Public perception of entertainment technologies and the scientific effects of those technologies on the brain development of children

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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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Introduction

I walked into a relatives house and the wave of childrens' screams hit me like a brick wall. Chaos all around envelopes my senses and I feel as if I'm being yelled at by a loudspeaker. Their lungs are unmatched and seem like they can hold ten times the amount of air as a grown man. Their voices are loud, high pitched, grating against my ears, and permeating from all around. I tried to find a space with a little bit quieter and what I stumbled upon was the living room where the television was located. I entered and expected the room to be empty because of how quiet it was, but instead I found a bunch of glassy-eyed children glued to the television screen. I stared for a moment and looked back outside the room. The screaming children could be heard as soon as I poked my head out of the room. Even though those screaming kids annoyed me, it made me happy seeing them play because it was what I did as a child. The children watching television seemed to be enjoying themselves, but I wondered how they would grow up compared to the screaming children and my childhood self.

Television has been a staple in the American household for years. It became the most popular form of household entertainment in the 1950's and has remained one of the most popular forms of entertainment since (Elon University, n.d.). The average number of hours of television watched per day has jumped from 4 hours and 35 minutes in 1950 to 7 hours and 50 minutes in 2017 (Madrigal, 2018). This shocking jump has come in part to the programming changes. At its inception, the format was similar to radio, in that they both produced similar sounding news and variety shows, comedies and dramas. However, programming quickly diverged from the radio format and evolved into its own form of entertainment (Stephens, n.d.). The number of networks grew and the number of programs did the same. Over the years, television eventually became a huge industry that found its way into nearly every home in the United States. With the immense

rise in popularity of television, there have always been those who dream of the possibilities and those who have nightmares of its consequences.

The past technology of television has been accused of causing developmental problems for children under 10. Television impact studies, both positive and negative, differ markedly from the developmental problems the media panicked about, and today we are seeing a similar trend between the promised advantages and worrying harms of another new entertainment technology - virtual reality (VR). My literature review covers the media's negative portrayal of television, the television industry, and the connections between television and virtual reality. The data from this paper will be gathered from a multitude of sources. I will examine articles and books from notable authors and figures of importance to analyze the way that media has viewed television and what narrative they intended to push onto the public. I will use medical research journals to analyze the way that children have been impacted by televisions. Additionally, I will use fictional books to analyze the similarities between television and virtual reality.

I have found that parents often use television to distract children and justify this by saying that television is an effective teacher. I have concluded that television is not an effective teacher for children, and it has negatively impacted children by replacing much more effective teachers, therefore hurting the development of children. Parents should be more cautious about the time they allow their children to watch television and therefore should be cautious about virtual reality based on these findings.

Literature Review

The media's understanding of television and its capabilities have been limited, which led to two major streams of thought: a desire to make television the most used form of

entertainment, and a general fear of what damage it could cause. Many in the 1940's and 50's worried that television and the entertainment it produced could be propaganda used for the communist agenda. Additionally, many saw television as an entertainment tool for the uneducated and saw reading as the intellectual route (Poepsel, n.d.). Some believed television to be a fad, while others envisioned so much more of television's capabilities. A radio pioneer, Lee DeForest, once said "While theoretically and technically television may be feasible, commercially and financially I consider it to be an impossibility…a development of which we need waste little time dreaming." In the same year, another report from the Daily News wrote "There may come a time when we shall have 'smellyvision' and 'tastyvision'. When we are able to broadcast so that all the senses are catered for, we shall live in a world which no one has yet dreamt about." (Elon University, n.d.). Ray Bradbury was one of the more notable authors of the time and was vehemently against television. He believed that television is a tool that will distract people from more important things and could dull the senses as a whole. He describes his own book in an interview as "a story about how television destroys interest in reading literature….and people being turned into morons by TV." (Open Culture, 2017)

Research on the effect of television on children has shown that while television does have adverse effects, the problems are layered, more intricate and potentially less harmful than was once thought. Television is not necessarily bad, but it can exacerbate underlying problems with children that lead to more aggressive behavior. It could also lead to less physical activity, reading or other activities that would be more beneficial for a child's development (Fields, 2016). Limited evidence was found for harmful or beneficial impacts of television exposure on children and their neurological development. The negative effects of television on children's development is much less significant than what is generally thought (Kühhirt & Klein, 2020). According to the

American Academy of Pediatrics, all screen use, except for video chatting, is highly discouraged for children under 18 months, due to the negative effects. They also recommend that children 18 to 24 months should only be exposed to high-quality programming and should only use high-quality apps when playing with other children. According to their recommendations, learning with other children is "how toddlers learn best. Letting children use media by themselves should be avoided." (Hill et al., 2016). Additionally, they recommend, "In children older than 2 years, limit media to 1 hour or less per day of high-quality programming. Recommend shared use between parent and child to promote enhanced learning, greater interaction, and limit setting." (Hill et al., 2016). These recommendations show clearly that young children do not need television, but instead they need to interact with other children as a way of learning.

While VR and television can be quite different, research shows that they are similar in their overarching goals and share common anxieties over potential effects. The goals of virtual reality are to be entertaining, immersive, and comfortable. These goals can be seen as very similar to the goals of television (Martin, 2021), and are exemplified by qualities of both technologies. To promote immersion, virtual reality technology attaches to the head of the user and completely immerses the user into what is shown on the VR set, while the average size of television screens has gone up nearly every year since 1997. 2022 sees an average of 50-inch television screens across the United States. The increase in the size of the television is an indicator of television producers trying to create a more immersive environment for the user (Laricchia, 2022). To promote entertainment there have been massive increases in the amount and diversity of programming for both technologies. The number of commercial television stations has grown from 98 in 1950 to 1,761 in 2017 (Stoll, 2021). To encourage comfort, both technologies can be used in the home, and oftentimes enjoyed while sitting down. These main

goals of immersion, entertainment and comfort have led to worries of the impacts of both technologies. These worries can best be shown through literature, such as *Fahrenheit 451* and *The Veldt*. In both books, the screen that the character is interacting with is the size of walls, wraps completely around the character, and essentially acts as a virtual reality/television hybrid. These screens totally immerse each character into the environment of the television and characters interact with the screen. In each book, the screens are available to the character inside the home and have a constant stream of programming made specifically for the character. Additionally, each book showcases a common fear of what television will do if the user becomes too attached to the screen, and most of the fears that the author demonstrates come from the main goals of immersiveness, entertainment, and comfort.

I will be using Pinch & Bijker's social construction of technology (SCOT). Technology and society are constructed together. Relevant social groups are the groups that organize around a shared meaning of a technology. They can influence technologies by changing the design process, how the technology can be used, and can even force companies to redesign the technology for future customers. Interpretative flexibility is the way that the television industry and users can interpret a technology based on their environment. The television industry may intend that television be used in a certain way, but individual users may interpret the technology in a different way. Closure is the idea that a problem is solved when the users and television industry see the collective problems as being solved. In the case of this paper, there are two sets of relevant social groups that will be addressed. The first group has the common meaning of those who watch television. This includes parents who directly control access to television, and the children who watch the television. The second group has the shared meaning of wanting the public to view television in a specific light. This will include varying media sources that will be

handpicked such as, authors, news anchors, and leaders of media organizations. I will use this framework to analyze the relevant social groups that have stakes in childrens' development. Then, I will use interpretative flexibility to find how the relevant social groups intend televisions to be used, and how users use them. Finally, I will use closure to see if television itself is a resolved problem in today's society, or if it continues to be debated if it is suitable for children.

Methods

I will use a combination of primary and secondary sources. The first primary source will be datasets from government websites and medical journals, dedicated to finding whether childhood development is changed by television, ex; NIH, and Academic Journals. For my second primary source, I will use books about the topic, particularly *Fahrenheit 451* to draw comparisons between television and VR, and to also look at how television was depicted around the time it was becoming popular. I will also look at how the society inside the book was changed because of how television was being used. For my secondary source, I will find media and journalistic reviews and take quotes from them to help back my argument of ways that television was being portrayed. In my review, I will examine all sources to find how the relevant social groups viewed television and how each group interpreted and interacted with television. Then, I will review whether closure has been achieved in the modern day by the relevant social groups.

Analysis

Television has been blamed for developmental problems of children under 10. Although developmental problems have been linked to television viewing, the root of the problem is

different than what has been propagated to the public, and this information can be used to make connections to virtual reality.

I argue that the media has historically been worried about the development of children with the growth of television because of its quick rise to popularity and its unknown consequences. *Fahrenheit 451*, by Ray Bradbury, was first published in 1953, right when television was gaining massive popularity. Ray Bradbury had not seen decades of television viewing. He had seen the popularity of a new technology grow before his very eyes. As an author, he is quite pro-reading and seeing the television grow obviously worries him. Therefore, he decided to write a book about how television would take over the lives of everyone who watched it. Wall-to-wall televisions would surround the family and suck them into the repetitive yet entertaining programming. Interaction with the television would further suck the soul out of anyone who would watch it. The parlor walls, as he called it, would essentially rot society one individual home at a time (Bradbury, 1953). Regardless of whether you agree with Bradbury's anxieties over technology, his ideas have permeated into the minds of many. *Fahrenheit 451* sold a massive 10 million copies. This shows that his reach and influence were massive for decades. The fear of television sucking the soul out of people and making them mindless drones was spread by the massive success of this book.

Another example of such worries came from the Federal Communications Commission chairman Newton Minnow who said in 1961, "When television is good, nothing—not the theater, not the magazines or newspapers—nothing is better. But when television is bad, nothing is worse." (American Rhetoric, 2021). He also went on to describe the massive amount of programming and described it as a "vast wasteland." He felt that many of the channels were not adding to the general good of people watching it, and that programming should be used to

improve a high culture. This 'vast wasteland' has grown exponentially since his speech. However, this is still one man's opinion on what television should be used for. His interpretation of television involves the dissemination of useful and informative news. Obviously, others have decided that television should be used for entertainment. So, one man's vast wasteland is another's immense pleasure.

These two men had very negative views on television because they did not know the effects that television would have on the general public. However, they did understand that it could be used poorly. These two men predicted that people as a whole were going to utilize television as a mind-numbing tool instead of a useful one. Arguably, television can be seen as both, but entertaining programming has a larger audience than informative programming.

In the 1960's and 70's further concerns over television arose due to what some believed was a firm connection between the rise in violent television and the rise in violence in America. Violent television was oftentimes in the form of fictional programming that rewarded heroes when they committed acts of violence against a villain (Perry, 2020). This connection even spurred the Surgeon General's Office to claim that TV violence was a public health problem and investigated childhood aggression and television violence (Faye, 2018). What was concluded was that there were sometimes children that acted aggressively when exposed to violent television, but no steady connection was proven. The controversy over violent television's impacts continued to pervade into the 1990's with television episodes from *The Group* and *Frontline*. *The Group* had social scientists on the show that were vehemently arguing that television did have a causal relationship with real world violence in children. However, *Frontline* conducted many interviews with social scientists, and studies in towns that had never had television before. The studies had varying results and the show ended with a media theorist

explaining his view to the public, which was that television does not kill. These concerns over television and violence show decades worth of research and confusion. There was no clear understanding of whether television truly did incite violence in young children, but it was a focal point of discussion because of the fears that the media and general public had towards television. While this was the center of research for a long time, I believe that other research was more important to how television impacts young children, and I will outline this in the following paragraphs.

The developmental damage television has caused is mostly due to it replacing other more meaningful learning methods. A study from developmental psychologist Daniel Anderson showed that television was not as good at teaching children as real-life interaction (Pappas, 2022). Children simply learn better through interactions with their parents, other children or their environment in general. One such example was an experiment performed using puppets to find if children, 12, 15, and 18 months old, could imitate the puppets. Two sets of children were used; one set of children were shown a puppet action in person, and another set were shown the same action of the puppet on a television screen. Two trials were performed, one in which the children were asked to imitate the puppet 24 hours after seeing the puppet and another in which the children were asked to imitate the puppet immediately after seeing it. The results showed that the children who were shown the puppet in person outperformed the children who were shown the puppet on the screen (Barr & Hayne, 1999).

One such explanation of the reasoning behind why children have a hard time imitating actions seen on television comes from a theory called the 'video deficit effect.' The video deficit effect is thought to occur in children 30 months and younger. The children simply have a hard time transferring learning of the physical world from a 2D demonstration to the 3D real world.

Children's inability to apply 2D learning to the real world has many possible reasons, such as poor video quality, infants' poor understanding of 2D symbols and dual representations, or a complete inability to differentiate between 2D and 3D objects. Regardless of the possible reasons behind why children may have such a difficult time with applying what they learned in the 2D world to real life, there is a clear 'video deficit' in infants and toddlers (Zack et al., 2009).

So, given that there is evidence against using television as the primary source of education, then we must ask ourselves the question of why parents used it as one. I believe that parents use television as a distraction for their children. Children, especially younger ones, are chaotic and take a lot of energy to take care of, let alone teach. So, parents have used television for a long time as a way to distract children. According to CNN, 58% of parents admitted to using technology to babysit their children (Laditan, 2013). While this may be a difficult pill to swallow, parents are using a potentially harmful device to distract their children. So, many parents may be reading this thinking that since television is not as good of a teacher as in person interaction, it should be stopped. This, however, is not entirely the case. Age is a big factor in deciding how much television your child can watch, if any at all. The recommendation of the American Academy of Child and Adolescent Psychiatry is that children under 18 months should be limited to video chatting as the only form of screen time (Anderson & Pempek, 2005), and children 2-5 should only have one hour of screen time per day (AACAP, 2020). Parents should try to steer away from babysitting their children with television until the age of 2 and should limit that babysitting time to only an hour. So, while television may not actively hurt your child, it can be an easy replacement for a learning method that would teach them much better. Additionally, children may not develop a learning disorder from watching television, but not learning as quickly as they should, will set back their development in general.

I argue that there is a visible connection between the technological purpose of television and virtual reality because of their shared goals, and this connection can be seen in the fears that the media propagated. Television and virtual reality are vastly different in the way that the technology works. One is held up right to your face and is interactive, while the other is further away and meant for passive viewership. However, they do share common goals: immersion, entertainment and comfort. In addition to the shared goals, they share fears of how these goals will impact children, when accomplished. *The Veldt* showcases these technological goals through the description of a room called the nursery. This room morphs into whatever the user can imagine, whether this be the ocean floor, traveling in space, or sitting in a jungle safari. The children in the book are immersed so deep into this virtual reality that they can hardly differentiate between reality and the nursery. The children are also so entertained that they are shown to be distraught when the nursery is taken away from them, almost as if they are addicted to it, and the children have this technology in the comfort of their own room. The fears are explained through the parents, who fear they expose their children too much to this virtual reality nursery. In the end, they wind up being fed to virtual lions by their children because they threatened to take the nursery away from the children. These fears come to fruition because of how well the nursery implements the goals of immersion, entertainment and comfort to the children. *Fahrenheit 451* also illustrates the same goals through parlor walls that are essentially gigantic television screens. The parlor walls surround the viewer completely, which promotes immersion. The walls also have programming made specifically for each viewer which showcases the entertainment and immersion goals. The parlor walls also promote comfort by being inside the home where viewers do not have to do anything except sit and interact. Ray Bradury explained his fears by saying that the people who view the parlor walls are becoming

stupid by watching it. These fears are realized because the parlor walls accomplished all of the goals so effectively. Both books describe a technology that promotes immersion, entertainment and comfort and results in disastrous effects because of how well the technology works. Neither book directly calls the nursery or parlor walls television or virtual reality. However, upon reading and studying both books, these technologies can be seen as a television and virtual reality hybrid.

Conclusion

American households have increased television viewership ever since the massive rise in popularity in the 1950's, and the television industry has grown exponentially since its inception. Children now have choices between playing amongst themselves or this extremely gratifying feel of watching a television that has been perfected for nearly 70 years. With the rise of television consumption comes the rise of concerns over its use. The previous concerns of television's effect on childhood development have been shown in this paper to be misguided. Instead of worrying over those concerns, the main concern should be that television is becoming an increasing replacement for real world learning. This concern should also be stronger with younger children, as evidence shows that early learning is essential for the proper development of children. Therefore, an emphasis should be put on ensuring that children spend more time developing in a non-virtual environment. This real-world environment will simply develop and educate children better than television can, especially with younger children.

The worries that the media has over television has translated into virtual reality because they share the same goals. Virtual reality is in danger of falling into this same trap of being feared by the media because of the shared goals it has with television. Therefore, the general public should be wary of media's depictions of virtual reality and at the bare minimum, employ

the same restrictions on virtual reality that they do on television. This means parents should not allow infants and toddlers to use virtual reality at all, and should be careful when using virtual reality to replace real world learning.

The goal of this research is to give parents the most pertinent information when it comes to the dangers of giving their children television. They may want to change the way that they allow their children to view television and virtual reality, in terms of viewership time and programming. Parents ultimately hold the power of deciding which learning pathways their children can use and this decision will dramatically affect the development of their child. Future researchers could build off this project by going into more depth about the impacts of virtual reality on children. For the scope of this paper, connections between television and virtual reality have been made without the use of scientific data, due to inconclusive and limited research on virtual reality impacts on children. Due to its relatively recent growth in popularity, virtual reality technology has a limited supply of research about the effects it has on children. So, with addition of data driven research, this paper could be more useful to parents who are deciding if their child is allowed to use virtual reality. Researchers could also dive deeper into how virtual reality can be useful for children. There have even been some limited studies that show links to development of mathematical abilities, language skills, emotional intelligence, discipline, and talent development (Linnik, 2018). In the end, this paper will hopefully illuminate to some parents the potential dangers of television and VR, and will guide them to a safe course of action when letting their children watch television and VR.

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