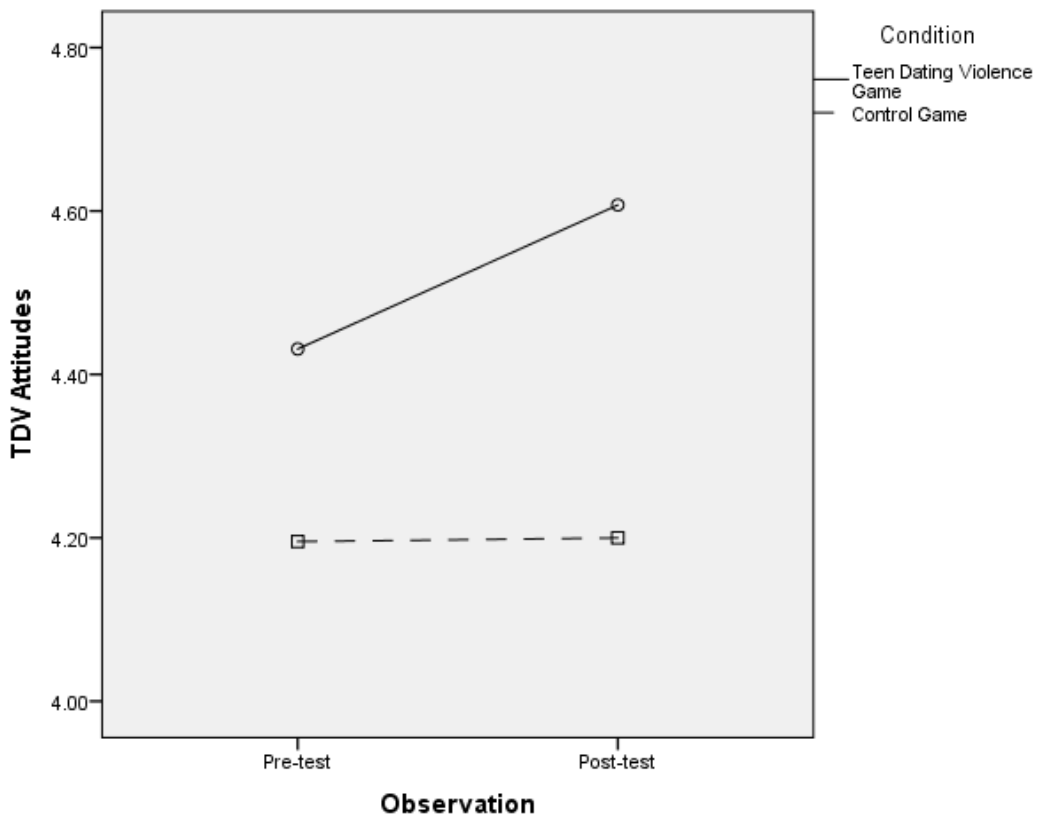

Figure 1: Attitude change in the TDV and control game conditions. Higher scores indicate lower acceptance of dating violence. The difference in pre-test between conditions is not significant at an alpha of .05, though that of the post-test is.

Data were also analyzed for the definition of abuse, the TDV games separately, and for the influence of demographic variables. For the item about definition, a ceiling effect negated any possible effects. The average number of elements included in the definition was 5.6 on the pre-test, and lowered to 5.5 on the post-test, though there were no significant discrepancies between the groups on the difference score ($t(65)=-1.5$, two-tailed-$p=0.150$, Hedges' $g_s=.20$). Looking at the TDV games separately, no differences were found between the five games used in this study when they were included in an ANOVA with attitude change as the dependent variable ($F(4,61)=.5$, $p=.714$). Lastly, gender differences were found in the pre-test on an independent samples t-test when looking only at players of the TDV games ($t(64)=2.629$, two-tailed-$p=.011$, Hedges' $g_s=.67$), indicating women ($M=4.7$, $SD=.4$) had higher scores than men ($M=4.3$, $SD=.6$). This difference was not found for the post-test ($t(64)=1.783$, two-tailed-$p=.079$, Hedges' $g_s=.46$). The attitude difference was close to significantly different between genders ($t(64)=1.947$, two-tailed-$p=.056$, Hedges' $g_s=.50$), indicating

that men's attitudes (*M*=.2, *SD*=.3) underwent greater changes than women's (*M*=.1, *SD*=.3), though this was not significant at an alpha of .05.

Discussion

Summarizing, the interaction effect found can be taken to mean that the change in attitudes for TDV game players was greater than it was for control game players. This can be seen in the slope of the graph for the TDV group in figure 1, whereas the control group showed no increase. This means that it is highly likely that the TDV games had an effect on the attitudes of its players. Because these results cannot be separated per game, the only conclusion that can be drawn is that, on the whole, games intended to have an effect on TDV attitudes affect these attitudes more than games that were not designed for this purpose.

As this was an exploratory study, it could not prove without doubt that all TDV games affect attitudes towards teen dating violence. As a first foray into this topic, however, these results are very promising. Further research could improve on this study in the following ways. The mTurk sampling strategy was not equal to the target audience, and it was not possible to randomize participants completely. Although we did not find systematic differences in our sample in the origin state of the participants, subtle differences between respondents of different states cannot currently be ruled out. Future studies should attempt to replicate the current results by truly randomizing participants, but also by taking a sample that is of sufficient size to detect possible differences in effects between the TDV games. In this way, the focus of research can begin to move from simply determining effects to establishing what properties of games increase or dampen their influences.

To conclude, despite the fact that the TDV games used in this study were not developed with the current study's sample in mind, the games clearly affected their players. This result supports the viability of persuasive games in combating the all-too-common phenomenon of teen dating violence.

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Author Disclosure

Drew Crecente is the founder/executive director of Jennifer Ann's Group and is in that capacity the producer and publisher of the videogames hosted on the Group's site. There were no other competing financial interests.

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