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Report on:

Piloting a Role-Playing Intervention for Aggression in a Translational Study

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Behavioral researchers have studied aggression and other problem behavior extensively. However, researchers have not reported formal functional analyses of bullying, though research suggests that bullying is often maintained by social reinforcement (see Ross & Horner, 2009).

Often when assessing problem behavior, behavioral researchers and practitioners use a procedure called the functional analysis of problem behavior, where participants or clients essentially go through simulated situations that may trigger the problem behavior and reinforce it, if the session simulation is similar to the actual function. For example, a child who engages in excessive physical aggression in the classroom may go through sessions where attention from an adult is only given when aggression occurs. If the aggression occurs at a high rate, lack of attention may be a trigger, and providing attention after the behavior may reinforce it. Conducting some kind of functional behavior assessment for bullying may still be beneficial, given the seriousness of the issue, and in consideration of the fact that understanding the function(s) of a bully's behavior could improve behavioral procedures to tailor intervention and prevention efforts. Adapting these assessments to bullying where the nature of the attention may be an important variable, and the contingencies that actually reinforce the behavior may be difficult to simulate, is a challenge. A possible solution or alternative is to study an aggressor's behavior in role-playing or video games where environmental parameters can be manipulated.

The link between exposure to violent media and desensitization to violent crimes and behaviors has been an area of concern. Carnagey, Anderson and Bushman (2007) conducted research aiming to see if playing violent video games correlated to a change in physiological response when watching real violence. They found that, exposure to playing violent video games, even for short periods of time can have an impact on arousal in response to violence in

the real world, suggesting that video games can be somewhat desensitizing. Similarly, Funk, Baldacci, Pasold and Baumgardner (2004) examined if desensitization associated with high exposure to violence could also be associated with lower empathy. In their study they found that, “exposure to video game violence was a significant predictor of empathy scores, with more exposure related to lower empathy.” Other studies have also been conducted that aimed to examine the role of long-term exposure to video games and trends in levels of prosocial behavior over time. Prosocial behavior is the behavior thought of to have the goal of benefitting society as a whole or intending to. Coyne, Warburton, Essig and Stockdale (2018) recently examined the longitudinal effects violent video games on externalizing behaviors and prosocial behavior. The study lasted five years with waves of data taken about every two years, self-reported by the mother, father, and the child involved. One of the most important findings of this study was that there was no direct link between violent video games and prosocial behavior, but that prosocial behaviors begin to suffer when violent video games are played.

When it comes to video games and violence, a concern may be that use of violent video games may lead to more violence in the real world. There is little empirical evidence that supports the claim that video games, and especially those that are violent, can lead to violence outside that realm. DeCamp and Furguson (2017) explained that despite the release of violent video games and increased consumption of such titles, the rate of real-world violence has dropped, and real-world violence has dropped much more significantly once video games of these types are released. Prescott, Sargent, and Hull (2018) suggest that what occurs in video games, the thoughts and feelings within those games have the potential to spill into real world thinking and behaviors. Nevertheless, the concerns over video games and changes in individual behavior led these authors to explore using live role-playing games as a skills training medium.

There is some research that suggests that the use of role playing can help with the treatment of certain problem behaviors, and this can be a more effective method when compared with modeling, and exposure techniques (Lira, Nay, McCullough, and Etkin, 1975). When it comes to role playing, both live games and video games such as typically referred to as role playing games (RPGs), there are certain qualities about these types of games that can make them attractive to play, such as: achievement, social, and immersion motivations (Lira, Nay, McCullough, and Etkin, 1975; Schimmenti, Infanti, Badoud, and Laloyaux, 2017). In addition, immersion into the storyline of an RPG can evoke strong emotions in people when there are moral and immoral choices to be made. The feeling of being “wrapped-up” in the narrative can leave players feeling guilty about the actions they have committed to while playing (Mahood & Hanus, 2015). Finally, Greitemeyer and Mügge (2014) examined effects of violent and prosocial video game play. They found that exposure “causally affects aggressive and prosocial behavior related variables.” This suggests that the use of RPGs can be an effective method for treating behaviors based on their immersion and emotion evoking potential.

Dungeons and Dragons

For live role-playing games, Dungeons & Dragons is one of the most widely-known and popular brands. Dungeons & Dragons (D&D) is a roleplaying game where the players help to create the story under the guidance and support of their Dungeon Master (DM). One of the most notable features of Dungeons & Dragons, which separates it from a typical roleplaying game, is that it is “a way of determining the consequences of the adventurers’ action,” (D&D Beyond, n.d.). Like many other roleplaying games, either with live play options or electronically in the form of a video game, players can create a character of their own design. They can pick their race, their class, moral alignment, abilities, weapons, personality traits, and much more. Once

characters are created, a DM can start a campaign, where the characters that have been created can explore a fantasy world and step into a narrative they can help to write.

The one of which this campaign will focus on primarily is the interaction aspect of the game. For simplicity sake, this functions more like a typical RPG, rather than a free-to-roam style campaign, where players are set on a certain story, and their choices in the roleplaying scenarios can dictate if they resolve tense situations peacefully or physical conflicts occur. This will be a transitional study with college students, aiming to see if there is any noticeable effect from providing a response cost to aggressing in-game. The purpose of the study will be to begin developing an assessment to determine function of aggressing, or of various responses to aggression. Response cost is an effective behavior-change procedure, but because its effect on reducing behavior involves a “penalty” of removing established conditioned reinforcers, it was necessary to test a translational version of the procedure before a clinical one. A brief review of response cost is provided next.

Response Cost

Early research concerning response cost (RC) examined the effects of RC on escape and other avoidance behaviors where humans were the subjects. Weiner (1963) found that subjects “failed” to engage in avoidance behaviors when they were in the response cost condition. It was also explained that response cost is different than other types of interventions where aversive stimuli are used since there is little, if any, risk of injury to the person experiencing response cost. Weiner points out that a response cost contingency can be a useful event counterproductive to the maintenance of avoidance and escape behaviors.

Many studies have examined the influence RC can have with decreasing problem or undesirable behaviors. Keeney, Fisher, Adelinis and Wilder (2000) found that response cost resulted in a decrease in destructive behavior when aiming to reduce self-injurious, aggressive, and disruption behaviors compared to noncontingent reinforcement. They explain that RC is relatively easy to implement, and that you do not need to change the demands based on use of this contingency. Capriotti, Brandt, Ricketts, Espil and Woods (2012) examined the role of response cost and the impact it might have on tics for persons with Tourette's Syndrome. They found that when intervention is complete and tics have reduced, then the response cost contingency is removed, it does not result in an increase in tic behaviors for those with Tourette's. This indicates the learning with response cost contingencies can maintain.

Deibel and Thorpe (2013) examined rats in the lab, where response cost was used to assess the rats foraging behaviors. They found that response cost may inhibit species-typical exploratory behaviors as a possible side effect of increased target behavior. Fox and Pietras (2013) conducted a study looking to see if response cost could lead to participants following what was considered to be arbitrary rules more often. They found that with the addition of a response cost contingency in a human operant experiment, it was observed that more rule following was seen compared to no response cost contingency. Taken together, these experiments indicate that RC is an effective behavior change procedure, reduces problem and avoidance behavior, is largely safe (non-human research indicates possible behavioral side effects), and may increase compliance with rules.

The present study is examining the role that response cost might have in relation to aggression when used in a live role-playing game. The goal of this study is to see if the implementation of a response cost contingency can aid in the reduction of aggression in-game.

Participants created their own characters to role-play as during testing. The study was a multiple-baseline design, where entry into intervention was staggered by three action points of separation for each condition. Participants further rated their emotional state before and after the game.

Thus, an aim of this study was to develop a procedure to change aggressive choices in a live role play scenario. This will help the researchers assess if behavior change strategies affect in-character choices, and out of game behavior (self reported).

Method

Design

The design was a multiple baseline across subjects design.

Participants

Participants were recruited from the central New Jersey area and had experience with either Dungeons & Dragons or other role-playing games.

Procedure

After consent procedures, participants were directed to make a character for this campaign, they were given access to the website, <https://www.dndbeyond.com/>, where they created a character of their design. After that, participants were guided into the testing room. After that, the participants began a Dungeon and Dragons campaign with the experimenter as DM. In the campaign, participants were presented with a choice point (or a trial) and given either two or three options to achieve their goal and progress in the story. Of the available options, only one was determined to be the aggressive choice, either physically or verbally. In the baseline phase, the participant did not face any extra consequence for making aggressive story choices. In

the intervention phase, players would encounter a response cost contingency based on if they choose the aggressive choice at any choice point in the campaign after baseline.

Measures

What we kept track of throughout participants' journey through the campaign was how many aggressive choices they made. When presented with the options on how they would choose to resolve conflict, the last choice was always deemed as the aggressive. They were deemed the aggressive choices because they either made the character threaten or physically engage with whoever was in that particular situation. Additional measures include questionnaires regarding emotional responding to the game. These questionnaires were delivered pre and post campaign. Finally, we also gave participants a questionnaire after they finished the campaign to assess how involved in the story they were.

Planned Analysis

We planned to compare number of aggressive choices in baseline and intervention across participants. We planed further analyze the characters and emotional and narrative involvement reporting to create hypotheses for further study.

Results

Five participants completed the procedure, and the response cost contingency was implemented at three different times across the participants. Three participants reduced their aggressive choices, one (A1) did not contact the contingency, and one (B2) did not change her choices due to the contingency. See the choices for each participant in Figure 1. The average percentage of aggressive choices for all participants in baseline was 56.67%, and in the response cost condition was 31.01%. See the percent change for each participant in Figure 2.

Participants in the A campaign were in baseline for actions one, two and three, and from actions four through sixteen they were in intervention and subject to the response cost contingency. Participant A-1 did not contact the response cost contingency throughout his progression in the story. Throughout the campaign at choice points where the participant could role-play something they would like to stay, was conveying a sense of morality. This idea is strengthened by participant A-1's comment after the campaign had concluded. Participant A-1 said they were not making aggressive choices because the character they created was not an aggressive person. Participant A-2 seemed to be testing the response cost contingency as they came into contact with it. After baseline ended and intervention kicked in, participant A-2 would alternate between engaging in aggressive behavior and not, followed by a short break, testing the contingency, and then not making any aggressive choices for their last four action points.

Participants in the B campaign were in baseline for actions one through six, and from actions seven through sixteen they were in intervention and subject to the response cost contingency. Participant B-1 contacted the response cost contingency in a similar fashion to A-2. The difference between A-2 and B-1 is that the testing of the contingency occurred towards the end of the campaign. From choice points eight through twelve, B-1 did not make any aggressive choices after coming in contact with the response cost contingency when intervention started at choice point seven. B-1 also made a comment after finishing the campaign that they had figured out that aggressive actions in the story cost him in game money. Participant B-2 was remarkably different from all other participants. They came into contact with the response cost contingency very regularly. They only made non-aggressive choices four times throughout the entire campaign. They also made a comment after finishing the campaign, they knew that aggressive actions made them lose gold each time (when the response cost contingency was contacted), but

that they made a character who would make those choices and if they knew they would lose gold, they would have created a different character to go through the campaign with.

Participants in the C campaign were in baseline for actions one through nine, and from actions ten through sixteen they were in intervention and subject to the response cost contingency. Participant C-1 contacted the response cost contingency in a similar manner to both A-2 and B-1. It is important to note that during baseline, C-1 engaged in six aggressive actions in nine possible points, and that once the intervention started and C-1 came into contact with response cost, aggressive choices diminished. Though C-1 did not test the contingency, it is clear that with contact with response cost engagement in aggressive actions drops.

Discussion

Thus far, it seems that in the intervention phase and after contact with the response cost contingency there is a reduction in aggressive choices being made in-game. Though this did not work for every participant we had, there was another explanation for their specific choices. Participant A-1, who did not contact the contingency, explained that they did not make an aggressive character. Participant B-2 (who contacted the contingency but did not reduce aggressive responding) explained they made only an aggressive character; these comments bring to light the potential issues of having no constraints in the character creation aspect of the experiment. Another important note was that both participants B-1 and B-2 explained that they understood that every aggressive choice led to a loss of in-game currency.

The idea behind this study was to examine the efficacy of using a response cost contingency combined with a live role-playing game can lead to a decrease in aggressive choices being made in this live role-playing game. If the response cost contingency can lead to changing

behaviors in games, it might be able to lead to behavior changes in “aggressive” persons eventually. Though this finding is hopeful, more data needs to be gathered and examined in order to support this idea before the attempt to bring this to children with aggressive tendencies or other populations is made. We additionally have secondary data to analyze, including self-reported affect before and after the game.

References

- Capriotti, M. R., Brandt, B. C., Ricketts, E. J., Espil, F. M., & Woods, D. W. (2012). Comparing the effects of differential reinforcement of other behavior and response-cost contingencies on tics in youth with Tourette syndrome. *Journal of applied behavior analysis, 45*(2), 251–263. doi:10.1901/jaba.2012.45-251
- Carnagey, N. L., Anderson, C. A., & Bushman, B. J. (2007). The effect of video game violence on physiological desensitization to real-life violence. *Journal of Experimental Social Psychology, 43*(3), 489-496. <http://dx.doi.org/10.1016/j.jesp.2006.05.003>
- Conyers, C., Miltenberger, R., Maki, A., Barenz, R., Jurgens, M., Sailer, A., ... Kopp, B. (2004). A comparison of response cost and differential reinforcement of other behavior to reduce disruptive behavior in a preschool classroom. *Journal of applied behavior analysis, 37*(3), 411–415. doi:10.1901/jaba.2004.37-411
- Coyne, S. M., Warburton, W. A., Essig, L. W., & Stockdale, L. A. (2018). Violent video games, externalizing behavior, and prosocial behavior: A five-year longitudinal study during adolescence. *Developmental Psychology, 54*(10), 1868–1880. <https://doi.org/10.1037/dev0000574.supp> (Supplemental)
- D&D Beyond. (n.d.) Introduction. Retrieved 3/28/19 from <https://www.dndbeyond.com/sources/basic-rules/introduction>
- DeCamp, W., & Ferguson, C. J. (2017). The impact of degree of exposure to violent video games, family background, and other factors on youth violence. *Journal of Youth and Adolescence, 46*(2), 388–400. <https://doi.org/10.1007/s10964-016-0561-8>

- Deibel, S. H., & Thorpe, C. M. (2013). The effects of response cost and species-typical behaviors on a daily time-place learning task. *Learning & behavior*, *41* 1, 42-53. doi:10.3758/s13420-012-0076-4
- Fox, A. E., & Pietras, C. J. (2013). The effects of response-cost punishment on instructional control during a choice task. *Journal of the Experimental Analysis of Behavior*, *99*, 346-361. doi: 10.1002/jeab.20
- Funk, J. B., Baldacci, H. B., Pasold, T., & Baumgardner, J. (2004). Violence exposure in real-life, video games, television, movies, and the internet: Is there desensitization? *Journal of Adolescence*, *27*(1), 23-39. <http://dx.doi.org/10.1016/j.adolescence.2003.10.005>
- 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 and Social Psychology Bulletin*, *40*(5), 578–589. <https://doi.org/10.1177/0146167213520459>
- Keeney, K. M., Fisher, W. W., Adelinis, J. D., & Wilder, D. A. (2000). The effects of response cost in the treatment of aberrant behavior maintained by negative reinforcement. *Journal of applied behavior analysis*, *33*(2), 255–258. doi:10.1901/jaba.2000.33-255
- Lira, F. T., Nay, W. R., McCullough, J. P., & Etkin, M. W. (1975). Relative effects of modeling and role playing in the treatment of avoidance behavior. *Journal of Consulting and Clinical Psychology*, *43*(5), 608–618. <https://doi.org/10.1037/0022-006X.43.5.608>
- Mahood, C., & Hanus, M. (2017). Role-playing video games and emotion: How transportation into the narrative mediates the relationship between immoral actions and feelings of

guilt. *Psychology of Popular Media Culture*, 6(1), 61–73.

<https://doi.org/10.1037/ppm0000084>

Prescott, A. T., Sargent, J. D., & Hull, J. G. (2018). Metaanalysis of the relationship between violent video game play and physical aggression over time. *PNAS Proceedings of the National Academy of Sciences of the United States of America*, 115(40), 9882–9888.

<https://doi.org/10.1073/pnas.1611617114>

Ross, S. W., & Horner, R. H. (2009). Bully prevention in positive behavior support. *Journal of Applied Behavior Analysis*, 42, 747-759. doi: 10.1901/jaba.2009.42-747

Schimmenti, A., Infanti, A., Badoud, D., Laloyaux, J., & Billieux, J. (2017). Schizotypal personality traits and problematic use of massively multiplayer online role-playing games (MMORPGs). *Computers in Human Behavior*, 74, 286–293.

<https://doi.org/10.1016/j.chb.2017.04.048>

Weiner, H. (1963). Response cost and the aversive control of human operant behavior. *Journal of the experimental analysis of behavior*, 6(3), 415–421. doi:10.1901/jeab.1963.6-415

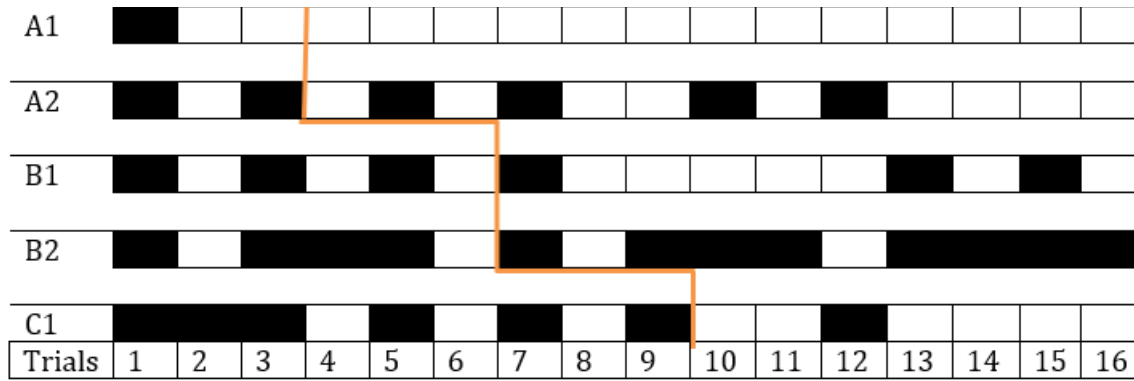


Figure 1. Choices at each choice point in the campaign for participants. The shaded cells are aggressive choices, and the non-shaded cells are non-aggressive choices. The response cost contingency begins when the orange phase-change line crosses each data path.

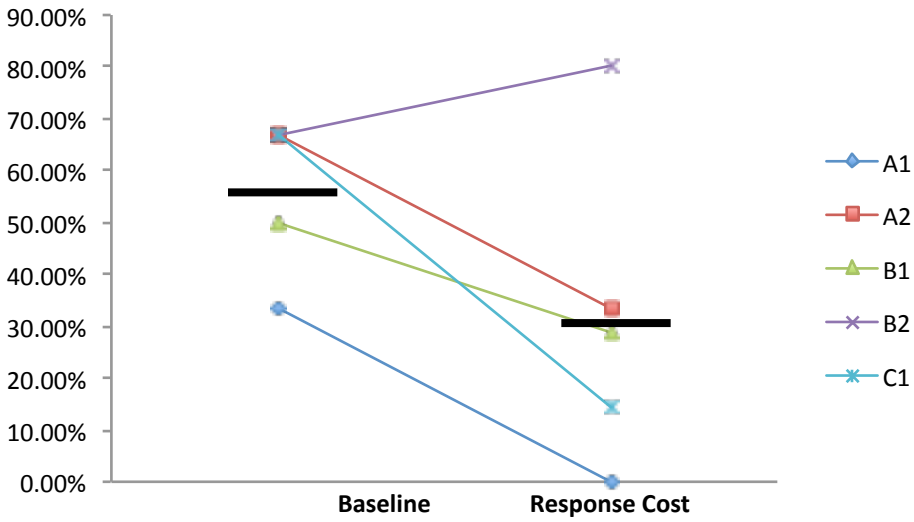


Figure 2. Percentage of aggressive choices made during baseline and response cost. The horizontal bars indicate the mean of all participants.