THE EFFECTS OF DIGITAL GAMES CONSUMPTION

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ABSTRACT. The paper *The effects of digital games consumption* is a literature review of existing studies conducted by scholars from multiple fields that have studied the effects of digital games on the audience's physical and psychological lives as well as the ways digital games influence social groups and the relations between individuals.

While the effects of other, more "traditional" media, such as television or radio, have been thoroughly studied by scholars from domains such as medicine, psychology, communication and sociology, the digital game industry has remained myth ridden for a long time before scholars started treating digital games as a media product that has effects on their target audience.

The present paper aims to show how in time, scholars have proven or disproven claims, myths and theories regarding the effect of digital games consumption. Among these theories, we can find those supporting claims such as: violent digital games create violent behavior in children, digital game consumption leads to non-social behavior in youth or the ill-effects of long-term digital game consumption on player's health.

Keywords: *digital games, effects, media consumption, social skills, violence*

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Introduction

Digital games (also referred to as computer games, video games or electronic games, depending on a few minor variables) can be defined as games that are being played on electronic platforms such as personal computers, consoles that are linked to TV sets, tablets, mobile phones, arcade games and other devices powered electrically and have a graphical display (Prundaru, 2013).

The industry has entered public attention in the early 1970's with the fast growing popularity of arcade and home console games. At first, digital games were considered a waste of time while games like *Death Race* created a real moral panic in the United States due to the violent content presented in the game.

Financially, the industry showed success during the early 1980's. If by 1978, the arcade game industry amounted sales of $50 million, by 1982, the industry sold game devices worth $8 billion. To put into perspective, in 1982, the pop music industry was grossing $4 billion in sales every year while Hollywood films amounted $3 billion (Rogers & Larsen, 1984), (Rogers & Larsen, 1984).

While digital games and the gamers have the subjects of multiple stereotypes (mostly negative), scholars and researchers have worked to prove or disapprove various beliefs regarding digital games and their impact on the audience. While scientists have debunked misconceptions such as violent games creating violent behavior, some negative events, such as mass shootings and murders, are still being linked in mass media with consumption of violent games.

Other scientists have worked out ways to use digital games as tools of learning for young children or even therapy for patients suffering the aftereffects of strokes and other ailments. Psychologists also use games to treat multiple issues while professionals use simulators to train skills such as flying or even police interventions.

The present paper is a literature review of existing studies conducted by scholars from multiple fields that have studied the effects of digital games on the audience's physical and psychological

lives as well as the ways digital games influence social groups and the relations between individuals. The paper aims to show the importance of digital games in today's culture and the importance of research in all aspects of digital games.

1. Addiction and treatment

The World Health Organization and American Psychiatric Association define substance addiction when three of the following criteria are met (American Psychiatric Association, 2000) (World Health Organization, 2016): as a brain disease in which the following things happen:

- Tolerance – The consumer requires bigger doses of the substance over time
- Withdrawal – Physical or emotional withdrawal is experienced when the substance is not being used
- Limited control – Consumer cannot stop consuming once started
- Negative consequences – Continued use even though there have been negative consequences on user's professional or personal life
- Neglected or postponed activities – Consumer puts aside or reduces social, recreational, work or household activities due to substance consumption
- Significant time or energy spent – obtaining, using, hiding, using or recovering from the substance abuse
- Desire to cut down – Trying to quit consuming a substance

In 2010, a South Korean couple became so obsessed with a videogame in which they raised a virtual baby that they left their three-month-old daughter starve to death. As they realized what has happened, the parents tried to flee from the authorities but were soon caught. One of the police officers told the press that t*he couple seemed to have lost their will to live a normal life because they did not have jobs and gave*

birth to a premature baby (Tran, 2010). The tragic event can easily highlight three of the criteria indicating addiction: negative consequences, neglected activities and significant time or energy spent.

While digital games are not a substance, playing videogames will provoke chemical reactions inside the player's brain, quickly releasing dopamine as studies have shown (Lidhen, 2011). However, the same studies found weak relations with real addictions. The American Psychiatric Association has not yet classified excessive video game consumption as a disorder; however, it is discussed if excessive gaming is an effect of other existing disorder (American Psychiatric Association, 2013).

The addictive nature of video games is considered by some psychologist to be caused by other elements than the rush of dopamine inside the player's brain. The nature of digital games is to provide a challenge followed by a reward once the requirements have been met. A study conducted by Nick Yee showed that the achievement system was the main motivational factor for playing digital games in male players while female players focused more on the social aspect, especially the relationship component of the game (Yee, 2006)

The social aspect preferred by female gamers is also related to the addictive nature of video games. Online communities and groups have been linked to show peer pressure like behavior inside the groups. Stories such as that of *World of Warcraft* player Ryan van Cleave (Lush, 2011) shed light on how gamers tend to feel the need of satisfying their needs by playing the video games while stories such as the one posted by user Fenryck on the *World of Warcraft* forums shows how players feel guilty for letting down their groups due to not being in the mood to play the game anymore (WoW Forums, 2015).

Despite not being officially classified as an addiction, rehabilitation clinics offer inpatient and outpatient rehabilitation programs for *videogame addicts*. Using similar techniques as with treating gambling addiction, clinics perceive video game *addiction* as a clinical impulse control disorder, thus treating it with cognitive behavioral therapy (PsychGuides, 2016) (Rehabs.com, 2016).

Professional rehab can last from 30 to 60 days varying from person to person time in which they can suffer from withdrawal symptoms (depression, difficulty to focus, anxiety, irritability, loneliness, lack of interest and more) and even have suffer a relapse (Computer Gaming Addicts Anonymous, 2016).

2. Physical effects

Popular culture loves portraying gamers as young obese (or sometimes extremely thin and muscle-less) teenage boys that suffer from countless allergies, must wear glasses at all times and have their pale complexion covered in zits. Such representations have led to stereotyping gamers as leading an unhealthy style of life, eating junk food and not exercising.

Studies show that gamers consume more calories after a session of playing games compared to other sedentary activities (Wang & Perry, 2006)**.** The same study shows that overall various metabolic and physiologic variables are increased in children when playing videogames, showing a small physical effort increase on behalf of the test subjects. While the study recommends not comparing gaming with watching television when evaluating sedentary activities due to the metabolic and physiologic increase, it places the effort bellow that observed during standard physical exercise or that recommended by health professionals.

A study on 17-year-old teenagers led by Robert G. McMurray showed little to no relation between watching television or playing video games and a higher Body-Mass Index (BMI) (McMurray, et al., 2000). However, a study led by Elizabeth A. Vandewater showed an increased BMI in children under eight that played games while those watching television showed normal values (Vandewater, Shim, & Caplovitz, 2004)

Another study involving 482 children, with an average age of 12, conducted by Michigan State University, psychology professor Lynda Jackson found no statistical link between playing video games, using the Internet or cellphones and the BMI of the participants. The study showed that most BMI differences between the test subjects were caused by race, income and age of the children (Jackson, von Eye, Fitzgerald, Witt, & Zhao, 2011)**.**

The release of active gaming devices such as the Nintendo Wii, the Xbox Kinect or the PlayStation Move announced the coming of active digital games. These games were seen at first as tools against teenage obesity, reaching children through their preferred medium. Playing the Wii and other devices would require players to actively move instead of passively using a controller. While the active gaming devices and active games cater to a different type of market (pre-teen girls, senior citizens) and different type of gaming habits (Sterlicchi, 2007)**,** they have not been proven to be very efficient against fighting obesity (Baranowski, et al., 2012)**.** Most researchers have repeatedly agreed that physical activity and proper nutrition are required to having a healthy style of life.

While playing video games was not successfully linked to obesity, other types of injuries have, some even having deadly effects. A survey over 436 schoolchildren reported moderate to severe pain in the neck/shoulder area, head and eyes. The same study showed moderate/severe inconvenience to everyday life usually attributed to pain in the head, neck/shoulders, and low back areas. The study linked the occurrence of pain to computer usage, the intensity of the pain increasing with the time spent at the computer (Hakala, Saarni, Punamäki, Wallenius, Nygård , & Rimpelä, 2012). The studied focused mostly on computer use; however, other illnesses have been attributed to console games only.

The *PlayStation thumb* is an injury attributed to the use of console controllers and other thumb operated devices. The condition can be characterized by blistering, numbness and tingling in the thumbs (Jenkins B. , 2012). Repetitive strain injuries are a common

occupational hazards, however, repetitive movements in active gaming devices have resulted in injuries such as tendonitis (mockingly called *nintendonitis*) or even broken bones resulted in falling from the Wii balance board (the Wii fractures), (Birdwell, 2011)**,** (Macgregor, 2000)**,** (Herwees, 2013)**.**

Long sessions of gaming can have serious negative effects on the player's health. Gamers and doctors alike report symptoms from blurry vision, sensitivity to light and dry eyes (American Optometric Association) to fatal deep vein thrombosis, a blood clot that forms from sitting to long without breaks of stretching which can kill the person (Hsien-Cheng, Burbridge, & Wong, 2013)**.**

3. Social life

Scholars have studied the link between digital game consumption and its impact on the player's social skill level. One study showed that low frequency use of computer games does not conflict with the social development of young people. However, the study showed that high and heavy frequency users found themselves in positions of social self-exclusion. Those categorized as high and heavy frequency users preferred computer games to socializing and reported that computer games conflicted with their existing social life (Griffiths, 2010)**.**

The same study also suggested that playing digital games might not necessarily be the cause of social-exclusion but an effect of anxiety, the players avoiding social interaction and receiving social rewards through digital games (Griffiths, 2010)**.** A different study associated high usage of video games (over 5 hours a week) with a decrease in peer relationship problems and in prosocial deficits in children aged between 6 and 11 (Kovess-Masfety, et al., 2016).

One of the main reasons the image of social isolation in the case of digital game players have been so successful is also linked to the

early single player aspect of games. While most digital games released before the early 2000's were designed for single players, most recent games are developed to involve a degree of social activity (playing online, cooperative modes, group tasks etc.) (Kulman, 2015). One popular depiction that shows the opposite of social isolation could be seen in arcade game venues in the late 1970's, early 1980's. These venues would gather children together, some even skipping school, to play on the popular arcade games. Social isolation was never considered as an issue during this period, quite the contrary, youngsters would often gather around a player, cheering, admiring and making remarks regarding their game (Nash & Calonico, 1996).

In an article written for *Additude,* a magazine dedicated for those with attention deficits, founder and president of LearningWorks for Kids, Randy Kulman, pointed out that in today's world, children do not have the same freedom of playing safely in the neighborhoods they had in the past. Kulman points to multiple reasons due to which this is happening, such as two parents working, safety concerns, overschedule and even the lack of opportunity for kids to engage in afterschool and weekend activities with other children (Kulman, 2015).

A study released by Entertainment Software Association, a non-profit body that assign computer game ratings, in 2016 gathered data from over 4000 American households showed that 54% of the most frequent gamers in those specific homes play games with others. Of the respondents, 40% stated they play with friends, 21% with family members. Most (53%) consider that games help them connect with their friends and 42% of them feel that video games help them spend time with family (Entertainment Software Association, 2016).

The same ESA report shows that parents play video games with their kids due to the following factors: Fun/entertainment for the entire family (88%), are asked to (76%), to socialize with their children (76%), can monitor the content their children consume (59%), they enjoy the content (57%) (Entertainment Software Association, 2016).

4. Therapeutic and educational use

Scholars are developing treatments and therapeutic tools for both children and adults by using digital games. Such treatments are being developed for children with autism (Tyrrell, 2016), anxiety (Moser, Moran, & Leber, 2015), stress related issues (Elkin, 2011)**,** post-traumatic stress syndrome, depression and bipolar disorder (Nixon, 2012)**.**

Alongside the therapeutic use, psychologists and game developers have realized the educational aspect of digital games. Research has shown that children who played videogames had better creativity scores**,** (Jackson, Witt, Games, Fitzgerald, von Eye, & Zhao, 2011) improved sensory, perceptual, and spatial cognitive functions than those who did not play digital games (Feng & Spence, 2010).

Flying and driving simulators have been used to fully immerse future pilots in a virtual world environment in which the purpose is learning how to drive a car or fly an airplane. While the experiences are not 100% real, the games are designed to match real life situations without having to put the players at a risk. Researchers proved that electronic games and simulations encourage "*exploration and experimentation, stimulating curiosity, discovery learning and perseverance"*, enhance the player's confidence (Klawe, 1994) and self-esteem (Dempsey, Lucassen, Gilley , & Rasmussen, 1993) and even reduces the learning time and instructor load (Ricci, 1994)**.**

In 2015, a study that followed over 3000 European children between 6 and 11 discovered that 20% of them spent more than 5 hours a week playing video games. After removing other external factors, the researchers discovered that high usage of videogames in children can be associated with 1.75 times the odds of high intellectual functioning and 1.88 times the odds of high overall school competence (Kovess-Masfety, et al., 2016)**.**

In 1987, a study conducted on participants above 9 years of age (with a mean age of 12) undergoing chemotherapy on a regular basis showed that playing video games is beneficial in countering nausea.

Those playing digital games reported a significant decrease of nausea and anxiety. When the video games were withdrawn for a period of ten minutes, their nausea began to rise again, only to decrease again once the children were exposed to video games again (Redd, Jacobsen, Die-Trill, Dermatis, McEvoy, & Holland, 1987).

Distraction with video games also proved beneficial in the case of burn victims. The patients had their wounds debrided and dressed while being partially submerged in a hydrotank. Patients perceived significantly less pain when playing an immersive virtual reality game during the procedure than when they underwent the procedure without playing the game (Hoffman, Patterson, Seibel, Soltani, Jewett-Leahy, & Sharar, 2008). The study showed that immersive virtual reality can be used effectively as a therapeutic tool to distract patients undergoing painful procedures.

5. Violent games and behavior

In 2008, Tyrone Spellman, a 27 year old Xbox player was sentenced to prison after beating to death his 17 months old daughter for knocking over his Xbox console (Arendt, 2008). The 1999 Columbine High School Massacre shootings that ended with 13 deaths and the suicide of the shooters was linked with the perpetrator's consumption of violent digital games (Nizza, 2007). Other mass shootings such as the Sandy Hook that resulted with death of 28 and the Oslo/Utøya island attacks that ended with 77 deaths were linked to the consumption of video games.

Whether video games were the cause of the violent behavior, respectively of the killing sprees, or if the attackers due to prior existing conditions preferred them has been a heated debate between psychologists, media outlets and concerned parents.

A statement signed by the American Academy of Pediatrics considers that "*Children who see a lot of violence are more likely to view*

violence as an effective way of settling conflict...are more likely to assume that acts of violence are acceptable behavior." The same statement notes that children are experiencing emotional desensitization when playing violent video games and that "*Viewing violence may lead to real life violence. Children exposed to violent programming at a young age have a higher tendency for violent and aggressive behavior later in life than children who are not so exposed.*" (American Academy of Pediatrics, 2000)**.** Other scholars and researches have noted the emotional desensitization effect violent games have on children (Greenfield, 2013) (Strasburger & Donnerstein, 2013) and their link with causing violent behavior (Anderson, 2009)**.**

Brad J. Bushman, Professor of Communication and Psychology at The Ohio State University mentioned that it is hard to prove a causality relation between videogames and violent behavior. Bushman thinks that people want to believe that games are harmless by pointing to the fact that not everyone playing violent videogames becomes a killer. However, he indicates that researchers have not managed to prove that video games directly cause violent behavior, nor have they managed to prove it does not. Bushman also points out that an experiment to test if playing violent videogames may push a person into violence could not be ethically ran (Bushman, 2013).

Other researchers consider that it is not violent games that create violent behavior but violent behavior happens to be attracted to violent games. Scholars point out that juvenile violent crime rate is at a 30 year **low** (Jenkins H. , 2004) and that during the last 33 years, "*homicides tended to decrease in the months following the release of popular M-rated violent video games...*" (Markey & Markey, 2014). In 2010, the United States Supreme Court ruled, in a 7-2 decision written by Justice Antonin Scalia that "*it cannot show a direct causal link between violent video games and harm to minors.*" (Supreme Court Of The United States, 2011)

Conclusions

Arguments pro and against have been made on most aspects when talking about digital games and their impact on society and individual. Mass media engorges in publishing stories about the "*devastating*" effects of digital games by hastily linking negative stories to the consumption of digital games. During the last 30 years, scholars have been studying the effects of digital games in all aspects of our daily life. From digital game addiction to obesity and violent behavior, psychologists, sociologists and other scholars have provided answers (sometimes conflicting) on how digital games are shaping our society.

While misconceptions such as video games cause obesity have been disproved, other type of injuries, strains and accidents have been linked to computer use and video game consumption. However, regular physical activity and proper stretching breaks when using the computer for long times have been recommended to negate the effects of long gaming sessions.

Another misconception regarding is the correlation between the quality of social life and the habit of playing digital games. While a link does indeed exists between social isolation and playing digital games, some scholars have concluded that digital games are not the cause of poor social skills but the effect of social interaction issues such as increased anxiety.

Since the late 1980's, mass media and concerned parents have stigmatized digital games, especially violent ones, believing they create violent behavior in children and teenagers. While multiple studies showed that there is indeed a link between playing violent games, emotional desensitization and the manifestation of violent behavior other scholars have argued against naming violent games as the causal factor. Similar to the link made in the case of social skill level, scholars have suggested that violent people are attracted to violent games.

Other researchers and game designers have used digital games to develop treatment tools for different psychological and mental issues. Hospitals have been successfully using video games to help

and educate patients undergoing difficult, unpleasant or even painful treatments and are constantly experimenting and trialing with ways to use games as a treatment or aiding tool for those in need.

Educational tools have also been developed in the form of games and simulators for both children and adults alike. While studies have encouraged teaching through digital games due to their benefits, it becomes the parents' responsibility to control how, what and how long their children consume digital games. Adults must also find a balance between their gaming habits and a healthy way of life.

Discussions

Different effects can also be seen in different game genres or platforms. A 2007 study showed that those playing computer games spent in average more time than console and arcade gamers did. In the case of computer games, those playing MMORPG games (online) spent significantly more game time compared to those playing single player games. MMORPG players also reported worse sleep quality and overall health quality compared to other computer, arcade and console gamers (Smyth, 2007).

While studies show both positive and negative effects of games, most conclusions show a correlation between the two and rarely identify a causality relationship. For more accurate data, long term research is required in order to differentiate causality to causation. Issues that long term research can encounter are constant change of game design and technological improvements.

Due to constant release of new games, new gaming peripherals, gaming platforms and increase of accessibility to digital games, scholars studying the gaming industry, and new media in general, should update topics that were previously researched in order to check their availability even more often than in other domains. The constant stream of changes in the gaming industry can make some studies obsolete in only a few years.

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