

Aggression and VR Violent Gaming: The Power of Moral Disengagement and Immersion

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ABSTRACT

Recent studies have revealed that exposure to in-game violence in certain circumstances can prompt players to view the behavior as moral and socially acceptable, leading to increased aggressive behavior. This has led researchers to consider the combination of in-game violence with moral psychology. This article examines the relationship between exposure to violent video games and behavioral aggression, focusing on the moderating effect of immersion. With the theoretical framework of the General Aggression Model (GAM), it is suggested that exposure to violent media leads to the repetition of the cognitive schema of aggression, resulting in increased behavioral aggression in non-gaming contexts. The study posits hypotheses that higher levels of moral disengagement in violent gaming scenarios lead to higher behavioral aggression, and immersion moderates the effect of violent game exposure. In order to investigate these hypotheses, a two-factor between-subjects experimental design will be employed. The study will utilize a VR game setting (on Operation Flashpoint) to maximize the effect of immersion. It will disclose the moderating effect of immersion on the correlation between moral disengagement and behavioral aggression. The Wasabi paradigm will be utilized to measure behavioral aggression. It is predicted that individuals exposed to morally disengaged and VR conditions will exhibit notably higher scores on the Wasabi task compared to those in non-disengaged and non-VR conditions. A significant interactive effect is anticipated between moral disengagement and immersion, which will magnify the impact of moral disengagement on aggressive behavior. The study seeks to contribute to the existing understanding of the factors contributing to aggressive behavior in violent gaming.

Keywords: Immersion, Violent Video Games, Behavioral Aggression, General Aggression Model

Introduction

Researchers have extensively studied the issue of violent video games and their influence on behavioral aggression over the past few decades. A prevailing belief supported by empirical evidence is that exposure to violent video games can increase an individual's aggressive behavior in real-life situations (Calvert et al., 2017). This notion is corroborated by several theories, including the General Aggression Model (GAM) (Bushman & Anderson, 2021; Sauer et al., 2015). According to the GAM, aggression is primarily a cognitive process, and exposure to violent media activates cognitive schemas associated with aggression, leading to increased behavioral aggression beyond the gaming context (DeWall et al., 2011).

While there have been some controversies, the majority of empirical studies support the idea that exposure to violent video games is a significant risk factor for aggressive behavior (Anderson et al., 2010). However, it is important to note that the relationship between violent video games and aggression is complex and multifaceted. Recent research has identified additional factors that can moderate or nullify the effect of exposure to violent games on behavioral aggression. For instance, studies have examined the role of narrative context and player avatar in influencing the impact of violent games on aggression (Adachi & Willoughby, 2011; Sauer et al., 2015). These studies have shown that how violence is presented within the game, such as within a morally justifiable context, can affect players' perceptions and subsequent aggressive behavior. Additionally, immersion in gaming has received attention as a potential moderator of the relationship between violent game exposure and aggression (Drummond et al., 2021; Chen et al., 2022).

Although previous research on immersion as a moderator has yielded inconclusive results, there is a growing body of empirical studies exploring this factor (Drummond et al., 2021; Chen et al., 2022). Immersion refers to the extent to which individuals feel absorbed and engaged in a virtual environment. It is hypothesized that higher levels of immersion in violent gaming experiences may amplify the effect of exposure to violent games on aggression due to increased affective and cognitive processes associated with immersion. This study aims to investigate the impact of immersion as a moderator to contribute to the existing understanding of the factors influencing aggressive behavior in the context of violent gaming. Specifically, the study will utilize a virtual reality (VR) game setting to maximize the level of immersion experienced by participants. By focusing on the potential moderating effect of immersion, the study aims to provide more insight into the complex relationship between violent video games, immersion, and behavioral aggression. Furthermore, it is worth noting that while the literature has explored the relationship between violent video games, aggression, and moral disengagement (Hartmann et al., 2010; Grizzard et al., 2014), more empirical studies are needed to investigate this aspect further. By considering the moral implications of violent gaming behaviors and examining the potential moderating effect of immersion, this study aims to fill this gap in the literature.

In summary, while previous research has established a connection between violent video games and behavioral aggression, the literature review acknowledges the need for further improvement by focusing on more similar empirical studies. By exploring the moderating effect of immersion and considering the moral aspects of violent gaming, this study seeks to enhance our understanding of the complex relationship between violent video games, immersion, moral disengagement, and aggressive behavior. To achieve these objectives, a two-factor experimental design will be employed. The study posits two hypotheses: the higher level of moral disengagement in violent gaming scenarios leads to higher behavioral aggression; immersion moderates the effect of violent game exposure, and a higher level of immersion in violent gaming will intensify this effect.

Methodology

Participants and design

In this study, it is expected to recruit 388 Hong Kong residents aged 16-34 as participants, ideally composed of 194 females and 194 males. According to the survey results, over 83% of Hong Kong respondents aged 16 to 34 reported playing online games (Thomala, 2022). Thus, it would be quantitatively representative to select participants from the age group of 16-34 for this study. Participants will be recruited on social media platforms via the HKU Psychology Society account, mass email, and poster posting on the HKU campus. After the recruitment, all participants will be randomly assigned to one of the four conditions, with $n=97$ in each condition.

This study is to test whether playing violent games involving moral disengaging elements (as opposed to those that don't involve moral disengagement) will increase behavioral aggression and the moderating effect of immersiveness in the correlation. Therefore, the between-subjects design of 2 (morally disengaged vs. morally non-disengaged violence) $\times$ 2 (high vs. low immersion) will be employed. Additionally, it is expected that participants who play a video game involving morally disengaging characters and with high immersion will exhibit greater levels of aggressive behavior compared to those experiencing only one or neither of these variables. Specifically, the interacting effect of violence with moral disengagement and immersion is expected to result in higher behavioral aggression than either of the variables alone.

To be eligible for participation in the study, individuals will be required to have normal vision or corrected-to-normal vision. Participants with long-sightedness will be excluded from the study due to the proximity of the Meta Quest 2 VR headset to the eyes. Additionally, individuals with any symptoms of vertigo will also be excluded from participation. They will be alerted in the general recruitment that those with self-reported uncomfortable feelings with first-person shooter games will not be accepted to participate in this study. A recompense of 150 HKD will be given to each participant completing the study.

Individuals who score four or higher on the Generalized Anxiety Disorder 2 item scale (GAD-2; $n = 9$) will be excluded from participating in the study, as the games will include horror content that would potentially trigger anxiety. Despite the proposition that it is unlikely for participants to experience extreme anxiety while playing the game, given the level of immersion in virtual reality, individuals who showed high levels of anxiety as a precautionary measure will be excluded from participation in this study to prevent the potential of anxiety episodes induced by the immersive virtual environment.

Materials and assessments

Video game, immersion, and manipulation

The game Operation Flashpoint will be employed for this study, which is a first-person shooter. Avatars will be used to manipulate the degree of moral disengagement of in-game violence. This measure has been proven successful in manipulation in prior studies (Chen et al., 2022). In the morally disengaged group, participants will play the role of a soldier who is tasked with attacking a torture camp in order to rescue hostages. Conversely, in morally non-disengaged violent groups, participants will play a terrorist role in advancing brutality to defend the camp. For immersion manipulation, the game will be the same, but as Operation Flashpoint VR using VORPx, which is basically a VR driver or VR-compatible mod that comes with true Stereo 3D profiles, converting games into VR modes. Therefore, in the morally disengaged + high immersive condition, participants will play as a humanity-restoring soldier in VR mode. Oppositely, participants in the non-disengaged + low immersive condition will play as a terrorist on a flat screen with normal PC speakers. For the VR headset, Meta Quest 2 will be used, as it provides Accurate motion tracking and sharp display and is relatively affordable (Greenwald & Minor, 2023).

Moral disengagement and immersion manipulation assessment

The state guilt scale modified by Hartmann(2010) will be employed to assess if the moral disengagement of moral disengagement manipulation is significant. This scale is composed of questions related to participants' feelings of guilt when engaging in morally questionable behaviors during gameplay (e.g., "In the game, how often did you feel like you did something wrong?"). The scores from all three items will be combined and averaged to generate an overall degree of moral disengagement score related to the violence depicted in the game (Cronbach's $\alpha = .84$).

Furthermore, the degree of immersion will be measured using the game immersion scale to determine the effectiveness of the immersion manipulation (Zhang & Xie, 2008). This scale consists of questions including "I forget my surroundings during the game," and responses will be based on a 7-point Likert scale. The scores from all five items will eventually be average (Cronbach's $\alpha = .76$).

Trait aggression

Trait aggression will be assessed in order to identify individual differences that may affect the study results. The 12-item Brief Aggression Questionnaire (Webster et al., 2013) will be used to assess participants' traits of aggression. Questions include, "If I have to resort to violence to protect my rights, I will." The scores of all 12 items will be averaged to give an overall trait aggression score for each participant, and the data of participants with extremely high levels of aggressive traits will be excluded (Cronbach's $\alpha = .88$).

Initial questionnaire

Participants will be required to fill out an initial questionnaire regarding their demographic characteristics (e.g., age, sex) and, more importantly, gaming experiences before commencing gameplay. Specifically, participants will be asked questions like "How often do you play video games." This assessment of previous gaming experience is intended to ensure the equal assignment of participants with approximately similar gaming experiences in each condition.

Aggressive behavior

The Wasabi task will be used to assess the behavioral aggression. This task is adapted from Lieberman's (1999) Hot Sauce paradigm and was previously utilized in Sauer's (2015) study, effectively identifying aggressive behavior following video game play. In this task, participants will be informed that wasabi is a highly spicy condiment that is disliked by many. They will then be instructed to dispense a specific amount of wasabi into a cup as part of a pilot study on people's taste experiences. Later, another person (fictional) will be asked to consume all the wasabi in that cup and provide feedback on their experience. Therefore, the quantity of wasabi dispensed is an indicator of aggressive behavior since the participant is imposing an uncomfortable experience on another.

Procedure

Prior to the commencement of the experiment, the participants will need to fill out a consent form that outlines the precautions and rights they have as human participants in the study. Following this, they will be informed that they are taking part in a video game study, which serves as a cover for the true purpose of the experiment. The participants will be required to first complete the assessment on demographical characteristics and prior experience, trait aggression, and mental health. They will be randomly assigned to the four conditions and will then be briefed about the basic operation of the game. After the briefing, participants will start to practice the game for 5 minutes and will then be allowed to play the game for 25 minutes. After the gameplay, participants need to fill in the state of guilt and game immersion scales. Finally, participants will be debriefed and questioned about whether they guessed the intention of the study to ensure its validity.

Data analysis

For the results analysis, a 2 (morally disengaged vs. morally non-disengaged) $\times$ 2 (high vs. low immersive) ANOVA will be conducted with the amount of wasabi as the dependent variable conducted by JAMOV, which is one of the most frequently and professionally used analytical tools in HKU. A post-hoc test will also be employed to determine the existence of significant differences between different groups.

Expected results

Based on the hypotheses, it is expected that participants in morally disengaged conditions will have significantly higher wasabi scores than those in the non-disengaged conditions. It is anticipated that participants who experience high levels of immersion will score significantly higher on the Wasabi task compared to those in low immersive conditions. Moreover, a significant interactive effect is expected between moral disengagement and immersion, with the hypothesis being that this interaction will amplify the effect of moral disengagement on aggressive behavior.

Discussion

Numerous studies have investigated how moral disengagement in violent video games affects moral consequences, revealing that when immoral behavior in a game is justified, feelings of guilt tend to decrease. However, the impact of this justification on aggressive behavior is not well studied, nor is the presence of any factors that might moderate the effect. This study is, therefore, designed to explore the impact of moral disengagement on behavioral aggression while testing the moderating effect of immersion. With anticipated significant results, this study aims to offer additional support for the notion of moral awareness in violent video games and its consequential impact on aggressive behavior. This study will additionally provide early solid evidence for the moderating effect of immersion on violent gaming exposure in young adults.

Potential limitations

There are some potential limitations to this study. The Wasabi task will be utilized to assess the aggressive behavior in participants, which is a modified version of the Hot Sauce task (Fischer et al., 2010). The Hot Sauce task has been utilized to validate other measures of behavioral aggression. Though the Wasabi and Hot Sauce tasks avoid the issue of multiple scoring methods, which could lead to unidentified researcher biases, it is important to note that modifying the task from Hot Sauce to Wasabi may impact the validity of this measure (Elson et al., 2014). Therefore, to confirm the lack of effect across different measures and stimuli, the results should be replicated with other measures of behavioral aggression. In terms of the game employed in this study, the specific context and the genre (first-person shooter game) may limit the generalization of study results. To achieve better generalizability of the results, varied game genres can be utilized in future studies to extend the study conclusions. Besides, this study only focuses on the effect of violent video game exposure on behavioral aggression.

However, based on the General Aggression Model, other variables, including effects, cognition, and arousal of aggression, are also essential and worth investigating in future research.

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