ABSTRACT

Title of Thesis:	THE PORTRAYAL OF SCREEN TIME IN CHILDREN'S PICTURE BOOKS
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The increasing prevalence of screen-based technology in children's daily lives has sparked growing concerns about its developmental, social, and psychological implications. While extensive research has explored the effects of screen time on children, little attention has been given to how screen time is portrayed in children's literature. This study aims to examine the depiction of screen time in contemporary children's picture books, analyzing the themes, messages, and potential implications these narratives have for young readers. Through a qualitative thematic analysis of 45 picture books published over the last 15 years, this research explores how screen time is framed in picture books – whether as beneficial, harmful, or neutral – and how these portrayals align with existing research on screen use among children and adolescents. Findings contribute to the understanding of children's literature as an intervention tool and provide insights into how these books may influence discussions and perceptions of screen time and screen-related behaviors. This study offers valuable implications for caregivers, educators, and mental health professionals seeking to support children in developing healthy technology habits.

THE PORTRAYAL OF SCREEN TIME IN CHILDREN'S PICTURE BOOKS

by

Bridget Moran

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Chapter 1: Introduction

The rapid evolution of technology over the past two decades has embedded screens into every facet of life: domestic, social, academic, and professional. While adults regularly engage in screen-based activities, screens have also become ubiquitous for children. In fact, a 2020 Pew Research study on technology use among children under the age of 12 found that 88% of parents report that their child watches television, 67% say their child uses a tablet, and 60% indicate that their child uses a smartphone (Pew Research Center, 2020). Of note, one-third of parents reported that their child began using a smartphone before the age of 5, and one-fifth of parents reported that their child under the age of 12 has his or her own smartphone (Pew Research Center, 2020). With such easy access to technology, it is no surprise that children are spending substantial amounts of time engaged in screen-based activities, with some estimates reaching up to 8 hours per day (LeBlanc et al., 2015; Trinh et al., 2015). In light of this pervasive screen exposure, experts have begun to investigate its impact on youth. Initial findings suggest a correlation between excessive screen time and a range of adverse developmental, physical, and mental health outcomes among children (Madagin et al., 2019; Marinelli et al., 2014; Kremer et al., 2014; Atkin et al., 2014). In response, organizations like the American Academy of Pediatrics (2016) have issued age-specific guidelines for screen time usage. Most experts recommend that individuals under the age of 18 limit screen time to no more than two hours per day, excluding school-related screen use (Legner, 2024). However, recent research indicates that many parents struggle to adhere to these recommendations, with children frequently exceeding the suggested screen time limits (Brushe et al., 2023; Qi et al., 2023; Center for Disease Control and Prevention, 2022).

This widespread use of technology among youth has garnered significant national attention, as evidenced by a range of health advisories addressing social media use among young people (U.S. Office of the Surgeon General, 2023; McCabe & Prinstein, 2023) along with increasing calls for cell phone bans in school districts across the country (Panchal & Zitter, 2024). This issue is also gaining global traction, with countries such as Australia taking steps to address the concern through implementing a ban on social media use for children under the age of 16 (Allyn, 2024). While many U.S. parents express a desire for their children to limit screen time, they often find themselves conflicted, recognizing that screens can be necessary tools for keeping their children occupied, calm, or even as a means of reward (Bentley et al., 2016; Elias & Sulkin, 2019). In fact, many parents report that parenting has become particularly challenging in the age of youth technology and social media use (Pew Research Center, 2020). Given the pivotal role parents play in managing their children's screen habits, targeted interventions that engage families may offer effective solutions to the conflicts surrounding screen use. Schools can also play a critical role by partnering with families through parent education nights and other collaborative initiatives to encourage healthy screen use across settings. This study examines how screen use is portrayed in children's picture books, with the goal of equipping caregivers and educators with insights and tools to navigate these challenges and to use books as a potential family- and school-based intervention.

Children's books have long been considered essential educational resources. Prior to the mid-1600s, most children's literature primarily focused on the teaching of grammar, religion, and moral values. This paradigm began to shift in 1658 with the publication of John Amos Comenius's *Orbis Sensualium Pictus*, the first children's picture book, which shifted societal focus toward children's reading for enjoyment. This significant change led to a surge in the

production of picture books, now acknowledged as vital tools for introducing young readers to new language, concepts, and relatable scenarios. Children's picture books also facilitate shared learning experiences between adults and children, providing caregivers and educators with opportunities to foster children's critical thinking skills and connect the book's content to real-life situations (Clare et al., 1996; Hansen & Zambo, 2007). As a result, academic research has increasingly acknowledged children's picture books as key instruments through which young readers make sense of their world, fostering both language and literacy growth as well as social-emotional development (Sipe, 1999).

Researchers have examined various themes and content gaps in children's picture books focused on various topics considered essential for children's development and socio-cultural awareness. Studies have examined the representation of various social issues in children's picture books, such as gender stereotypes (Taylor, 2003), poverty (Chafel et al., 1997; Dedeoğlu et al., 2011), diversity (Monoyiou & Symeonidou, 2015), power dynamics between adults and children (Anderson, 2011), bullying (Wiseman & Jones, 2018), and LGBTQ+ identities (Crisp et al., 2017). Other research has investigated the representation of various topics like ecology (Martín et al., 2019), autism (Azano et al., 2017), social-emotional development (Mostek, 2023), and parenting (Adams et al., 2011). While ongoing research in these areas remains crucial, the present study highlights screen time as a significant socio-cultural phenomenon that has yet to be explored in the context of children's picture books, advocating for the need to address this research gap.

The way screen time is portrayed in children's picture books can have a significant impact on how adults and youth perceive and address this issue. These portrayals can spark important discussions during shared reading sessions (Pellegrini & Galda, 2003) and may

encourage caregivers and educators to adopt effective strategies for managing screen time, or conversely, may offer little to no guidance. This study examined how screen time and its associated outcomes are presented in picture books targeted at children ages 0 to 12. With the growing number of children's books addressing this topic, the findings provide valuable insights into how these books function as tools that can either support or hinder efforts to discuss screen time with children. The results also inform future research in this area as well as the development of children's literature on this critical issue. In the following sections, I outline theoretical frameworks that explore the relationship between screen time and health outcomes in children, alongside frameworks that position children's books as tools for intervention. I then trace the historical rise of screen use among youth, emphasizing the relevance of this issue. Next, I review existing studies on the portrayal of technology in children's picture books, highlighting a notable gap in research on the portrayal of screen-based technology and its associated outcomes. Finally, I examine research on the impact of screen time on children's physical and mental health, which served as a foundation for the thematic analysis.

Chapter 2: Literature Review

Theoretical Frameworks

This section will examine the theoretical frameworks that establish the link between screen time and health-related outcomes in children, which include Ecological Systems Theory, the Displacement Hypothesis, and Social Comparison Theory.

Ecological Systems Theory

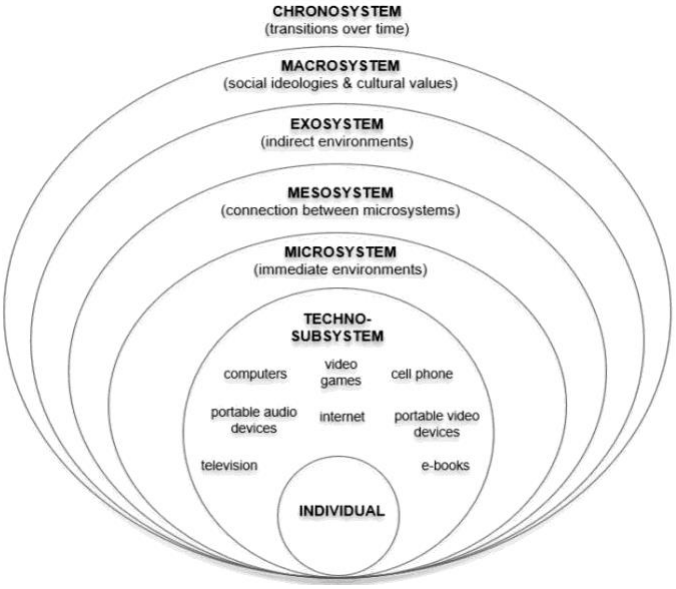
Ecological systems theory (EST) offers a framework for understanding the complex interactions between individuals and their environments (Bronfenbrenner, 1979). This theory posits that human development is influenced by multiple layers of environmental systems: the microsystem, mesosystem, exosystem, macrosystem, and chronosystem. Each of these layers interact with the others, shaping an individual's experiences and development. The macrosystem encompasses broad societal contexts, such as cultural and societal influences, while the microsystem consists of immediate settings like home and school, involving direct interactions with family and peers. The mesosystem refers to the relationships and interactions between different microsystems, such as the connections between family, school, and peers, while the exosystem includes external factors that, while not directly involving the child, still have an impact on their development through indirect influences. The chronosystem introduces a temporal dimension, addressing how changes over time impact development (Bronfenbrenner, 1979).

In the context of screen time, EST provides a framework for understanding how the rise of technology influences various aspects of youth development. Screen time and social media have transformed children’s home, school, and social environments (microsystems), while also influencing broader cultural and societal trends (macrosystem) over time (chronosystem). The

rapid expansion of technology and the widespread integration of screens into daily life, often occurring before research can catch up on health outcomes or develop corresponding interventions, makes the temporal dimension of this transformation especially significant. Given technology's pervasive role across these systems, scholars have proposed expanding the original framework to include the "Ecological Techno-Subsystem" within the microsystem, as illustrated in Figure 1 (Haddock et al., 2022; Johnson & Puplampu, 2008). By examining these interconnected layers, the Ecological Techno-Subsystem provides a comprehensive lens through which to understand how factors like screen time and technology significantly shape a child's development, in both positive and negative ways. While this review primarily focuses on the negative associations with excessive screen time, it will also briefly explore the potential positive associations when screen time is used in a balanced and healthy manner.

Figure 1

Ecological Techno-Subsystem



Note. From "Positive Effects of Digital Technology Use by Adolescents: A Scoping Review of the Literature," by A. Haddock, N. Ward, R. Yu, and N.O'Dea, 2022, *International Journal of Environmental Research and Public Health,* 19(21), (doi: 10.3390/ijerph192114009).

Displacement Hypothesis

The displacement hypothesis suggests that time spent engaging in one activity can reduce the time available for other activities, potentially displacing them (Putnick et al., 2022; Mannell et al., 2005). In the context of technology use, this hypothesis posits that increased screen-based activities, such as watching television, playing video games, or engaging in social media, can crowd out other important activities, such as physical exercise, face-to-face social interactions, or academic pursuits. Essentially, as individuals allocate more time to screen-based activities, they diminish their involvement in other enriching activities. Thus, the displacement hypothesis posits that screen time negatively impacts mental well-being due to the displacement of healthier alternatives (Kraut et al., 1998; Nie, 2001). This hypothesis underscores the concern that excessive screen time might not only replace productive or healthy activities but also contribute to various negative outcomes by reducing overall engagement in diverse and balanced life experiences.

Social Comparison Theory

Social comparison theory explores how individuals evaluate their own abilities and opinions by comparing themselves to others (Festinger, 1954). This theory posits that people have an innate drive to assess their own worth and competence by contrasting themselves with their peers, which helps them gain self-knowledge and self-esteem. According to this theory, social comparisons can occur in two ways: upward, where individuals compare themselves to others who they believe are in a more favorable position, potentially leading to feelings of inadequacy or motivation to improve (Collins, 1996), and downward, where comparisons are made with those perceived as less advantaged, which can enhance self-esteem or provide reassurance (Wills, 1981). Social comparison theory highlights how these comparisons influence

personal perceptions, emotional states, and social behaviors, revealing the significant role that relative judgments play in shaping individual identity and psychological well-being.

Historically, children's microsystems, comprising their immediate social environment, such as family and friends, were relatively small, consisting of several dozen people from family and school environments. However, with the rise of technology, children now engage with hundreds of thousands of peers worldwide through digital platforms such as Instagram, TikTok, and YouTube. This dramatic expansion of their social landscape has made experiences of social comparison far more complex and pervasive. While research indicates that moderate social media use can provide benefits, such as fostering social connections and building a sense of community (Haddock et al., 2022), excessive use has been linked to increased upward social comparison and lower self-esteem (Vogel et al., 2014). To mitigate these negative effects, increased parental oversight and involvement in children's technology use is essential, ensuring a balanced and healthy digital experience that supports their mental and emotional well-being.

Sociocultural Learning Theory and Zone of Proximal Development

The following sections explore the theoretical frameworks that reinforce the use of children's picture books as tools for intervention. These frameworks illustrate how adults can leverage children's books to further develop children's understanding of complex issues, particularly those related to screen time.

Sociocultural Learning Theory emphasizes the role of social interaction and cultural context in the development of cognitive abilities. According to this theory, learning is strongly influenced by the social environment, with knowledge being co-constructed through communication and collaboration with others, such as peers, teachers, and family members (Vygotsky, 1986). A central concept within this theory is the zone of proximal development

(ZPD), which represents the range of tasks that a learner can accomplish with guidance but cannot yet manage independently (Vygotsky, 1978). This concept highlights the distinction between what a child can achieve on their own and what they can achieve with the support of a more knowledgeable individual, such as a teacher or parent. The ZPD emphasizes the critical role of social interaction and collaborative learning in cognitive development and posits that the most effective learning occurs when tasks are slightly beyond the learner's current capabilities but achievable with appropriate support. This support, referred to as "scaffolding," helps learners acquire new skills and understanding, gradually leading them toward greater independence (Vygotsky, 1978).

Sociocultural Learning Theory and ZPD provide a framework for adults to help children access complex topics and relate them to their own lives. Specifically, parents and educators can use picture books to address concerns about unhealthy screen time and technology use with children. These discussions can both highlight the risks of excessive or inappropriate technology use and promote healthier habits and strategies. Children's books, in combination with adult-led discussions around concepts raised in the books, serve as scaffolding tools, helping children engage with and critically reflect on the dangers of excessive screen time use. This approach not only facilitates meaningful conversations about potential adverse effects but also fosters conversations about healthier, alternative behaviors.

Social-Information Processing Model

The Social Information Processing (SIP) model provides a framework for understanding how children perceive, interpret, and respond to social situations, including those involving screen use. Developed by Crick and Dodge (1994), the SIP model conceptualizes behavior as the outcome of a series of cognitive and emotional processes through which individuals make sense

of their social environments and decide how to act. According to this model, individuals move through several steps when responding to a situation, including encoding social cues, interpreting those cues, clarifying goals, generating possible responses, evaluating potential outcomes, and enacting a behavioral response. These processes are influenced by one's emotional states, prior experiences, and individual characteristics, such as self-regulation and impulse control.

In the context of screen use, the SIP model helps explain how children may come to engage in problematic or excessive digital behaviors. For example, children must interpret screen-related cues (e.g., peer engagement or emotional feedback from digital content), clarify their goals (e.g., seeking entertainment, social connection, or distraction), and evaluate the perceived rewards or consequences of continued screen engagement. Difficulties at any point in this process – such as heightened sensitivity to rewarding cues, challenges with emotion regulation, or difficulty in considering long-term consequences – may increase vulnerability to problematic screen use. From this perspective, SIP highlights the importance of attending to children's internal cognitive and emotional processes, rather than focusing solely on observable behaviors or external outcomes.

The SIP model also provides a framework for evaluating how children's picture books function as intervention tools. Narrative portrayals that depict characters reflecting on their emotions, motivations, and choices may help children engage with SIP-related processes, such as recognizing emotional cues, considering alternative responses, and evaluating consequences. In contrast, portrayals that emphasize abrupt behavior change or focus primarily on external consequences may leave these internal processes underdeveloped. During shared reading, children may therefore benefit from adult guidance that explicitly draws attention to characters' thoughts, feelings, goals, and decision-making processes. Integrating SIP with sociocultural

approaches allows picture books to support not only shared meaning-making but also the development of children's internal processing skills, ultimately promoting more reflective and intentional engagement with screen use and digital well-being.

Screen Time Literature

In this study, the term "screen time" refers to a broad range of activities conducted on screen-based devices, including televisions, computers, smartphones, and tablets. These activities encompass digital media consumption, such as watching movies or TV shows, playing video games, browsing the Internet, and viewing YouTube content, as well as social media engagement, including texting, internet messaging, video chatting, and platforms like Instagram or TikTok. Although formal guidelines advise against children under the age of 13 from having social media accounts, a 2021 survey found that nearly 40 percent of American children aged 8 to 12 use social media (Rideout et al., 2022). Given this widespread deviation from recommendations, this study examines social media use as a particularly concerning form of screen exposure for this demographic. Special attention will be given to neuroscience research highlighting the negative effects of excessive social media use on children and adolescents.

While children's excessive screen time may seem like a recent concern, it has been an issue since the early days of widespread technology use. As far back as the late 1990s, growing concerns about the effect of television and computer use led Roberts (1999) to conduct one of the first major studies examining the relationship between technology use and well-being. This central study found a clear link between prolonged screen time, as measured by time using computers and watching television, and negative mental and physical health outcomes. Notably, the study emphasized that youth, as the most technology-engaged demographic, were the most vulnerable to its harmful effects (Roberts, 1999). Roberts' work emphasizes a longstanding

problem of technology overuse among children and adolescents, highlighting the risks associated with such overuse.

Since this original study, there have been significant advancements in technology, particularly in entertainment and communication. Today's digital landscape presents a complex challenge, as youth spend increasing amounts of time on various digital devices at home and school. To help parents navigate this issue, the American Academy of Pediatrics (AAP) has developed screen-time guidelines tailored to different age groups, emphasizing co-viewing and high-quality programming for children aged 2 to 5, and mindful screen use for youth aged 5 to 18. The AAP emphasizes that families must prioritize sleep, physical activity, and family interactions, and encourages open discussions with children about safe media consumption (AAP, 2016). Despite these guidelines, research has found that some children begin engaging with screen-based technology and activities as early as four months old (Radesky & Christakis, 2016) and that 65% of children aged 2 to 17 exceed the recommended daily screen time limits (Centers for Disease Control and Prevention, 2022). Alarmingly, recent reports reveal that children aged 8 to 12 average nearly 5 hours of screen use daily, while teens aged 13 to 18 average around 7.5 hours, not including school-related screen activities (Rideout & Robb, 2019).

In addition to the rapid technological advancements and resulting societal shifts, major national events like the COVID-19 pandemic have had a profound impact on how both adults and children engage with technology. During the two-year period of pandemic restrictions, children experienced dramatic changes in their home, school, and social lives. The pandemic created a need for all students to have access to technology for remote learning, leading 90% of U.S. public schools to acquire enough laptops or tablets for every student (AAP, 2025). Research suggests that, during this time, children's screen time unrelated to remote learning significantly

increased (Choi et al., 2023). In fact, some studies suggest that youth screen time levels have not yet returned to pre-pandemic levels (Hedderson et al., 2023). Given this surge in screen use, it is essential to consider the ways in which children's books, tools used for learning and development, portray screen time and its associated risks and benefits.

Prior Research on The Portrayal of Technology in Children's Picture Books

Although direct research on screen time and its outcomes within children's literature is lacking, several studies explore the broader representation of technology in this context. The subsequent review of these related studies guided our thematic analysis of screen time in contemporary children's picture books.

Dimac (2008) conducted a content analysis focused on the presence of information technology (IT) in children's literature. In this study, IT was broadly defined to include telephones (both wired and wireless), personal computers, video games, and MP3 players. The research was divided into two parts. The first part involved a content analysis of 370 randomly selected picture books published between the 1950s and early 2000s, drawn from catalog records at the University of North Carolina-Chapel Hill Public Library. This analysis focused on coding references to various forms of IT in book titles and summaries. The second part of the study involved coding the presence or absence of IT in a sample of 115 randomly selected picture books, analyzing the text, illustrations, and overall messages of the books.

Findings revealed that forms of IT were rarely mentioned in the titles or summaries of children's picture books and that cameras were the most frequently depicted form of IT present in book illustrations, followed by telephones, computers, and MP3 players. The researcher also noticed a gradual increase in the presence of IT in book illustrations starting in the 1980's, which corresponds with the information and telecommunications revolution and invention of the World

Wide Web. Overall, the study found that forms of IT played a minor role in the narratives of the stories and were often depicted as neutral objects in the background. Only three books featured technology as a central plot element, and in each case, the technology was portrayed negatively. This finding is especially significant for the current study, as it raises important questions about how technology is represented in children's literature.

Although this study made an important contribution by documenting the presence, or absence, of technology in children's books, the rapidly evolving technological landscape calls for further research. Today's context requires a more nuanced examination, not only of technology's presence in contemporary children's literature but also of the qualitative nature of its portrayal and the potential outcomes associated with screen use. Given that the study was conducted in 2008, focused on books published between the 1950s and the early 2000s, direct comparisons to today's environment are limited. Technological advancements over the past 15 years have been significant, underscoring the need for a more current study that addresses the portrayal of screen time and its associated effects in contemporary children's picture books.

Axell (2019) further explored how technology is portrayed in children's books, particularly related to nature and future technological developments. Through a thematic analysis of 160 Swedish children's picture books, published between the early 1900s to 2019, the study identified several themes as to how technology is portrayed. The study highlighted that children's books often use a variety of literary techniques – including metaphors, analogies, and anthropomorphism – to create a connection between humans, nature, and technology. This approach tends to humanize technology, making it easier for young readers to relate to. A related example provided in the analyses includes a book that portrayed both children and machines as capable of being disobedient or mischievous.

In addition to the common literary devices used to depict technology, this study found that positive portrayals of technology often centered around the theme of technology as a catalyst for creativity. In these depictions, technology was framed as a tool for innovation and self-expression, with protagonists using it to solve problems in imaginative and novel ways. Creativity was positioned as the driving force behind technological progress, a view that aligns with contemporary research highlighting screen-based platforms as powerful tools for creativity (Haddock et al., 2022). However, the study also identified a recurring theme focused on the potential dangers of technology, particularly through the portrayal of autonomous machines (technologies that operate independently of human control) often leading to unintended consequences. While much of the technology examined in these books was manufacturing-related, this theme is especially relevant today with the rise of Artificial Intelligence (AI) and social media addiction, both of which highlight the potential loss of human agency to technology.

Axell (2019) also found that the portrayal of technology highlighted various historical and societal attitudes. The analyses highlighted a strong association between technology and masculinity, which mirrors the historical tendency to credit male inventors and engineers as the primary drivers of scientific progress. Additionally, the study found that technology was depicted as enduring, highlighting its role in shaping human history and development. While some books portrayed older technologies as obsolete, others presented them in a more neutral or even positive light. Regardless of the specific portrayal, this theme emphasized the lasting impact of technology on society, highlighting its historical significance and continued influence on daily life.

Axell concluded that children's books present technology in a nuanced, dualistic manner, simultaneously as a tool for creativity and problem-solving, and as a potential source of danger. These diverse portrayals shape children's understanding of technology, influencing their perceptions of its role in their lives and their attitudes toward future technological advancements. The study suggests that such representations not only encourage children to imagine the possibilities of technological innovation but also prompt them to consider its possible consequences. A limitation of this study is that the sample consisted exclusively of Swedish children's books, which may not be fully representative of other cultural contexts. Additionally, the technology examined in these books was predominantly related to manufacturing. While examining the historical portrayal of different types of technology is important, a more focused exploration of how screen-based technologies are depicted in children's books is necessary, given the growing concerns surrounding children's interactions with digital and social media.

Building on Axell's (2019) research, Axell and Boström (2021) expanded their investigation into the portrayal of technology in children's literature, with a particular focus on how gender norms shape these depictions. Their study analyzed 180 Swedish children's picture books targeted at children aged 1 to 6. The analysis identified several themes consistent with their earlier work, as well as new findings, such as the portrayal of technology through a Western lens. In these depictions, modern technologies were often positioned as superior to older ones, with little consideration given to issues of sustainability or environmental impact. This theme may also be reflected in children's literature about screen time, as portrayed by a societal preference for fast-paced digital content over older, less stimulating forms of media.

Building on the gender bias identified in their first study, this research uncovered two ways in which this bias manifests. First, researchers highlighted a clear imbalance in character

representation, with male characters significantly outnumbering female characters. Second, technology itself was gendered, with masculine-coded technologies, such as trucks and excavators, being prominently featured, while feminine-coded technologies, like sewing machines, were underrepresented. These disparities were further reinforced by traditional gender roles, with male characters typically associated with masculine technologies, while female characters were relegated to more stereotypically feminine roles and technologies. The researchers argue that such portrayals not only perpetuate gender stereotypes but also shape children's perceptions, reinforcing the notion that technology is predominantly a male-dominated field. A similar pattern of gender bias may emerge in the depiction of screen time in children's literature. Research suggests that screen-based addictions vary by gender, with boys more likely to develop video game addiction and girls at higher risk for social media addiction (Esposito et al., 2020; Peris et al., 2020). However, this does not mean that boys cannot become addicted to other forms of screen time, nor that girls are immune to video game addiction. Understanding how technology and screen time are gendered was crucial in qualitative analyses of this issue, as it can provide important insights into how gendered norms shape children's digital habits and influence discussions about screen time. Similar to Axell's earlier work (2019), two key limitations of this study include its exclusive focus on Swedish children's books and its predominant representation of manufacturing-related technologies.

These three studies highlight that the portrayal of technology in children's picture books can significantly shape how children and families perceive and talk about technology in their daily lives. A shared theme across these studies is that technology can be depicted either positively or negatively in children's picture books, and this portrayal can influence readers'

attitudes. These findings provide a foundation for a thematic analysis exploring the portrayal of screen time and its associated risks and benefits in contemporary children's picture books.

The Impact of Screen Time on Youth

Given the limited research on how screen time is depicted in children's literature, coupled with the growing importance of understanding its effects on child development and mental health, the following section explores the research-supported risks and benefits associated with screen time. We anticipated that these risks and benefits may be reflected in children's picture books focused on screen use, potentially shaping conversations between caregivers, educators, and children. This review served as a foundation for the qualitative analysis and helped to identify how screen time is currently depicted as well as to discover potential gaps in its representation in contemporary children's literature.

Negative Outcomes of Excessive Screen Time

As concerns about the impact of screen time on youth continue to grow, researchers have examined its potential effects on children's development, social-emotional well-being, and physical health. Research findings highlight significant risks associated with excessive screen time, including adverse effects on physical, psychological, social, and neurological well-being (Lisak, 2018; Chau et al., 2022; Wu et al., 2016). Key factors contributing to these negative outcomes include the link between increased screen time and reduced physical activity, decreased sleep and poor sleep quality, diminished learning outcomes, heightened internalizing symptoms, social media addiction, and experiences of social comparison and fear of missing out (FoMO). The following section will review research on these associations.

Decreased Physical Activity. The U.S. Department of Health and Human Services (2018) recommends that children engage in at least 60 minutes of physical activity daily to

promote optimal development. Failing to meet these guidelines can increase the risk of various health problems, including cardiovascular issues, obesity, and diabetes. As screen time among youth continues to rise, concerns have grown about its potential to reduce physical activity levels, especially since many screen-based activities are sedentary in nature.

Sandercock et al. (2012) conducted a cross-sectional study with 6,176 British children and adolescents, ages 10 to 15, to explore the relationship between screen time and physical activity. Using self-reports of screen time and physical activity levels, the study found a negative correlation between screen time and free-time physical activity. Participants who reported spending less than two hours per day on screens were significantly more active than those who exceeded this threshold. Based on these findings, the researchers recommend limiting screen time to under two hours per day, which is line with existing medical guidelines. Similarly, de Araújo et al. (2018) conducted a cross-sectional study of 270 Brazilian children and adolescents and found an association between decreased time spent on screens and increased physical activity. The study also identified a critical period between ages 10 and 12, when physical activity levels significantly declined while screen time increased. While these studies cannot establish causality, given the potential influence of other factors like pre-existing health or psychological issues, they can highlight a strong association between high screen time and reduced physical activity levels in children and adolescents. Thus, while other factors may contribute, the displacement hypothesis may play a role, with sedentary screen-based activities potentially displacing opportunities for youth physical activity.

Decreased Sleep. Sleep hygiene is critical for maintaining overall health and well-being at all ages, but it is especially important for children and adolescents, who are in a key period of physical and neurological development (Centers for Disease Control and Prevention, 2023).

Insufficient sleep in this age group can lead to various physical and mental health problems, including increased stress, depression, and a weakened immune system (Alshoaibi et al., 2023). The recommended amount of sleep for children aged 6 to 12 is between 9 to 12 hours of sleep each night. However, research indicates that many children do not meet these guidelines, with 60% of children ages 11 to 13 failing to get adequate sleep on school nights (Centers for Disease Control and Prevention, 2023). Several studies have demonstrated the negative effects of excessive screen time on sleep-related outcomes in children, including delayed bedtimes (King et al., 2013), lower sleep quality (Munezawa et al., 2011), and longer sleep onset latency (Gaina et al., 2006). In light of these findings, the American Academy of Pediatrics (2016) warns parents about the detrimental effects of screen time on sleep and emphasizes that increased screen exposure is linked to poorer sleep quality and shorter sleep duration among adolescents.

There are several neurological factors that contribute to the disruptive relationship between screen time and sleep. Electronic devices emit blue light, which suppresses melatonin production and disrupts circadian rhythms, which ultimately compromises sleep quality (Silvani et al., 2022; AAP, 2023). Additionally, children and adolescents are particularly vulnerable to screen addiction, often engaging with devices late into the night when allowed, which further reduces sleep duration (Alshoaibi et al., 2023). As a result, the American Academy of Pediatrics recommends keeping screens out of children’s bedrooms and advises that all individuals, regardless of age, refrain from using screens at least one hour before bedtime, with research supporting this recommendation (AAP, 2023).

Falbe et al. (2015) investigated the impact of screens in children's sleep environments on sleep duration and perceptions of insufficient rest. This cross-sectional study examined the relationship between the presence of various screens (smartphones, televisions, computers) in the

bedrooms of 2,048 adolescents and their sleep patterns, including sleep duration and feelings of insufficient rest. The researchers found that children with screens in their bedrooms slept, on average, 20 minutes less per night and were more likely to report feeling unrested compared to those without screens in their rooms. A similar pattern emerged in a longitudinal study conducted by Foerster et al. (2019) examining older adolescents' nocturnal screen time. Over the course of a year, the study tracked the sleep habits of 843 adolescents, revealing that they spent, on average, more than three hours per day on screens. Additionally, 80% of participants reported that they did not turn off their cell phones at night, which led to nocturnal awakenings due to incoming calls and text messages. Adolescents with higher screen time and more frequent nocturnal awakenings were more likely to have trouble falling asleep, as well as feelings of exhaustion, low energy, and poor concentration. As a result, these studies highlight the widespread prevalence of screen use before bed or in the bedroom among youth, despite expert recommendations, and emphasize the detrimental effects this behavior has on sleep quality and overall health.

Poorer Learning Outcomes. Screen time has been found to have varied effects on learning outcomes, with research yielding mixed findings. Some studies suggest that overall screen time is not significantly related to academic performance (Adelantado-Renau et al., 2019), while others have found that adhering to screen time recommendations is associated with better academic outcomes (Poulain et al., 2018; Faught et al., 2019) and that memory function can be impaired to varying degrees with prolonged screen use (Liu, 2023). One noteworthy study conducted by Faught et al. (2019) examined the longitudinal impact of factors such as diet, physical activity, sleep, and screen time on academic achievement among Canadian adolescents. The researchers hypothesized that following Canadian guidelines for these behaviors would lead

to higher academic performance. Screen time was assessed using self-reported data on daily hours spent watching TV, playing video games, browsing the internet, and texting or emailing, while academic performance was measured by percentage grades in Math and English. The study found that adherence to screen time recommendations was consistently linked to better academic achievement over time. However, a key limitation of the study was its narrow measure of socioeconomic status, which was based solely on children's spending money. This limited measure may not fully capture the broader socioeconomic context, which could interact with diet, physical activity, sleep, and screen time to influence academic achievement.

Other studies have found a relationship between screen time and long-term academic outcomes. Hancox et al. (2005) conducted a longitudinal study in New Zealand tracking children's television viewing from ages 5 to 15. The research revealed that higher television viewing during these years was associated with a greater likelihood of not obtaining formal education qualifications and a lower chance of earning a university degree by age 26. Key covariates such as IQ and socioeconomic status were also found to influence both television viewing and educational outcomes, with higher IQ and better socioeconomic status linked to improved academic achievements, while behavioral problems were associated with poorer outcomes. The study also found that increased television viewing during childhood was correlated with lower socioeconomic status, lower IQ, and behavioral issues. Even after controlling for these factors, the relationship between early television viewing and later academic outcomes remained significant, suggesting that the effects of screen time on educational attainment are not fully explained by IQ, socioeconomic status, or childhood behavioral problems.

The relationship between screen time and academic outcomes is complex, influenced by a variety of factors including parental education, physical activity, and sleep. Research consistently highlights that sleep is crucial for children and adolescents' learning, memory processes and school performance (Curcio et al., 2006; Wolfson & Carskadon, 2003; Dewald et al., 2010). Thus, the interconnected nature of sleep, physical activity, academic outcomes, and screen time is critical, as they collectively shape children's overall health (Tremblay et al., 2016). While it is difficult to parse apart these variables, healthy behaviors tend to cluster together, and research is in agreement that children who engage in less physical activity, unhealthy sleep habits, and higher screen time are at risk of poorer academic outcomes.

Increased Internalizing Symptoms. Research on screen time and negative mental health outcomes among children and adolescents has been mixed, with some research suggesting that increased screen time has a small or negligible relationship with outcomes of depression and anxiety symptoms (Tang et al., 2021). However, many studies have found that increased screen time is associated with various negative mental health outcomes among adolescents, including depression and suicidal behavior (Wood & Scott, 2016; Maras et al., 2015). In a meta-analysis of sixteen studies, twelve cross-sectional studies and four longitudinal studies, Liu et al. (2016) found that higher screen time in preadolescent children and adolescents was significantly associated with a higher risk of depression. The authors identified a significant curvilinear, dose-response relation between depressive symptoms and overall screen time. Consistent with medical recommendations and guidelines, researchers found a continuously increasing risk of depression with more than 2 hours of screen time per day. Interestingly, this study also found that when screen time is limited to 0 to 2 hours per day, screen time is associated with a lower risk of depression, with the lowest risk detected at one hour of screen time per day. Researchers draw on

benefits of screen time when used in moderation, which will be discussed later in this review, as potential reasons for this relationship. A risk factor identified was the type of screen time, with computer use having an increased risk of depression compared with the reference group of television and video games. A limitation of this study is that it did not include smartphone or social media use as a specific screen time activity, which, given the national concern around this specific form of screen use, is important to examine. An additional limitation is that most of the studies examined did not adjust for family history of mental illness or physical activity levels, which has been shown to be a protective factor against depression (Brown et al., 2013; Liu et al., 2016).

Chau et al. (2022) investigated the relationship between screen time and school-behavior-mental-health difficulties (SMBDs) among French adolescents. These difficulties included issues such as academic struggles, substance use, poor social support, depressive symptoms, and suicide attempts. The study surveyed 1,666 French adolescents using self-report questionnaires that assessed screen-based activities, school performance, behavioral and mental health challenges, and socioeconomic adversities like non-intact families, low parental education, and insufficient family income. The findings revealed that most adolescents engage in excessive daily screen time, which is associated with an increased risk of SMBDs, even after controlling for socioeconomic factors. The researchers emphasize the need to reduce screen time among youth and highlight risk factors identified in previous studies, such as higher maternal screen time and eating while watching television (Hardy et al., 2006). Conversely, they note protective factors, including co-viewing with parents rather than solitary screen use (Latomme et al., 2018). This study reinforces the significant link between excessive screen time and a range of mental

health challenges in youth, underscoring the urgent need for targeted interventions to reduce screen time and address associated risks.

Longitudinal research has examined the association between screen time and mental health problems over time. Wu et al. (2016) examined screen time – as measured by time spent on the computer, playing video games, and/or watching television – and the mental health outcomes of anxiety and depression among college students at baseline and one year following and found significant associations between increased screen time and higher risk of mental health problems. The researchers highlight that this relationship may be bidirectional, suggesting that youth who experience mental health struggles may turn to the television or computer to cope. One limitation of this study is that screen time does not specifically encapsulate social media use, which is a screen-based activity highly prevalent among youth and young adults (Pew Research Center, 2020).

Research on the neurological foundations of screen time offers valuable insights into the potential risk and protective factors that influence the relationship between screen use and internalizing symptoms. Zhao et al. (2023) investigated the relationship between screen time, brain development, and internalizing symptoms in youth using structural magnetic resonance imaging (sMRI). Youth ages 9 to 10 were categorized into three groups based on screen time usage: low (≤ 1 hour per day), moderate (1-7 hours per day), and high (> 7 hours per day). Findings revealed that high screen time was linked to a higher risk of anxiety and depression, with those in the high group being at least twice as likely to experience internalizing problems. Additionally, increased screen time predicted internalizing symptoms two years later, partially due to brain changes, particularly in regions related to cognitive and emotional processing. The

study suggests that excessive screen media use can influence brain development and contribute to mental health challenges, offering insights into potential risks for internalizing behaviors.

As previously mentioned, behaviors such as physical activity, sleep, and screen time are strongly interconnected, with internalizing symptoms playing a key role in this complex relationship. Sedentary behavior has been strongly linked to an increased risk of depression (Wang & Peiper, 2022), while higher levels of physical activity have been shown to protect against negative mental health outcomes (Brown et al., 2013). Similarly, poor sleep has been linked to a greater risk of both internalizing and externalizing behaviors (Williamson et al., 2020). Given these connections, excessive screen time may contribute to or amplify these negative outcomes by reinforcing sedentary behavior and displacing healthier activities such as exercise and restorative sleep. This complex interaction highlights how prolonged screen time can compound existing challenges, increasing its impact on mental and physical well-being and creating a cascade of adverse effects.

Social Media Addiction. While screen time has a nuanced relationship with behaviors such as physical activity, sleep, and internalizing symptoms, its relationship with screen addiction is much more direct. Excessive engagement with screen-based activities can lead to screen addiction, with video game addiction and social media addiction being two of the most common forms among youth (Esposito et al., 2020; Ciacchini et al., 2022). Research highlights a gendered difference in these addictions, with boys at higher risk for video game addiction and girls more prone to social media addiction (Esposito et al., 2020; Peris et al., 2020). Given the growing national concern around social media addiction (U.S. Office of the Surgeon General, 2023; McCabe & Prinstein, 2023), this review primarily focuses on this form of screen addiction.

Social media addiction, also known as problematic social media use (PSMU), has been characterized by various addiction symptoms including “mood modification, salience, tolerance, withdrawal symptoms, conflict, and relapse” (Bányai et al., 2017, p. 2; Griffiths, 2005). Some related behaviors indicative of PSMU include excessive time spent on social media, neglect of other responsibilities, and compulsive checking of social media (Shensa et al., 2017). Research suggests that 45% of teens engage with “near-constant” usage of social media platforms and has posited that increased social media use can evoke compulsive tendencies, reflected by symptoms such as loss of control and preoccupation with social media (Pew Research Center, 2018).

Adolescence, as defined by the World Health Organization, encompasses the ages of 10 to 19 and represents a crucial period of brain development (World Health Organization, 2024). During this developmental stage, significant changes occur in neural systems responsible for social-reward processing, emotional regulation, and social understanding (Blakemore & Mills, 2014). These neural systems are directly engaged during interactions with social media platforms. For instance, research has shown that “likes” on social media platforms serve as a form of "quantifiable social endorsement," acting as powerful rewarding stimuli. These "likes" activate the brain's dopaminergic reward pathways, reinforcing the desire for continued engagement (Burhan & Moradzadeh, 2020). Studies have also demonstrated that receiving or viewing “likes” trigger neural responses associated with heightened activation of reward circuits and increased attention, particularly in children and adolescents (Moor et al., 2010; Silk et al., 2011; Sherman et al., 2016). This interaction with the brain’s reward system plays a central role in the development of social media addiction or problematic social media use (PSMU).

The addictive nature of social media presents a significant risk to youth well-being. Social media platforms are designed with features like endless scrolling and variable reward

schedules, which creates a neurological experience similar to gambling on a slot machine. These features encourage users to compulsively check their feeds, reinforcing addictive behavior (Schultz et al., 2016; Turel et al., 2014). Adolescents are particularly vulnerable to these addictive elements due to their underdeveloped brains, especially in areas related to impulse control and executive functioning (Blakemore & Mills, 2014). In fact, longitudinal fMRI studies have shown that increased social media use during early adolescence may lead to long-term changes in the brain's response to social rewards and punishments (Maza et al., 2023). This suggests that not only are there neurological factors that make adolescents more susceptible to problematic social media use (PSMU), but such behaviors may also have lasting effects on brain development.

Negative Social Experiences. In addition to the risk of addiction to social media, excessive or problematic social media use has also been linked to negative social experiences, including increased experiences of social comparison and Fear of Missing Out (FoMO), defined as the fear of missing out on activities others are experiencing (Nesi & Prinstein 2015; Servidio et al., 2024). Because adolescence is a developmentally sensitive period, young users are more susceptible to negative experiences related to peer influence, online rejection, and online acceptance compared to adult users (Rodman et al., 2017). Research has consistently linked both social comparison and FoMO to negative mental health outcomes among youth.

Nesi and Prinstein (2015) examined the link between technology-driven social comparison and internalizing symptoms in adolescents, finding that increased online social comparison is associated with a higher risk of depressive symptoms. For adolescent girls, social comparison on social media has also been tied to greater body dissatisfaction (Scully et al., 2020). Similarly, FoMO has been linked to heightened feelings of loneliness and depression

among adolescents, while reducing social media use has been associated with decreases in loneliness, depression, anxiety, and FoMO (Hunt et al., 2018). Additionally, concerns have been raised about whether online communication on social media platforms may displace in-person social interactions with strong-tie relationships (e.g., family and friends), replacing them with weak-tie relationships (e.g., strangers and acquaintances). Some studies suggest that these weak-tie relationships fail to meet adolescents' need for social support (van den Eijnden et al., 2008), which aligns with Bronfenbrenner's Bioecological Model, highlighting that the quantity and quality of a relationships a child forms plays a crucial role in their development (Bronfenbrenner & Morris, 2006).

Positive Outcomes of Healthy Screen Time

While much of the research on screen time has focused on the risks associated with excessive use, there is also a growing body of literature suggesting that healthy, moderate screen time can offer a range of benefits to youth. Studies have shown that, when used appropriately, screen time can support children's learning of educational content. High-quality programming has been found to foster learning by presenting information in both verbal and nonverbal formats, a combination that enhances comprehension and retention, positively impacting memory and learning outcomes (Linebarger, 2015; Liu, 2022).

Moderate screen time can also provide valuable personal and interpersonal benefits for adolescents and teenagers. These benefits include increased opportunities for information gathering, social connection, community building, creativity, identity development, and emotional support (Haddock et al., 2022; Subrahmanyam & Greenfield, 2008; Vaingankar et al., 2022; Craig et al., 2021; Lucero, 2017). A Pew Research study revealed that 31% of teens reported that social media had a "mostly positive" impact on their lives (Pew Research Center,

2018). Many teens highlighted the ways social media facilitates connection, with one teen reporting, "I feel that social media can make people my age feel less lonely. It creates a space where you can interact with people." Another teen emphasized the role of social media in self-expression, stating, "It has given many kids my age an outlet to express their opinions and emotions, and connect with people who feel the same way" (Pew Research Center, 2018). Additionally, research has shown that for youth of color, online interactions with peers of the same age and ethnicity can support positive ethnic identity development (Smith et al., 2024). Thus, when used responsibly and in moderation, screen time and social media can provide important benefits to youth.

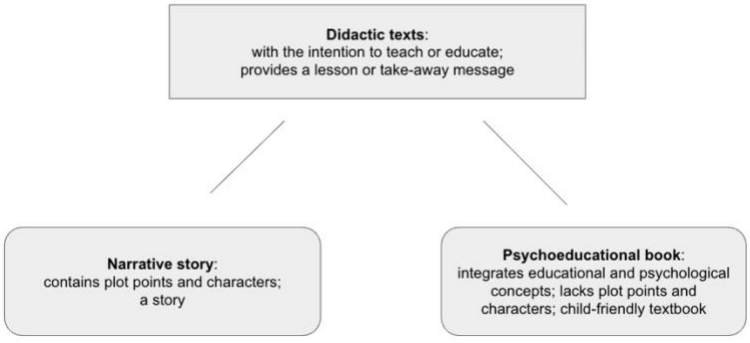
Despite these potential benefits, it is essential for parents and educators to be aware of the risks associated with excessive youth screen time, especially given that screens and social media are often not designed with young users in mind. Screen addiction can disrupt a child's ability to use screens in a balanced and healthy way, making it difficult for children to address these screen-related challenges alone. Consequently, children may require adult guidance to help maintain moderation. Contemporary children's books provide an effective means of addressing these issues, highlighting both the risks of excessive screen time and the potential benefits of responsible use. These books can offer a nuanced perspective, providing valuable insight and guidance for educators, families, and young readers as they navigate the complexities of screen use.

Chapter 3: Methods

Key Terms

This study employs several key terms to describe the nature and function of the books reviewed. The term "didactic" refers to books created with a clear intention to teach or guide readers, particularly those that incorporate explicit moral or instructional messages. The term "narrative" describes books that present a sequence of connected events featuring identifiable plot points and characters – in other words, story-based texts. The term "psychoeducational" refers to books that integrate psychological and educational principles to convey information. In this study, psychoeducational books aim to provide a lesson and educate the reader on specific content related to emotional or behavioral development. All books in the sample were classified as didactic, given their instructional aims. While most took the form of narrative stories, a smaller subset consisted of psychoeducational books, which included neither characters nor plot. Instead, these books resembled child-friendly textbooks that presented information about interactions between screen time and emotional and behavioral health. No narrative stories contained explicit psychoeducational elements, and no psychoeducational books included narrative components. Therefore, for the purposes of this study, books were categorized as either narrative didactic stories or psychoeducational didactic books.

Figure 2
Key Terms



Current Study

The number of children's picture books addressing the topic of screen time has grown significantly over the past fifteen years, with the majority of these books being published in the last decade. However, to date, there has been no comprehensive qualitative analysis of children's books that explore the topic of screen time. Although existing research has examined the representation of technology generally in children's picture books, there is a need for further investigation into how screen-based technology is represented in contemporary books to provide insights into the recurring themes and messages conveyed. The findings from this research will be valuable for caregivers, educators, and clinicians in selecting picture books as tools to facilitate discussions and enhance children's understanding of the risks and benefits associated with screen use. These books could serve as effective, non-confrontational starting points for discussions about screen habits between parents and children, teachers and students, or clinicians and clients. The current study aims to fill this research gap and provide an initial understanding of how children's picture books depict screen time for children ages 0 to 12. The goal of this study is to address the following research questions through qualitative analysis:

1. How do children's books portray outcomes associated with screen time?
    a. What risks of screen time, if any, are presented?
    b. What benefits of screen time, if any, are presented?
    c. What is the message or central theme about screen time?
2. How do children's books portray children's interactions and psychological processes associated with screen time?
3. How is a change in screen time habits portrayed, if at all?
    a. Who is the change-maker and/or what elicits making a change?

b. What are characters' level of awareness and/or perceived sense of agency in making a change?
c. Which screen time management strategies, if any, are presented and how are they presented?
d. What are the outcomes resulting from changes in screen time habits?

These research questions were informed by the theoretical frameworks guiding this study, Ecological Systems Theory, Sociocultural Learning Theory, and the Social Information Processing (SIP) model. Together, these frameworks allow for a multidimensional examination of screen time as a developmental, relational, and cognitive phenomenon within children's picture books. Ecological Systems Theory informed the first research question by emphasizing how screen time outcomes are embedded within children's broader social environments. This ecological lens highlights the role of external influences and consequences of screen use operating at the microsystem and mesosystem levels, such as family, peer, and school contexts, and how these systems are represented within narrative portrayals. Attention to outcomes associated with screen use reflects how books situate screen-related behaviors within children's immediate environments and social relationships.

Sociocultural Learning Theory informed the focus on books' central themes and messages, as well as portrayals of learning, change, and adult involvement. From this perspective, children's picture books can be understood as instructional tools that support learning through shared reading and adult-mediated discussion. This framework guided examination of how screen time messages are conveyed through narrative structure, character interactions, and relational interventions, as well as how children's understanding of screen use may be scaffolded through social engagement. The SIP model further informed the second and

third research questions by providing a framework for examining children's internal psychological processes related to screen use. SIP emphasizes how children attend to and interpret cues in their environments, clarify goals, regulate emotions, generate possible responses, and evaluate potential consequences when making behavioral decisions. This perspective guided attention to whether and how children's books portray characters' internal experiences, including their awareness, emotional responses, decision-making, and perceived agency related to screen use. Elements of SIP also shaped analysis of change in screen time habits by distinguishing between behavior change driven by external forces and change accompanied by internal reflection or self-awareness.

By integrating ecological, sociocultural, and social information processing perspectives, this study examines how children's picture books depict screen use not only in terms of observable behaviors and outcomes, but also in relation to the social contexts and internal processes that shape children's experiences with digital media. This integrated approach provides a comprehensive framework for understanding how children's books may function as tools for supporting conversations, reflection, and learning around healthy screen use.

Sample

This study targeted children's picture books with recommended age ranges inclusive of 0-12 years, encompassing all stages of early childhood, in recognition of the early and widespread exposure to screens in children's lives. Drawing on previous research indicating that screen use can impact children of all ages (Radesky & Christakis, 2016; Centers for Disease Control and Prevention, 2022), we aimed to include a broad age range to gain a deeper understanding of how children's picture books can initiate discussions about healthy and unhealthy screen time. The goal was to better understand the type of preventative discussions

these books may facilitate when children are young and first introduced to screens, as well as how these conversations may evolve as children grow older and begin engaging with an expanding range of screen-based platforms. The inclusion criteria for this study focused on children's picture books that specifically deal with screen time as a central topic, published within the last 15 years.

When deciding on how to collect a sample of children's books on screen time, I consulted with librarians, curated book lists, library catalog systems, and book-selling sites. First, I consulted with various librarians from major cities across the United States, including New York City, Denver, and Chicago. These librarian consultants provided their personal recommendations for books on the topic (8 books), referred existing lists published on their library website (9 books), and/or referred other existing curated book lists published online. These external lists were produced by reputable organizations such as *Common Sense Media* (6 books) and the *International Literacy Association* (4 books), as well as individuals including a *Digital Wellness Institute*-certified mental health counselor (8 books) and an educator specializing in digital citizenship (5 books). This resulted in an initial sample of 40 books. To expand the sample further, I conducted a search using the Washington D.C. Public Libraries catalog using the keywords "screen time" and "technology," applying filters for publication date (within 15 years), language (English), genre (fiction), audience (juvenile), and format (print or eBook). Review of the search results revealed considerable overlap with the books that were librarian-recommended and sourced from curated lists. For example, titles such as *Screen Time is Not Forever, Tek the Modern Cave Boy, When Grandma Gives You a Lemon Tree, Dot.,* and *The Couch Potato* appeared in both the catalog results and the previously identified sources. Because this overlap reduced the number of unique titles available for analysis, additional sources were needed to

achieve a larger sample. Therefore, I extended the search to Amazon, one of the most widely used book-selling platforms (Kreutzmann-Gallasch & Schroff, 2022), to identify further children's picture books addressing screen time.

I conducted an initial search on Amazon using the two key terms of "screen time" and "children's picture book." Using the advanced search tool, the following filters were set to refine the results: Subject (Children's Books), Reader Age (All Ages, Baby to 12), Language (English), and Publication Date (after September 2009). This search generated 386 results. To further narrow the selection, I applied additional filters, requiring each book to have a minimum of 100 consumer reviews and a rating of 4.5 stars or higher. Titles classified as chapter books were excluded to maintain a consistent focus on picture books. Many of the resulting titles also overlapped with the books recommended by librarians and curated book lists, and others were not relevant to the study's aim because they did not focus on screen use. However, this refined search identified 6 additional books that met the criteria. Following this multi-step selection process, the final sample comprised 46 children's picture books.

Research Design and Approach

Research examining socio-cultural representations in children's picture books has frequently drawn on qualitative analytic approaches to examine recurring ideas, representations, and messages conveyed through both text and illustrations (Axell, 2019; Axell & Boström, 2021; Wiseman & Jones, 2018; Crisp et al., 2017). Building on prior work that employed thematic analysis to examine representations of technology in children's picture books (Axell, 2019; Axell & Boström, 2021), the present study adopted a thematic analytic approach – specifically, hybrid thematic analysis (Fereday & Muir-Cochrane, 2006) – to investigate portrayals of screen time in children's picture books.

Hybrid thematic analysis was selected given the qualitative nature of the materials, including the combined textual and visual content of picture books, and the study's aim of developing an in-depth understanding of a phenomenon (Attride-Stirling, 2001; Daly, Kellehear, & Gliksman, 1997). Existing research on the risks and benefits associated with screen use informed a deductive coding framework, while close engagement with the book content also supported an inductive coding process that allowed unanticipated patterns to emerge from the data. Although the analytic procedures involved generating descriptive code frequencies at certain stages, these counts were used to support pattern identification rather than serving as analytic endpoints. Instead, codes and their distribution across the dataset informed the development of latent, interpretive themes, which is a central objective of thematic analysis (Daly, Kellehear, & Gliksman, 1997). By engaging closely with both written and visual elements of the picture books, this hybrid thematic analytic approach supported the identification of patterned representations that extend beyond individual instances of screen use within the books. Because portrayals of screen time and their potential implications are multifaceted and open to interpretation, this approach allowed for an examination of how screen use is framed, contextualized, and positioned within children's literature, rather than limiting the analysis to surface-level descriptions of content frequency alone. Importantly, theme development was informed not only by the presence and frequency of screen-related content, but also by the qualitative nature and intensity with which these elements were portrayed. In this way, hybrid thematic analysis allowed for the integration of deductive insights from existing research, inductive insights grounded in the dataset, and both quantitative descriptors and qualitative interpretation to generative overarching themes that reflect how screen use is portrayed in children's picture books.

Data Analysis Procedures

This study employed a qualitative research design to examine how screen time is portrayed in contemporary children's picture books. Given the exploratory nature of the research questions and the narrative and visual complexity of picture books, a hybrid thematic analysis was used (Fereday & Muir-Cochrane, 2006). The analysis was also informed by principles of codebook-based thematic analysis and applied thematic analysis, including systematic code development, collaborative coding, iterative category refinement, and the use of intercoder reliability procedures to support analytic consistency (O'Connor & Joffe, 2020; Boyatzis, 1998; Guest et al., 2012). Hybrid thematic analysis integrates deductive and inductive approaches, allowing themes to be informed by existing theory while also remaining responsive to patterns emerging from the data.

Intercoder reliability statistics were calculated to evaluate consistency in code application across coders, enhancing transparency and supporting the rigor of the analytic procedures (O'Conner & Joffe, 2020; Boyatzis, 1998; Guest et al., 2012). All books in the sample were transcribed and uploaded to Google Drive, and the data were coded and organized using NVivo qualitative analysis software. Both the textual content and illustrations were coded, with attention to specific phrases, sentences, and visual elements relevant to the research questions.

Codebook Development

Codebook development involved both deductive and inductive analytic strategies. The process began with a deductive approach informed by the research questions and existing literature on screen time. Coders then engaged in concurrent and independent coding phases, during which new codes were added as patterns emerged in the data. This combined deductive–inductive approach supported a comprehensive analysis and allowed for the identification of patterns not anticipated by the initial deductive framework (Roberts et al., 2019).

Deductive Coding. To examine how children's picture books depict screen time and its associated outcomes, coders first applied a deductive approach. Drawing from prior research and medical guidelines, the team developed a preliminary list of screen-related outcomes, encompassing both the positive and negative effects of screen time, as well as psychological experiences and processes related to screen use. The initial codebook included 7 coding categories related to the research questions and 13 deductive codes informed by prior research and medical guidelines, with 8 risk-related codes and 5 benefit-related codes. These deductive codes are presented in Table B1 in the Appendix.

Inductive Coding. The inductive coding process was conducted in multiple stages to enhance the validity and reliability of the findings. The three-member coding team began by reviewing and discussing the deductive codes that were derived from prior research. The team then examined an initial subset of 3 books to become familiar with the data and generate preliminary inductive codes. In-vivo coding was used, meaning that words or phrases taken directly from the books were used to label content in the codebook (Boyatzis, 1998). During this phase, coders were instructed to use full sentences as the unit of analysis to maintain contextual information that might be important for interpretation and to proceed through the text sentence by sentence, guided by the coding categories. Given that the data came from children's books, much of the data related to the coding categories of Problematic User, Type of Device, Risk, Benefit, and Change in Screen Use were presented explicitly and coded as content appeared. Other coding categories, such as Central Theme, often required consideration of the book's overall takeaway and were coded through both sentence-level coding and subsequent re-readings if necessary. Sentences containing multiple relevant concepts were "double coded."

Because the books included illustrations, book transcriptions contained descriptive sentences of the images (e.g., "Illustration: Zoey is on her phone alone smiling and, in the background, other children are smiling and playing together") so that visual content could be coded alongside text using the same unit of analysis and inform broader contextual interpretations. While illustration content often reinforced text content, coders were encouraged to identify any additional meaningful information gained from the illustrations. A YouTube read-aloud version of each book was also included in the codebook, which coders consulted to ensure accurate coding of picture-based content. This familiarizing phase created 58 inductive codes across 7 coding categories aligned with the research questions: Relevant Literary Context, Problematic Screen User, Type of Screen, Risk of Screen Time, Benefit of Screen Time, Change in Screen Use, and Central Theme. These inductive codes were integrated with the prior deductive codes to create Codebook Version 2 (see Table B2 in the Appendix), which served as the preliminary codebook for formal coding.

First Analytic Step

In the first analytic step, which occurred from May to June 2025, the coding team co-coded a subset of 10 picture books from the sample. These books were coded in sets of three to four books at a time (Books 01-03, 04-06, and 07-10). Using the preliminary codebook as a guide, coders identified full sentences relevant to the research questions and the previously identified overarching coding categories. When excerpts did not align with existing codes or categories, coders documented these instances in a "Questions" section of the codebook, noting the date, book number, coder initials, excerpt, and associated question or comment and entries were reviewed during weekly or biweekly Zoom meetings. During these meetings, the team discussed potential revisions to the codebook, clarified code definitions and interpretations,

resolved discrepancies, ensured consistent application across coders, and introduced new codes or coding categories as needed (see Table B4 in the Appendix for an example of the "Questions" section of the codebook). Intercoder reliability was assessed throughout this phase using Cohen's kappa, with values between .81 and 1.00 indicating very strong agreement (O'Conner & Joffe, 2020; Boyatzis, 1998; Guest et al., 2012). NVivo calculated reliability using the full sentence as the unit of analysis, comparing coders in pairs. When discrepancies arose, final classifications were discussed during coding meetings, agreed upon by the team, and then corrected in the dataset. Coding continued iteratively until the completion of the co-coding phase and until the intercoder reliability exceeded the minimum threshold of .80.

At the conclusion of the co-coding phase, the average kappa between each coder and the expert coder (myself) reached .90 and .92, respectively, and the average kappa between the two non-expert coders was .90, demonstrating very strong reliability (see Table C1 in the Appendix for intercoder reliability). Once consensus was achieved, the remaining books were evenly distributed among the coders, with each coder independently coding 12 books. To maintain reliability, as the expert coder, I conducted double coding of all books assigned to other coders.

During the independent coding phase, which occurred throughout June and July 2025, coders continued to document questions and emerging observations in the codebook, and the team met regularly to discuss refinements and clarify newly introduced codes. Through this process, one book (*Time to Recharge, Harper!*) was excluded after closer analysis revealed that its narrative focused on rest rather than screen use or technology-related themes. This resulted in a final analytic sample of 45 children's picture books.

Following independent coding, the final codebook contained 13 deductive codes, 101 inductive codes, and 11 coding categories: Relevant Literary Context, Problematic Screen User,

Person Concerned, Screen Time Context, Type of Device, Risk of Screen Time, Benefit of Screen Time, Change in Screen Use, Awareness Progression, Central Theme, and Type of Learning (see Table B3 in the Appendix for the final codebook).

Second Analytic Step

In the second stage of analysis, which took place between August and October 2025, deductive and inductive codes were consolidated into broader axial categories based on recurring patterns related to the research questions (Boyatzis, 1998). The team reviewed coding consistency and the accuracy of category construction through ongoing discussions that considered relationships among codes, interpretations, and emergent categories (Boyatzis, 1998). During this process, codes and categories were reviewed, refined, renamed, or merged. For instance, the initial code "spread positivity" under the category of "Benefit of Screen Time" was renamed to "online altruism" to better encompass the range of examples found across the books. Similarly, robot characters, which were initially coded separately, were later merged into the category of anthropomorphic characters after coders agreed that robot characters functioned as a comparable literary device to anthropomorphized animals (see Table B5 in the Appendix).

Throughout both analytic steps, coders engaged in memo writing and group discussions to reflect on their interpretations in relation to child development, relationships among codes, and broader category formation (Boyatzis, 1998). As part of this practice, coders considered how their own experiences with technology might influence interpretation. During one discussion, team members noted shared experiences of being introduced to personal devices during mid-adolescence and contrasted this with contemporary children's earlier exposure to technology through school-issued devices. This prompted reflection on potential biases and reinforced the importance of grounding interpretations in the content of the books rather than personal assumptions. A specific instance of reflexive discussion occurred when all coders identified

excerpts from *The Couch Potato* and *But It's Just a Game* as depicting a perceived "sense of control" derived associated with screen use:

> Yes, from this very couch I can control everything in my life
> all the time with just a few taps and a couple of clicks.
> – *The Couch Potato*

> With my game control is in my hands, I'm the boss of the whole world.
> I can be who I want and do as I please.
> – *But It's Just a Game*

The team debated whether this new "sense of control" code should be categorized as a risk or benefit of screen use. One coder expressed hesitancy about labeling this code as a benefit, noting that the sense of control might be illusory or unrealistic. However, after extensive discussion, the coders agreed that since the excerpts portrayed the perceived sense of control positively and with no associated negative consequences, the code was best categorized as a benefit of screen time. Ongoing discussions and reflections such as these provided depth and transparency to the qualitative coding process and enhanced the rigor of the study, contributing to the development of key insights into how screen time is portrayed in children's picture books.

The final stage of analysis focused on identifying overarching themes and patterns across the dataset to inform the study's broader interpretation. The primary goal of this analytic stage was to move beyond individual instances of screen use to interpret how such representations were framed and contextualized across the sample. Coders examined the central takeaway messages of each book, with particular attention to how risks and benefits of screen time were represented. As part of this process, the team reviewed the frequency with which specific codes and dynamics appeared across the sample to confirm that identified patterns were consistently represented in the dataset, rather than driven by individual coder interpretations. These descriptive counts were not treated as analytic endpoints; instead, they were used to support

transparency in the analytic process and to illustrate patterns that informed the development of four overarching themes. In parallel, the qualitative nature and intensity of the content were considered alongside frequency information to ensure that thematic interpretations reflected not only the most common representations, but also how representations were depicted. During this phase, the coding team examined whether books portrayed screen time as a complex and multifaceted phenomenon or framed it in a more prescriptive or moralistic manner. Coders also considered narrative features, including whether stories centered on a single problematic user or multiple characters, the extent to which characters' inner experiences were developed, and how changes in screen use were depicted, if at all. Through this integrative process, the team synthesized information about central messages, character development, and plot patterns to address the study's research questions and generate four overarching themes. These findings are presented in Chapter 4.

Research Reflexivity

As the expert coder for this study, I identify as a millennial White woman and a doctoral student in school psychology. My personal and professional experiences shape how I interpret portrayals of screen time and digital engagement in children's picture books. Growing up, technology was a steady presence in my life, from getting my first basic cell phone at age 11 to receiving my first smartphone at age 15. After receiving a smartphone, I engaged in social media throughout late adolescence into young adulthood. These experiences have led me to view technology and digital media as a common part of daily life. At the same time, my own complicated relationship with screens and social media use has made me cautious about the ways screen-based platforms can impact well-being, leading to a personal goal of balanced use.

In early adulthood, I began noticing how social media affected my mental and emotional health. On these platforms, I often felt overwhelmed by the sense of being constantly "perceived," as many young people describe, and by the pressure to demonstrate my worth through photo-based social media posts. I also noticed patterns of anxiety connected to my social media use, including experiences of Fear of Missing Out (FoMO) and social comparison, when seeing content posted by friends or peers. The negative emotions from these experiences led me to step away from most social media platforms during college, and this break lasted about six years. After deleting my accounts, I experienced a renewed sense of confidence and reduced preoccupation with others' lives, along with fewer thoughts of comparison. However, I still felt a persistent pressure to respond immediately to texts or emails, revealing a potential sensitivity to the constant connectivity that screen-based technologies facilitate. These ongoing reflections on my own digital habits and emotional responses helped shape my interest in examining how screen use influences children and adolescents, particularly those who may be more vulnerable to its effects.

Before beginning this research, I was aware that my previous experiences with social media might make me more attuned to themes of self-regulation and balance in the stories. To counteract this potential bias, I intentionally re-engaged with social media to better understand current digital culture. Particularly, I wanted to see how newer platforms, like TikTok, function and why they appeal to so many young people. My goal was to approach this research with a more balanced view, acknowledging both the positive and negative aspects of screen use.

As I re-engaged with Instagram, I chose not to follow friends or peers, since the negative aspects of my previous engagement often stemmed from social comparison or performance-related anxiety. Instead, I followed public accounts that aligned with my personal interests. For

example, because of my interest in vintage clothing, I began following the accounts of small, female-owned vintage boutiques. Through exposure to their videos and posts, I learned about the history and restoration of vintage clothing. I also observed that there was a close-knit community between all the accounts I followed – they often followed one and supported one another's work. I even attended a local in-person event where many of the boutiques I followed were featured, and I got the opportunity to meet many of the boutique owners in real life. That experience helped me see both the educational and community-building potential of social media in a new light.

Using TikTok for the first time, however, brought mixed feelings. Through my engagement, I developed a newfound appreciation for online humor and creativity, and for the sense of connection that the platform can offer. I found myself relating to creators who shared my interests and feeling excited whenever they posted new videos. At the same time, I noticed how easy it was to get caught in endless scrolling, in search of the "dopamine hit" that came from watching entertaining content. I also became more aware of content that could negatively influence young users, such as repeated advertisements promoting "must-have" beauty products or clothing, often targeted toward young girls. Despite my awareness of these patterns, I found myself susceptible to experiences of social comparison, even as an adult. The immediacy of the TikTok Shop feature also stood out to me, which is an aspect of the platform that allows users to instantly purchase the items that are featured in certain videos. This experience made me reflect on how social media platforms may promote specific beauty ideals and consumerist values, potentially impacting children's self-esteem and perceptions of self-worth.

My personal conclusions about social media have evolved since my initial six-year break. I now see value in being connected to interesting or entertaining information, particularly if it

promotes personal discovery or development. However, I remain concerned about the curated and consumerist nature of some online content, much of which is created by "influencers" whose livelihood depends on appearing aspirational and promoting products. Unlike traditional advertisements found in magazines or television commercials, platforms like TikTok and Instagram present an endless stream of advertising that is embedded between content that is algorithmically designed to sustain attention. Additionally, I continue to be wary of the "highlight reel" phenomenon – the tendency for people to share only the most positive or exciting aspects of their lives online – which had previously triggered feelings of anxiety for me. Even though I intentionally avoided following peers I knew personally, I was still exposed to many public content creators whose posts evoked similar feelings. While I noticed that many influencers attempt to counter the "highlight reel" by sharing content that conveys their vulnerability or imperfections, the ratio of seemingly "perfect" to "imperfect" content still felt unbalanced from a user's perspective. I found myself grappling with the idea that any extreme portrayal – whether highly positive or highly negative – will never capture the full range of the human experience, which varies from the joyful to the difficult to the mundane.

As a result, my re-exposure to social media allowed me to gain a more holistic perspective around social media and screen use, while also acknowledging that I may be someone more susceptible to negative experiences while engaging with certain platforms that evoke feelings of social comparison. I also recognize that my racial and socioeconomic privilege shapes how I experience and interpret social media. These privileges may limit my ability to fully understand how online spaces can serve as important areas for identity development, belonging, and resistance for marginalized groups. At the same time, I remain mindful of how

certain individuals may be more vulnerable to the potentially harmful aspects of screen-based technologies.

Professionally, my background as a former elementary school teacher and current doctoral student in school psychology strongly informs how I think about screen use. My graduate training emphasizes children's social-emotional learning and self-regulation, which guides how I interpret the developmental themes in this research. Through my work in schools, I have seen how students, caregivers, and teachers struggle to navigate the challenges and opportunities that come with screen use. These experiences continue to shape how I make sense of screen-related stories and guide a desire for practical tools to support these stakeholders in supporting youth development.

This study also benefited from the perspectives of two additional coders, both "Zillenial" doctoral students in school psychology at the University of Maryland. One coder identifies as a first-generation Filipina immigrant, whose experiences growing up in both the Philippines and the United States, and her work as a behavior technician and educator, shape her perspective on children's development and well-being. The second coder identifies as a second-generation Chinese American woman, and her experiences as a researcher working closely with children inform her approach to this project. Together, our diverse backgrounds and shared expertise contributed to a more balanced understanding of how screen time is represented in contemporary children's literature.

Chapter 5: Results and Discussion

This chapter reports the findings from the thematic analysis conducted with 45 children's picture books focused on screen time, beginning with descriptive results on publication characteristics, author background, and book format. Most books in the sample were published in the United States (33 books; 74% of the sample) whereas smaller subsets were published in the UK (9 books; 20% of the sample), Canada (2 books; 4% of the sample), and Australia (1 book; 2% of the sample). Most authors (37 books; 82% of the sample) published through traditional publishing houses, while a smaller portion (8 books; 18% of the sample) were self-published. The authors represented a range of professional and personal backgrounds. Over half (25 books; 57% of the sample) were written by established children's authors or illustrators, while others had professional experience in education or academia (6 books; 13% of the sample) or the mental health field (5 books; 11% of the sample). Non-credentialed authors included public figures (7 books; 15% of the sample), such as actress Jamie Lee Curtis and former first-lady Laura Bush and her daughter Jenna Bush Hager, as well as individuals who identified as parents (2 books; 4% of the sample). Table A1 provides further information on book authors and publication details.

The vast majority of books were narrative in format, featuring characters and storylines (41 books; 91% of the sample). A smaller subset (4 books; 9% of the sample) were psychoeducational and lacked characters or plot points, instead presenting information in a child-friendly, textbook-like format. Among the narrative stories, 21 books (52% of the narrative sample) featured exclusively human characters, 13 books (31% of the narrative sample) employed anthropomorphism through non-human characters such as animals or robots, and 7

books (17% of the narrative sample) included both human and anthropomorphic characters. For example, *If You Give Your Mouse an iPhone* featured both a human boy and a mouse character.

Some narrative books also included topics based in diversity, equity, and inclusion (DEI). Two books (5% of the narrative sample) explicitly incorporated DEI-related content, both of which featured characters with marginalized identities. In *Rocket Says Look Up!*, the protagonist, an African American girl with an interest in space, references the first African American astronaut to travel to space during a period of dialogue. The second book, *Hair Love*, centers on an African American girl and her father, who use a tablet to assist them in learning methods for styling her hair.

Across the sample, all books adopted a didactic instructional style, emphasizing moral or behavioral lessons. In the psychoeducational subset (4 books; 9% of the sample), learning occurred through the provision of explicit information about screen use and its psychological effects. For example, *Be Smart About Screen Time* discusses the social nature of human beings and how this shapes our engagement with social media:

> Humans are social. We're wired to care about being part of a group.
> That's how early humans survived.
> When we're part of a group, we feel terrific. When we're excluded, we feel rotten.
> Social media grabs our attention because of our impulse to connect with others.
> — *Be Smart About Screen Time*

In the narrative subset (41 books; 91% of the sample), lessons were typically conveyed through negative consequences related to problematic screen use or through dialogue-based interventions from other characters. For example, in *But It's Just a Game*, the protagonist's mother highlights the importance of balanced screen use during a conversation following her son's excessive engagement with video games:

"Video games can be part of your life,
But you need to make sure that they don't become your entire life."
— *But It's Just a Game*

One narrative book, however, stood out to the coding team for its focus on the problematic user's inner experience, highlighting his thoughts, feelings, and desires while conveying a moral message about screen use. Coders felt this approach fostered a deeper understanding of the character's struggles and personal growth in regard to his screen use, as illustrated in *Noah's New Phone*:

"Hey, Mom… technology isn't really good or bad, is it?"
"No, not really," his mom replied. Noah nodded.
"It's all about how I choose to use it."
What kind of ripples will you CHOOSE to make today?
— Noah's New Phone

The following section presents the findings from the thematic analysis of the children's picture books in the sample. These findings contribute to the limited literature on how screen time is portrayed in children's books and may assist parents, educators, and clinicians in selecting materials for guided reading sessions focused on screen use.

How Do Children's Books Portray Outcomes Associated with Screen Time?

This research question explores how children's books depict the outcomes of screen use, including both positive and negative effects on children's behavior, emotions, and relationships. Understanding these portrayals offers insight into how children's literature frames technology's role in development and well-being and offers implications for how educators, parents, and clinicians can facilitate discussions about the risks, benefits, and overarching messages related to screen use in shared reading sessions with children. To address this question, the coding team examined three primary areas represented across the books: screen-related risks, screen-related benefits, and themes. The findings contributed to the development of Theme 1.

Theme 1: Predominantly Negative Depictions of Screen Use and Its Consequences

Analyses revealed a rich variety of screen-related risks and benefits presented across children's picture books. This variety enriches the existing literature by translating complex, research-based concerns into story form, showing how children's books reflect and convey contemporary understandings of screen use and its effects. In analyzing screen-related outcomes, a subset of books exclusively portrayed risks associated with problematic screen use (13 books; 28% of the sample) and an even smaller subset exclusively portrayed associated benefits (3 books; 6% of the sample). Rather, most books (29 books; 64% of the sample) portrayed both risks of problematic screen use and benefits of healthy screen use. Notably, within the set of books portraying both risks and benefits, the majority (23 books) emphasized risks more prominently than benefits, evidenced by a higher ratio of risks to benefits. Even in instances where the ratio was more balanced, the risks tended to be portrayed as more severe and consequential than the benefits. For example, while some books acknowledged benefits to screen use such as social connection or entertainment, these were often overshadowed by depictions of more severe risks such as cyberbullying or physical safety risks associated with irresponsible screen use. Furthermore, across the sample, the number of risk-related codes (35) that emerged far exceeded the number of benefit-related codes that emerged (14). The following section explores these risks and benefits in greater detail, and the specific codes from the analyses will be presented in italics.

Screen-Related Risks. Characters frequently experienced adverse outcomes stemming from excessive or inappropriate screen use. Screen-related risks fell into four overarching categories: physical and health risks (e.g., *poor sleep hygiene*), emotional and psychological

health risks (e.g., *screen addiction*), social and relational risks (e.g., *decreased offline social engagement*), and behavioral and conduct risks (e.g., *user cyberbullies others*).

The most prevalent risks, which appeared in nearly half of the sample, included *disinterest in offline activities* (22 books; 49% of the sample), *screen addiction* (22 books; 49% of the sample), *decreased offline social engagement* (21 books; 47% of the sample), and *distraction* (21 books; 47% of the sample). Other common risks included *physical safety risk* (13 books; 29% of the sample), *decreased empathy* (9 books; 20% of the sample), *poor sleep hygiene* (8 books; 18% of the sample), and *media multitasking* (7 books; 16% of the sample). While 8 deductive risk codes were represented across the sample, 27 inductive risk codes emerged throughout coding. *Decreased empathy* was a particularly noteworthy inductive risk code, which was often depicted through a user's insensitivity to others' emotions as a result of their screen-related behavior, as in *Noah's New Phone*:

> He remembered how last week he had posted a photo of his classmate eating lunch with a caption that said, "Oink oink!"
> The kid seemed upset and glared at Noah all day.
> "What a baby!" Noah thought, rolling his eyes.
> Noah pushed these thoughts away and boarded the bus.
> — *Noah's New Phone*

Many of these inductive risk codes connect to concerns based in research related to excessive screen use, including associations between screen use and negative impacts on children's socio-emotional and cognitive development (Vasconcellos et al., 2025; Santos et al., 2022).

Screen-Related Benefits. Despite the predominance of negative portrayals, many books highlighted a range of benefits associated with healthy screen use. These screen-related benefits were clustered into four categories: social and relational benefits (e.g., *social connection with online peers*), psychological and identity development benefits (e.g., *online altruism*),

educational benefits (e.g., *educational learning*), and entertainment and enjoyment (e.g., *entertainment*). The most commonly depicted benefits included *social connection with online peers* (15 books; 33% of the sample), *bonding with offline family or peers* (14 books; 31% of the sample), and *entertainment* (13 books; 29% of the sample). Other frequently coded benefits were *convenience* (9 books; 20% of the sample), *educational learning* (9 books; 20% of the sample), and *social validation* (8 books; 18% of the sample). The inductive code of *bonding with offline family or peers* was particularly noteworthy, reflecting how screens can facilitate shared experiences within offline relationships. For example, in *Nerdy Birdy Tweets*, two friends enjoy engaging in social media together:

> The next day, Vulture had a surprise for Nerdy Birdy.
> Vulture had joined Tweetster.
> They Tweetstered together all morning.
> — *Nerdy Birdy Tweets*

Across the sample, there were 4 deductive benefit codes and 10 inductive benefit codes. The deductive codes of *social connection with online peers* and *educational learning* appeared consistently across multiple books. In contrast, deductive codes such as *creativity* (3 books; 6% of the sample) and *identity development* (2 books; 4% of the sample) were represented less consistently. Given the growing body of literature emphasizing the developmental value of these benefits when screens are used responsibly (Haddock et al., 2022), their limited portrayal is noteworthy. While the primary focus of these books is on problematic screen use and reflects the empirical associations between excessive use and risk-related outcomes, greater representation of these research-supported benefits to healthy screen use could help promote a more balanced and developmentally informed understanding of children's screen engagement.

Depending on the goal of a reading session, parents, clinicians, or educators might select a book that highlights specific screen-related risks or benefits as a key point of discussion. For

example, a book highlighting the benefit of *opportunity for responsibility*, such as *Webster's Manners*, could be particularly useful for teachers introducing students to their own digital devices. Conversely, a parent whose child has engaged in cyberbullying might select a book focused on that specific risk, such as *Troll Stinks*, to guide conversations about the emotional and social impact of online behavior. Utilizing stories focused on particular risks or benefits can encourage dialogue and offer a constructive framework for promoting awareness and healthier digital habits among youth.

Book Themes. In addition to screen-related risks and benefits, the coding team analyzed the overarching themes of each book to further conceptualize how screen time was portrayed across the sample. These analyses revealed two distinct types of thematic framing: "black-and-white" themes and "nuanced" themes. Across the sample, "black-and-white" themes predominated (30 books; 67% of the sample), with most stories presenting screen use as something to be controlled, restricted, or avoided. In contrast, "nuanced" themes were identified in 15 books (33% of the sample). These themes emphasized that screen use can be positive when practiced in balanced, intentional, and responsible ways. Themes within each category were coded non-exclusively, meaning that multiple "black-and-white" themes could be applied to a single book if relevant. However, no book was coded as containing both "black-and-white" and "nuanced" themes simultaneously, reflecting the mutually exclusive nature of these perspectives.

"Black-and-white" themes reflect all-or-nothing perspectives on technology, portraying screen use as either entirely positive or entirely negative. The most prevalent theme within this category was *in-person over online*, appearing in 21 books. These books emphasized the superiority of offline relationships and experiences, and the narrative stories employing this theme often used an external intervention to prompt a character's rediscovery of the joys of face-

to-face interactions and experiences. This is represented in *Hey Zoey! Get Off Your Phone!* when the protagonist, who engages in excessive screen use, becomes trapped in her phone. After being freed, she expresses gratitude for her in-person life and friendships:

> Zoey jumped in the hole, a slide to turn off power.
> She then slid down the slide into a bed of flowers.
> "Hey, Zoey!" Ben yelled. "We found your phone outside.
> What a great way to trick us so you could go hide!"
> "You found me!" she said, "And I know that it's true,
> Instead of my phone, I'd rather play with you."
> — *Hey Zoey! Get Off Your Phone!*

Another common "black-and-white" theme was *full disconnection*, represented in 9 books. Narrative stories employing this theme often featured characters who become entirely disconnected from their screens, either because of an external event (e.g., a volcanic eruption permanently eliminates their access to devices), because negative consequences of their problematic use lead them to give up screens, or because positive experiences following reduced use diminish their desire to return to screens. For example, in *Doug Unplugs on the Farm,* the robot child protagonist experiences a power outage that prompts him to explore the world "unplugged." After having positive experiences "unplugged," Doug chooses to remain disconnected:

> And got back in their car.
> "Everyone plug in," said Dad.
> But Doug stayed unplugged.
> He thought about all the ways he'd helped out on the farm—
> And all the stories he'd have for his Grandbots."
> — *Doug Unplugs on the Farm*

A third "black-and-white" theme, *screens are purely dangerous*, was identified in 7 books. These narratives depicted physical or social dangers associated with problematic or unsupervised use that can lead to real-world harm. In *Chicken Clicking*, for instance, a young chick befriends a deceptive stranger online, who is later revealed to be a fox:

"A chick had found the perfect chum…
'I found a friend online,' she cheeped.
The fox said, 'That was me!'"

— *Chicken Clicking*

Such stories serve as cautionary tales about the potential dangers of unsupervised engagement with technology, and do not present any scenarios in which screens are used in a safe or healthy manner. Only one book portrayed the opposing "black-and-white" theme of *screens are purely positive*, depicting technology as entirely beneficial and omitting any mention of potential risks. In this book, an African American girl and her father use a tablet to watch hairstyling videos, with screens depicted as a tool for identity development, bonding, and empowerment:

Daddy gathered all the tools we needed, and we were set.
Watching carefully, Daddy combed, parted, oiled, and twisted.
He nailed it! Funky puff buns!

— *Hair Love*

In contrast to these clear-cut portrayals, "nuanced" themes portrayed screens as a normative part of modern life and focus on mindful engagement rather than full disconnection. These books often depicted both risks and benefits of screen use, emphasizing that how one uses screen-based technology is what matters most. In these stories, protagonists typically retained access to their screens, despite prior problematic use, and discovered strategies for moderation and mindful engagement.

Two key "nuanced" themes emerged: *be intentional* and *balance*. Twelve books were coded under the theme *be intentional*, with messages emphasizing the development of intentionality and self-regulation in screen use. Protagonists learned to make active, conscious decisions about when and how to engage with screens, adopting strategies such as *setting screen limits* or *putting screens away*, often with the help of adults in cases where the problematic user

was a child. For instance, in *But It's Just a Game*, after parent intervention, the protagonist gains a newly empowered and regulated relationship with screens:

> I still get to play my video games for an hour every day,
> But now they don't control me and tell me I have to play.
> — *But It's Just a Game*

Similarly, books coded under *balance* convey the importance of integrating online and offline activities to achieve a healthy equilibrium. Eleven books were coded as employing this theme and references were often made of "healthy" amounts of screen use that can be balanced with non-screen activities. In *Screens Away, Time to Play!*, the psychoeducational book frames screen time as one component of a well-rounded day. The book uses a metaphor of a "pie chart" to help readers understand that screens can coexist with other fulfilling non-screen-based activities:

> For now, I hope you understand the need for screen time rules.
> And if you draw a pie chart of the things you do today,
> Your screen time section should be just a tiny slice, okay?
> They say kids all have important jobs. Yes, even at your age.
> You're setting up your future, where the world can be your stage.
> So when your grown-up says to stop, consider what they say.
> It's time to do your other jobs: create, explore, and play.
> — *Screens Away, Time to Play!*

These two thematic approaches, "black-and-white" and "nuanced," may serve different purposes depending on a child's developmental stage and capacity for self-regulation. For younger children who may struggle with understanding abstract concepts or monitoring their own behavior, stories employing a "black-and-white" theme, such as *Fabulous Friend Machine*, may be effective in establishing clear cause-and-effect relationships regarding the risks associated with problematic screen use. On the other hand, older children and pre-adolescents may benefit from more nuanced portrayals, such as *Noah's New Phone*, that encourage critical reflection and personal responsibility, especially as they approach ownership of their own

devices. Children who need support understanding the "why" behind screen-time rules or limits may benefit from psychoeducational books that explicitly educate youth on screen-related concepts and impacts. Additionally, pairing books with opposing "black-and-white" messages, such as *Chicken Clicking* and *Hair Love*, may help enhance children's critical thinking skills. In such cases, an adult can guide the child in recognizing that screens can be harmful in some contexts yet beneficial in others. Adult scaffolding would likely be essential for helping children notice and interpret these contextual nuances. Thus, reading sessions and discussions about screen time with youth can be differentiated and tailored intentionally, with book selections aligned to children's developmental abilities and the overall goals of a guided reading session.

How Do Children's Books Portray Children's Interactions and Psychological Processes Associated with Screen Time?

This research question examined how children's books depict the emotional, cognitive, and social processes that relate to children's interactions with screen-based technology. Understanding these portrayals is valuable for educators, parents, and clinicians, as it clarifies how children's books frame children's self-awareness, emotional regulation, and interpersonal dynamics in the context of screen use. To address this question, coders analyzed what type of individual or character engaged in problematic screen use, what type of individual or character was affected by that use, and the level of autonomy and awareness demonstrated by the problematic user. These analyses produced Theme 2 and Theme 3.

Theme 2: Problematic Screen Use Centered on a Single Character

To understand how children's books represent the psychological processes related to screen use, we examined how problematic users were portrayed across the sample. Over half of the books (26 books; 58% of the sample) depicted problematic or excessive screen use as a

selective issue, typically centering on a single character or "type" of user perceived as especially vulnerable to problematic use. In contrast, 19 books (42% of the sample) depicted problematic screen use as a broader, more universal challenge, affecting multiple characters or "types" of users who struggle to balance or manage their screen time effectively.

Within the narrative subset, 29 books (70% of the narrative sample) portrayed a child character as a problematic user, while 12 books (29% of the narrative sample) portrayed a parent character as a problematic user. In 7 books (17% of the narrative sample), the problematic user's age was indeterminate, often due to the use of anthropomorphic characters or the absence of a clear parent-child dynamic. These codes were non-exclusive; therefore, stories in which both a parent and a child character exhibited problematic use were coded for both categories. Finally, two narrative stories (5% of the narrative sample) did not feature a character who engaged problematically with screens.

When children were portrayed as problematic users, the most common dynamic that emerged was a parental figure showing concern about the child's use, as represented in 17 books (41% of the narrative sample), followed by a peer showing concern about another peer (11 books; 27% of the narrative sample). Only one book (2% of the narrative sample) depicted an educator as a concerned party regarding a child's excessive use. Another dynamic that emerged was a child expressing concern about a parent's use (6 books; 15% of narrative sample), highlighting emerging generational reversal in technology-related behaviors.

Building on the gender analysis of Axell and Boström (2021) regarding the portrayal of technology in children's literature, the gender of the problematic user was analyzed in this study. Character gender was determined through analyzing the gender pronouns used; however, the gender of the problematic user could not be determined in 6 books (15% of the narrative sample)

due to the use of anthropomorphic characters and the absence of gender pronouns. Among the identifiable cases, 20 books portrayed male characters engaging in problematic screen use (19 children and 1 adult), while 16 books depicted female characters engaging in problematic use (14 children and 2 adults). While some of the screen-based activities were explicitly identified, such as videogaming or social media use, many were more general (e.g., computer or smart phone use). The most frequent depiction of a specific form of screen use involved male children engaging in problematic videogaming (6 books; 15% of the narrative sample), consistent with existing research linking excessive videogame use to male youth (Esposito et al., 2020). However, one counterexample featured a female child engaging in problematic videogaming in *Polly and the Screen Time Overload*. In contrast to prior findings that young girls are more vulnerable to problematic social media use (Peris et al., 2020), portrayals of problematic social media engagement were evenly distributed across male and female child characters (3 books each). Thus, there may be emerging trends toward more diversified representations of technology use across genders.

Overall, these findings suggest that children's literature most commonly portrays problematic screen use through a singular, child-centered narrative. This trend aligns with research indicating that certain individuals are more vulnerable to problematic screen use than others and that children represent a particularly susceptible demographic (Blakemore & Mills, 2014; Roberts, 1999). However, some books depict problematic screen use as a more universal struggle, reflected in stories that focus on parental problematic use or portray multiple characters grappling with similar challenges. For example, in *Me Myselfie and I*, a parent engages in problematic social media use, becoming obsessed with taking photographs and posting online:

> Mom squealed out loud, Ah! It's like a new toy!
> Then she dashed outside for more selfie joy.

She jumped in the snow and stuck out her tongue.
Posed with our post girl, selfie snow girl fun.
Selfies with dad, and with our dog Maisie.
She selfied and said, “I'm selfie crazy!”
Hunger was building.
She said, “I need more.”
Holding her cell phone, “Let’s selfie the store!”
— *Me Myselfie and I*

The way a book frames selective versus universal vulnerability, along with the central character or characters it employs, may inform its selection for specific contexts. For example, a clinician working with a child who feels isolated at home due to family members’ excessive screen habits might choose a book like *Blackout*, which portrays a child protagonist seeking connection from their family members who are absorbed in their devices. Conversely, caregivers beginning to establish family-wide screen-use guidelines might use *The Berenstain Bears: Computer Trouble* to emphasize how screen overuse can affect the entire family system, promoting shared responsibility for healthy screen habits. Thus, parents, educators, and clinicians can consider the type of screen-based activity, the child’s experiences with screen use and their gender, and whether the discussion should emphasize selective or universal vulnerability when choosing a book for shared reading sessions.

Theme 3: Limited Character Development of the Problematic User

Across the narrative sample, analysis of character development revealed that the inner emotional lives and psychological processes of problematic users were rarely explored or developed. Characters were often labeled “technology-obsessed” from the onset of the story, with little insight into the progression of their use or their underlying intentions, motivations, emotional states, or contextual factors shaping their behavior. Viewed through the lens of the Social Information Processing (SIP) model (Crick & Dodge, 1994), these omissions are notable, as children’s screen-related behaviors can be understood as the result of how they attend to cues,

interpret situations, clarify goals, and evaluate possible responses and outcomes. The limited attention to these processes in many books suggests that children are given few narrative opportunities to understand why characters engage in problematic screen use or how internal experiences contribute to their behavior. This is illustrated in *Tek the Modern Cave Boy,* where Tek is introduced as a character defined primarily by his problematic screen use:

> Tek stayed alone in his cave room, glued to his phone,
> his tablet and his game box all day, all night, all the time.
> Outside the real world was evolving, but Tek couldn't have cared less.
> "You should have never invented the Internet!" Tek's Mom grunted to Tek's Dad.
> Outside the real world was evolving, but Tek couldn't have cared less.
> Tek missed out on all the winter fun during the Ice age.
> He never even learned his dinosaur names…
> The hours, days, and months were slipping by…
> Tek's parents tried everything to pry him away from his gadgets, but Tek wouldn't budge.
> No one could get Tek's attention.
>
> — *Tek the Modern Cave Boy*

Across these stories, the question of what drove characters to engage in problematic screen use was rarely addressed; instead, characters were typically portrayed as passive victims of technology's allure. When change did occur, it was consistently externally instigated, most often through an unforeseen physical disruption (e.g., a power outage or blackout), negative consequences of their use, or a relational intervention. Only after such interventions, particularly relational ones, did some characters reflect on their problematic use. However, when a natural event served as the intervention, characters did not always engage in meaningful self-reflection. Rather, at times the external disruption simply removed screens from the character's environment, and the character transitioned to non-screen-based activities, leaving readers with little insight into the internal processes behind this change in behavior. While such stories can still serve as valuable tools for clinicians, parents, and educators to illustrate that problematic screen use is undesirable, they may not naturally prompt deeper conversations about key internal

processes, such as emotional regulation, goal evaluation, or reflection on consequences associated with problematic use. In these cases, adults would need to intentionally scaffold discussion to help children explore characters' possible thoughts, feelings, and intentions, filling in narrative gaps related to internal processing.

Only one book (2% of the narrative sample), *Noah's New Phone*, offered genuine insight into the emotions or motivations shaping problematic screen behavior, providing a rare window into the user's internal world:

> Inside his room, Noah felt alone and isolated…
> Noah thought about how he and his friends
> just stared at their phones every day before and after school.
> He realized that he stared at his phone between bits of homework,
> after homework, after dinner, and even in bed.
> Now he was the target of someone's joke.
> By the time dinner started, however, Noah was angry.
> He felt betrayed, as if his cherished pet had suddenly bitten him.
> Was this all phones and tablets were good for? Did he want to get rid of his phone?
> No. But there had to be something more to this technology. Something better.
>
> — *Noah's New Phone*

This story stood out to the research team for its detailed portrayal of the user's inner world, illustrating the complex emotions that can accompany problematic screen use. As the protagonist reflects on the negative consequences of his behavior, he develops self-awareness and a desire for change. This level of insight into the characters' internal experience was notably different from other portrayals, and such a book could be a particularly effective tool for adults seeking to engage children in non-confrontational dialogue about their emotions and experiences related to screens. This type of portrayal allows for discussions to focus not only on the behavioral and relational outcomes of screen use but also about the underlying emotional and cognitive processes that underlie them.

How Is a Change in Screen Time Habits Portrayed?

This research question examined how children's books portray change in characters' screen habits, examining whether these changes are presented as self-initiated or externally imposed, and whether they are framed as desirable or undesirable processes. Understanding these portrayals offers valuable insight for educators, parents, and clinicians, as it highlights the messages young readers may receive about agency and perceived consequences of technology use. To address this research question, the analysis focused primarily on the narrative subset of the sample, as the psychoeducational books did not feature problematic users and, therefore, did not depict a change in problematic use. Of note, two books within the narrative sample (5%) did not feature a user who engaged problematically with screens; thus, there was no change in use depicted in these stories.

Theme 4: Change in Screen Use Driven by External Change Agent and Associated with Positive Outcomes

External Change Agent. Within the 41 stories in the narrative subset, 39 books contained at least one character engaging in problematic screen use, and in all 39 cases, the character's screen use was reduced over the course of the story. In every instance, the catalyst for change was initiated by an external force. These forces typically took the form of physical disruptions (e.g., a power outage or natural events), relational interventions (e.g., a concerned adult or peer), negative consequences that prompt the user to change their use, or a combination of these. Problematic users were typically unaware of or unconcerned about their excessive use until these external events occurred. Illustrative examples of each intervention type include the following:

But one day, there was a blackout.
And Blip tripped over her wire.
She tumbled all the way down the stairs
and out the front door.
Blip toppled down a steep, grassy hill,
rolled through a forest of very tall trees,
and drifted down a long, winding river.
Blip was outside.

— *Unplugged*, physical disruption

But I knew it had now gone way too far.
Now she wants selfies of all that we do.
Til I stopped the madness.
"No more, mom, we're through."
Mom got all quiet.
She hugged me and said, "This whole selfie madness has gone to my head."

— *Me Myselfie and I*, relational intervention

He decided he would email it.
He clicked, and it was gone.
Daddy saw it straight away, and that was number one.
Daddy sent it on to Grandma.
He thought she'd like to see.
Grandma passed it on to Granddad.
So they were two and three….
His email had come back to him. Webster was number twenty.
But he didn't send it on again. They decided twenty's plenty.

— *Webster's Email*, negative consequence

Across these books, most interventions, regardless of type, were portrayed as successful. Only 6 books (15% of the narrative sample) featured failed relational intervention attempts; however, in each of these cases, an additional intervention eventually succeeded in reducing or eliminating the problematic user's digital engagement. Figure 3 presents the types of interventions and their success rates, highlighting an emphasis on relational interventions and physical disruptions across books. Intervention coding was non-exclusive, meaning that a single book could be coded as containing both a successful and unsuccessful intervention.

Figure 3
Type of Intervention within the Narrative Subset of the Sample

Type of Intervention and Success	# of Books	Prevalence (%)
Physical disruption intervenes, with success	16	39%
Parental figure intervenes with child, with success	9	22%
Negative consequence intervenes, with success	8	20%
Child intervenes with parent, with success	3	7%
Peer intervenes with peer, with success	3	7%
Parent intervenes with child, with no success	3	7%
Peer intervenes with peer, with no success	2	5%
Educator intervenes with child, with no success	1	2%

*Note: Percentages are calculated utilizing the narrative subset of the sample (41 books)

Notably, none of the narrative stories portrayed a character attempting to change their own behavior without an external event or other character first raising their awareness of the issue. This pattern suggests an underlying assumption in children's literature that problematic users require an external cue or negative outcome to motivate behavioral change. As shown in Table 1, common catalysts for changes in screen use included physical disruptions (16 books; 39% of the narrative sample), such as a blackouts or natural events that removed access to screens, and negative consequences associated with screen use (8 books; 20% of the narrative sample). These negative consequences typically stemmed from irresponsible or unsafe digital behaviors, such as cyberbullying, misrepresentation, or risky online interactions, and ranged from socially or morally troubling situations, such as upsetting or hurting a peer online, to more serious risks related to personal safety, including in-person encounters with strangers that began

through unsafe screen-based interactions. However, the most common intervention portrayed involved relational interventions, with 21 books featuring successful or unsuccessful relational interventions (51% of the narrative sample). Fifteen of these relational interventions were successful, while 6 were unsuccessful. The most prevalent relational interventions involved parents intervening with children (12 books; 29% of the narrative sample), followed by peers intervening with peers (5 books; 12% of the narrative sample), children intervening with parents (3 books; 7% of the narrative sample), and educators intervening with children (1 book; 2% of the narrative sample).

The prominence of parental interventions may reflect an underlying assumption that parents are the primary stakeholders concerned with youth problematic screen use. Within the parent-child intervention category, 2 books (5% of the narrative sample) portrayed reciprocal interventions, in which a parent first intervenes in a child's screen use and then the child later intervenes in the parent's use. Stories of this kind, such as *Webster's Manners* and *Cami and Wyatt Have Too Much Screen Time*, may provide opportunities for parents, clinicians, and educators to highlight the ways in which challenges to managing screen use can be universal, which may foster relatability and mutual understanding in discussions with children. Notably, only 1 book (2% of the narrative sample) featured an educator's involvement in the problematic screen use of a child. This limited representation is noteworthy given that many school districts have implemented or proposed phone bans in response to growing educator concerns about the effects of screen use on students during the school day (Panchal & Zitter, 2024). This discrepancy points to a broader gap in children's literature regarding educators' roles in addressing problematic screen use. Furthermore, failed relational interventions were underrepresented (6 books; 15% of the narrative sample), and every failed attempt was

subsequently followed by another successful intervention. Given the growing adult concern surrounding youth screen use (Bentley et al., 2016; Elias & Sulkin, 2019; Panchal & Zitter, 2024) and the complex nature of behavior change (Bouton, 2015), this pattern suggests that current children's literature may provide an insufficient portrayal of unsuccessful attempts to influence screen-related behavior.

While in some stories the physical disruption or relational intervention led characters to simply reduce or remove screen use and transition happily to non-screen-based activities, a substantial proportion of books (15 books; 37% of the narrative sample) portrayed subsequent character engagement in *self-reflection*. For example, in *The Couch Potato*, after a blackout removes the protagonist's access to screens, he engages in non-screen-based activities, such as walking outside, which prompts awareness of his prior excessive use and motivates him to take agency over his behavior moving forward:

> Then I noticed my reflection in one of the screens.
> I wondered how much of my life had been spent in that very spot.
> It was then and there that I made the decision to peel myself off the couch
> a bit more often, maybe every day even.
> — *The Couch Potato*

This suggests that many stories promote an experiential learning approach to reducing screen use, in which characters rediscover the enjoyment of non-screen-based activities through direct experience rather than through explicit instruction. After these experiences, characters often reflect on a newfound appreciation for a more balanced approach to screen time. These stories depict that meaningful change happens gradually, through experience and reflection, rather than immediately. In fact, a few stories (4 books; 10% of the narrative sample) portrayed a minor *adjustment period* as characters attempted to reduce their screen use. These portrayals align with research reflecting the difficult aspects of behavior change (Bouton, 2015) and may be

helpful for parents who seek to discuss the gradual and sometimes uncomfortable process of reducing screen use with their children. However, all of these portrayals ultimately depicted sustained success; there were no portrayals of characters significantly struggling to manage their use or regressing into problematic use. The lack of such portrayals overlooks the often-nonlinear nature of behavior change (Bouton, 2015), particularly in the context of habits related to technology and screen use. This limitation will be discussed further in the Future Directions section.

Positive Outcomes Associated with Decreased Screen Use. Both narrative stories and psychoeducational books portrayed a reduction in screen use as associated with a range of positive outcomes. These outcomes included *increased offline social connection* (34 books; 75% of the sample), *increased participation in non-screen activities* (28 books; 62% of the sample), *increased time spent in nature* (24 books; 53% of the sample), *increased physical activity* (20 books; 44% of the sample), and *improved mood and affect* (16 books; 36% of the sample). Some of the non-screen activities suggested or portrayed included reading books, engaging in non-screen-based play, and painting. Some books also promoted that reduced screen use can lead to *increased intentionality* in future screen use (21 books; 46% of the sample) and *increased insight* into one's motivations and desires surrounding one's relationship with technology (17 books; 38% of the sample). This is illustrated in *Limit Your Dragon's Screen Time,* in which a child helps his pet dragon, Diggory Doo, reduce problematic screen use. Diggory Doo agrees to go several days without screens, and during that time he experiences a variety of positive outcomes as well as increased insight into his relationship with screens:

> Day two was spent climbing trees and riding on our bikes
> And other fun activities I knew that Diggory likes.
> Day three we focused mostly on some healthy things to do
> Like exercise and walking, and a game of tennis too.

Day four we planted flowers. We couldn't wait to see them grow.
Day five we read some books. Diggory Doo admitted, "That was fun!...."
At first my dragon had his doubts, but Diggory Doo agreed
That though devices could be fun,
He didn't really need to fill the hours of every day by looking at a screen.
— *Limit Your Dragon's Screen Time*

Across the sample, several strategies were recommended or depicted in promoting behavior change and reduction in screen use, including *putting screens away* (18 books; 40% of the sample), *creating screen time limits* (18 books; 40% of the sample), *transitioning to co-viewing* (3 books; 7% of the sample), establishing *age limits* for certain screen-based activities (2 books; 4% of the sample), and *co-creating a list of alternative, non-screen activities* (2 books; 4% of the sample). Each of these strategies aligns with current recommendations from research and medical organizations for managing children's screen use (AAP, 2016; AAP, 2023).

Chapter 6: Summary, Implications, and Future Directions

The current study was guided by three complementary theoretical frameworks, Ecological Systems Theory, Sociocultural Learning Theory, and the Social Information Processing (SIP) model. Together, these frameworks informed the research questions and shaped interpretation of the findings. Each framework offered a distinct lens through which to examine how children's picture books portray screen use, allowing screen time to be conceptualized as a societal, relational, and individual-level phenomenon.

Ecological Systems Theory (Bronfenbrenner, 1979) informed research questions related to the portrayal of outcomes associated with screen use and the broader contexts in which screen-related behaviors were embedded in the stories. From this perspective, screen use is situated within children's microsystems and mesosystems, including family, peer, and school environments. Across the sample, books most frequently emphasized family-level dynamics, particularly parental concern and intervention (12 books; 29% of the narrative sample). Portrayals of peer concern or conflict related to screen use were less common (5 books; 12% of the narrative sample), and school-based concerns or interventions were largely absent (1 book; 2% of the narrative sample), which does not align with the current landscape of school-based initiatives addressing youth screen use (Panchal & Zitter, 2024). The most common representation of a problematic user was that of a singular, child character (29 books; 70% of the narrative sample), consistent with research highlighting youth susceptibility to unhealthy screen behaviors (Roberts, 1999; Maza et al., 2023). However, a smaller subset of books (12 books; 29% of the narrative sample) depicted adults struggling with screen use, aligning with research indicating that excessive screen use is not limited to youth. For example, 46% of adolescents report perceptions that their parents use their phones excessively, a phenomenon referred to as "distracted parenting" (Pew Research Center, 2024). Together, these portrayals reinforce the

ecological nature of screen-related challenges by situating children's screen use within broader family and social systems.

Across the sample, outcomes associated with screen use were depicted as predominantly negative, with 13 books exclusively portraying risks (28% of the sample) and 23 emphasizing risks more heavily than benefits (51% of the sample). These portrayals align with prior research linking excessive screen use to adverse developmental, physical, and mental health outcomes (Madagin et al., 2019; Marinelli et al., 2014; Kremer et al., 2014; Atkin et al., 2014), while also revealing notable gaps and omissions. Specific representations aligned with existing constructs, including screen addiction (Esposito et al., 2020; Ciacchini et al., 2022), the displacement hypothesis (Putnick et al., 2022; Mannell et al., 2005), and screen disruption (King et al., 2013; Alshoaibi et al., 2023). However, social comparison theory (Festinger, 1954) was rarely represented, despite its relevance to youth social media use (Vogel et al., 2014; Nesi & Prinstein, 2015). Similarly, while some books conveyed research-supported benefits of screen use such as educational learning and social connection, other empirically supported benefits, like creativity and identity development, were largely absent (Haddock et al., 2022; Subrahmanyam & Greenfield, 2008; Vaingankar et al., 2022; Craig et al., 2021; Lucero, 2017). These findings may help guide parents, clinicians, and educators in selecting books focused on specific screen-related topics (see Table D1 in the Appendix). At the same time, the identified representational gaps highlight opportunities for authors to develop more balanced portrayals in future children's books addressing screen use.

Sociocultural Learning Theory (Vygotsky, 1978, 1986) informed how takeaway messages or lessons about screen use were conveyed and how learning may be supported through adult mediation. Most books employed a narrative didactic approach, using characters and plotlines to convey lessons (41 books; 91% of the sample), while a smaller subset adopted a

psychoeducational approach by providing explicit instruction on educational or psychological concepts (4 books; 9% of the sample). Book themes were largely "black-and-white" (67%) in nature, emphasizing avoidance of screens or the superiority of non-screen-based activities, whereas a smaller subset conveyed more "nuanced" themes (33%) that promoted balanced or intentional use. From a sociocultural perspective, this variation suggests that book selection should be guided by children's developmental stage and individual needs, with adults scaffolding access to content that exceeds children's independent understanding or incorporating elements that may be absent from the portrayals. Older children with emerging critical thinking skills may benefit from more complex narratives that encourage discussion and reflection, whereas younger or more vulnerable readers may benefit from clearer, cautionary stories. In both cases, adult scaffolding during shared reading can extend learning beyond what is explicitly depicted in the text (Vygotsky, 1978).

The Social Information Processing (SIP) model (Crick & Dodge, 1994) informed research questions related to portrayals of characters' internal psychological processes, associated outcomes, and behavior change. Across the sample, all characters either displayed problematic screen behaviors from the outset or developed them shortly after being introduced to screens, with little insight into their own motivations, goals, or emotional states. When behavior change occurred, it was consistently initiated by external forces through physical disruptions, negative consequences, or relational interventions. Physical disruptions (e.g., power outages) were consistently effective on the first attempt (16 books; 39% of the narrative sample), whereas relational interventions (21 books; 51% of the narrative sample) and negative consequences (8 books; 20% of the narrative sample) occasionally required multiple efforts before resulting in change. Despite variation in how change was initiated, all characters ultimately modified their

screen use following external intervention. The majority of books positioned adults as central agents of change and emphasized learning through relational intervention and guided behavior modification. Adults in the narratives typically encouraged screen-reduction strategies that align with current research-based and medical recommendations for managing children's screen use, such as setting limits or putting screens away (AAP, 2016; AAP, 2023).

While these portrayals align with sociocultural assumptions about adult responsibility to support learning, they also reflect limited representations of child autonomy and self-awareness. Behavior change was largely driven by external forces rather than by children's understanding of their own internal processes. This depiction contrasts with research indicating that older youth demonstrate awareness of problematic screen use, with 38% of adolescents reporting that they spend too much time on their smartphones (Pew Research Center, 2024). From an ecological perspective, responsibility for behavior change is situated primarily within the child's microsystem, particularly with caregivers, which may be appropriate for younger children but less applicable for older children and adolescents.

Individual-level perspectives on screen use were rarely explored and when present, they were often simplified or incomplete. Although some narrative stories included brief moments of reflection following interventions (15 books; 37% of the narrative sample), the majority did not depict sustained self-reflection. Similarly, very few books depicted characters experiencing any adjustments associated with changing screen use habits (4 books; 10% of the narrative sample) and no books portrayed a return to problematic use, which contrasts with research indicating that behavior change is often complex, gradual, and non-linear (Bouton, 2015). From a SIP perspective, key internal processing steps before, during, or after changes in use – such as cue interpretation, goal clarification, evaluation of consequences, and self-reflection – were typically

not made explicit. Thus, given t prior research suggesting that shared reading experiences can provide opportunities for adults to introduce concepts related to characters' mental states, including thoughts, desires, and perceptions, thereby supporting children's social-emotional development (Adrian et al., 2005; Aram et al., 2013), adult mediation may be especially important for prompting children to infer internal processes that contribute to and accompany problematic use and connect narrative events to children's own experiences with screens.

This study highlights both the representational strengths and gaps of existing children's picture books addressing screen time. Guided by ecological, sociocultural, and SIP frameworks, the findings underscore the importance of integrating societal, relational, and individual perspectives when considering how children's books may support development of healthy digital habits. From a sociocultural standpoint, picture books can function as instructional tools that facilitate adult-child dialogue and scaffold children's understanding of screen use within family, educational, and clinical contexts (Sipe, 1999; Clare et al., 1996; Hansen & Zambo, 2007). From an individual-level perspective, incorporating SIP concepts may allow adults to support children in understanding characters' thoughts, emotions, and decision-making processes on a deeper level. Different books may therefore serve distinct purposes depending on a child's age, developmental level, screen access, and the goals of the reading experience. Effective scaffolding would depend not only on adult guidance but also on an understanding of children's cognitive and self-regulatory capacities. Thus, thoughtful book selection, paired with intentional adult mediation, may play an important role in supporting children's awareness of screen-related challenges and fostering more intentional, balanced digital habits.

Limitations

Several potential limitations should be considered when interpreting the findings of this study. First, sampling bias may have been introduced during the book selection process. Although the research team drew from multiple sources to compile the sample, some of these sources were based on subjective recommendations, such as librarian suggestions. Additionally, the inclusion of books from Amazon, while a leading platform for book sales, may raise concerns about the credibility and quality of the selected titles. Since popularity was a key inclusion criterion – as measured by consumer ratings – the sample primarily reflects books that sell well on Amazon, which captures consumer preferences but may not fully represent the broader diversity of children's literature. From a sociocultural perspective, this reliance on popular and widely circulated books may also reflect dominant cultural narratives about screen time rather than a full range of perspectives on children's digital engagement.

Most authors in the sample were established children's book writers and illustrators, and the majority of books were written from a creative or narrative perspective. While it is possible that some narrative writers may have considered empirical or developmental research, given that many screen-related risks were consistent with current theory, it is possible that portrayals of screen use may have been shaped more by cultural and social assumptions than by evidence-based understandings of children's media use, especially considering recent national discourse around youth screen time (U.S. Office of the Surgeon General, 2023; McCabe & Prinstein, 2023). Research-supported benefits of screen use, such as creativity, learning, and identity development, were generally underrepresented in the narrative stories. Psychoeducational books, by contrast, appeared more explicitly informed by research and included both risks and benefits, though benefits were typically mentioned briefly while significant screen-related risks such as cyberbullying or screen addiction were explored in greater depth. As a result, many books

appeared to prioritize cautionary messaging aligned with prevailing societal concerns over balanced portrayals that reflect the full range of empirically supported outcomes associated with screen use.

Additionally, given the rapidly evolving nature of this topic, children's books addressing screen use continue to be published. Since the completion of data collection, at least six additional books meeting inclusion criteria have been released, suggesting that the findings represent a snapshot rather than an exhaustive account of available literature. Moreover, although the study sought to include a diverse range of children's books featuring screen-related themes, many cultures and languages remain underrepresented in the final sample. Prior research has found that U.S.-published children's books often lack diversity across dimensions such as culture, ability, religion, and language (Ingram & Cahill, 2022). Consequently, the findings of this study may not generalize across different cultural contexts. Because children's experiences with technology are embedded within culturally specific values, these limitations may further constrain the extent to which the findings can be generalized across diverse ecological contexts. Continued research should therefore examine portrayals of screen use in books published in other languages and representing a broader range of cultural identities and experiences.

Future Directions

Future work could examine the usefulness of children's picture books as scaffolding tools by directly engaging youth, caregivers, and educators. For example, focus groups with children could explore which portrayals most effectively support reflection, discussion, and self-awareness around screen use and its challenges. Similarly, focus groups with caregivers and educators could identify which books are perceived as most relevant to specific family or classroom contexts and which SIP-related processes they believe require the most adult support.

Examining how children interpret and respond to these portrayals would provide valuable insight into whether the books function as intended scaffolding tools or require additional adult mediation to minimize the potential pitfalls of screen use and promote digital well-being.

In addition, this study identified several representational gaps in children's picture books addressing screen use, underscoring the continued need for accessible, easy-to-read texts that present both the challenges and benefits of screen engagement while authentically representing children's internal experiences. Although chapter books may allow for deeper and more realistic depictions of screen-related challenges, caregivers, clinicians, and educators may lack the time or resources to engage in longer narratives. Collaboration between creative professionals and child development experts could help produce developmentally grounded, evidence-informed picture books that acknowledge complexity, promote critical thinking, and support meaningful dialogue. Such books may serve as valuable tools for families, clinicians, and educators seeking to foster balanced, reflective conversations about screen habits with children.

Appendix

Table A1.

Sample Information: Author Title/Occupation, Publication Information, and Source

Book #	Book Title	Author Title/Occupation	Publisher	Country Published	Source
Book 1	Nerdy Birdy Tweets	Children's author	Roaring Brook Press	USA	Common Sense Media: Kids' Books About Social Media and Digital Life
Book 2	Tek the Modern Caveboy	Cartoonist/author	Little, Brown Books for Young Readers	USA	Common Sense Media: Kids' Books About Social Media and Digital Life
Book 3	The Couch Potato	Children's author	HarperCollins	USA	Common Sense Media: Kids' Books About Social Media and Digital Life
Book 4	But It's Just a Game	Former teacher/school counselor	National Center for Youth Issues	USA	Edmonton Public Library: Picture Books to Promote Digital Citizenship
Book 5	Me Myselfie & I	Public figure	Feiwel & Friends	USA	Common Sense Media: Kids' Books About Social Media and Digital Life
Book 6	The Fabulous Friend Machine	Children's author	Scholastic Australia	Australia	Edmonton Public Library: Picture Books to Promote Digital Citizenship
Book 7	Noah's New Phone	Therapist	Educate and Empower Kids	USA	Reconnect: My Super Duper Round Up of Books about Online Safety to Give to Your Kids!
Book 8	When Grandma Gives You a Lemon Tree	Teacher	Union Square Kids	USA	International Literacy Association: The Screen Time Dilemma
Book 9	Dot.	Public figure	HarperCollins	USA	Common Sense Media: Kids' Books About Social Media and Digital Life
Book 10	#Goldilocks: A Hashtag Cautionary Tale	Children's author	Andersen Press UK	UK	Digital Citizenship Grades K–5 Book List
Book 11	Our Great Big Backyard	Public figure	HarperCollins	USA	International Literacy Association: The Screen Time Dilemma

Book 12	Unplugged	Children's author/illustrator	Hodder Children's Books	UK	Edmonton Public Library: Picture Books to Promote Digital Citizenship
Book 13	The Breaking News	Children's author/illustrator	Roaring Brook Press	USA	International Literacy Association: The Screen Time Dilemma
Book 14	Hair Love	Public figure	Dreamscape Media, LLC	USA	International Literacy Association: The Screen Time Dilemma
Book 15	The Technology Tail: A Digital Footprint Story	Former teacher/school counselor	Boys Town Press	USA	Reconnect: My Super Duper Round Up of Books about Online Safety to Give to Your Kids!
Book 16	Webster's Email	Children's author/illustrator	Self-published	UK	Digital Citizenship Grades K–5 Book List
Book 17	Limit Your Dragon's Screen Time: Help Your Dragon Break His Tech Addiction	Children's author	DG Books Publishing	USA	Amazon - Over 100 reviews above 4.5 stars
Book 18	Polly and the Screen Time Overload	Parent	Crossway	USA	Amazon - Over 100 reviews above 4.5 stars
Book 19	The Penguin Who Found a Magic Box	Parent	Self-published	USA	Amazon - Over 100 reviews above 4.5 stars
Book 20	Once Upon a Time Online	Scientific researcher	Scholastic, Inc.	USA	Reconnect: My Super Duper Round Up of Books about Online Safety to Give to Your Kids!
Book 21	Cami and Wyatt Have Too Much Screen Time	Former teacher	Self-published	USA	Amazon - Over 100 reviews above 4.5 stars
Book 22	Cell Phoney: A Picture Book About Using Cell Phones Responsibly	Former teacher/school counselor	National Center for Youth Issues	USA	Reconnect: My Super Duper Round Up of Books about Online Safety to Give to Your Kids!
Book 23	When Charlie McButton Lost Power	Television screen writer	Puffin Books	UK	Reconnect: My Super Duper Round Up of Books about Online Safety to Give to Your Kids!

Book 24	Berenstain Bears: Computer Trouble	Children's author	HarperCollins	USA	Reconnect: My Super Duper Round Up of Books about Online Safety to Give to Your Kids!
Book 25	Hey Zoey! Get Off Your Phone!	Comedian	Self-published	USA	Reconnect: My Super Duper Round Up of Books about Online Safety to Give to Your Kids!
Book 26	On the Internet: Our First Talk About Online Safety	Child psychologist	Orca Book Publishers	Canada	Reconnect: My Super Duper Round Up of Books about Online Safety to Give to Your Kids!
Book 27	You're Missing It!	Children's author/illustrator	Nancy Paulsen Books	USA	Jefferson County Library School-Age Coordinator
Book 28	Doug Unplugs on the Farm	Children's author/illustrator	Knopf Books for Young Readers	Canada	Stavros Niarchos Foundation Library Librarian
Book 29	Webster's Friend	Children's author/illustrator	Self-published	UK	Digital Citizenship Grades K–5 Book List
Book 30	(Be Smart About) Screen Time!	Former researcher/ educator	Little, Brown Books for Young Readers	USA	Jefferson County Library School-Age Coordinator
Book 31	Blackout	Children's author/illustrator	Little, Brown Books for Young Readers	USA	Skokie Public Library: Books about Technology and Screen Time for Ages 3–5 and Caregivers
Book 32	Rocket Says Look Up	Public figure	Random House Books for Young Readers	USA	Skokie Public Library: Books about Technology and Screen Time for Ages 3–5 and Caregivers
Book 33	Doug Unplugged	Children's author/illustrator	Random House Books for Young Readers	USA	Skokie Public Library: Books about Technology and Screen Time for Ages 3–5 and Caregivers
Book 34	Doll-E 1.0	Former teacher	Little, Brown Books for Young Readers	USA	Skokie Public Library: Books about Technology and Screen Time for Ages 3–5 and Caregivers
Book 35	On a magical do-nothing day	Children's author/illustrator	HarperCollins	USA	Skokie Public Library: Books about Technology

					and Screen Time for Ages 3–5 and Caregivers
Book 36	hello! hello!	Children's author/illustrator	Little, Brown Books for Young Readers	USA	Skokie Public Library: Books about Technology and Screen Time for Ages 3–5 and Caregivers
Book 37	Screen time is not forever	Children's author/illustrator	Free Spirit Publishing	USA	Stavros Niarchos Foundation Library Librarian
Book 38	Goodnight iPad	Children's author/illustrator	Blue Rider Press	USA	Amazon - Over 100 reviews above 4.5 stars
Book 39	Run Wild	Graphic designer	Viking Books for Young Readers	USA	Jefferson County Library School-Age Coordinator
~~Book 40~~	~~Time to recharge, Harper!~~	~~Children's author/illustrator~~	~~Dial Books~~	~~USA~~	~~Stavros Niarchos Foundation Library Librarian~~
Book 41	Troll Stinks	Children's author/illustrator	Andersen Press UK	UK	Jefferson County Library School-Age Coordinator
Book 42	Webster's Manners	Children's author/illustrator	Self-published	UK	Digital Citizenship Grades K–5 Book List
Book 43	If You Give A mouse an iPhone	Children's author/illustrator	Blue Rider Press	USA	Digital Citizenship Grades K–5 Book List
Book 44	Chicken Clicking	Children's author/illustrator	Andersen Press UK	UK	Amazon - Over 100 reviews above 4.5 stars
Book 45	Unplugged Ninja: A Children's Book About Technology, Screen Time, and Finding Balance	Children's author	Self-published	UK	Amazon - Over 100 reviews above 4.5 stars
Book 46	Screens Away, Time to Play!	Former teacher	Self-published	USA	Amazon - Over 100 reviews above 4.5 stars

*Note: Book 40 was eliminated from the sample during the second analytic phase when the coding team determined the book did not meet the inclusion criteria.

Table B1.
Preliminary Codebook: Coding Categories and Deductive Codes (Codebook Version 1)

Code Category / Code	Definition	Quote/Book
1. Relevant Literary Context	Coding Category	
2. Problematic Screen User	Coding Category	
3. Type of Screen	Coding Category	
4. Risk of Screen Time	Coding Category	
Decreased (D) physical activity	User decreases their physical activity due to or in relation to their screen use (Related Theory: Displacement Hypothesis)	
Decreased (D) sleep	User is tired due to usage typically late at night/uses screens at night/doesn't sleep (Related Theory: Displacement Hypothesis)	
Decreased (D) social engagement/ increased isolation	User decreases their social engagement or isolates themself/ increased isolation due to or in relation to their screen use (Related Theory: Displacement Hypothesis)	"Inside his room, Noah felt alone and isolated. He hadn't hung out with his friends since getting his phone." - Noah's New Phone; "Tek missed out on all the winter fun during the Ice Age." -Tek the Modern Cave Boy
Poorer learning outcomes	User has poorer learning outcomes/ doesn't know what they should know/misses academic content due to or in relation to their screen use (Related Theory: Displacement Hypothesis)	"He never even learned his dinosaur names" - Tek the Modern Cave Boy

Screen addiction	User develops screen addiction as depicted by constantly being on a screen or difficulty getting off their screen; words like "can't stop" (Related Construct: Social Media Addiction, Problematic Social Media Use, Problematic Screen Use, Screen Addiction, Video Game Addiction)	"In fact, he couldn't think of a time in the past month where he hadn't reached for his phone when he was bored, when he was lonely, or when he felt an unpleasant feeling coming on." - Noah's New Phone; "Tek stayed alone in his cave room, glued to his phone, his tablet, and his game box, all day, all night, all the time." - Tek the Modern Cave Boy
Social comparison	User engages with social comparison due to or in relation to their screen use (Related Theory: Social Comparison Theory)	
FoMO	User experiences FoMO related to using screens (e.g., sees other people doing something on social media and wishes they were doing it too, feels left out, etc.) (Related Theory: Social Comparison Theory; Related Construct: Fear of Missing Out)	
User is cyberbullied	User is cyberbullied by another user	"To his horror, for the whole world to see on social media, there was a picture of Noah with his pants wet, standing in the aisle of the bus. Under the photo was a caption that said, 'What a baby!" - Noah's New Phone
5. Benefit of Screen Time	Coding Category	
Educational learning	Screens provide educational learning opportunities	"In science class, Noah saw online images of supernovas and planets thousands of light years away. In social studies, his class connected with another class on the other side of the country in an online video chat" -Noah's New Phone

Social connection with online peers/communities	Online platforms and communities provide a space for social connection	"Tweet messages and pictures for them all to see!" -Nerdy Birdy Tweets
Creativity	Screens provide opportunities for creativity	
Identity development	Online platforms and communities provide opportunities for identity development	
Access to resources	Online platforms and communities provide access to resources	
6. Change in Screen Use	Coding Category	
How? (Screen-Time Reduction Strategy)	Sub-Coding Category	
Who? (Change Agent)	Sub-Coding Category	
Result? (Outcome from Reduced Use or Removal of Screens)	Sub-Coding Category	
Awareness? (Level of Awareness)	Coding Category	
Autonomy? (Sense of Autonomy)	Coding Category	
7. Central Theme	Coding Category	

Table B2.
Preliminary Codebook: The Addition of Preliminary Inductive Codes (Codebook Version 2)

Coding Category / Code	Definition	Quote/Book
1. Relevant Literary Context	Coding Category	
Anthropomorphism	Animal character behaving like a human	Nerdy Birdy Tweets
Robot characters	Robot character behaving like a human	Doug Unplugged
Modern human characters	Modern human	Noah's New Phone
Prehistoric human characters	Prehistoric human character	Tek the Modern Cave Boy
2. Problematic Screen User	Coding Category	
Child	Child is problematic user	Noah's New Phone Tek the Modern Cave Boy
Age unclear	Age is unclear due to anthropomorphism	Nerdy Birdy Tweets
Parent	Parent is the problematic user	Me Myselfie and I
3. Type of Screen	Coding Category	
Tablet	Screen device used is a tablet	Tek the Modern Caveboy
Smart phone	Screen device used is a smart phone	Noah's New Phone
Computer	Screen device used is a computer	
Videogame	Screen device used is a videogame	When Charlie McButton Lost Power
4. Risk of Screen Time	Coding Category	

Decreased (D) physical activity	User decreases their physical activity due to or in relation to their screen use (Related Theory: Displacement Hypothesis)	
Decreased (D) sleep	User is tired due to usage typically late at night/uses screens at night/doesn't sleep (Related Theory: Displacement Hypothesis)	
Decreased (D) social engagement/ increased isolation	User decreases their social engagement or isolates themself/ increased isolation due to or in relation to their screen use (Related Theory: Displacement Hypothesis)	"Inside his room, Noah felt alone and isolated. He hadn't hung out with his friends since getting his phone." - Noah's New Phone; "Tek missed out on all the winter fun during the Ice Age." -Tek the Modern Cave Boy
Poorer learning outcomes	User has poorer learning outcomes/ doesn't know what they should know/misses academic content due to or in relation to their screen use (Related Theory: Displacement Hypothesis)	"He never even learned his dinosaur names" - Tek the Modern Cave Boy
Screen addiction	User develops screen addiction as depicted by constantly being on a screen or difficulty getting off their screen; words like "can't stop" (Related Construct: Social Media Addiction, Problematic Social Media Use, Problematic Screen Use, Screen Addiction, Video Game Addiction)	"In fact, he couldn't think of a time in the past month where he hadn't reached for his phone when he was bored, when he was lonely, or when he felt an unpleasant feeling coming on." - Noah's New Phone ; "Tek stayed alone in his cave room, glued to his phone, his tablet, and his game box, all day, all night, all the time." - Tek the Modern Cave Boy
Social comparison	User engages with social comparison due to or in relation to their screen use (Related Theory: Social Comparison Theory)	
FoMO	User experiences FoMO related to using screens (e.g.,	

	sees other people doing something on social media and wishes they were doing it too, feels left out, etc.) (Related Theory: Social Comparison Theory; Related Construct: Fear of Missing Out)	
User is cyberbullied	User is cyberbullied by another user	"To his horror, for the whole world to see on social media, there was a picture of Noah with his pants wet, standing in the aisle of the bus. Under the photo was a caption that said, 'What a baby!" - Noah's New Phone
Online relationships do not provide desired support	The online relationships do not provide desired support as depicted by the user still being upset or needing support/relief; or hoping for better outcomes with the online connections than they end up receiving	"An hour later, nobody had tweeted back." -Nerdy Birdy Tweets
Lack of care towards offline life	The user is disinterested in offline activities due to or related to screen use (Related Theory: Displacement Hypothesis)	"Outside, the real world was evolving, but Tek couldn't have cared less." - Tek the Modern Cave Boy
Distraction	User is distracted by their screen	"Was his phone just a big-kid pacifier? Something to distract or comfort him?" ; "Did you realize I can fit your whole body in my beak? I could eat you in one bite if I wanted." "Mm-hm. That's nice." -Nerdy Birdy Tweets ; "No one could get Tek's attention." - Tek the Modern Cave Boy
User cyberbullies others	User cyberbullies others	"Why did you tweet it to all your tweester friends?" "I thought it was funny!" "Just because you thought it, doesn't mean you should tweet it." "Why?" "It's embarassing." -Nerdy Birdy Tweets ; [Image: Noah

		comments on a friend's picture, 'That looks soooo dumb....']
Illusion of large social network	Character experiences an illusion of a large social network due to large amounts of people online/followers/friends; relates to theory about quality>quantity	"Collect tons of friends online who may, or may not, text you back; He had never dreamed he could have that many friends" -Nerdy Birdy Tweets
Negative impact on offline relationships	Peers or family members physically distances themselves from user due to or related to user's screen use.	"You're friends with a vulture!! And she's dying of boredom. Boredom!" - Nerdy Birdy Tweets ; "Everyone stood in silence, staring at their phones. No one talked to eachother." - Noah's New Phone
Peer/family differences	Differences emerge between the way peers or family members use or feel about screens compared to the user.	"Let's do something different." "In a minute." "This is not fun." - Nerdy Birdy Tweets ; "'My brain may be the size of a walnut, but even I know that is not a healthy situation,' said his best friend, Larry. 'I wish Tek would come out and play.'" - Tek the Modern Cave Boy
Peer/family distancing from user	Peers or family members distances themselves from user due to user's screen use.	"Vulture decided she'd had enough of watching Nerdy Birdy play Tweetster. Vulture spread her wings and flew away." -Nerdy Birdy Tweets
Unhealthy screen habits	User engages in unhealthy screen use	"He liked to scroll through his phone first thing, even before he rolled out of bed." -Noah's New Phone
Loss of time awareness	User loses sense of time while on screens	"'How long have I been starting at my phone?' he wondered." - Noah's New Phone ; "The hours, days, and months were slipping by." - Tek the Modern Cave Boy
Online replaces offline communication	User uses screens to communicate instead of in person communication; user values online relationships more than offline relationships	Image: Noah texts his mom 'when's dinner?' and she replies 'You can come ask me in person.' - Noah's New Phone

	(Related Theory: Displacement Hypothesis)	
Screen use to pacify negative emotions	User uses screens when feeling upset or angry; screens are a tool or coping mechanism for soothing negative emotions	"In fact, he couldn't think of a time in the past month where he hadn't reached for his phone when he was bored, when he was lonely, or when he felt an unpleasant feeling coming on." - Noah's New Phone
Online content prolongs emotional impact of events	Content on screens/social media prolong the impact of an bad experience for the user; can't always fully delete or forget things posted online	"Within the hour his pants were dry and the incident was forgotten...To his horror...there was a picture of Noah with his pants wet, standing in the aisle of the bus."
Online anonymity	Online anonymity on screen-based platforms poses a problem for user(s)	"Clicking on the account, Noah could tell that the account was fake. He knew people sometimes created accounts like these to hide their identity when they posted something mean." - Noah's New Phone
Difficulty identifying adults to support with online problems	The user struggles to identify adults who can support with online or screen-based problems	"Should he tell a teacher? Should he talk to his parents?" - Noah's New Phone
Media multi-tasking	User engages with media multi-tasking or being on multiple screens at once (Related Construct: Media Multitasking)	"During lunch, excitement filled Noah as he and his friends watched a video of how to create an awesome village in Mincraft." - Noah's New Phone
5. Benefit of Screen Time	Coding Category	
Educational learning	Screens provide educational learning opportunities	"In science class, Noah saw online images of supernovas and planets thousands of light years away. In social studies, his class connected with another class on the other side of the country in an online video chat" - Noah's New Phone

Social connection with online peers/communities	Online platforms and communities provide a space for social connection	"Tweet messages and pictures for them all to see!" -Nerdy Birdy Tweets
Creativity	Screens provide opportunities for creativity	
Identity development	Online platforms and communities provide opportunities for identity development	
Access to resources	Online platforms and communities provide access to resources	
Social support	Online platforms and communities serve as a place to seek or find social support	“But then it hits him. Nerdy Birdy had five hundred Tweetster friends! He’d ask them for advice. He tweeted, ‘My best friend is mad at me. What should I do?’”
Can fit in with friends	User feels they can fit in with their friends now that they have screens/online platforms	"I can finally text and play games like my friends" - Noah's New Phone
Spread positivity	Online platforms serve as a space to spread positivity	"Instead of his usual one line caption, Noah wrote a sincere compliment about each person in the photo and tagged them"
Source of bonding with offline friends/family	User and family or peers bond while using screens	"His friends wasted no time showing him new games to download and videos to watch. His big sister taught him how to follow 'friends' and famous people on social media." - Noah's New Phone ; "During lunch, excitement filled Noah as he and his friends watched a video of how to create an awesome village in Minecraft."
6. Change in Screen Use	Coding Category	

How? (Screen-Time Reduction Strategy)	Sub-Coding Category	
Screens put away/limits	They put away screens or put limits on usage.	Nerdy Birdy Tweets
Destroyed entirely	The technology is destroyed or removed entirely.	Tek the Modern Cave Boy
Who? (Change Agent)	Sub-Coding Category	
Parent with no success	Parent attempted to intervene with no success	"Tek's parents tried everything to pry him away from his gadgets, but Tek wouldn't budge." - Tek the Modern Cave Boy
Peer with no success	Peer attempted to intervene with no success	Nerdy Birdy Tweets
External event with success	An external event (e.g., a volcanic eruption) removes screens/devices.	"The eruption shot Tek and his phone, tablet, and game box out of his cave and into the sky." - Tek the Modern Cave Boy
Result? (Outcome from Reduced Use or Removal of Screens)	Sub-Coding Category	
Increased non-screen-based activities	Users begin to engage in non-screen based activities	"It was just like old times. They made fun of each other's lunch."
Increased intentionality	User develops intentionality around screen use	
Increased engagement with nature	The result is increased engagement in or awareness of nature	"He looked around and discovered a dragonfly, a tiger lily, a ginkgo tree, a hairy elephant, the hairy people, an awesome Awesomesaurus...the big beautiful world!" - Tek the Modern Cave Boy
Increased social connection offline	The result is more social connection offline	"On his way he kissed his dad and mom." - Tek the Modern Cave Boy

Increased physical activity	The result is more physical activity (e.g., getting up, moving around, biking, etc.)	"Tek hopped onto a wheel, plucked a fresh apple, whistled to a dodo bird..." -Tek the Modern Cave Boy
Increased positive affect	The result is increased positive affect (e.g., laughing, smiling, feeling better)	"Tek and Larry laughed and played all day in that sunny garden." - Tek the Modern Cave Boy
Reflection	User reflects on impact of screen time and problematic use.	"Noah thought about the past few weeks. He was surprised to realize that his phone had already changed his life. It had changed his free time." - Noah's New Phone
Awareness? (Level of Awareness)	Coding Category	
Aware	User is aware of need for change	
Not aware	User is not aware of need for change	Tek the Modern Cave Boy
Autonomy? (Sense of Autonomy)	Coding Category	
Has autonomy	User feels a sense of autonomy over screens	
Develops autonomy	User develops a sense of autonomy over screens	Noah’s New Phone Nerdy Birdy Tweets
Lacks autonomy	User lacks a sense of autonomy over screens, doesn’t exhibit any signs of autonomy	Tek the Modern Cave Boy
7. Central Theme	Coding Category	
In person over online relationships	Value of in-person friendships over numerous online connections	"What about your five hundred tweetster friends?" Nerdy Birdy shrugged. "One real like you is worth

		a thousand tweetster friends." -Nerdy Birdy Tweets
Balance	Balance of screen and non-screen-based activities	"Some days, Nerdy Birdy decides what they should do. Some days Vulture decides what they should do." -Nerdy Birdy Tweets
Be intentional	Intentionality with screen use	"'Hey mom, technology isn't really good or bad, is it?' 'Not really, no' his mom replied, smiling. Noah nodded. 'It's all about how I CHOOSE to use it." - Noah's New Phone
Full disconnection	Disconnect from screens entirely to enjoy life more fully	"Tek and Larry laughed and played all day in that sunny garden." - Tek the Modern Cave Boy

Table B3.
Final Codebook (Codebook Version 7)

Coding Category / Code	Definition	Quote/Book
1. Relevant Literary Context	Coding Category	
Anthropomorphism	Animal or robot character behaving like a human	"It was Papa Bear who first brought a computer home to the Bear family treehouse." - The Berenstain Bears: Computer Trouble
Human characters	Modern human	"But Zoey preferred to play all alone. When she behaved well, she could play on her phone." - Hey Zoey! Get Off Your Phone!
DEI element	Intentional use of a main character of color, discussion of cultural topic related to diversity, equity, and inclusion	"Like Mae Jemison, the first African American woman in space." - Rocket Says Look Up
2. Problematic Screen User	Coding Category	
Child	Child is noted or portrayed as problematic with screens - Male child - Female child	"But Papa soon found that Brother and Sister were coming to his shop to play video games on his computer." - The Berenstain Bears: Computer Trouble
Parental figure	Parental figure (e.g., parent, grandparent) is noted or portrayed as problematic with screens - Male parent - Female parent	"Mama had been worrying about this very thing herself. She just didn't seem to be able to tear herself away from eBear." - The Berenstain Bears: Computer Trouble
Age unclear	A user is noted or portrayed as problematic with screens, but age is unclear	Nerdy Birdy Tweets

No problematic user	No user is noted or portrayed as problematic with screens	"The Internet is full of interesting information. It's a nice way to communicate with friends or family you don't always get to see in real life, and it's an excellent resource for learning about things that interest you." - On the Internet
3. Person Concerned	Coding Category	
User concerned about self	User is concerned about/bothered by themself and their problematic screen use	"Then I noticed my reflection in one of the screens. I wondered how much of my life had been spent in that very spot." - The Couch Potato
Parental figure concerned about child	Parental figure is concerned about/bothered by child and their problematic screen use	"Mom: “Jasper, if we don't leave right now, you'll be late for school. You're spending way too much time playing that new video game of yours.”" - But It's Just a Game
Child concerned about parent	Child is concerned about/bothered by their parent and their problematic screen use	"She's a selfie fool. My self-obsessed mom makes me want to hide." - Me Myselfie and I
Peer concerned about peer/sibling	Peer is concerned about/bothered by another peer (e.g., friend, sibling) and their problematic screen use	"But she can't tell me that I look up more than my big brother Jamal looks down at his silly phone. [brother on phone at breakfast table]" - Rocket Says Look Up
Educator concerned about child	Educator (e.g., teacher) is concerned about/bothered by child and their problematic screen use	“Mom: Your teacher called me, and she's worried about you.”" - But It's Just a Game
No party concerned	No party is concerned or bothered by any character's problematic screen use	Hair Love
4. Screen Time Context	Coding Category	
Solitary in bedroom	Screens used in solitude in bedroom	"Tek stayed alone in his cave room, glued to his phone, his tablet and his

		game box all day, all night, all the time. " - Tek the Modern Cave Boy
Solitary in public/around others	Screens used in solitude in public space/with or around others	"Popcorn went to morning tea with her friends as usual but she was so busy sending messages she didn't even look up to say hello." - Fabulous Friend Machine
Joint with friend	Screens used jointly with a friend	"Take goofy pictures of each other. They Tweetstered together all morning." - Nerdy Birdy Tweets
Joint with family	Screens used jointly with family member(s)	" They did wind up sitting in front of a screen that evening. But it was a much, much bigger one. And they got to eat popcorn too!" - The Berenstain Bears: Computer Trouble
In school supervised	Screens used in school supervised by a teacher or other school staff; educational purposes	"In science class, Noah saw online images of supernovas and planets thousands of light years away." - Noah's New Phone
In school unsupervised	Screens used in school unsupervised (with friends or alone); seemingly not educational	"He got caught watching videos and playing games at school— Even though Diggory knew that he was breaking teacher's rule." - Limit Your Dragon's Screen Time
5. Type of Device	Coding Category	
Tablet	Screen device used is a tablet	" Aunt Patty had bought Polly her very own iTab." - Polly and the Screen Time Overload
Smart phone	Screen device used is a smart phone	"His parents had finally given him his own smartphone." - Noah's New Phone
Computer	Screen device used is a computer	"It was Papa Bear who first brought a computer home to the Bear family treehouse." - The Berenstain Bears: Computer Trouble

Videogame	Screen device used is a videogame	"My name is Jasper, but all my friends call me thumbs because I'm super duper good at playing video games." - But It's Just a Game
Television	Screen device used is a television	"And a huge, LCD Wi-Fi HD TV." - Goodnight iPad
6. Risk of Screen Time	Coding Category	
Decreased (D) physical activity	User decreases their physical activity due to or in relation to their screen use (Related Theory: Displacement Hypothesis)	"I spend all my free time sitting in this exact spot. Why would I ever leave this comfy, cozy couch?" - The Couch Potato
Poor sleep hygiene	User is tired due to usage typically late at night/uses screens at night/doesn't sleep (Related Theory: Displacement Hypothesis)	"Then he fell asleep in class and again made teacher mad. He'd been playing games all night, and missing sleep was bad." - Limit Your Dragon's Screen Time
Decreased (D) offline social engagement	User decreases their social engagement or isolates themself/ increased isolation due to or in relation to their screen use (Related Theory: Displacement Hypothesis)	"Inside his room, Noah felt alone and isolated. He hadn't hung out with his friends since getting his phone." - Noah's New Phone
Poorer learning outcomes	User has poorer learning outcomes/ doesn't know what they should know/misses academic content due to or in relation to their screen use (Related Theory: Displacement Hypothesis)	"He never even learned his dinosaur names" - Tek the Modern Cave Boy
Screen addiction	User develops screen addiction as depicted by constantly being on a screen or difficulty getting off their screen; words like "can't stop" (Related Construct: Social Media Addiction, Problematic Social Media Use, Problematic Screen Use, Screen Addiction, Video Game Addiction)	"In fact, he couldn't think of a time in the past month where he hadn't reached for his phone when he was bored, when he was lonely, or when he felt an unpleasant feeling coming on." - Noah's New Phone; "Tek stayed alone in his cave room, glued to his phone, his tablet, and his game box, all day, all night, all the time." - Tek the Modern Cave Boy

Social comparison	User engages with social comparison due to or in relation to their screen use (Related Theory: Social Comparison Theory)	" If being on social media leaves you feeling badly about yourself...If you're always comparing yourself to what you see..." - Be Smart About Screen Time
FoMO	User experiences FoMO related to using screens (e.g., sees other people doing something on social media and wishes they were doing it too, feels left out, etc.) (Related Theory: Social Comparison Theory; Related Construct: Fear of Missing Out)	"But some people have trouble taking breaks from social media. They're afraid they'll miss out or won't be part of the group." - Be Smart About Screen Time
User is cyberbullied	User is cyberbullied by another user	"To his horror, for the whole world to see on social media, there was a picture of Noah with his pants wet, standing in the aisle of the bus. Under the photo was a caption that said, 'What a baby!" - Noah's New Phone
Online relationships do not provide desired support	The online relationships do not provide desired support as depicted by the user still being upset or needing support/relief; or hoping for better outcomes with the online connections than they end up receiving	"An hour later, nobody had tweeted back." -Nerdy Birdy Tweets
Disinterested in offline activities	The user is disinterested in offline activities due to or related to screen use (Related Theory: Displacement Hypothesis)	"Outside, the real world was evolving, but Tek couldn't have cared less." - Tek the Modern Cave Boy
Distraction	User is distracted by their screen	"No one could get Tek's attention." - Tek the Modern Cave Boy
User cyberbullies others	User cyberbullies others	[Image: Noah comments on a friend's picture, 'That looks soooo dumb....'] - Noah's New Phone
Illusion of large social network	User experiences an illusion of a large social network due to large amounts of people online/followers/friends; relates to theory about quality>quantity of social relationships	"Collect tons of friends online who may, or may not, text you back; He had never dreamed he could have that many friends" -Nerdy Birdy Tweets

Peer/family distancing from user	Peers or family members physically distances themselves from user due to or related to user's screen use.	"Vulture decided she'd had enough of watching Nerdy Birdy play Tweetster. Vulture spread her wings and flew away." -Nerdy Birdy Tweets
Loss of time awareness	User loses sense of time while on screens	"'How long have I been starting at my phone?' he wondered." - Noah's New Phone
Online replaces offline communication	User uses screens to communicate instead of in person communication; user values online relationships more than offline relationships (Related Theory: Displacement Hypothesis)	Image: Noah texts his mom 'when's dinner?' and she replies 'You can come ask me in person.' - Noah's New Phone
Screen use to pacify negative emotions	User uses screens when feeling upset or angry; screens are a tool or coping mechanism for soothing negative emotions	"In fact, he couldn't think of a time in the past month where he hadn't reached for his phone when he was bored, when he was lonely, or when he felt an unpleasant feeling coming on." - Noah's New Phone
Online behavior/content can resurface offline	Content on screens/social media prolong the impact of a bad experience for the user; can't always fully delete or forget things posted online	"Within the hour his pants were dry and the incident was forgotten...To his horror...there was a picture of Noah with his pants wet, standing in the aisle of the bus." - Noah's New Phone
Online anonymity	Online anonymity on screen-based platforms poses a problem for user(s)	"Clicking on the account, Noah could tell that the account was fake. He knew people sometimes created accounts like these to hide their identity when they posted something mean." - Noah's New Phone
Difficulty identifying adults to support with online problems	The user struggles to identify adults who can support with online or screen-based problems	"Should he tell a teacher? Should he talk to his parents?" - Noah's New Phone
Media multi-tasking	User engages with media multi-tasking or being on multiple screens at once (Related Construct: Media Multitasking)	"During lunch, excitement filled Noah as he and his friends watched a video of how to create an awesome village in Minecraft." - Noah's New Phone

Screen-related resentment or disappointment	User expresses resentment about rules around screen time enforced by school or parent; expresses they wish they had the same rules as a peer	"Soccer practice was kind of a blur, and my best friend Max wasn't there. I bet he stayed home to play his game cause his mom doesn't care. I wish my mom was like that." - But It's Just a Game
Social media as fake	Social media is described as or portrayed as "fake" or "not realistic"	"All of these pictures now really seem fake." - Me Myselfie and I
Hyper fixation on online presence	User becomes hyper fixated on their online appearance, how they look, etc.; over-sharing or sharing content not appropriate or necessary for online due to fixation on online presence (Related Theory: Appearance-Related Social Media Consciousness)	"She even took selfies at a stranger's wedding. Mom: “Move to my left, hon, that's not my good side.”" - Me Myselfie and I
Physical safety risk	User's engagement presents physical safety risks such as texting while driving, walking into traffic, engaging with people online who's real identities are unknown, etc.	"And she almost got run over crossing the road." - Fabulous Friend Machine
Decreased (D) empathy	User's engagement presents decreased levels of empathy for others (e.g., thinking their behavior towards others is no big deal, being mean or cruel to others and not caring or being unable to see how it might hurt others)	"He remembered how last week he had posted a photo of his classmate eating lunch with a caption that said, "Oink oink!" The kid seemed upset and glared at Noah all day. "What a baby!" Noah thought, rolling his eyes. Noah pushed these thoughts away and boarded the bus." - Noah's New Phone
Physical effect on body	Screen use results in a physical effect on the body (e.g., exhaustion, headache)	"And Dot loves to talk and talk and talk and talk. [on a cell phone, tablet, computer] But now Dot’s all talked out. [laying down/exhausted/looks dizzy]" - Dot.
Exposure to inappropriate or false content	Risk that unsafe screen use can expose users to inappropriate or false content (e.g., violence, nudity, sex, cruelty, misinformation)	"But there are things on the Internet that are not very good. When you go online at home, at school, or with friends, you might see some things you don't

		understand. Maybe you have clicked on something without being sure what it means or where it will lead." - On the Internet
Decreased (D) boredom tolerance	Without screens, individual has decreased boredom tolerance, isn't sure what to do, etc.	"“But now there’s nothing to do,” Cami complained. “We can’t watch TV. Our tablets aren’t charged.”" - Cami and Wyatt Have Too Much Screen Time
Parent emphasis on child's digital literacy	Portrayal or expression of parent thinking/wanting their child to be smart/a genius and a relationship with screen use/digital literacy	"Doug’s parents wanted him to be the smartest robot ever." - Doug Unplugs on the Farm
Screen-related deception or defiance	User deliberately lies about screens/defies parental (or other authority figure's) rules on screen usage	"Pip: I’m not listening! There is nothing that can make me leave my magic box!" - The Penguin Who Found a Magic Box
Irresponsible screen use	User engages in academic dishonesty, excessive spending, etc.	"Holes come from posts that are not very smart— Like when you shared test answers in Language Arts." - A Technology Tail
Online safety risk	User engages in online safety risks such as sharing passwords, security questions, etc.	"Oh, that happened when you shared your password with your friends. Now, why would you go and do that? Your password is private information— Between you and me." - A Technology Tail
Disconnection from reality	User prefers to live within digital world and loses touch of the real world	"Diggory Doo played games so much, he thought that they were real. He was simply stuck in his virtual world—and how it made him feel." - Limit Your Dragon's Screen Time
Emotional dysregulation	User experiences increased emotional reactivity/panic when screens are no longer available or exhibits emotional dependence on screens	"And when the battery runs out… He'll totally freak. Mouse: Ahhh!!!!! [mouse freaking out/getting upset when screen dies] No! No! No! No! And when he totally freaks… He'll probably beg you for a charger.

		Mouse: "Please! Please! Please! Please! Please!"" - If You Give a Mouse an iPhone
7. Benefit of Screen Time	Coding Category	
Educational learning	Screens provide educational learning opportunities	"In science class, Noah saw online images of supernovas and planets thousands of light years away. In social studies, his class connected with another class on the other side of the country in an online video chat" - Noah's New Phone
Social connection with online peers/communities	Online platforms and communities provide a space for social connection and support	"Tweet messages and pictures for them all to see!" -Nerdy Birdy Tweets
Creativity	Screens inspire/provide opportunities for creativity	"Mama discovered buying and selling things on eBear and wanted a computer too." - The Berenstain Bears: Computer Trouble
Identity development	Online platforms and communities provide opportunities for identity development	"My name is Jasper, but all my friends call me thumbs because I'm super duper good at playing video games." - But It's Just a Game
Can fit in with offline friends	User feels they can fit in with their friends now that they have screens/online platforms	"I can finally text and play games like my friends" - Noah's New Phone
Online altruism	Online platforms serve as a space to spread positivity by complimenting others or do altruistic deeds (e.g., raise money, help animals get adopted, etc.)	"Instead of his usual one-line caption, Noah wrote a sincere compliment about each person in the photo and tagged them"
Bonding with offline family-peers	User and family or peers bond while using screens	"His friends wasted no time showing him new games to download and videos to watch. His big sister taught him how to follow 'friends' and famous people on social media." - Noah's New Phone

Increased (I) social diversity	Increased social diversity in terms of who the user can connect with/engage with online	"Nerdy Birdy: "I'm friends with a flamingo. Neat! I'm friends with a puffin. She lives in Iceland! I'm friends with an ostrich. How cool is that?" -Nerdy Birdy Tweets
Convenience	Technology/devices provide opportunities for convenience	"It's much easier than trying to meet up somewhere like folks did in the old days." - The Couch Potato
Social validation	Screen-based activities (e.g., friending people, texting, people liking your photos) provides social validation and potentially an increased sense of self-esteem in the user, even if temporary	"1 million likes later, she's a selfie star." - Me Myselfie and I
Sense of control	Screen based activities present a potential sense of autonomy or control of being who one wants, presenting oneself in a desired image, curating an online persona, etc.	"With my game control is in my hands, I'm the boss of the whole world." - But It's Just a Game
Digital relevance	Screen based activities present opportunities for digital relevance (e.g., being "modern" or "up on the times")	"Mom is old fashioned. She likes things handsewn. To make her more modern, we bought her a smartphone." - Me Myselfie and I
Entertainment	Screen based activities offer entertainment	"His friends wasted no time showing him new games to download and videos to watch." - Noah's New Phone
Opportunity for responsibility	Screen based activities present opportunities for learning responsibility	"It's important to look after things. So if you are running when you play, Anything noisy that flashes or beeps should be safely tucked away." - Webster's Manners
8. Change in Screen Use	Coding Category	
User has no change in use	There is a user in these books, but there is no evidence of change	Hair Love
No user and no change in use	There is no user in these books, so there is no change	When Grandma Gives You a Lemon Tree

How? (Screen-Time Reduction Strategy)	Sub-Coding Category	
Screens put away/limits	They put away screens or put limits on usage; add privacy settings and parental controls	"At lunchtime, they put away their games." - Nerdy Birdy Tweets
Removed temporarily	The technology is destroyed or removed temporarily.	"Then one day a thunderstorm blew into town and brought his tech empire tumbling down. A lightning bolt struck an electrical tower." - When Charlie McButton Lost Power
Removed entirely	The technology is destroyed or removed/taken entirely.	"The wolves ran back to the forest, and they took the friend machine with them." - Fabulous Friend Machine
Transition to co-viewing	Encouragement towards co-viewing screens (e.g., watching television or using tablet together)	"Share the experience. Watch shows and play games together. Co-watching content is a great way to check in with your family's values." - Be Smart About Screen Time
Age limit	Encouragement towards instituting age limits to control screen time (e.g., no social media until age 13; one hour for children age 2-5, two hours for children age 6+)	"How can parents and trusted adults help? Wait until age 13 to greenlight social media." - Be Smart About Screen Time
Co-create list of non-screen activities	Encouragement towards co-creating a list of non-screen activities that children can use to refer to when they aren't using screens	"Mommy agreed. “Let’s make a list of the things you could do instead of screen time.”" - Cami and Wyatt Have Too Much Screen Time
Who? (Change Agent)	Sub-Coding Category	
Parental figure intervenes with child, with no success	A parent attempts to change user's usage with no success	"Tek's parents tried everything to pry him away from his gadgets, but Tek wouldn't budge." - Tek the Modern Cave Boy

Parental figure intervenes with child, with success	A parent attempts to change user's usage with success	"Jasper: The last thing I want to be is out of control, so I listen to what my mom said." - But It's Just a Game
Peer intervenes with peer, with success	A peer attempts to change user's usage with success	"When Kind Ninja suggested he try a fun new way to go about his day." - Unplugged Ninja
Peer intervenes with peer, with no success	A peer attempts to change user's usage with no success	Vulture: "This is not fun….Did you realize I can fit your whole body in my beak? I could eat you in one bite if I wanted." -Nerdy Birdy Tweets
User intervenes with self, with no success	The user themself attempts or initiates to change their own usage with no success	[No representation of user with no success]
User intervenes with self, with success	The user themself attempts or initiates change in their own usage with success	[No representation of user with success]
Physical disruption intervenes, with success	A physical disruption (e.g., volcanic eruption, power outage) causes the user to change their usage	"The eruption shot Tek and his phone, tablet, and game box out of his cave and into the sky. Tek crashed. He was totally....disconnected." - Tek the Modern Cave Boy
Child intervenes with parent, with success	A child attempts to change user's usage with success	"Til I stopped the madness. No more, mom, we're through." - Me Myselfie and I
Educator intervenes with child, with no success	An educator attempts to change a child's usage with no success	"Your teacher called me, and she's worried about you." - But It's Just a Game
Result? (Outcome from Reduced Use or Removal of Screens)	Sub-Coding Category	
Increased (I) non-screen-based activities	The result is more engagement in non-screen based activities	"It was just like old times. They made fun of each other's lunch." - Nerdy Birdy Tweets
Increased (I) intentionality	The result is the user develops intentionality in various areas of life, including screens; more mindfulness or presence	"I have a lot more balance now, and I'm happier than I've ever been. I still get to play my video games for an hour every day, but now they don't

		control me and tell me I have to play.” - But It's Just a Game
Increased (I) engagement with nature	The result is increased engagement in or awareness of nature	"He looked around and discovered a dragonfly, a tiger lily, a ginkgo tree, a hairy elephant, the hairy people, an awesome Awesomesaurus...the big beautiful world!" - Tek the Modern Cave Boy
Increased (I) social connection offline	The result is more social connection offline	"On his way he kissed his dad and mom." - Tek the Modern Cave Boy
Increased (I) physical activity	The result is more physical activity (e.g., getting up, moving around, biking, etc.)	"Tek hopped onto a wheel, plucked a fresh apple, whistled to a dodo bird..." -Tek the Modern Cave Boy
Increased (I) positive affect	The result is increased positive affect (e.g., laughing, smiling, feeling better)	"Tek and Larry laughed and played all day in that sunny garden." - Tek the Modern Cave Boy
Adjustment period	The result is an adjustment period when changing habits (e.g., it was difficult, different, or new)	"It wasn't as comfortable as my couch, not even close, but after a while it wasn't so bad." - The Couch Potato
Increased (I) insight	The result is more insight around the limitations and impacts of screen use	"She hugged me and said, “This whole selfie madness has gone to my head.”" - Me Myselfie and I
Improved (I) sleep hygiene	The result is more healthy sleep hygiene or depiction of sleeping when supposed to/not engaging with screens at night or in bed	"Now, at night, instead of playing video games, I actually go to bed." - But It's Just a Game
User reflection	Once screens are removed or there is an external intervention, the user is able to reflect on and clearly see the nature of their problematic use.	"Then I noticed my reflection in one of the screens. I wondered how much of my life had been spent in that very spot." - The Couch Potato
Improved (I) academic outcomes	The result is improved academic outcomes and/or increased learning (e.g., doing better in school/doing homework/paying attention in class instead of using screens/learning more)	"I'm caught up in school - my grades are good, and I'm spending real time with my friends." - But It's Just a Game

9. Awareness Progression	Coding Category	
Physical disruption creates awareness	A physical disruption (e.g., power outage) creates an awareness in the user regarding their problematic use	"Then I noticed my reflection in one of the screens. I wondered how much of my life had been spent in that very spot. It was then and there that I made the decision to peel myself off the couch a bit more often, maybe every day even. And so that's what I've done." – The Couch Potato
Never gains awareness	The user is never aware of their problematic use, even if they change their use	"The eruption shot Tek and his phone, tablet, and game box out of his cave and into the sky. Tek crashed. He was totally....disconnected." - Tek the Modern Cave Boy
Relational intervention creates awareness	A relational intervention creates an awareness in the user regarding their problematic use	"No more, mom, we're through. Mom got all quiet. She hugged me and said, "This whole selfie madness has gone to my head."" - Me Myselfie and I
Negative consequence creates awareness	A negative consequence for the user's problematic use creates an awareness	"He decided he would email it. He clicked, and it was gone. Daddy saw it straight away, and that was number one." – Webster's Email
10. Central Theme	Coding Category	
In-person over online	There is more value in in-person friendships over numerous online connections; in-person community and relationships are more important than online presence or validation; in person/non-screen activities are better or have more longevity than screen activities; screens over non-screen activities and behaviors	"What about your five hundred tweetster friends?" Nerdy Birdy shrugged. "One real like you is worth a thousand tweetster friends." -Nerdy Birdy Tweets
Balance	One must have a balance of screen and non-screen-based activities to enjoy life fully.	"Some days, Nerdy Birdy decides what they should do. Some days Vulture decides what they should do." -Nerdy Birdy Tweets

Be intentional	One must be intentional while using screens to enjoy them fully and responsibly; use rules/limits	"'Hey mom, technology isn't really good or bad, is it?' 'Not really, no' his mom replied, smiling. Noah nodded. 'It's all about how I CHOOSE to use it." - Noah's New Phone
Full disconnection	Disconnect from screens entirely to enjoy life more fully.	"He was totally….. disconnected. Tek and Larry laughed and played all day in that sunny garden. And in the evening they reached for the glorious stars." - Tek the Modern Cave Boy
Screens as dangerous	Screen-based technologies present dangerous situations to youth, thus screens should be avoided.	"The wolves ran back to the forest, and they took the friend machine with them. Popcorn thanked her friends, and the not so fabulous Friend Machine was never spoken of again at Fiddlesticks Farm." - Fabulous Friend Machine
Screens as positive	Screens are portrayed as positive tools and no negative repercussions or risks are presented.	"Daddy gathered all the tools we needed, and we were set. [iPad on the ledge in the bathroom with a Youtube video up] Watching carefully, Daddy combed, parted, oiled, and twisted. [watching the video] He nailed it! Funky puff buns!" - Hair Love
11. Book Format	Coding Category	
Narrative + didactic	The book has a purpose of teaching or instructing with a clear moral, lesson, or point of view. The book features include presenting positive and/or negative aspects of screen use, but frames the problematic user in a largely negative light with little access to their inner world. The outcome of the book offers a take-away message about what constitutes "healthy" or "appropriate" screen use.	Tek the Modern Caveboy Noah's New Phone
Psychoeducation + didactic	The book has a purpose of teaching readers about psychological concepts, emotional health, and coping strategies	On the Internet: Our First Talk About Online Safety

	related to screen use. The book features include focusing on awareness of the risks and benefits of screen use and providing practical strategies for engaging with screens in balanced ways. The outcome of the book increases readers' knowledge and skills to support healthier screen use.	Be Smart About Screen Time

Table B4.
Excerpt of "Questions" Section of Codebook

Date	Transcript #	Coder	Quote	Question/ Coding	Final Team Decision/Resolution
6/1/25	4	EL	With my game control is in my hands, I'm the boss of the whole world. I can be who I want and do as I please.	Sense of control?	Sense of control
6/1/25	4	EL	I bet he stayed home to play his game cause his mom doesn't care.	Should we code a reference to another character possibly engaging in this behavior (e.g., decreased physical activity)?	Social comparison; Resentment around ST rules
6/2/2025	4	BRM	I get all the chances that I need. If I make a mistake, it's okay.	Second chances? Or sense of control also?	Sense of control
6/2/2025	5	BRM	Everyone thinks I'm it on a stick, and all the bad stuff goes away, like spelling tests and cleaning my room, and my annoying little sister, who wants me to play house with her yuck!	Social validation? He gets positive feelings from people ascribing positive value to his videogame skills	Social validation Sense of identity
6/2/2025	4	PS	I can be who I want and do as I please. I can get the highest score. I get all the chances that I need. If I make a mistake, it's okay.	Different potential benefits of screen time: Sense of Achievement? Low stakes learning environment?	Sense of control

Table B5.
Examples of Code Refinements Made Over Time

Code Category	Code Name (Codebook Version 1)	Code Name (Codebook Version 7)
Benefit	Social support	Social support online
Benefit	Can fit in with friends	Can fit in with offline friends
Benefit	Bonding with family-peers	Bonding with offline family-peers
Screen Time Context	Screen time with sibling	Screen time with family
Risk	Tired	Poor sleep hygiene
Risk	Decreased social engagement	Decreased offline social engagement
Benefit	Spread positivity	Online altruism
Awareness Progression	Aware	External intervention creates awareness
		Relational intervention creates awareness
		Negative consequence creates awareness
Awareness Progression	Not aware	Never gains awareness
Change in Use - How	External event with success	Physical disruption intervenes with success
Literacy Context	Robot characters	Anthropomorphism

Table C1.
Inter-Rater Reliability

Sample Subset	Coders	Kappa
# 01, 02, 03		
	BM & EL	0.77
	BM & PS	0.69
	EL & PS	0.73
# 01, 02, 03, 04, 05, 06		
	BM & EL	0.88
	BM & PS	0.86
	EL & PS	0.82
# 01, 02, 03, 04, 05, 06, 07, 08, 09, 10		
	BM & EL	0.9
	BM & PS	0.92
	EM & PS	0.9

*Note: Book sentence as the unit of analysis.

Table D1.
Book Selection Resource

Key Feature / Risk / Benefit / Theme	Recommended Books from Sample
Feature: Psychoeducational learning	*Screens Away, Time to Play!*
	Screen Time is Not Forever
	Be Smart About Screen Time
	On the Internet: Our First Talk about Online Safety
Feature: Child problematic user	*Tek the Modern Cave Boy*
	But It's Just a Game
	Noah's New Phone
	Dot.
	#Goldilocks
	When Charlie McButton Lost Power
	The Berenstain Bears: Computer Trouble
	Hey Zoey! Get Off Your Phone!
	Doug Unplugs on the Farm
	Doug Unplugged
	Webster's Friend
	Blackout
	Rocket Says Look Up
	Doll-E 1.0
	Our Great Big Backyard

	Polly and the Screen Time Overload
	Cell Phoney
	Goodnight iPad
	hello! hello!
	Run Wild
	Troll Stinks
	Webster's Manners
	Unplugged Ninja
	On a Magical Do Nothing Day
	Cami and Wyatt Have Too Much Screen Time
	A Technology Tale
	Webster's Email
	Limit Your Dragon's Screen Time
Feature: Parent problematic screen user	*Me Myselfie and I*
	You're Missing It!
	The Breaking News
Feature: Several characters engage in problematic use/screen use as a universal struggle	*Webster's Manners*
	hello! hello!
	Cami and Wyatt Have Too Much Screen Time
	The Berenstain Bears: Computer Trouble
	Webster's Friend
	Blackout

	Webster's Email
	Once Upon a Time Online
	A Technology Tale
	Goodnight iPad
	Troll Stinks
	The Couch Potato
	Noah's New Phone
	Screen Time is Not Forever
	Screens Away, Time to Play!
	Be Smart About Screen Time
Feature: Characters from marginalized backgrounds	*Hair Love*
	Rocket Says Look Up!
Feature: Physical disruption intervention	*Tek the Modern Cave Boy*
	The Couch Potato
	When Charlie McButton Lost Power
	You're Missing It!
	Doug Unplugs on the Farm
	Blackout
	Hey Zoey! Get Off Your Phone!
	Unplugged
	On a Magical Do Nothing Day
	If You Give a Mouse an iPhone

	Polly and the Screen Time Overload
	Cami and Wyatt Have Too Much Screen Time
	Doug Unplugged
	A Technology Tail
	hello! hello!
	The Penguin Who Found a Magic Box
Feature: Negative consequence intervention	*Webster's Email*
	Fabulous Friend Machine
	Noah's New Phone
	Cell Phoney
	Webster's Friend
	Troll Stinks
	Chicken Clicking
	Nerdy Birdy Tweets
Feature: Successful relational intervention	*But It's Just a Game*
	#Goldilocks
	Once Upon a Time Online
	Dot.
	The Berenstain Bears: Computer Trouble
	Doll-E 1.0
	Our Great Big Backyard
	Goodnight iPad

	Webster's Manners
	Unplugged Ninja
	Rocket Says Look Up!
Feature: Unsuccessful relational intervention	*Tek the Modern Cave Boy*
	Rocket Says Look Up!
	Our Great Big Backyard
	Hey Zoey! Get Off Your Phone!
	Nerdy Birdy Tweets
Feature: User reflection after intervention	*Nerdy Birdy Tweets*
	The Couch Potato
	But It's Just a Game
	Me Myselfie and I
	Noah's New Phone
	Doug Unplugs on the Farm
	Blackout
	Doug Unplugged
	Webster's Email
	The Penguin Who Found a Magic Box
	The Berenstain Bears: Computer Trouble
	Our Great Big Backyard
	Unplugged
	Polly and the Screen Time Overload

	Cami and Wyatt Have Too Much Screen Time
Feature: Adjustment period to changing screen habits	*The Couch Potato*
	On a Magical Do-Nothing Day
	If You Give a Mouse an iPhone
	Goodnight iPad
Risk: Decreased offline engagement due to increased screen use	*Nerdy Birdy Tweets*
	Tek the Modern Cave Boy
	The Couch Potato
	The Penguin Who Found a Magic Box
	Cami and Wyatt Have Too Much Screen Time
	Rocket Says Look Up
	Hey Zoey! Get Off Your Phone!
	The Breaking News
	Blackout
Risk: Cyberbullying	*Nerdy Birdy Tweets*
	Noah's New Phone
	Be Smart About Screen Time
	A Technology Tail
	Cell Phoney
	Troll Stinks
	The Berenstain Bears: Computer Trouble
	On the Internet

Risk: Excessive screen use or screen addiction	*But It's Just a Game*
	Fabulous Friend Machine
	Limit Your Dragon's Screen Time
	If You Give a Mouse an iPhone
	Unplugged Ninja
	On a Magical Do Nothing Day
Risk: Problematic social media use	*Me Myselfie and I*
	#Goldilocks
	Be Smart About Screen Time
Risk: Irresponsible screen use	*The Technology Tail*
	Webster's Email
	Once Upon a Time Online
	Webster's Friend
	Troll Stinks
	#Goldilocks
Benefit: Opportunities for bonding with offline friends or family	*Hair Love*
	The Berenstain Bears: Computer Trouble
	Once Upon a Time Online
	Nerdy Birdy Tweets
	The Couch Potato
	Noah's New Phone
	Charlie McButton Lost Power

	On the Internet
	Be Smart About Screen Time
	Polly and the Screen Time Overload
	A Technology Tail
	Screen Time is Not Forever
Benefit: Educational benefits	*Unplugged*
	Noah's New Phone
	Dot.
	Doug Unplugs on the Farm
	Be Smart About Screen Time
	On the Internet
	Unplugged
	Screens Away, Time to Play!
Theme: Balance screen-based and non-screen-based activities	*Dot*
	Doll-E
	But It's Just a Game
	Limit Your Dragon's Screen Time
	Polly and the Screen Time Overload
	Cami and Wyatt Have Too Much Screen Time
	Unplugged
	Polly and the Screen Time Overload

Theme: Be intentional with screen use and incorporate limits	*The Couch Potato*
	Me Myselfie and I
	Noah's New Phone
	The Berenstain Bears: Computer Trouble
	On the Internet
	Be Smart About Screen Time
	A Technology Tail
	Cell Phoney
	Webster's Manners
	Unplugged Ninja
	Once Upon a Time Online
	Screen Time is Not Forever
Theme: Full disconnection from screens	*Tek the Modern Cave Boy*
	Fabulous Friend Machine
	Doug Unplugs on the Farm
	If You Give a Mouse an iPhone
	On a Magical Do Nothing Day
	Run Wild
	The Penguin Who Found a Magic Box
	Goodnight iPad
Theme: In-person experiences and friendships are better than those online	*Me Myselfie and I*
	When Charlie McButton Lost Power

	Hey Zoey! Get Off Your Phone!
	You're Missing It!
	Doug Unplugs on the Farm
	Blackout
	Rocket Says Look Up!
	Doug Unplugged
	Our Great Big Backyard
	Screen Time is Not Forever
	hello! hello!
	Screens Away, Time to Play!
	Unplugged
	When Grandma Gives You a Lemon Tree
	Webster's Friend
	Nerdy Birdy Tweets
	The Breaking News
Theme: Screens are dangerous	*Troll Stinks*
	Fabulous Friend Machine
	Chicken Clicking
	Webster's Email
	#Goldilocks
Theme: Screens as tools for identity development	*Hair Love*

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