The Evolutionary Transformation of Games: Digital Games and Children's Cyber Security

Oyunun Evrimsel Dönüşümü: Dijital Oyunlar ve Çocukların Siber Güvenliği

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ABSTRACT

In the digitalized world, there are changes in people's behaviours and reactions. A good example of this is observed in children in the context of digital games replacing traditional games. Today, children tend to meet their entertainment needs through digital games outside of school, usually in closed and safe spaces. Although digital games have positive aspects associated with cognitive development and intelligence, excessive playing of these games or not paying attention to age criteria can threaten children's physical and mental health. In addition, children may have poor academic performance and behavioural problems. Unfortunately, children's cyber security can also be jeopardized in digital games played over the network without supervision. In this context, this study was carried out considering the need for a study that compiles the types of digital games, the positive and negative effects of digital games on children, the criteria that can guide parents in the selection of digital games, and awareness-raising initiatives in the field of digital games in Turkey based on the current literature. It is aimed that the study will contribute to educators and parents in terms of obtaining information and developing attitudes and contribute to this literature.

Keywords: Game, Digital Games, Children, Cyber Security, Awareness Raising Initiatives

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ÖZ

Dijitalleşen dünyada insanların davranış ve tepkilerinde değişimler yaşanmaktadır. Bunun güzel bir örneği de geleneksel oyunların yerini alan dijital oyunlar bağlamında çocuklarda gözlemlenmektedir. Günümüzde çocuklar okul dışında genelde kapalı ve güvenli alanlarda dijital oyunlar aracılığıyla eğlence ihtiyaçlarını karşılama eğilimindedir. Her ne kadar dijital oyunların bilişsel gelişim ve zekâ ile ilişkilendirilen olumlu yönleri olsa da oyunların aşırı oynanması ya da yaş ölçütlerine dikkat edilmemesi fiziksel ve ruhsal açıdan çocukların sağlıklarını tehdit edebilmektedir. Bunun yanında çocuklarda akademik performans düşüklüğü ve davranışsal sorunlar da görülebilmektedir. Denetimsiz şekilde ağ üzerinden oynanan dijital oyunlarda çocukların siber güvenliği de ne yazık ki tehlikeye girebilmektedir. Dijital oyun türleri, dijital oyunların çocuklardaki olumlu ve olumsuz etkileri, dijital oyun seçiminde ebeveynlere rehber olabilecek ölçütler ile dijital oyun alanında Türkiye'deki bilinçlendirme çalışmalarını toplu halde güncel alanyazını temel alarak derleyen bir çalışmanın ihtiyaç haline geldiği düşünülerek bu çalışma gerçekleştirilmiştir. Çalışmanın eğitimcilere ve ebeveynlere bilgi edinme ve tutum geliştirme bakımından katkı sağlayacağı ve alanyazına katkı sunması hedeflenmektedir.

Anahtar Kelimeler: Oyun, Dijital Oyun, Çocuk, Siber Güvenlik, Farkındalık Yaratma Çalışmaları

Introduction

21. Children's gaming habits date back to the depths of history. Even early humans spent a great deal of their time playing games. However, with the advancement of technology, children's game preferences have begun to change. Today, children's relationships with games have become almost entirely digital (Clements, 2019). Digital games have become an indispensable part of our lives as technology has rapidly developed. Children's toys, outdoor activities, and games they can play with friends have mostly become digitized (Clements, 2019). This has led to an increase in children's interest in the digital world.

Children's play activities in the past varied depending on the cultural and social environment of the time, as well as the available resources and technology. Outdoor activities, board and card games, toys, storytelling, and role-playing were some of the most common forms of play for children (Christensen & Prout, 2005; Huizinga, 1950; Opie & Opie, 1959). Outdoor activities, such as running, climbing trees, jumping rope, and playing games like tag, hide and seek, and capture the flag, were popular among children in the past (Opie & Opie, 1959). Board games and card games, such as chess, checkers, and Go Fish, were also commonly played with family members or friends (Huizinga, 1950). Children played with a variety of toys, including dolls, stuffed animals, toy cars, and building blocks (Christensen & Prout, 2005). Storytelling was an important part of play in many cultures, with children gathering together to listen to stories told by adults or older children (Christensen & Prout, 2005). Finally, children engaged in imaginative play, often taking on different roles and pretending to be characters from books or movies, or inventing their own stories (Opie & Opie, 1959). Overall, children's play in the past was shaped by the cultural and social environment of the time, as well as the resources and technology available to them (Christensen & Prout, 2005; Huizinga, 1950; Opie & Opie, 1959).

Social, cultural and technological factors in the environment where children live affect children's play conditions and play behaviours (Roopnarine et al., 1994). Today, the rapid development of technology has changed children's games and play materials by affecting the social life and cultures of societies (Işıkoğlu Erdoğan, 2019). Thanks to technological devices such as computers, tablets and

smartphones, children are introduced to digital games at a younger age. This widespread use of technology has led to the emergence of terms such as technological play, contemporary play, and digital games. Hence, the general definition of digital gaming is the use of technology for gaming. (Marsh et al., 2016).

Digital games have become a huge part of children's lives and these games can contribute to the development of intelligence as well as having fun. However, there are some risks associated with digital games. One of these risks is cyber security dangers. Cybersecurity means that users' personal information, financial information and even their lives can be jeopardized on the internet. Since digital games also require an internet connection, children need to be aware of cyber security. Because children can encounter people who can harm them on the internet, be exposed to malicious software and become the target of cyber criminals by sharing their personal information.

This review article is based on the present academic literature. Numerous studies regarding the effects of digital games on children's development and mental health have been done and published in the literature. (e.g., Şahin & Gençöz, 2019; Subrahmanyam & Smahel, 2011). However, it was thought that there was a need for a study that compiles the types of digital games, the negative effects of digital games on children, the criteria that can guide parents in the selection of digital games, and awareness-raising activities in the field of digital games in Turkey based on the contemporary literature. In line with this need, this study aims to contribute to the digital game literature and guide researchers, parents and educators. Definition of digital games will be made and types of digital games, points to be considered when choosing digital games, positive and negative effects of digital games and attempts to raise awareness about digital games in Turkey will be discussed.

1. Digital Games

Digital games can be briefly defined as software that allows individuals playing digital games to interact with each other or with artificial intelligence (Sayın, 2016). According to Frasca (2001), a digital game is a leisure time activity software on digital software that one or more people can physically use alone (against artificial intelligence) or mutually (with a friend/acquaintance) over an online network by installing game tools. Deterding et al. (2011), on the other hand, define a digital game as a competition or competition for the participants to perform certain tasks, results or goals through technological tools. Games which are played on personal computers, game consoles like the Microsoft Xbox, Sony Playstation, and Nintendo Wii, tablets like the iPad, and mobile devices like smartphones are referred as "digital games". (Sağlam & Topsümer, 2019). Digital gaming, which is very difficult to limit, includes all gaming activities on video and computer games, Internet sites, electronic toys, smartphones, and tablets. Digital game is a unique activity that is difficult to define and is even positioned against traditional game types (Mustola et al., 2016).

It can be said that young people who follow technology closely are more interested in digital games and these games are a part of the youth's popular culture today (Yalçın Irmak & Erdoğan, 2016).

With a budget of 24.75 billion dollars and more than a billion users, the digital game industry, which began with the release of the first commercial game Computer Space in 1971, now plays a significant role in the media world (Entertainment Software Association, 2013). The game industry has witnessed remarkable growth over the past few decades, particularly since the 1990s, resulting in the emergence of various kinds of digital games that are being rapidly consumed by gamers. This growth

has led to the developmentof newer versions of games, which are releasedin quick succession to cater to the increasing demand of the gamers. There are many different types of games shaped in line with player preferences today.

2. Types of Digital Games

Researchers disagree how to classify the various types of video games but Adams and Rollings (2006) identified seven game genres: tactical, puzzle, adventure, action, sports, role -playing and simulation. Also there are digital games that can be played offline or online in four different platforms: console, computer, mobile and arcade game machine. These games can be multi-player or single-player depending on the number of participation.Table 1 shows examples of digital game types.

38% of the most popular games sold in 2013 were tactical games, and 31.9% of them were action games, according to market research from the Entertainment Software Association (ESA). According to Phan (2011), 341 participants between the ages of 18-51 preferred tactical (47%), action (39%) and role-playing (39%) games respectively.

Table 1: Types of digital games (Adams & Rollings, 2006)

Genre	Objective	Sample
Strategy	Strategic planning and exclusive tactics are required to win. Players plan a series of actions to eliminate the opposing forces managed by rival gamer(s).	Chess, Dune 2, Tycoon Series, Warcraft, StarCraft, Age of Empires, etc.
Puzzle	Players make plans to win on their own, i.e. there is no competitor. Players manage shapes, colors, or symbols in a certain pattern.	Angry Birds, Diamond Crush, Tetris, Frozen Bubble, Luxor, Sudoku Gridmaster, etc.
Adventure	Players try to find the route, collect objects, and solve puzzles in a mysterious world/story.	The Longest Journey, Indiana Jones, Myst and Riven, etc.
Action	Action games require several physical challenges, such as hand-eye coordination, good timing, high reaction time, and precision. These are games involving a lot of actions and speed. Players try to win the game against one or more players via bodily/physical actions along with mental efforts. Players are required to complete levels, collect various rewards, overcome obstacles, and survive the attacks.	Pac-Man, Call of Duty: Advanced Warfare, Grand Theft Auto , Far Cry, Dragon Age: Inquisition, Assassin's Creed, etc.
Sports	These are sports games requiring a lot of physical movements and techniques.	FIFA, NBA, Skating, Tennis, Championship Manager, etc.
Role-playing	Players assume the role of a character for a certain situation. The problems these characters face are solved using the contextual hints. Among the games in this genre, massively multiplayer online role-playing games (MMORPGs) allow a very large number of players interact with each other in an online medium where they assume various characters.	Dungeons & Dragons, EverQuest, Diablo, World of Warcraft, etc.
Simulation	These are never-ending games involving the creation of a virtual world, or practicing an action or the operation of a vehicle.	SimCity, The Sims, flight simulators, Trauma Center, etc.

3. Positive Effects of Digital Games on Children

It can be said that digital games, which have gained popularity among all age groups, have positive effects on children's development (Talan & Kalınkara, 2020). The opportunity to interact with individuals with different learning styles and behaviours can be created with digital games designed for educational purposes. In addition, quality learning can be provided in all formal and informal learning environments, both one-on-one and in groups (Turner et al., 2018). Digital games that can be effectively integrated into the learning process can provide an effective mechanism to facilitate meaningful learning of transferred information and individualized classroom learning experiences (Sykes, 2018). By contributing to individuals in many aspects such as physical, social, cognitive, and psychological; it helps to raise successful individuals who take responsibility, self -confident, sociable, courageous, self-aware and successful individuals (Gündoğdu, 2021). By reshaping learning pathways,

digital games can provide the power to provide a more attractive learning mode and encourage deeper learning (Li et al., 2020). It provides many benefits to the learning process at the point of cognitive development such as strategic thinking, creating correct and active decisions, and solving problems (Hazar & Hazar, 2017). It can also be stated that it has a positive effect on cognitive goals such as reasoning, critical thinking, and receptivity (Granic & Lobel, 2013; Sykes & Reinhardt, 2012).

4. Negative Effects of Digital Games on Children

Despite the positive effects of digital games, researchers and parents have concerns about them. The primary defense of digital games is that children need "free play" to develop, and that need cannot be satisfied by limited interaction and screen time (Gray, 2012; Levin, 2015). Technology's potential to harm children's development is a crucial counterargument. Particularly, there are worries that children who use technology excessively could develop addiction, inactivity, and posture issues (Agger & Shelton, 2007; American Academy of Pediatrics, 2016). On the other hand, supporters of digital games argue that it offers the same learning opportunities as non-digital games and even new learning opportunities for children (Fleer, 2014; Marsh, 2010; Miller et al., 2012; Stephen & Plowman, 2014; Wohlwend, 2015).

Digital gaming is accepted as normal in moderation as part of a healthy lifestyle, and that it can even be beneficial for things like emotional release and relaxation (Green & Bavelier 2003, Prot et al. 2014). According to various studies (Griffiths et al. 2005, Gel 2012, Young 2009), uncontrollable desire to play games that leads to changes in emotions, thoughts, and social life is considered a problem or addiction. Digital game addiction, as defined by Lemmens et al. (2009), refers to the excessive and compulsive use of computer or video games despite the negative social and emotional consequences and the player's inability to control their usage. The concept of game addiction is referred to differently in various publications, such as "excessive use of games" by Charlton & Danforth (2007) and Grüsser et al. (2007) or "game addiction" by Charlton & Danforth (2007), Chiu et al. (2004), Lemmens et al. (2009) and Wan & Chiou (2006). Other studies named it as "obsessive-compulsive gaming" (Grüsser et al. 2007), "problematic gaming behaviours" (Desai et al. 2010), and "pathological gaming behaviours" (Gentile, 2009). However, clinicians are cautious about using the term "gaming addiction" and prefer alternative definitions. Digital game addiction is addressed as Internet Gaming Disorder in the third research supplement of the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM 5) created by the American Psychiatric Association (APA, 2014) and released in May 2013. The American Psychiatric Association recommended that more research be conducted to support the clinical diagnosis and to define this disorder as a mental illness in order to add it to the manual.

Several studies have investigated the potential negative effects of playing violent video games. For instance, some studies have found that individuals who play violent video games may experience feelings of loneliness (Wack & Tantleff-Dunn, 2009), low levels of life satisfaction, and depression (Mentzoni et al., 2011). Additionally, some studies have linked playing violent video games to increased levels of anxiety (Gentile et al., 2004; Mentzoni et al., 2011), aggressive behaviour (Anderson & Carnagey, 2009; Anderson et al., 2004; Bartholow et al., 2005), and violent tendencies (Fischer et al., 2010; Williams et al., 2011). Other studies suggest that playing violent video games may lead to a decrease in prosocial behaviours (Greitemeyer & Müge, 2014) and attention deficit (Chan & Rabinowitz, 2006; Gentile et al., 2012). Furthermore, some studies have linked playing violent video

games to increased aggressive feelings and desensitization to violence (Gentile et al., 2004; Anderson & Bushman, 2009; Engelhardt et al., 2011).

In addition to the potential mental health concerns, excessive gaming has beenassociated with academic underperformance by many studiessuch as the ones carried out by Anand(2007) and Gentile (2009) while Foti et al. (2011) and King et al. (2013) pointed out irregular sleep patterns. Excessive gaming is also linked to a sedentary lifestyle with little physical activity by Ballard et al. (2009) and Fullerton et al. (2014). In addition, it has been asserted that game addiction is closely related with unhealthy diet leading to obesity (Ballard et al., 2009; Fullerton et al., 2014), and skeletal issues together with to inadequate self-care (Manteghi, 2002).

5. Criteria for Digital Game Selection

The evaluation and classification of media content, including digital games, is a matter of a society's unique moral, religious and cultural values. The general rationale for the evaluation and classification of media content is related to the protection of individuals, especially young people, and children, from inappropriate content, as well as the principle of respect for human dignity (Özhan, 2011). The aim of evaluation and classification is to minimize the exposure of individuals, as consumers, to unwanted visual, audio, or written elements in media content and to ensure that they are informed about the content of the media products they wish to consume.

When games first appear on the market, they are evaluated by various institutions and organizations according to their content. As a result of this evaluation, there are classifications that inform individuals and parents with children about the age-appropriateness and negative content of the game. Two of the most striking of these are the Entertainment Software Rating Board (ESRB) and the European Game Information System.

Figure 1: Symbols and their meanings as defined by the Entertainment Software Rating Board (2023)

As indicated in Figure 1, parents should take into account the content characteristics corresponding to these smart cues when providing games to their children. It is also recommended to consider PEGI (Pan European Game Information) as another globally inclusive rating standard.

Figure 2: European Game Information System Classification

PEGI is a rating system that classifies digital games not only in terms of suitability for age groups, but also in terms of different elements such as violence, vulgar language, and fear. According to this classification system, it has been determined that there are 8 different determining factors as criteria in games:

VIOLENCE: The game contains violence.

BAD LANGUAGE: The game uses coarse language.

FEAR: The game is frightening and may cause anxiety in young children.

SEX: The game contains sexual content, behaviour or nudity.

DRUGS: The game contains content that encourages drug use.

DISCRIMINATION: The game contains content that encourages and discriminates.

GAMBLING: The game's content contains gambling-related elements.

ONLINE GAME: The game allows online gaming.

Considering these factors, PEGI groups are classified as follows:

PEGI 3: Games with this label are suitable for almost all ages. The comic figures in the content are fictitious and children should not confuse these characters with real life.
PEGI 7: Same content as PEGI 3, but some content may frighten young children.
PEGI 12: Game content is generally similar to PEGI 7, but fantasy characters, some slang and some sexual content are more prominent.
PEGI 16: Game content is more explicit and one level higher, including sexual content, tobacco and drug use, and more foul language and slang.
PEGI 18: Content includes language so bad as to create a new class, violent content, immediate reaction, and disgust.

6. Awareness Initiatives on Digital Gaming in Turkey

The Information and Communication Technologies Authority (ICTA) attaches great importance to digital games. We can list some of the studies on raising awareness on digital games as follows:

Digital games were designed for children to play safely on the *guvenlicocuk.org.tr* website. There are also various activities and e-book content on the website. *guvenlioyna.org.tr* portal was put into service. The portal includes blog posts about digital games, current news, scientific studies and reports, parental supervision tools and reviews of popular games on the market. guvenliweb.org.tr portal includes presentations, guides, and reports as well as blog posts about digital games to raise awareness about digital games.

Güvenli İnternet Merkezi Mobil Uygulaması -GİM (Safe Internet Center Mobile Application): GIM Mobile Application was launched for the whole society to benefit from the internet awareness-raising content network Safe Internet Center. The application provides access to news, blog posts and other resources containing information and advice on the Internet and technology. In response to parents' growing concerns about finding and selecting reliable media content for their children on the Internet, the GIM Mobile App includes information on reliable media content that has passed the "Rating System". With the Internet Help in the application, there are questions and solution suggestions on 8 main topics (illegal content on the Internet, Internetand privacy, information security and shopping on the Internet, social networking platforms, Secure Internet Service, digital games, cyberbullying, Internet, and health) regarding the problems experienced by users in digital environments within the scope of conscious, safe and effective use of the Internet. In addition, with the "Safe Net" profile management in the application, the Safe Internet Service profile can be learned. Families can protect themselves and their children from harmful content on the internet by choosing the Safe Internet Service, which consists of two profiles: Family Profile and Child Profile. Some of the awareness-raising activities on digital games conducted by ICTA are as follows:

cocukicinicerik.com: Founded in 2017 by the "Content for Children Association", *cocukicinicerik.com,* also known as Çiçek, is a portal where digital game reviews are made as well as movie and book reviews that may appeal to children and that children may be exposed to. In digital game reviews, issues such as how the game is played, what its content is, etc. are addressed and advice is given to parents. The association also has a channel on YouTube called Content for Children Association. It aims to evaluate the content that children can watch, read, and play and to guide parents and experts working in this field.

Farkındayız The farkindayiz.gov.tr portal, which was commissioned against the risks of the digital world, was prepared by the Ministry of Youth and Sports of the Republic of Turkey to raise awareness in all segments of society against the risks and dangers of the digital world, especially digital games. Providing training to young people and parents on the risks they face on virtual platforms such as online harassment, cyberbullying, propaganda, insulting religious and cultural values, violence and sexual content, internet addiction, the ministry aims to reach all segments of society throughseminars organized across Turkey and the farkindayiz.gov.tr website.

The main objective of the *SİBERAY (Department of Combating Cybercrimes)* program is to guide users and citizens for safe internet use. By raising awareness on issues such as cyber security, technology use, social media use, cyberbullying and technologyaddiction on national and international

platforms, the program aims to combat habits that harm individuals and society such as internet, screen and technology addiction, cyberbullying, and all kinds of cybercrimes before they occur. The aim of the program is to contribute to raising the awareness and consciousness of our citizens by developing activities, content, workshops, online and offline conferences and products to ensure that every member of society uses the internet and technology in a safe, useful, and effective way.

Conclusion and Suggestions

Digital games and children's cyber security are discussed in this review study. The types of digital games are examined and their effects on children's development and possible ne gative effects are discussed. In addition, criteria that can guide parents in choosing digital games are presented. In the literature, there are studies suggesting that digital games contribute to the development of children's cognitive, social, and motor skills. However, excessive use of digital games also has negative effects, especially in terms of physical health, academic performance, and behavioural problems. Therefore, it is important for parents to limit children's use of digital games and to select games within the appropriate age range. Researchers conducting research in this area can compare awareness-raising and cybersafety measures in different countries with initiatives in Turkey.

Last but not the least, in light of the ever-changing digital landscape, it is imperative to emphasize the importance of regular updates and timely recommendations in the field of children's digital content. Websites like the Children's Content platform mentioned in this study often struggle to keep pace with the rapid advancements, leaving their latest recommendations outdated by one or two years. This issue warrants critical attention, as it highlights the phenomenon where projects initially show promise but eventually experience a decline. Unfortunately, the pace of digital progress surpasses the ability of many initiatives in Turkey to keep up.

References

Adams, E., & Rollings, A. (2014). Fundamentals of Game Design. 3.Baskı, Prentice Hall, s.67-81.

American Academy of Pediatrics, Council of Communications and Media (AAP). Policy statement (2016). Media and young minds. *Pediatrics, 138*(5). doi:10.1542/peds.2016-2591

American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, 5. Baskı, 2013. http://www.dsm5.org/Documents/Internet%20Gaming%20Disorder%20 Fact %20Sheet.pdf adresinden 9 Aralık 2022'de alınmıştır.

Agger, B., & Shelton, B. (2007). *Fast families, virtual children: A critical sociology of families and schooling.* Boulder, CO: Paradigm.

Anand, V. (2007). A study of time management: The correlation between video game usage and academic performance markers. *Cyberpsychol Behav, 10*, 552-559.

Anderson, C.A., & Bushman, B.J. (2009) Desensitizing effects of violent media on helping others. *Psychol Sci, 20*, 273-277.

Anderson, C.A., Funk, J.B., & Griffiths, M.D. (2004). Contemporary issues in adolescent video game playing: Brief overview and introduction to the special issue. *J Adolesc, 27*,1-3.

Anderson, C.A., & Carnagey, N. (2005). The effects of reward and punishment in violent video games on aggressive affect, cognition and behavior. *Psychol Sci, 16*, 882-889.

Anderson, C.A., Sakamoto, A., Gentile, D.A. et al., (2008) Longitudinal effects of violent video games on aggression in Japan and the United States. *Pediatrics, 122*, e1067-72.

Bartholow, B.D., Sestir, M.A., & Davis, E.B. (2005). Correlates and consequences of exposure to video game violence: Hostile personality, empathy, and aggressive behavior. *PersSoc PsycholBull, 31*, 1573-1586.

Ballard, M., Gray, M., Reilly, J. et al., (2009). Eating behaviors correlates of video game screen time among males: Body mass, physical activity, and other media use. *Eat Behav 10*, 161-167.

Chan, P.A., & Rabinowitz, T. (2006). A cross-sectional analysis of video games and attention deficit hyperactivity disorder symptoms in adolescents. *Ann Gen Psychiatry, 5,* 16-26.

Charlton, J.P., & Danforth, I.D.W. (2007). Distinguishing addiction and high engagement in the context of online game playing. *Comput Human Behav, 23*, 1531-1548.

Chiu, S., Lee, J., & Huang, D. (2004). Video game addiction in children and teenagers in Taiwan. *Cyberpsychol Behav, 7*, 571-581.

Christensen, P., & Prout, A. (2005). Childhood and the cultural construction of the rural. In P. Christensen & A. Prout (Eds.), Changing contexts of childhood and youth (pp. 71-86). Routledge.

Clements, J. (2019). Digital games in the twenty-first century. In J. Suess, D. C. Cavanaugh, & R. L. Morris (Eds.), Handbook of research on the societal impact of digital media (pp. 147-167). IGI Global. https://doi.org/10.4018/978-1-5225-7432-3.ch008

Desai, R.A., Krishnan-Sarin, S., Cavallo, D. et al., (2010) Video-gamingamong high school students: Health correlates, gender differences, and problem aticgaming. *Pediatrics, 43,* 173–183.

Deterding, S., Khaled, R., Nacke, L. E., & Dixon, D. (2011). Gamification: Toward A Definition, http://gamificationresearch.org/wp-content/uploads/2011/04/02-Deterding-Khaled-NackeDixon.pdf.

Engelhardt, C.R., Bartholow, B.D., Kerr, G.T. et al., (2011) This is your brain on violent video games: Neural desensitization to violence predicts increased aggression following videogame exposure. *J Exp Soc Psychol, 47*, 1033- 1036.

Entertainment Software Association (2013). Essential Facts About Computer and Video Industry 2012. Washington D.C, USA: Entertainment Software Association.

Eurepean Software Rating Board (2023). https://www.esrb.org/ratings-guide/

Fischer, P., Kastenmüller, A., & Greitemeyer, T. (2010). Media violence and the self: The impact of personalized gaming characters in aggressive video games on aggressive behavior. *J Exp Soc Psychol, 46*:192-195.

Fleer, M. (2014). The demands and motives afforded through digital play in early childhood activity settings. *Learning Culture and Social Interaction, 3*(3), 202–209.

Foti, K.E., Eaton, D.K., Lowry, R. et al., (2011) Sufficient sleep, physical activity, and sedentary behaviors. *Am J Prev Med, 41*, 596-602.

Frasca, G. (2001). Rethinking agency and immersion: Videogames as A meansof consciousness-raising. *Digital Creativity, 12*(3), 167-174.

Fullerton, S., Taylor, A.W., Grande, E.D. et al., (2014) Measuring physical inactivity: Do current measures provide an accurate view of ''sedentary'' video game time? *J Obes 2014*, 287013.

Gentile, D.A., Lynch, P.J., Lınder, J.R. et al., (2004). The effects of violent video game habits on adolescent hostility, aggressive behaviors and school performance. *J Adolesc 27*, 5-22.

Gentile, D.A. (2009). Pathological video game use among youth 8 to 18: A national study. *Psychol Sci, 20,* 594-602.

Gentile, D.A., Swing, E.L., Lim, C.G. et al., (2012) Video game playing, attention problems, and impulsiveness: Evidence of bidirectional causality. *Psychol Pop Media Cult, 1*, 62-70.

Gentile, D. A. (2009). Pathological video game use among youth 8 to 18: A national study. *Psychol Sci 20*, 594-602.

Granic, I., Lobel, A., & Engels, R. C. (2014). The benefits of playing video games. *American psychologist, 69*(1), 66. https://psycnet.apa.org/doi/10.1037/a0034857

Gray, P., (2012). The decline of play and the rise of psychopathology in children and adolescents. *American Journal of Play, 3*(4).

Green, C.S. & Bavelier, D. (2003). Action video game modifies visual selective attention. *Nature 423*, 534–537.

Greitemeyer, T. & Müge, D. O. (2014). Video games do affect social outcomes: A meta-analytic review of the effects of violent and prosocial video game play. *Pers Soc Psychol Bull, 40,* 578–589.

Griffiths, M.D., Davies, M.N.O., & Chappell, D. (2005) Demographic factors andplaying variables in online computer gaming. *Cyberpsychol Behav, 7*, 479-487.

Grüsser, S.M., Thalemann, C., & Griffiths, M. (2007) Excessive computer game playing: Evidence for addiction and aggression? *Cyberpsychol Behav 10*, 290-292.

Gündoğdu (2021). Dijital oyun kavramına yönelik: Bir meta-sentez betimleme. [Master's thesis, Yozgat Bozok Üniversitesi].

Hasan, Y., Bègue, L., Scharkow, M. et al., (2013) The more you play, the more aggressive you become: A long-term experimental studyof cumulative violent videogame effects on hostile expectations and aggressive behavior. *J Exp Soc Psychol 49*, 224–227.

Hazar, Z., & Hazar, M. (2017). Çocuklar için dijital oyun bağımlılığı ölçeği. *Journal of Human Sciences, 14*(1), 203-216. https://doi.org/10.14687/jhs.v14i1.nnnn

Huizinga, J. (1950). *Homo Ludens: A study of the play-element in culture.* Beacon Press.

Işıkoğlu Erdoğan, N. (2019). Dijital oyun popüler mi? Ebeveynlerin çocukları için oyun tercihlerinin incelenmesi. *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi, 46,* 1-17. https://doi.org/10.9779/pauefd.446654

King, D.L., Gradisar, M., Drummond, A. et al., (2013). The impact of prolonged violent video-gaming on adolescent sleep: An experimental study. *J Sleep Res 2,* 137–143.

Lemmens, J.S., Valkenburg, P.M., & Peter, J. (2009). Development and validation of a game addiction scale for adolescents. *Media Psychol, 12*(Suppl.1), 77-95.

Li, Q., Tay, R., & Pustaka, A. (2020). Let us save lives using games! A study of the effect of digital games for traffic education. *Journal of Educational Technology Systems, 49*(2), 199-218. https://doi.org/10.1177%2F0047239520926152

Manteghi, M. (2002). Study The Consequences Computer and Video Games. Publisher: contemporary culture. Tehran, Iran.

Marsh, J. (2010). Young children's play in online virtual worlds. *Journal of Early Childhood Research, 8(*23). https://doi.org/10.1177/1476718X09345406.

Marsh, J., Plowman, L., Yamada-Rice, D., Bishop, J., & Scott, F. (2016) Digital play: a new classification. *Early Years, 36*(3), 242-253. https://doi.org/10.1080/09575146.2016.1167675.

Mentzoni, R.A., Brunborg, G.S., Molde, H. et al., (2011). Problematic video game use: Estimated prevalence and associations with mental and physical health. *Cyberpsychol Behav Soc Netw, 14,* 591–596.

Miller, D., Robertson, D., Hudson, A., & Shimi, J. (2012). Signature pedagogy in early years education: A role for cots game-based learning. *Computers in the Schools, 29*(1–2), 227–247. https://doi.org/10.1080/07380569.2012.651423

Mustola, M., Koivula, M., Turja, L., & Laakso M.L., (2016). Reconsidering passivity and activity in children's digital play. *New Media ve Society*. https://doi.org/10.1177/1461444816661550.

Opie, I., & Opie, P. (1959). *The lore and language of schoolchildren*. Oxford University Press.

Ögel, K. (2012). İnternet Bağımlılığı, İnternetin Psikolojisini Anlamak ve Bağımlılıkla Başa Çıkmak. Türkiye İş Bankası Kültür Yayınları, s.47-60.

Özhan, S. (2011). Dijital oyunlarda değerlendirme ve sınıflandırma sistemleri ve Türkiye açısından öneriler. *Aile ve Toplum, 7*(25), 21-33.

Phan, M.H. (2011). Video gaming trends: violent, action/adventure games are most popular, *Usability News, 13*(2).

Prot, S., Anderson, C.A., Gentile, D.A. et al., (2014) The Positive And Negative Effects Of Video Game Play. Children And Media. A. Jordan, D. Romer (Eds) New York. Oxford University Pres, p.109-128.

Roopnarine, J., Johnson. J., & Hooper. F. (Eds.). (1994). Children's play in diverse cultures. Albany. NY: State University of New York Press.

Sağlam, M., & Topsümer, F. (2019). Üniversite öğrencilerinin dijital oyun oynama nedenlerine ilişkin nitel bir çalışma. *Akdeniz Üniversitesi İletişim Fakültesi Dergisi, Aralık* (32), 485-504.

Sayın, M. E. D. (2016). Dijital Oyunların Bilişsel Yeteneklere Etkileri: Faktör Referanslı Bilişsel Test Kiti ile Oyuncu ve Oyuncu Olmayan Grupların Karşılaştırılması, Marmara Üniversitesi Sosyal Bilimler Enstitüsü, Doktora Tezi, İstanbul.

Stephen, C., & Plowman, L. (2014). Digital play. In L. Brooker, M. Blaise, ve S. Edwards (Eds.), The SAGE handbook of play and learning in early childhood (pp. 330-341). London: Sage.

Subrahmanyam, K. & Smahel, D. (2011). *Digital youth: The role of media in development.* Springer.

Sykes, J., & Reinhardt, J. (2012). Language at play: Digitalgames in second and foreign language teaching and learning. In J. Liskin-Gasparro & M. Lacorte (Series Eds.), Theory and practice in second language classroom instruction (pp. 1– 157). New York: Pearson-Prentice Hall.

Sykes, J. M. (2018). Digital games and language teaching and learning. *Foreign Language Annals, 51*(1), 219-224. https://doi.org/10.1111/flan.12325

Şahin, N. H., & Gençöz, T. (2019). Dijital oyun oynamanın çocuk ve ergenlerin psikolojik sağlığına etkileri: Bir literatür taraması. *Journalof Cognitive-Behavioral Psychotherapyand Research, 8*(1), 5-14.

Talan, T., & Kalınkara, Y. (2020). Ortaokul öğrencilerinin Dijital Oyun Oynama Eğilimlerinin ve Bilgisayar Oyun Bağımlılık Düzeylerinin İncelenmesi: Malatya İli Örneği. Öğretim Teknolojileri ve Öğretmen Eğitimi Dergisi, 9 (1), 1-13.

Turner, P. E., Johnston, E., Kebritchi, M., Evans, S., &Heflich, D. A. (2018). Influence of online computergames on theacademicachievement of nontraditionalundergraduatestudents. *CogentEducation, 5*(1), 1437671. https://doi.org/10.1080/2331186X.2018.1437671

Wack, E, Tantleff-Dunn, S. (2009). Relationships between electronic game play, obesity, and psychosocial functioning in young men. *Cyberpsychol Behav 12*, 241-244.

Wan, C.S., & Chiou, W.B. (2006). Psychological motives and online games addiction: A testof flow theory and humanistic needs theory for Taiwanese adolescents. *Cyberpsychol Behav 9,* 317-324.

Williams, D., Kennedy, T.L.M., & Moore, R.J. (2011). Behind the avatar: The patterns, practices, and functions of role playing in MMOs. *Games and Culture 6,* 171-200.

Wohlwend, K. E. (2015). One screen, many fingers: Young children's collaborative literacy play with digital puppetry apps and touchscreen technologies. *Theory into Practice, 54*, 154-162, doi: 10.1080/00405841.2015.1010837.

Yalçın Irmak, A., & Erdoğan, S. (2016). Ergen ve genç erişkinlerde dijital oyun bağımlılığı: güncel bir bakış. *Türk Psikiyatri Dergisi, 27*(2), 128-37.

Young, K.S. (2009). Understanding online gaming addiction and treatment issues for adolescents. *Am J Fam Ther, 37*, 355-372.

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