

THE EFFECT OF SOCIAL VIOLENT ACCEPTANCE ON THE DEVELOPMENT OF VIDEO GAMES

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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DEVELOPMENT OF AUTOMATIC ROBOTS IN BOARD GAMES AND THE RISE OF VIOLENT VIDEO GAMES

AI and Robotics have influenced the way games are designed and played over the past decades, from the early days of scripted behavior to procedurally created content up to player modeling via neural networks and evolutionary algorithms (Ipfelkofer, 2018). Robot machines with artificial intelligence can learn how to perform certain tasks through tactile, physical interactions instead of relying heavily on visual cues. During recent decades, various types of artificial intelligence have been playing against people in highly competitive games and then quickly destroying their human competition (Holley, 2019). In 1997, the Deep Blue computer beat the world Chess champion Garry Kasparov (Miley, 2018). In 2015, a computer program, AlphaZero, beat human opponents at all 49 games in the Atari 2600 suite (challenges that include Pong, Space Invaders, and Pac-man) (Mihn, 2015). Human players have since been shown to be weak opponents in such games compared with a variety of machine programs.

Realizing the advanced development and popularity of artificial intelligence and robotics in playing board games, the objective technical project is to design a chess board with the automatic rearrangement ability that supports players to reorganize their chess pieces to the original positions to start a new game. Chess is one of the oldest board games (Pastor, 2019). Played by humans, chess is a game of strategic thinking, calm concentration and patient intellectual endeavor. There are a great deal of robotic inventions, such as, automatic chessboard, robotic arms, etc, that let AI and humans play chess against each other (Srivatsan & Lakshmi Sutha, 2020). Robotics in board games have become more accepted by society, however, the AI and robotic developers have still faced some challenges. According to Henley (2022), a chess-playing robot unsettled by the fast responses of a seven-year-old boy, grabbed and broke his finger during a match at the Moscow Open. This incident raised the questions about the

responsibility and ethics in robotics. Taking into consideration the safety of players, the technical project hides electronics and mechanical parts from the users, as they are located underneath the chessboard. This feature minimizes the chance of user injuries and thus increases the overall safety of the device.

Parallel to the advanced development of robotics in board games, the video game industry has grown to become one of the most lucrative in the world. Video games are interactive electronic games that can be played on various devices such as personal computers, consoles, mobile phones, and tablets. They have become an increasingly popular form of entertainment and can range from simple puzzle games to complex, immersive worlds with rich narratives and advanced graphics. Players can engage in solo gameplay, play with friends online or in person, or compete in organized esports competitions. Video games offer a diverse range of experiences and have become a major cultural force, with many games influencing popular culture and even inspiring films and television shows (Peckham, 2017).

Various genres of video games exist, such as action, role-playing, sports, racing, and first-person shooters. However, the majority of the top-selling video games have fallen under the violent category, either depicting war settings, strong language, and physical fights. Overall total consumer spending on video games in the United States totaled \$56.6 billion in 2022 (“U.S consumer”, 2023). Importantly, ProCon (2021) reports that more than half of the current top-selling video games feature violent content. For more than ten years, both correlational and experimental studies have indicated a connection between violent video games and negative behaviors and thoughts, such as aggression, hostility, and aggressive thinking (Anderson et al., 2004; Gentile, Lynch, Linder, & Walsh, 2004; Graziano & Sheese, 2005; Olson, 2004). Within a modern city, direct and physical violence is unacceptable under any circumstance. Nonetheless,

these same societies are more tolerant towards virtual violence. How society accepted video game violence and how the social acceptance of virtual violence drove the development of the video game industry are the cores of the STS thesis. The paper applies the Social Construction Of Technology (Bijker & Pinch, 1984) into video-games and identifies which social groups were responsible for the current, stabilized idea of a video game we have as of now. As well, it analyzes the facilitated ability to obtain a violent video game in modern society and aims to see the social groups who are culpable for this factor.

SOCIAL VIOLENT ACCEPTANCE THAT SIGNIFICANTLY IMPACTS THE DEVELOPMENT OF VIOLENT VIDEO GAMES

FROM NON-VIOLENT VIDEO GAMES TO VIOLENT VIDEO GAMES

The Beginning as Non-violent Video Games

In the 1950s and 1960s, the history of video games began as computer scientists designed simple games and simulations on minicomputers and mainframes ("History of video games", 2011). For example, in 1952, British professor A.S Douglas created OXO, also known as a tic-tac-toe, as part of his doctoral thesis at the University of Cambridge (Fauzia et al., 2016). In 1958, William Higinbotham invented *Tennis for Two*, simulating a game of tennis, at the Brookhaven National Laboratory in Upton, New York (Nyitray, 2011). During this time, computers were large in size and had a significant cost associated with them, which made their availability limited to universities and large corporations. The majority of people had a limited understanding of the capabilities of these electronic machines and were unfamiliar with the intricate mathematical equations that were typically programmed into them for computation. Simple and non-violent games such as tic-tac-toe or *Tennis for Two* were good at getting people interested and supported.

In 1962, Steve Russell and a group of other hackers at the Massachusetts Institute of Technology invented *SpaceWar!*, the first video game that could be played on multiple computer installations (“Video game history”, 2022). *Spacewar!* involves simulated space battles between two spaceships, and it does involve shooting lasers and destroying enemy ships. However, the game was not considered as a violent video game by modern standards because the game graphics and gameplay were very primitive by today’s standards (Wolf, 2012, p.21). In addition, instead of the intention of promoting or glorifying violence, *SpaceWar!* was created as a technological demonstration and an entertaining way for computer scientists to experiment with the capabilities of early computer systems (Brand, 1995). In 1972, developed by Atari, Pong was the first commercial video game in history (“History of video games”, 2011). The main objective of the game is using a sliding paddle to get rid of floating points with a bouncing ball. Even though the game had no violence in its content, it still quickly became one of the most popular arcade games of the 1970s and helped establish the video game industry as a viable form of entertainment (Postigo, 2003).

The Rise of Violent Video Games

Mortal Kombat, one of the first violent video games, was a fighting game that was released in 1992 and featured graphic violence and gore (“Mortal kombat”, 2022). The game was controversial at the time and was eventually subject to scrutiny by lawmakers and regulatory bodies (Frostling-Henningsson, 2009). Since then, violent video games have become increasingly popular and widespread. Video game consumers have become desensitized to graphic violence in their devices and as a result, the user base for violent video games has dramatically increased. Over the past few years, the popular titles have turned into first-person

shooters, which incorporated violent elements featuring war and even apocalypse settings in a first person perspective (“First-person shooter”, 2018). For example, in 2020, the top-selling video game in the United States was “Call of Duty: Black Ops Cold War”, a first-person shooter game that features violent content (Grubb, 2021). “Grand Theft Auto” involves executing heists, killing authorities, and stealing vehicles from innocent people (Beerthuizen et al., 2017), and the series had sold over 345 million copies worldwide as of 2021 (Strickland, 2021).

History of Violence as A Performance

In modern society, physical violence is considered unacceptable under any circumstance, while virtual violence is more widely tolerated. The prevalence of violent video games, movies, and other forms of media has sparked debates about the impact of virtual violence on individuals and society as a whole. According to Anderson et al. (2003), video games can increase aggressive behavior, cause emotional outbursts, and decrease inhibitions in people (p.81). However, throughout history, humans have enjoyed watching violent performances as a form of entertainment (Goldstein, 1998). From ancient times to the present day, cultures around the world have had their own forms of violent sports, games, and rituals.

Humans are driven by their inherent competitive spirit which is often witnessed the most during a match or a duel that has life at stake. Although, winning a game adds up as a major element in enhancing people's lives, defeat is gracefully accepted as well. During ancient times, the team finishing second lost their limbs and even life along with the game (Delamere & Shaw, 2006). For example, the Mayans played a ball game where drivers could whip their rivals, toss them from the chariots, or trample fallen riders with their horses (Zaccagnini, 2003). Seminole Indians wrestled alligators for food and sport (Alderson, 2020). These violent activities highlight

the human fascination with competition and the inherent drive to be the best.

Despite the debates surrounding virtual violence, it is important to acknowledge that violence has been an inherent part of human nature for a long time. While society has made progress in reducing physical violence, the desire for competition and the fascination with violence still exist. In this context, violent media, including video games, can be seen as a reflection of human nature and a way to channel competitive and aggressive tendencies in a safe and controlled environment.

Violent Video Game Consumption Has Increased Due To The Demands of Society

According to Dill et al. (2005), as many as 89% of games contain some violent content, and about 50% of the games include serious violent actions toward other game characters. Males adolescents and young adults are the most devoted players of violent games (Wartella et al., 2000, p. 26–28). According to a report by the Entertainment Software Association (2021), about 65% of American adults play video games, and the average age of a video game player is 35 years old. In terms of violent video games specifically, a study conducted by the Pew Research Center (2015) found that about 43 of Americans aged 18-29 reported playing violent video games at least sometimes, while 26% of those aged 30-49 reported doing so.

With advancements in technology and changes in the gaming industry, it has become easier than ever for almost everyone, including children, to obtain these types of games. One of the primary reasons for this is the growth of digital distribution platforms, such as Steam, PlayStation Network, Xbox Live, and the App Store. These platforms allow users to purchase and download games directly onto their devices, making it simple to obtain and play violent video games without leaving the comfort of one's home. Given that children are primarily

attracted to video games, it is up to the parents to impose restrictions. However, parental supervision for obtaining and playing violent video games is relatively low (DeCamp, 2019).

Furthermore, it is worth considering the role that game developers and publishers play in shaping the demand for violent video games. While consumer demand can influence what types of games are created and marketed, game developers also have the power to shape and influence consumer preferences through their design choices and marketing strategies. Many of these platforms do not have the same strict age verification measures that physical retailers are required to adhere to, which could make it easier for underage users to purchase violent video games. Another factor contributing to the ease of obtaining violent video games is the proliferation of mobile devices, such as smartphones and tablets, which have become a popular gaming platform. The App Store and Google Play store provide access to a wide range of games, including violent ones, which can be easily downloaded and played by children. Due to many driving factors behind the social construction of video game development, the paper examines the various influences that have shaped the development of video games in the later sections. It explores the social groups that have played a role in creating the current, established concept of what a video game is today.

SOCIAL CONSTRUCTION OF TECHNOLOGY OF VIOLENT VIDEO GAME ACCEPTANCE

A key factor in examining the social acceptance of violence in video games is an understanding of the complex interplay of various stakeholders that contribute to the virtual violence acceptance. The Social Construction Of Technology (SCOT) helps visualize how social factors influence the development and use of technology (Bijker & Pinch, 1984). In this specific context, SCOT gives the best guide to investigate how social groups drive violent video game

acceptance in society. Figure 1 defines four main stakeholders: users, parents, distributors, and governments.

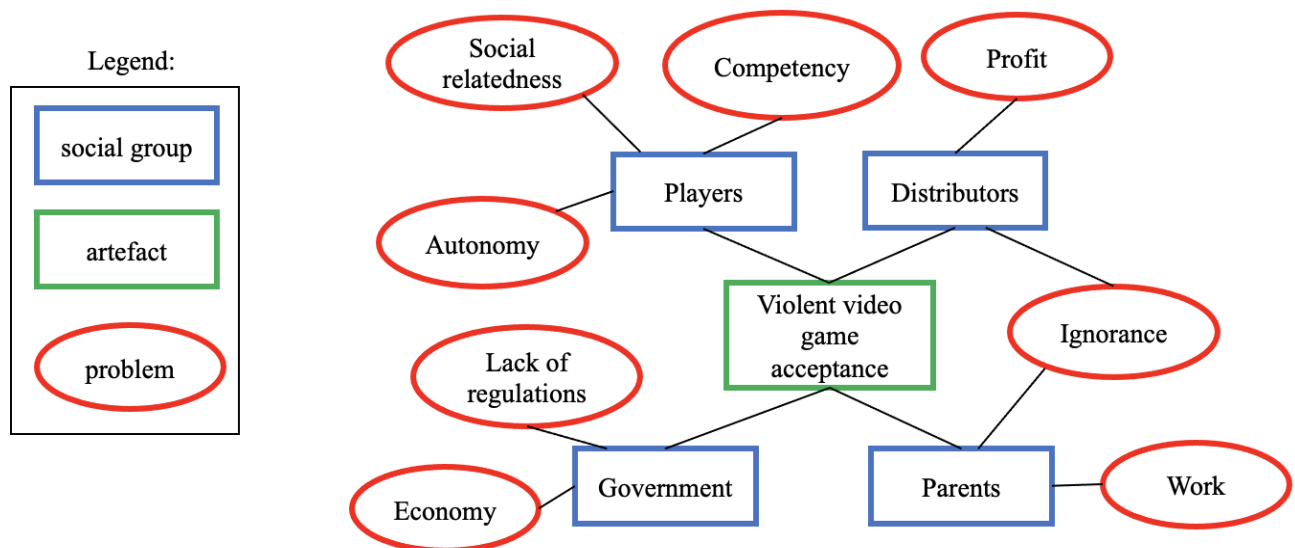


Figure 1: Violent video game acceptance. The violent video game acceptance is affected by social groups, each which prefer different solutions based on their interpretation of the technology (Pham, 2022).

Video Game Players as A Direct Social Factor of Virtual Violent Acceptance

Applying the Social Construction of Technology (Bijker & Pinch, 1984), video games are a form of technology that are designed to appeal to particular social groups that have preferences for specific features. The first social group of the violent video game acceptance is video game users. Video games users can refer to anyone who plays video games, whether it is on a console, PC, mobile device, or any other platforms. This includes casual gamers, hardcore gamers, competitive gamers, and everyone in between. Video game users can be of any age, gender, nationality, or socioeconomics status. Researchers have been exploring the relationship between psychological needs and video game usage for over a decade (Adachi & Willoughby, 2017; Oliver et al., 2016; Yee, 2006). Video games are thought to satisfy the basic human needs of autonomy, competency, and social connectedness (Przybylski, Rigby, & Ryan, 2010).

Autonomy pertains to the sensation of having the ability and independence to act and have an impact on one's surroundings (Deci & Ryan, 2012). In the context of video games, players have over their actions and decisions within the game world, such as, customizing their character's appearance or abilities, tailoring their experience to better suit their preferences and play style. This sense of control is particularly appealing for players who may not have as much as agency or control over their real-life circumstances. Another way that video games can promote autonomy is through emergent gameplay, which refers to the unpredictable and dynamic experiences that can arise from player interactions within the game world (Consalvo & Dutton, 2006). For example, in multiplayer games, players may collaborate or compete in ways that are not explicitly defined by the game mechanics, leading to unique and unexpected experiences. This can provide players with a sense of ownership over their experience and contribute to feelings of autonomy.

According to Deci & Ryan (2012), competency is an important aspect of video games and refers to a player's ability to play the game effectively. Video games as well as violent video games often require players to learn and master a range of skills, such as hand-eye coordination, strategic thinking, decision-making, and problem-solving. As players progress through a game, they become more competent and confident in their abilities, which can enhance their sense of autonomy and satisfaction (Przybylski et al., 2006). Moreover, violent video games offer a variety of challenging and difficult levels, where players must overcome difficult obstacles and enemies. As players progress through the games, they can unlock new abilities and upgrades, which can provide a sense of accomplishment and mastery.

Video games can also provide opportunities for players to connect with others, form social relationships, and experience a sense of belonging (Deci & Ryan, 2012). For example,

many video games have online communities where players can connect with others who share similar interests and engage in discussions or activities related to the game. These communities can provide a sense of belonging and social support. Violent video games may not aim to promote social interaction, but their online multiplayer modes and gameplay can create a sense of relatedness through cooperation and competition. Playing with others can provide a sense of camaraderie and shared experiences which can promote a sense of belonging.

People are inclined to play video games that meet their psychological needs for autonomy, competence, and relatedness (Monley et al., 2023). As the satisfaction of these needs increases, so does the likelihood of them continuing to play those games (Przybylski, 2010). “Video games, especially violent ones, may provide an outlet for psychological status seeking, and people may play more violent video games to improve their self-perceived social standing, dominance, or value as a romantic partner” (Kasumovic et al., 2015, p.204). Violent video games appear to fulfill the psychological needs of players, allowing them to overlook the violent aspects in order to enjoy the games.

Other social groups as Indirect Social Factors of Virtual Violent Acceptance

When it comes to the acceptance and popularity of violent video games, it is important to recognize that there are various stakeholders who play a role in shaping attitudes towards these games. While video game players themselves are certainly a direct factor in the acceptance of violent games, there are also other groups, such as parents, distributors, and developers, who contribute to this phenomenon. Parents, for example, may not be the ones playing the games, but they can still have a significant impact on whether or not their children have access to violent video games. Parents are unlikely to be aware of concerns about violent games (Ferguson et al.,

2015). Many parents may not fully understand the potential risks associated with violent video games or may not be aware of the age restrictions assigned to these games. According to Saunders (2003), an average of over 50% of parents let their children play video games rated for ages of 18 years old and older.

In addition, parents' most common concern about their child's video game use was the amount of time spent playing games instead of the violent content (Kutner et al., 2008). There is no denying that video games can be a fun and engaging way for children to pass the time while their parents are busy. However, there is also concern about the potential negative effects that excessive video games use can have on a child's development (Ferguson, 2015;). Instead of paying attention to the video game content, parents often worry that their children are spending too much time playing video games and not enough time engaging in other activities, such as socializing with friends, exercising, or doing homework. On the whole, it appears that parental appreciation of video regarding the use of video games may be upon their own personal convictions and past encounters.

Governments are another group that plays an important role in the acceptance of violent video games. The United States has implemented age restrictions for video games through the Entertainment Software Rating Board (ESRB) (Haninger & Thompson, 2004). The ESRB rates video games based on their content and assigns them an age rating, such as E for Everyone, T for Teen, M for Mature, and AO for Adults Only (Haninger & Thompson, 2004). Stores, such as Walmart and Best Buy, as well as online retailers like Amazon and Steam, enforce these ratings by only selling games to customers who are of the appropriate age. However, the age ratings on video games do not hold any legal weight as those for alcohol consumption. It is possible for parents or anyone else to assist minors in purchasing video games without facing legal

repercussions. Additionally, individuals can misrepresent themselves their age online to gain access to violent video games. Although there is a standardized rating system for who can play certain video games set by the government, distributors in charge of enforcing these standards have failed to check or ignore the ratings (Cunningham, Engelstätter, & Ward, 2011).

While gamers are primarily interested in the unique features and gameplay mechanics that new games offer, the ethical responsibility of violence in video games falls on the engineers and developers who design them. They have a responsibility to ensure that the content they create does not harm the physical or mental well-being of their users. However, understanding the needs and requirements of the user base is not always straightforward. It can be challenging to identify the target audience of a game, particularly as the video game industry has a broad range of users, from children to adults. Moreover, different players may have distinct expectations and preferences when it comes to game content, and catering to all of them can be a daunting task. Then, software engineers face the challenge in that they often lack insight into the extent of their user base.

Figure 2 describes the updated social construction of violent video game acceptance.

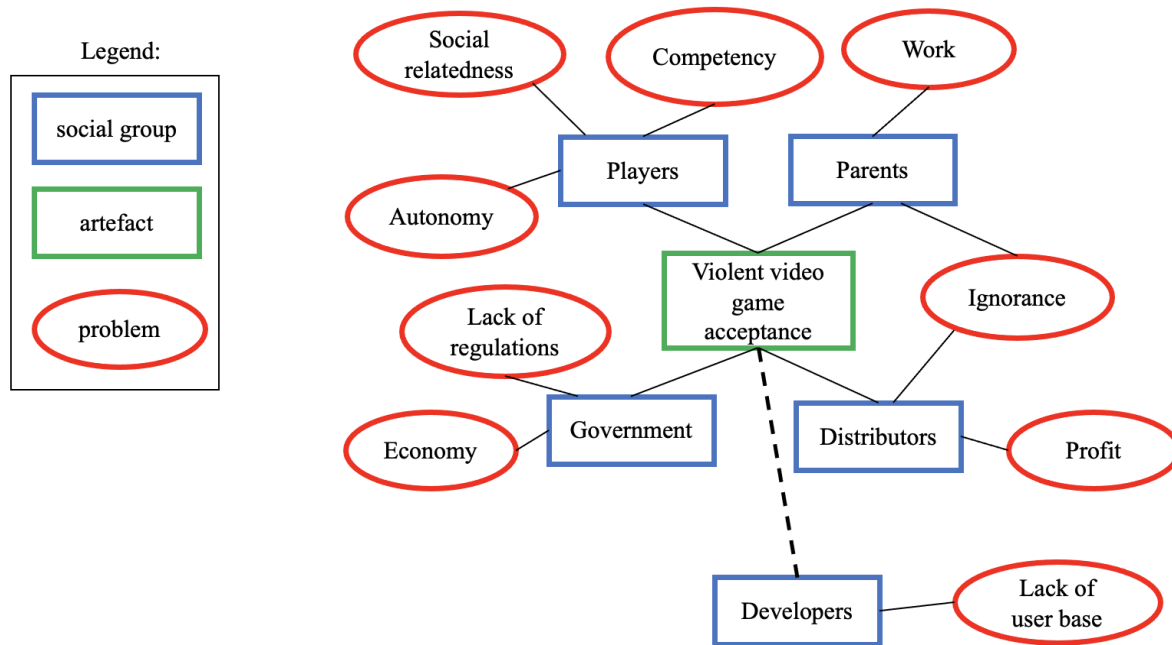


Figure 2: Updated violent video game acceptance. The violent video game acceptance is affected by social groups that include the developer groups (Pham, 2023).

FUTURE IMPLICATION FOR STS ANALYSIS

With regard to the STS analysis presented in this thesis, the success of violent video games in modern society is the result of a complex interplay between a variety of factors, including the actions of video game developers, distributors, government regulators, parents, and players themselves. Thus, to drive the development of the gaming industry in a different way, all social stakeholders must contribute and implement changes. As direct users, players could benefit from having more information available to them about games before they decide to invest their time and money. This could come in the form of reviews, previews, and gameplay videos, among other things. By having access to more information, players would be able to make more informed decisions about which games they want to try, and which ones they want to skip. Additionally, players could benefit from having more tools available to them to help them

evaluate games. This could include things like user ratings, metascores, and other objective measures of a game's quality. By having access to these kinds of tools, players could get a sense of what other people think about a particular game, and use that information to make a more informed decision about whether or not to invest their time and money.

It is important for parents to educate themselves on the potential negative effects of video games and to pay attention to the age ratings assigned to these games. Parents should consider the age and maturity level of their children when selecting video games and should enforce age restrictions to ensure that their children are not exposed to content that is not appropriate for their age and level development. "Parents can act as gatekeepers to certain media, though perhaps through a strong bond rather than through strict discipline" (DeCamp, 2019, p. 202). By fostering a culture of open communication and mutual respect, parents can encourage their children to share their thoughts and feelings about the media they consume. This can help parents to better understand their children's interests and concerns, and can also provide opportunities for parents to offer guidance and support as their children navigate the complex landscape of media.

Besides age restrictions, governments can work with the video game industry to establish a rating system that provides information on the content of the game, including violence, language, and sexual content. This also helps parents and consumers make informed decisions about whether a game is appropriate for them or their children. Governments can also regulate the marketing and advertising of violent video games. This can include restrictions on where and how such games can be advertised, as well as guidelines for the content of those ads. Future research is needed to identify and develop solutions for each stakeholder that can help mitigate the issue of rising violent video games.

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