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Left to Their Own Devices

An analysis on screen time usage among children aged 2-5, attending the Quileute Head Start Program, in order to inform a social marketing campaign

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As personal device ownership has skyrocketed within the last decade, screen-time discourse has grown more widely in public health circles(Pew Research Center, 2021). In 2021, 97% of American adults reported owning a smartphone, and more than three quarters said they owned a personal desktop/laptop computer. In comparison, only 35% of adults owned a smartphone in 2013. However, technology use is not limited to the adult population. According to recent data, around 66% of children aged 0-5 were exposed to an hour or more of screen-time per day(National Survey of Children’s Health, 2021). This far exceeds the Healthy People 2020 objective of limiting non-school related screen-time for children to no more than two hours per day (Office of Disease Prevention and Health Promotion, 2020).

Healthy People 2020 covers three main objectives relating to screen time for children. Summed up, these include reducing the number of children aged 2-5 who use computers, television and video games more than two hours per day¹ outside of school-related usage(Office of Disease Prevention and Healthy Promotion, 2020). Including work and school, technology has become an increasingly prominent feature of everyday life. As such, it is important to examine the potential consequences of this new integration. Varying by the type of technology used, studies have shown that screen-time usage for children negatively correlates with physical strength, adiposity, sleep duration, cognitive development, socioemotional health and various other factors. There has been some research to suggest that screen-time can have positive effects on cognitive development, especially when viewed in unison with a parent. However, the volume of research on positive outcomes is minor compared to the research presenting adverse effects (Domingues-Montanari, 2017).

¹ Healthy People 2030 has reduced this number to 1 hour per day(<https://health.gov/healthypeople/objectives-and-data/browse-objectives/physical-activity/increase-proportion-children-aged-2-5-years-who-get-no-more-1-hour-screen-time-day-pa-13>). However, for the purposes of this paper, Healthy People 2020 objectives will be used.

Technology ownership is fairly consistent across demographic factors such as race, gender and geographic location (Pew Research Center, 2021). Despite that, technology *usage* is known to be influenced by many socio-economic and demographic factors. Specifically, this article will be focusing on youth aged 2-5 in the Quileute Tribe, located within the Northwest corner of the Olympic Peninsula.

The Quileute Nation resides on a one-square mile reservation in LaPush, Washington. This reservation was the result of an executive order signed by President Harrison in 1889, vastly reducing the previous Quileute territory, which spanned from the Pacific Coast to Mt. Olympus (Mt. Rainier). Western colonial practices such as this have brought disruptions to traditional Quileute life, including the influence of Western technology and industrialization (Quileute Tribe, 2021).

Program

In partnership with the Quileute Head Start organization, this program seeks to address concerns around excessive screen-time usage in children aged 2-5. The interests of the program are to educate and inform the target population on the adverse effects of screen time, as well as suggest alternatives to screen-time usage. The target population will be parents and caregivers of children aged 2-5, whose children attend the Quileute Head Start program.

Social Ecological Model

The Social Ecological Model (SEM) provides a comprehensive framework for understanding the complexities of screen-time usage among children. This model is designed around five levels: intrapersonal, interpersonal, community, organizational and public policy.

Observing the impact of these overlapping social spheres can help inform competent public health interventions and social marketing materials. For the purposes of this program, only the intrapersonal, interpersonal and community/organizational levels of the SEM will be analyzed (McLeroy et al., 1988). Through utilizing this framework, screen-time usage can be understood outside of a purely behavioral point of view, and instead viewed as an impact of individual and environmental factors. Influences such as economic status, school policy, built environments and family structures all potentially contribute towards this health behavior.

The social determinants of health are embedded with the Social Ecological Model, acting as a fabric to understand how the environments individuals live in, affect their overall health outcomes and quality of life (Office of Disease Prevention and Health Promotion, n.d.). This fabric included factors such as built environments, social contexts, education access, economic stability and quality of healthcare access. The social determinants of health and social ecological models act as helpful tools to understand the complexities of screen-time as a health behavior.

Intrapersonal

At the intrapersonal level, factors such as age, gender, socioeconomic status, knowledge and beliefs are analyzed to understand parent's behavior around limiting screen time for their children. Studies have found a link between parents' education and screen time usage among children, citing that children from lower educational backgrounds tend to have more screen time hours.(Matta, Kaukonen, et al 2017) As well as education, socioeconomic status can play a role in how much screen-time children receive. Similar to education level, children from lower socioeconomic status tend to engage with devices more compared to children from higher socioeconomic neighborhoods. One study found that parents from lower SES backgrounds

tended to have less or no rules around television viewing compared to parents from higher SES backgrounds. (De Decker, De Cramer. et al 2012) However, this study only collected qualitative data, which makes definitive conclusions difficult. Overall, SES is an important component to consider for this program because the US Census Bureau reported that from 2015-2019, 39.5% of families on the Quileute Reservation lived at or below the federal poverty line, while the national average is 10.5% (Center for New Media and Promotion, 2017, U.S. Census Bureau, 2020).

Additionally, screen time usage can be delineated by the type of device used. For example, on average, children from higher SES backgrounds engage with more computers, and children from lower SES backgrounds engage with more video games devices. This could be attributed to the availability or value placed on certain devices in different socioeconomic backgrounds. However, the health behavior can be even further delineated by gender. Caron's study found that overall, boys engage with more screen time compared to girls, even from a young age. On the other hand, girls in lower SES neighborhoods engaged with significantly more screen time compared to girls from higher SES neighborhoods.² This is an important factor to consider when developing materials, as some parents might be unaware of this gender-differentiation when setting limits around screen time for their children (Carson et al., 2010)

On a more individual level, a parent or caregiver's self-efficacy and outcome expectations around screen-time limiting behaviors can have a large effect on their child's screen time usage. Lee's study found that parents who scored low on their confidence to set limits around children's screen time, had children who watched more screen time. This inverse relationship also proved to be true for parents who didn't feel confident that setting limits would

² This pattern was not observed between boys from higher or lower SES neighborhoods. In addition, gender's outside of the binary (girl and boy) were not considered for this study.

result in the desired behavior (outcome expectations) (Lee et al., 2018). Various studies have found similar results, meaning that increasing parental self-efficacy around screen time limiting behaviors could be a promising approach to reduce children's screen time. For example, one study found that increasing parental self-efficacy was associated with a 77% reduction in the likelihood that a child would watch greater than 2 hours of television per day. (Jago et al., 2013)

Additionally, a parent or caregiver's perception on the benefits and drawbacks of screen time could affect their child's usage. One study measuring parent perceptions around screen time found that overall, parents considered education to be the greatest benefit of television viewing for the child. Additionally, parents considered the greatest benefit to themselves being personal time. Some disadvantages mentioned were concerns about a sedentary lifestyle, their child's temperament and eyesight. These perceptions are important to consider when developing materials, as they indicate personal motivators around limiting or not limiting screen time for one's child. (De Decker et al., 2012)

Interpersonal

At the interpersonal level, factors such as family structure, parenting practices, social networks and peer group support are analyzed to understand the contributing factors towards youth screen-time behavior. As with most behaviors children learn, having the behavior modeled from an adult has significant impacts on the child's behavior. One study found that parent modeling of screen time was directly correlated with higher screen time among toddlers, meaning the more parents watched television, the more their children did too (Lee et al., 2018). In correlation, statistics show that a higher proportion of Native American and Indigenous adults watch television compared to their youth counterparts. However, Native American and

Indigenous youth who watched television, tended to watch more hours compared to their adult counterparts. The discrepancy could be attributed to the concept of modeling, where children are learning screen time behavior through observing the adults in their lives. Additionally, Indigenous youth, on average tend to report up to an hour more of screen-time compared to North American European youth (Foulds et al., .2019).

A child's screen time viewing can also be influenced through the family environment, as one study proved. Families who watched TV together were 33% less likely to meet APA screen-time guidelines. Co-viewing can shape a child's behavior through observational learning, meaning that children are learning behavioral norms around screen time from a young age. Inversely, this study found that when parents enforced family rules around screen time, they were two times more likely to have their children meet screen time guidelines.(Pyper et al., 2016). However, not all co-viewing should be viewed through a negative lens. Other research has proven that co-viewing can aid a child's cognitive development, as they are positively interacting with an important caregiver in their life (Domingues-Montanari, 2017).

Parenting style also plays an important role here. One study found that children of parents who tended to be more authoritarian or permissive watched more hours of television on average compared to children of authoritative parents. Traditionally, authoritative parents tend to be the best at setting clear guidelines with their children, which is known to be an effective strategy to reduce viewing time(Howe et al., 2017)

Outside of the home, parent and caregivers attitudes around screen time can be heavily influenced by the norms of their peers and communities. Descriptive norms are any social norm that describes how an individual thinks, acts, feels or thinks in a given situation (American Psychological Association, n.d.). These norms are influenced by a variety of demographic

factors, including-but not limited to- age, education, or race. In terms of screen time, education is often cited as one of the largest influences of descriptive norms. Parents with higher educational backgrounds often have stricter descriptive norms compared to parents of lower educational backgrounds, meaning they actively use less screens in front of their children and place a higher importance on limiting screen time. In turn, their children have less engagement with screens. The study also suggested that parents of lower educational and SES backgrounds faced different societal pressures around screen time, such as the high cost of extracurricular activities, pressure to purchase certain devices and the value of learning to use technology at a young age. Therefore, the motivation to change one's screen time behavior could differ based on educational background and socioeconomic status. (Matta et al., 2017)(Goncalves et al., 2019)

Community/Organizational

At the community/organization level, factors such as school, workplaces and cultural values are analyzed. Sometimes this level is also called the "built environment," meaning it takes the physical environment around an individual into account (Boris et al., 2018). As each level builds on the previous, it becomes increasingly apparent how the levels simultaneously contribute to and are affected by the levels adjacent to them.

Children's screen time usage can often be broken down by the time of day or week. Studies have found that children tend to have less screen time during the week, compared to the weekend. Specifically, children have significantly more television, video game and computer minutes during the weekend. As a result of school and work structures being set up on a Monday-Friday basis, children and parents are left with more free time on the weekends, which can lead to more screen time. Additionally, the interpersonal section discussed how parents often

view screen time as a mechanism to give themselves more free time, which is useful to get weekend chores and responsibilities done. Recognizing and addressing these time disparities could bring more awareness to potentially habitual parenting patterns.

In terms of built environments, the safety of a family's surroundings could aid or hinder screen time prevention efforts. One study out of Canada found that children from neighborhoods perceived as "unsafe" spent more time inside doing sedentary activities, which included an increase in screen time. Based on data from the Federal Bureau of Investigation, reports of violent crime from the La Push Tribal Agency have reduced to almost none over the last ten years (Federal Bureau of Investigation, 2019), pointing towards a positive trend for neighborhood safety. However, there is a possibility for this data to be convoluted based on changes in reporting practices. Also, the previous study also analyzed the relationship between sedentary behaviors and relative access to parks or recreational facilities, finding a positive relationship between the two. Overall, physical access to screen time alternatives can make a big difference for children's participation in those activities (Veugelers et al., 2008).

On a smaller scale, a child's home environment can equally influence device usage. Various studies have reported the correlation between the number of devices in a home and children's screen time. There is a positive correlation between the number of devices in a household and how much time a child spends on those devices. It was also noted that children with a television in their room had a greater likelihood of watching more than two hours of television, compared to children that did not have a television in their room (Veldhuis et al., 2014).

Additionally, a systematic analysis of screen time use for children under three years old found that there was no correlation between parental employment, number of parents or daycare

options and screen time use for infants. This contradicts the common perception that a caregiver's work schedule or childcare options are significant influences over a child's screen time usage (Dutch et al., 2013).

Evidence Based Interventions

Social Marketing Campaigns

As awareness of the effects of screen time has come more prominently into the public domain, so have prevention efforts to address this health behavior. Based on a systematic analysis of intervention efforts, it seems as if many efforts have been developed around behavior change theories. These theories tend to focus on the intrapersonal and interpersonal levels of the social ecological model. Out of the behavior change theories, the social cognitive theory tends to be the most utilized framework for building an intervention.(Kaur & Gupta, 2019). A core component of social cognitive theory is the concept of self-efficacy, defined as one's belief in their ability to perform a behavior for a desired outcome. (Stajkovic & Lufthansa, 1998). As mentioned previously, self-efficacy is known to be a large barrier for parents and caregivers to reduce screen time for their children.

The "Fit 5 Kids" TV reduction program for Latino preschoolers aims to reduce TV viewing time for preschoolers and encourage alternative activities. The study was designed around the social cognitive theory, with a primary focus on modeling, retention and reinforcement through observational learning. The curriculum was specifically developed to maintain cultural relevance with the target population, through conducting informational interviews and a trial run of the materials with a pilot audience. This program was given over a 7-week period, consisting of 5-6 lesson plans, which were taught in the classroom setting.

Children were encouraged to observe and model the desired behavior (ex. turning off the TV and choosing alternative activities) and then parents were given optional assignments to continue the behaviors at home. Overall, the program showed significant success, resulting in a 25 minute per day decrease in television viewing for the experimental group, while the control group showed no significant difference. (Mendoza et al., 2016)

Another social cognitive theory based intervention technique was done through the Social Pediatrics Department in Dr. Sami Ulus Children's Hospital. The study also aimed to reduce screen time among preschoolers, through utilizing the time during well-child checkups to introduce simple intervention materials. Parents were given printed materials, a CD and a counseling call as the main components of the intervention. These various components were meant to educate parents on the dangers of excessive screen time and encourage alternatives. Though simple, the intervention showed promising results. At a 9 month post-intervention follow up, the experimental group had reduced their average screen-time by 70 minutes, and the control group had no significant change in average screen time. This study proves that increasing parent's self-efficacy can be an effective strategy for reducing children's screen time. (Yilmaz et al., 2014)

Conclusion

Screen time is an undeniable facet of the modern world. Protecting children from the harmful effects of excessive screen time becomes increasingly important as technology progresses. Through utilizing the social ecological model, excessive screen time can be understood as a behavior affected by many overlapping environmental, cultural, and personal factors. With understanding, empathy, and a focus on cultural relevance, a social marketing

campaign can help address the multifaceted issue of excessive screen time usage among children attending the Quileute Head Start Program.

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