PARENTAL MEDIATION OF SCREEN MEDIA USE IN CHILDREN AND YOUTH AT-RISK OF ATTENTION DIFFICULTIES

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Abstract

Screen media is an omnipresent and ever-evolving component of children's lives. Across development, it is essential to understand the strategies that parents use to manage their children's screen media use (known as parental mediation), as they may serve as important predictors of healthy relationships with screen media. While children at-risk of attention difficulties (e.g., children with ADHD, children with early neurological risk) have been identified as being more vulnerable to screen media related risks, few studies have investigated parental mediation in these populations. Three studies were conducted to characterize parental mediation of screen mediation of children at-risk of attention difficulties by addressing the following research objectives: (1) examine the underlying dimensional structure of parental mediation, (2) characterize and compare parental mediation strategies in a community sample and in children and youth at-risk for attention difficulties, including those with ADHD and those with early neurological risk, (3) assess parent and child factors that relate to parent mediation strategies across community and at-risk samples, (4) determine the parental mediation strategies that predict better screen media outcomes, and (5) develop a more nuanced understanding of parents' lived experiences of parenting around screen media use in children with attention difficulties via semi-structured interviews. In Study One, the factor structure of parental mediation was assessed, revealing a three factor models representing strategies of restriction, active mediation, and internet safety mediation. In Study Two, parental mediation and associated factors (e.g., parental stress, impact of screen media on the child, child age, child attention problems, etc.) were assessed and compared across three samples, namely a community sample, children with ADHD, and children with early neurological risk. Parents in the community sample generally endorsed using more parental mediation strategies, while parents of children

with ADHD endorsed more negative outcomes including parental stress and negative impact of screen media on the child. Parental mediation strategies were found to be differentially associated with various screen media outcomes, including impact on the child, parental stress about child screen use, and daily child screen use. In Study Three, we conducted semi-structured interviews with parents of children with ADHD about their lived experiences of mediating their child's screen media use and conducted a qualitative analysis to better understand their perspectives. Broadly, parents spoke about their challenges in navigating parental mediation, the strategies that they attempt to use, as well as how they adapt their approaches to their child's developmental stage and attentional profile. Taken together, these findings suggest that children with attentional difficulties may experience unique challenges with screen media use, which may require unique parental mediation strategies to mitigate the associated risks.

Dedication

To my grandmother, Arden, for her unwavering support, wisdom, and love. From the beginning, you laid the foundations of this dissertation by teaching me the value of hard work and determination, and by always believing in my wildest ambitions. Thank you for everything.

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Chapter 1: General Introduction

Screen media use is an omnipresent and ever-evolving component of children and youth's lives. With the onset of the COVID-19 lockdown restrictions, concern rose regarding the amount of time that children and youth are spending on screen media devices, as well as the ways in which they interact with their screen media devices (Marsh & Rajaram, 2019; Trott et al., 2022). There is some evidence to suggest that children and youth with certain vulnerabilities, such as those at-risk of attention difficulties, may be particularly susceptible to difficulties with screen media use (Santos et al., 2022). It is essential to characterize the factors that contribute to how children learn to interact with screen media, including ones that may be protective in nature and help children develop healthy relationships with screen media. In childhood and adolescence, it is important to consider the role of caregivers, as they are likely to importantly inform child screen media use (Domoff et al., 2020). Parental mediation is defined as the parenting strategies that caregivers use to manage their child's screen media use (Livingstone & Helsper, 2008). This construct is crucial to investigate systematically in children with and without vulnerabilities, as parental mediation may serve as an important predictor of healthy relationships with screen media in children and youth (Iqbal et al., 2021; Shin, 2013). Parental mediation strategies that help children develop the insight into decision-making processes in the context of screen media use may be particularly useful in helping youth develop healthy relationships with screen media, though have largely not been investigated to date (Toplak, 2022).

The overall aim of the current research was to investigate parental mediation of screen media use in children and youth with and without attention difficulties. This aim was achieved through three related studies. In Study One, we developed the Parental Mediation Scale (PMS)

and validated this measure in a large community sample of parents of children aged 6-18 years who were screened for attention difficulties. In Study Two, we assessed parental mediation in two samples of children at-risk of attention difficulties, namely those with ADHD and those with early neurological risk. In Study Three, we conducted semi-structured interviews with a sub-sample of parents of children with ADHD to better understand their lived experiences of parenting around screen media. The overarching goal of this research is to help inform parenting approaches and interventions to best support children and youth who have difficulty managing screen media, especially when attention difficulties may be present. We begin with a review of the literature on screen media in childhood and parental mediation generally, and then describe the current project in greater detail.

Screen media use in childhood: Current and historical trends

The landscape of screen media use in childhood has changed drastically over the past decades in response to the technological advancements and developments that have taken place in society at large. Broadly speaking, screen media use includes any screen-based activities such as internet surfing, computer use, mobile phone use, engagement of social media, television viewing, and video game playing (Marshall et al., 2006). Concerns around screen media use were first documented and studied in the 1980s, with the drastic increase of television use that was noted amongst children, youth, and families. By the early 2000s, it was documented that televisions were found in 98.2% of homes in the United States, with an average of 2.4 televisions per home (Wartella & Robb, 2008). Additionally, television was found to become more central in the lives of children, as represented by an increasing proportion of children reporting to have their own television in their bedroom, which raised concerns amongst professionals regarding how and when children were viewing television (Hamel & Rideout, 2006). Experts in child

development soon began to raise questions regarding the potential negative effects of increasing television use among children. In particular, researchers identified that children were spending more time engaging with media content, often at the expense of other activities such as hobbies, time outdoors, and reading (Sahin & Robinson, 1981). Following the rise in popularity of television, video games and computer use began to gain popularity as well. A systematic review from data between 1949-2004 suggested that the average youth viewed television approximately 2 hours per day, and those who also had access to video games or a computer would use these devices for an additional 30-60 minutes per day (Marshall et al., 2006).

One of changes that most drastically affected the screen media landscape was the introduction of mobile devices with internet capabilities, such as smartphones, tablets, and handheld video gaming devices. As developmental researchers began to include measurement of the use of these newer mobile devices in their studies, it became apparent that children and youth's consumption of media was steadily increasing with the introduction of these devices. For example, a review of studies from the 2000s suggested that on average, children and youth were using screen media devices (including television, video games, mobile devices, etc.) for 3.6 hours per day (range of 1.3-7.9 hours per day), which was well above the recommended the screen time guidelines of a maximum of 2 hours, according to the *Australian 24-Hour Movement Guidelines for Children and Young People* (Thomas et al., 2020). Excessive screen media consumption in children has been found to continue steadily increasing over the past decade. For example, research has shown that screen media use in adolescence doubled from 2006 to 2016, with the average 12th grader in the United States using screen media for approximately 6 hours per day by 2016 (Twenge et al., 2019). Similar trends have been replicated in Canada, finding that adolescents in Ontario spent over 5 hours a day on screen media devices on average in 2017

(Boak et al., 2017). It has been suggested that because mobile screen media devices are more accessible and commonplace, it can much more easily lead children and adolescents to overuse them. Additionally, many of the activities that can take place on the internet are likely very motivating and enticing for children and youth, such as having access to endless information, entertainment, and communicating (often instantaneously) with peers (Marsh & Rajaram, 2019).

In addition to excessive screen media use, experts have raised concerns about the fact that children are using screen media devices excessively from a younger age. For example, a recent meta-analysis revealed that only 24.7% of children younger than 2 years and 35.6% of children aged 2-5 years met the guideline of using screen media devices for a maximum of 1 hour per day (McArthur et al., 2022). Children have also been found to own their own mobile devices at a younger age. For example, it was found in the United States that 53% of children own smartphones by the age of 11, and 84% of adolescents own their own smartphones (Rideout & Robb, 2019).

Experts have also noted that it is essential to consider what children are doing on their screen media devices, and not simply the amount of time that they are engaging with screen media. In particular, unsupervised access to the internet can lead children and adolescents to engage in risky behaviours with greater ease and accessibility, such as cyberbullying and viewing inappropriate content (Beyens & Eggermont, 2014; Juvonen & Gross, 2008; Sefa & Adu, 2018). As children and youth's brains are still developing, it has also been suggested that they may be less easily able to critically evaluate the information that is presented to them online (Metzger et al., 2013). Taken together, this information raises significant concern as it suggests that children are using screens more excessively, have increased ownership of devices from a younger age, and are also susceptible to engaging in risky behaviours online.

In recent years, research has also emerged about the changes that the COVID-19 pandemic has made to the ways that children and youth interact with screen media. In 2020, the COVID-19 pandemic had drastic effects on the ways that children and youth were living with the introduction of stay-at-home orders and, consequently, the introduction of virtual schooling for many. As a result, experts quickly began raising concerns about the potential for an increase in screen media use among children and adults alike, due to the reduced options for outdoor activities and the increase in indoor time at home (Jennings & Caplovitz, 2022a). As suspected, meta-analytic work has since confirmed that screen media use did increase significantly for everyone during the pandemic, though use among elementary-school aged children increased the most drastically (Trott et al., 2022). However, it is important to consider that screen media may also have played an important role in terms of coping for children and youth during the pandemic. As the pandemic was a time of increased stress, research has found that screen media use among youth may have played an important role in relieving stress, enhancing mood, and staying connected to those outside of their home (Jennings & Caplovitz, 2022a). Nonetheless, emerging research is starting to suggest that higher levels of screen media use in youth have not returned to their pre-pandemic levels, which is of increasing concern to experts and parents alike (Werling et al., 2021).

It is also important to highlight that although much of the literature to date has focused on the negative effects of screen media on children, there are some important adaptive and positive ways that children and youth can interact with screen media. For example, there are many educational resources available on the internet that children may not otherwise have access to (e.g., websites, podcasts, audiobooks, etc.). In fact, some research has supported that when used effectively, studying with resources from the internet was positively associated with academic

performance among adolescents (Kim et al., 2017). Access to the internet can also allow for increased socialization among youth, particularly amongst youth who may experience significant social anxiety or who have pre-existing friendships with individuals who live at a distance (Subrahmanyam & Greenfield, 2008; Valkenburg & Peter, 2009a, 2009b). Additionally, the internet can allow for increased accessibility to e-interventions for mental health (i.e., teletherapy), which have generally been found to be effective for youth (Zhou et al., 2021). Taken together, this suggests that screen media use can have positive effects for youth and that the purpose behind using screen media is important to consider when studying its effects.

Correlates of screen media use in childhood

Research regarding correlates of excessive screen media use has become increasingly prominent over the past decade to help understand factors that may predispose children to excessive use, as well as the downstream effects of overuse. Domoff et al. (2020) proposed the interactional theory of childhood problematic media use, which explains that there are many child and family factors that interact with one another to help predict and understand how problematic screen media use may develop and be maintained in childhood.

Child age and sex. First, child age and sex effects have been studied in the screen media literature. In general, it has been well-documented that screen media use tends to increase as children and youth get older. For example, school-aged children are found to use more screen media than pre-school children (Paudel et al., 2017). Similarly, adolescents have been found to use screen media more than pre-teens (Jennings & Caplovitz, 2022b). However, it may be important to replicate these findings with post-pandemic data, as data supports the fact that elementary-aged children's screen media use has most significantly increased since the pandemic (Trott et al., 2022). When looking at sex differences, it has been reported that males tend to use

screen media more than females, though the activities that males and females tend to engage in online differ. For example, males are more likely to play video games, while females are more likely to listen to music and use social media (Rideout & Robb, 2019). However, some research suggests that there may be interaction effects to consider between age and sex. For example, Twenge and Martin (2020) found that adolescent females actually spent more time on smartphones and computers than adolescent males, and found similar trends regarding the types of online activities they engage in. Similarly, Cocoradă et al. (2018) found that adolescent females had higher rates of smartphone addiction than their male counterparts. As such, it is essential to consider both child age and sex to help understand trends in screen media use.

Other child and family factors. In addition to age and sex, research has investigated several other child-focused variables that may be related to their screen media use. In Paudel et al. (2017) systematic review of correlates of screen media use in children aged 0-8 years, they identified that higher child skill level with technology and greater access to screen media devices were related to higher use of mobile device use. Sociodemographic factors have also been explored, and it has been found that children from families of higher income tend to use less screen media devices, with the exception of video calls (Nagata et al., 2022). It has also been suggested that children living in poverty may have been differentially affected by the pandemic, such that they were more likely to continue to experience high levels of excessive screen time after the pandemic than children from families of higher income (Kwon et al., 2024). While the literature on other sociodemographic factors has been less consistent, a review by Duch et al. (2013) found that factors such as belonging to a minority ethnic group, lower parental education and living in a one-parent household may also be associated with reduced screen time in young children (i.e., 0-3 years old).

In adolescents and young adults, the relationships between screen media use and personality and attachment styles have also been studied. For example, Cocoradă et al. (2018) examined how personality traits were related to screen media use in adolescents and found that adolescents who scored higher in personality domains of neuroticism, openness and conscientiousness tended to use less screen media. Attachment style in adolescents and young adults has also been linked to an increased risk of screen media addiction. For example, studies have supported that an insecure attachment style is related to more problematic mobile phone use and internet use (Eichenberg et al., 2017; Eichenberg et al., 2019). It has also been found that young adults with ambivalent attachment styles were more prone to social media addiction (Eichenberg et al., 2024).

As suggested in Domoff et al. (2020) interactional theory of childhood problematic media use, there are also many parent-level or family-level factors that have been shown to predict screen media use in children and youth. For example, a systematic review by Paudel et al. (2017) identified that higher parent screen media use predicted higher child screen media use. However, parent's age, sex and education level did not seem to predict their child's use. In addition to parent's own time spend on screen media devices, parental attitudes towards screen media has been shown to affect their child's use (Lauricella et al., 2015). There has also been some research to suggest that a higher level of parents' psychological difficulties (e.g., internalizing difficulties) is related to increase in screen media use in their children, particularly with regards to TV watching, video watching, and gaming (Pulkki-Råback et al., 2022). This suggests that centrally considering the role of parents and the family system more broadly is essential to understanding child screen media use.

Effects of screen media on children's physical and psychological well-being

For several decades, researchers have raised many concerns about the possible negative effects of screen media use on children and youth, both physical and psychological in nature. Since the introduction of television, experts began raising concerns about the sedentary nature of screen media, and wondered about how this could negatively impact the physical health children and youth (Sahin & Robinson, 1981). These concerns have continued to grow as mobile devices have played an increasingly central role in the lives of the children. More recently, reviews have identified that increased screen media use is linked to poorer sleep quality and quantity, and risk factors for cardiovascular disease such as high blood pressure, obesity, low HDL cholesterol, poor physiological stress regulation, and insulin resistance (Carter et al., 2016; Hale & Guan, 2015; Lissak, 2018). Screen media use has also been found to be associated with vision difficulties such as eye fatigue, eye dryness, and headaches as a result of the glare from computers and mobile devices (Altalhi et al., 2020). There are also rising orthopedic concerns related to screen media use, as this type of sedentary behaviour has been linked to an increase in musculoskeletal load which causes discomfort (Lissak, 2018). Additionally, many screen media activities (e.g., smartphone use, video game playing) require repetitive wrist and arm movements which may cause pain or discomfort, as well as possibly negatively affecting bone density in the long term (Lui et al., 2011).

In parallel, many researchers have also identified increased screen media use to be linked with difficulties with psychological well-being. Many studies and reviews have suggested that high screen media use is linked to poor mental health outcomes, such as increased symptoms of depression, anxiety, stress, and addiction difficulties, as well as a decrease in self-esteem and pro-social behaviour (Madigan et al., 2020; Neophytou et al., 2021; Oswald et al., 2020;

Saunders & Vallance, 2017; Sohn et al., 2019). There is also evidence to suggest that increased screen media use is negatively associated with academic performance, especially among adolescents (Adelantado-Renau et al., 2019). As children have begun engaging with screen media from a younger age, researchers have also raised concerns regarding the effect that this may have on neurodevelopment, cognition and brain structure more broadly (Paulus et al., 2019). Research with animal models has found that excessive exposure to lights and sounds via television had a significant deleterious effect on short-term memory, learning, risk evaluation, and general cognitive functioning (Christakis et al., 2012). In humans, studies have suggested that excessive screen media use from a young age may have prolonged effects on attention, memory, learning and language acquisition in children (Christakis et al., 2004; Linebarger & Walker, 2005; Zimmerman et al., 2007). Taken together, experts have suggested that the combinatory negative associations of screen media with mental health, addiction, and neurocognitive functioning could place children with excessive use at risk of premature neurodegeneration (Neophytou et al., 2021).

These findings highlight the importance of investigating factors that contribute to screen media use to support the physical and psychological well-being of children and youth. However, it is important to note some methodological limitations across many of these studies. Most importantly, most of the literature in the screen media domain is correlational in nature, and causal links for these deleterious effects are often difficult to establish. As such, although the literature is quite consistent and convincing that screen media use seems to be related to several negative physical and psychological metrics, it is important not to assume causality in these relationships until it has been empirically proven (Hale & Guan, 2015). Additionally, the mechanisms of these possible effects of screen media still remain unclear, which will be

important to clarify in future work in this area (Domingues-Montanari, 2017). There is a call for high-quality longitudinal studies to be conducted to help answer some of these questions with greater clarity (Oswald et al., 2020).

Screen media use in children and youth at-risk of attention difficulties

Considering the rising evidence regarding how screen media can be related to psychological constructs in children, many have investigated the association with attention abilities. A systematic review conducted by Santos et al. (2022) found that most studies in their review identified a significant association between screen time and attention in children. For example, several studies showed that a higher degree of attention problems in children was associated with overall screen time, as well as increased video game use (Hetherington et al., 2020; Rosen et al., 2014; Swing et al., 2010). Several researchers have also aimed to understand whether use of screen media in early childhood (i.e., in the first 3 years of life) could predict or cause attention difficulties. For example, several studies have found that excessive screen time as a preschooler predicted attention problems later in childhood (Barlett et al., 2012; Lin et al., 2020; Xie et al., 2020). However, it is important to note that at this time the mechanism to explain this relationship remains to be understood.

Researchers have also been interested in identifying children and youth who may be particularly vulnerable to difficulties with screen media use, such as excessive use and engaging in risky online behaviours. One group of potentially vulnerable youth that has been identified is individuals with attention difficulties, such as those with Attention-Deficit/Hyperactivity Disorder (ADHD). A meta-analysis identified a small significant relationship between media use and ADHD-related behaviors (Nikkelen et al., 2014). However, many have identified that there are several factors that remained to be explored to confidently state that there is an empirical link

between screen media difficulties and ADHD-related behaviours (I. Beyens et al., 2018). Nonetheless, there are many theoretical reasons that support the hypothesis that problematic screen media use would be more likely to occur in the context of ADHD. For example, individuals with ADHD are more prone to developing addictive behaviours than individuals without ADHD (Schellekens et al., 2020). As such, further investigation into screen media use and the factors that may mitigate this behaviour in children and youth with ADHD is well substantiated.

Additionally, it has been well-documented that children with early neurological risk (e.g., perinatal stroke, congenital heart disease, preterm birth, etc.) are also more likely to experience difficulties with attention abilities (Bosenbark et al., 2018; Narad et al., 2020; Tsao et al., 2017; Williams et al., 2018). Despite being at-risk for attention difficulties, screen media difficulties have not been systemically investigated in children and youth with early neurological risk. As such, it is important to investigate screen media use in these populations who are also at-risk for attention difficulties to better characterize their potential vulnerabilities and inform practical approaches to supporting these children and youth.

Parental mediation of screen media use

Parental mediation can be defined as the strategies that parents engage in to regulate and shape their child's screen media use (Livingstone & Helsper, 2008). The ultimate goal of parental mediation is to teach children adaptive ways to engage with technology, in order to mitigate the potential risks of negative online experiences (Shin, 2013). Parental mediation theory was initially proposed and developed at a time when television was the primary method of screen media consumption. This early research into parental mediation identified three basic strategies: active mediation (i.e., active discussions with their child about content they access),

restrictive mediation (i.e., setting rules and limitations on their child's screen media use), and co-use (i.e., using screen media together with their child; (Valkenburg et al., 1999)). Over the past decades, research has shifted to focus on parental mediation of digital technologies, which includes how parents mediate their children's use of mobile devices that can access the internet (Clark, 2011). While the initially proposed three strategies of parental mediation are likely still relevant in the current digital context, researchers have proposed additional parental mediation strategies that are likely increasingly relevant. For example, technical restrictions (i.e., installing software to limit their child's activity) and monitoring (i.e., monitoring their child's online activities) have been proposed as additional parental mediation strategies in the digital context (Livingstone & Helsper, 2008).

In response to the ever-changing landscape of screen media use, Iqbal et al. (2021) recently proposed an extended theoretical framework of parental mediation. Drawing from multiple theories of child development, Iqbal et al. (2021) applied the socio-ecological resilience model (Ungar, 2011) to the context of screen media use and parental mediation, recognizing the complex and interacting layers of influence. This theory broadly describes that there are three categories of factors (i.e., parent factors, context factors and child/youth factors) that, in combination, determine a child/youth's level of risk for difficulties with screen media use. This individual risk level should then guide the parental mediation requirements. The authors propose that there are five primary dimensions of parental mediation that are relevant to the digital context:

1. Active co-use: parent discusses and uses devices together mutually with their child.
2. Restrictive mediation: parents set restrictions, rules and regulations.
3. Monitoring: parents monitor and supervise their child's screen media use.

4. Technical mediation: parents use software or control mechanisms to restrict or filter online activities.
5. Active internet safety: parents discuss with and guide their child towards safer online practices.

Iqbal et al. (2021) suggest that from their child's level of determined risk, parents then apply, re- assess and re-adjust their mediation approaches as needed to support their child's changing and evolving needs. This dynamic process helps to build resilience in the child and youth's ability to navigate the digital world, which simultaneously diminishes the risks that they may encounter online (Figure 1). This theoretical framework is the first to propose a comprehensive understanding of parental mediation strategies that are available, and the multitude of interacting factors that determine the appropriateness of these strategies within the context of mobile devices and internet use (Iqbal et al., 2021).

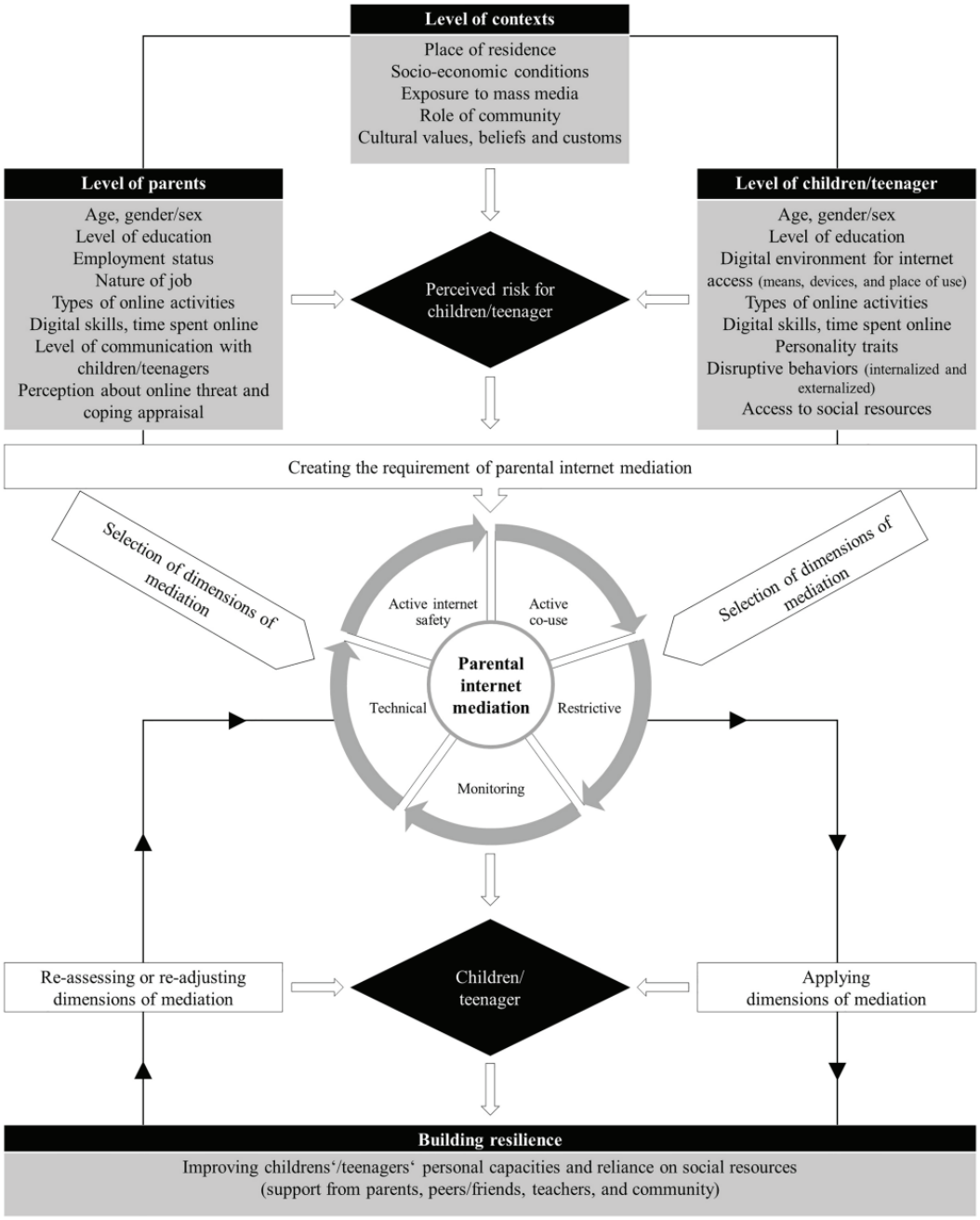


Figure 1. Extended framework of parental mediation (Iqbal et al., 2021).

Parental scaffolding of healthy screen media decision-making skills. Decision-making skills in children and youth have been described as dynamic, implying that they can potentially be improved or scaffolded by different environmental factors, such as parents and other adults (Dhami et al., 2013). It has been suggested that children and youth may be particularly prone to

making cognitive errors when using screen media, due to the complex and nuanced environment of the internet (Toplak, 2022). While engaging with screen media, it is possible that children and youth may not recognize various decision-making possibilities or opportunities to make judgments. As such, screen media use may be a domain where parent modeling and scaffolding of decision-making skills could be relevant and useful. This parental approach may help to build insight and recognition and help children and youth develop more independent and healthy relationships with screen media use. To date, this possible parent mediation skill has not been described or characterized in the parental mediation literature, though it may constitute an important parent mediation skill to consider to help children develop a healthy relationship with screen media.

Correlates of parental mediation

Many researchers have wondered which factors determine the parental mediation strategies that caregivers will select to use with their child, as the types of strategies and frequency with which they are applied vary significantly between caregivers. Broadly, it has been found that some parents prioritize the educational value of screen media while others prioritize the entertainment value associated with it. For example, some parents have been found to create distinct media spaces in their homes, where they prioritize encouraging certain screen media platforms and resources due to their educational potential and may choose to engage in shared play and learning with their child through this process (Nikken & Schols, 2015). In contrast, other parents are found to prioritize the entertainment and distraction value attributed to screen media use. For example, parents may use screen media devices as a distraction tool for their child (e.g., when waiting in a line, at a shopping center, etc.), and may even provide their child with their own devices to use in their room with the goal of providing parents with a break,

providing children with a relaxation tool, or even helping them manage behavioural or sleep-related challenges (Haines et al., 2013; Vaala & Hornik, 2014). Understandably, the value that parents place on screen media and the role that they see this playing in their family's life may in turn guide the parental mediation practices that they tend to use.

Parent and family factors. Several studies have assessed the role that parent-focused variables play in guiding parental mediation practices. It has been found that mothers tend to be more engaged in parental mediation practices (Craig, 2006), and that in this role mothers show a higher level of control, as well as a higher level of warmth and emotional support within the context of child screen media use (Brito et al., 2017; Mascheroni et al., 2018; Symons, Ponnet, et al., 2017a). Generally, parent age hasn't been found to be a strong predictor of the mediation strategies that they engage in (Nikken & Schols, 2015; Symons, Ponnet, et al., 2017a). In contrast, Livingstone et al. (2015) found that parent education level as well as family income interact with one another to inform parental mediation strategies. For example, they found that in lower income and less educated families, parents expressed a high degree of worry about screen media use, but a lower level of confidence in their own digital skills, which resulted in more restrictive parental mediation approaches. In contrast, in lower income and more highly educated families, parents were found to have an increased level of confidence in their digital skills and were more likely to be able to prioritize active mediation practices over restriction. In higher income and more educated families, the widest range of mediation practices were found (e.g., active mediation, restriction, technical mediation), however parents who used more screen media devices themselves expressed having more challenges in navigating how to mediate screen media use within their children (Livingstone et al., 2015). Additionally, the general attributions that parents make about the effects of screen media use on their child have been associated to the

strategies they will use. For example, parents who express high levels of worries about the risks and negative effects of screen media use tend to implement more restriction and monitoring strategies and tend to speak more critically about media with their child. In comparison, parents who recognize the educational and other values of screen media use have been found to engage in more active mediation and co-use approaches (Sonck et al., 2013; Warren, 2003).

Child factors: Age and sex. In terms of child demographic factors, child age and sex have been most frequently studied within the context of parental mediation. Findings regarding child age have been relatively consistent, such that parents tend to use more parental mediation strategies more intensely when their child is younger, and then this diminishes as their child ages (Nagy et al., 2023). The types of parental mediation used tend to also change with age, such that parents of younger children tend to use more restrictive approaches while parents of older children tend to use more active mediation approaches (Symons, Ponnet, et al., 2017a; Symons, Ponnet, Walrave, et al., 2017; Talves & Kalmus, 2015). Brito et al. (2017) also found that in adolescence, parents tend to reduce the intensity and frequency of their mediation approaches once screen media becomes a source of conflict in the parent-adolescent relationship. However, experts continue to advocate that parental mediation continues to be important in adolescence and even in emerging adulthood as new challenges with screen media may present themselves and susceptibility to risky online behaviours increases (Vanwesenbeeck et al., 2016).

In contrast, findings regarding child sex have been more varied. Talves and Kalmus (2015) found that in a sample of 9 to 16-year-old children, parents tended to mediate girls' internet use more stringently than boys, mostly through active mediation. When mediating internet use with boys, parents tended to use more restriction, technical mediation and monitoring approaches (Talves & Kalmus, 2015). Similarly, Brito et al. (2017) found that among

parents who exercised more control over their child's screen media, they tended to implement more restrictions with girls than boys. However, Symons, Ponnet, et al. (2017a) found that parents tended to restrict social media sites among boys more than girls. Nonetheless, it is clear that considering these child factors in the study of parental mediation is essential.

Impact of parental mediation on child screen media use

Several studies have examined how the implementation of parental mediation strategies affects how their children interact with screen media, as the goal of parental mediation is to reduce the risks associated with screen media use in children. However, findings about this have largely been mixed. While some studies have found that the implementation of co-use and autonomy-supportive restrictive mediation was related to lower screen media use (Lee & Chae, 2007; Padilla-Walker et al., 2020), others have found that mediations strategies such as monitoring, technical mediation and restrictive mediation were not related to reduced screen media use (Vaala & Bleakley, 2015). A meta-analysis by Chen and Shi (2018) suggested that different parental mediation strategies may be related to different kinds of outcomes with regards to child screen media use. For example, they found that restrictive mediation was the most effective strategy to reduce the amount of time that children spend on screen media. However, active mediation and co-use were more effective in reducing the prevalence of media-related risks (Chen & Shi, 2018).

Another hypothesis that could explain these mixed findings is age differences, as different parental mediation strategies may be more or less appropriate across different periods of development. For example, one study of adolescents showed that while restrictive mediation was related to less time spent on screen media devices, it was also linked to increased risks on the internet, perhaps due to lack of exposure and autonomy online (Steinfeld, 2021). Others have

suggested that restriction becomes less and less effective in reducing screen media use as adolescents get older (Chen & Shi, 2018). This speaks to the importance of examining the effectiveness of parental mediation strategies across development in order to better characterize developmental appropriateness of strategies at different stages.

Parental mediation of children and youth at-risk of attention difficulties

While children at-risk of attention difficulties have been identified as possibly being more vulnerable to difficulties with screen media use, few studies have investigated the link between screen media use and parental mediation in these populations. Some have raised concerns about the vulnerabilities of children and youth with neurodevelopmental risk, such as ADHD, in the digital world, citing the importance of parental interventions and appropriate guidance (Good & Fang, 2015). The few studies that have examined parental mediation in adolescents with ADHD have identified that parents tend to engage in more restrictive and monitoring mediation strategies, though they may not actually be effective in mitigating the risks of their children's online behaviour (Arrizabalaga-Crespo, 2010; Dawson et al., 2019). More broadly, studies have suggested that in adolescents with ADHD, increased parental monitoring of behaviours that could lead to risk could help to decrease the adolescents' engagement in these risky behaviours (Pollak et al., 2017). There is a clear need to better characterize parenting approaches in children and youth with attention difficulties, considering the vulnerabilities that they face and the potential for parent-based interventions to mitigate the risks associated with screen media use.

Summary of the current research

Screen media is increasingly prevalent in the lives of children and youth, and there is evidence to suggest that overuse and broader difficulties with screen media are also becoming more prevalent. Parental mediation has been shown to play an important role in helping children

develop healthy relationships with screen media, though it has not been well characterized to date in children with attentional difficulties. The current research aimed to contribute to the characterization of parental mediation of screen media use in children and youth by making five overarching contributions: (1) examine the underlying dimensional structure of parental mediation among children and adolescents (Study 1), (2) characterize and compare parental mediation strategies in a community sample and in children and youth at-risk for attention difficulties, including those with ADHD and those with early neurological risk (Study 2), (3) assess parent and child factors that relate to parent mediation strategies across community and at-risk samples (Study 2), (4) determine the parental mediation strategies that predict better screen media outcomes (Study 2), and (5) develop a more nuanced understanding of parents' lived experiences of parenting around screen media use in children with attention difficulties (Study 3).

In Study One, we developed the Parental Mediation Scale (PMS) by compiling and adapting items from existing scales in the literature that assessed parental mediation. Additionally, we developed new items to assess strategies that parents may use to scaffold and model decision-making in the context of their child's screen media use. This endeavor was important as it provided the opportunity to update this measurement tool to reflect the current screen media landscape. We then administered the PMS to a large community sample of parents of children aged 6-18 years without attention difficulties. To characterize the kinds of parental mediation strategies that were captured in this measure, we examined the underlying dimensional structure using exploratory factor analysis (EFA) and assessed the reliability of the domains that emerged. Finally, we assessed how child age and sex related to the different domains of the PMS.

In Study Two, we administered the PMS to a community sample and two samples of parents of children and youth at-risk for attention difficulties, including those with ADHD and those with early neurological risk. In each of these groups, parents completed questionnaires that assessed parental mediation of screen media use (PMS), parental stress related to their parenting around screen media use, daily child screen media use, child attention problems, and the negative/positive impacts of screen media use on their child. We then created a matched sample (based on child age and sex) from the community sample, the ADHD sample, and the neurological risk sample. Using the matched samples, we compared ratings of parental mediation, parental stress, impact of screen media on the child, and child and parent screen use across these three groups. Within each of the full three groups independently, we also examined associations amongst these variables of interest (e.g., PMS domains, parent stress, child use, child negative and positive impact, child inattention, child age and sex) through correlational and regression analyses.

In Study Three, we conducted semi-structured interviews with a sub-sample of parents of children with ADHD to better understand their lived experiences of parenting around screen media. We followed a qualitative exploratory case study design. The goal of this study was to develop a more nuanced understanding of parents' experiences, particularly with regards to their selection and implementation of various parental mediation strategies, developmental changes in their child, and the role of attention in parenting around screen media. To answer these questions, we conducted a qualitative analysis on transcripts of these interviews using inductive content analysis (ICA).

Chapter 2: Development and Validation of the Parental Mediation Scale

Parental mediation has been proposed as an essential construct of study to help us better understand ways in which parents can intervene with their children in the hope of mitigating the potential negative effects of screen media use on children. However, the construct of parental mediation has evolved significantly over time as types of screen media devices and their accessibility have changed. As such, it is essential to have tools to measure parental mediation that are reflective of the current screen media landscape. The aim of this study was to develop an updated measure of parental mediation and examine its underlying factor structure in a sample of parents of typically developing children aged 6-18. We also aimed to assess the associations of the parental mediation factors with child age and sex, to better understand developmental trends of different parental mediation approaches.

Existing parental mediation scales

The term parental mediation was initially coined to describe the strategies that parents use to manage their child's television and video game use (Valkenburg et al., 1999). With this scope in mind, the following three factor model of parental mediation was often used as a guiding framework for the development and validation of initial measures: active or instructive mediation (i.e., talking about or explaining how to engage in proper use), restrictive mediation (i.e., setting rules or restrictions around use), and co-viewing (i.e., viewing content together with their child) (Barkin et al., 2006; Nathanson, 1999; Nikken & Jansz, 2006; Valkenburg et al., 1999). As the internet gained prominence and became central in the lives of most children and youth, researchers began to call into question the applicability of the initial parental mediation scales in the nuanced context of internet use. For example, co-viewing may be a less appropriate or commonly used strategy to mediate internet use for logistical reasons (e.g., smaller screen

size, independent ownership of private screen media devices, etc.). In response, Livingstone & Helsper (2008) aimed to test the original trichotomy model of parental mediation by developing and applying a parental mediation scale in the context of internet use. In their large sample of parents of adolescents (*N*=634), they found that a four-factor model best applied to parental mediation of youth's screen media use, proposing the domains of active co-use, interaction restrictions, technical mediation, and monitoring (Livingstone & Helsper, 2008). This study highlighted the importance of continuously re-evaluating and revising existing parental mediation scales in the face of new and emerging technologies, as parents were found to use different kinds of strategies in the face of evolving technology.

Following this initial attempt to measure parental mediation in the context of internet use, several scales have been developed and tested across several studies. While research regarding parental mediation of internet use has increased substantially, a minority of these studies have empirically assessed the underlying factor structure of this construct. Kuldas et al. (2021) reviewed 10 parental mediation scales (internet use) that were developed and reported analysis of the underlying factor structure. Notably, the authors highlight that varying factor structures have been found amongst these different scales. While there are several common strategies that are often found between these scales (e.g., active mediation, restrictive mediation, monitoring, etc.), the number of factors identified and the naming of these factors vary from measure to measure (Kuldas, 2021). Additionally, some researchers have chosen to develop items that are only reflective of the two primary categories of parental mediation strategies, namely restriction and active mediation (Ren & Zhu, 2022). While many parental mediation scales have been developed, there is no clear agreement in the literature regarding a gold standard scale or factor structure to date. Additionally, these inconsistencies with regards to the factor structure of

parental mediation (e.g., number of factors, types of factors included, age of children/youth, etc.) and the various measurement tools that have been developed in response pose a challenge in being able to complete any meta-analytic work on this important construct.

Challenges in measuring parental mediation

It has been well documented that rapid changes and developments have occurred in the screen media landscape, which have inherently impacted the way in which children and youth interact with screen media (Twenge et al., 2019). Similarly, the ever-changing screen media demands on youth should inform and inevitably guide the mediation strategies that parents engage in. It has also been documented that the increasing spread of different kinds of technologies, particularly those that are mobile in nature, contribute to parents feeling less effective in managing their children's screen media use (Nagy et al., 2023). Additionally, some of the mediation strategies that parents have at their disposal depend on the technical advancements at their disposal. For example, technical restriction strategies can include parents using technology to mediate their child's use (e.g., installing software). The monitoring strategies that parents can engage in have also evolved and expanded with technology, including "digital monitoring" (e.g., looking through their child's browser history) in addition to "live monitoring" (e.g., watching their child use devices; (Sciacca et al., 2022)). As a result, it is essential that parental mediation scales accurately reflect the strategies that parents have at their disposal in the context of their current digital landscape. The ever-evolving nature of this landscape creates a challenge, as it requires scales of parental mediation to be frequently updated in response.

Another challenge that has been identified in the development and validation of parental mediation scales concerns developmental stage. In the parental mediation literature, it has been proposed that child age likely will affect the way that children engage with screen media and, as

a result, the strategies that parents engage in to mediate their child's screen media use (Beyens & Valkenburg, 2019). For example, it has been found that younger children are generally more reliant on their parents for access to screen media compared to adolescents, who tend to have more autonomy and personal ownership in their screen media use (Rideout, 2015). However, Kuldas et al.'s (2021) review of parental mediation scales highlighted that there is significant variation in the age range of children in the samples that have been recruited to develop and test various parental mediation scales. While some parental mediation scales have been developed and tested specifically in younger children (Livingstone et al., 2017; Nikken & Jansz, 2014), others have focused only on parental mediation in adolescents (Atalan Ergin & Kapci, 2019; Glatz et al., 2018; Symons, Ponnet, et al., 2017a, 2017b). This may account for some of the discrepancies in the factor structures that have been identified across different scales and is an important consideration in future studies of parental mediation.

Additionally, some statistical challenges have been raised in the study of parental mediation. Namely, there is inconsistency amongst different scales with regards to the use of binary items (e.g., yes/no items) or ordinal items (e.g., 5-point Likert scale). First, the use of binary data raises concerns regarding subsequent factor analytic work, as binary data are generally considered inappropriate for exploratory factor analysis (Barendse et al., 2015). As a result, many studies have utilized a principal component analysis (PCA) approach rather than EFA. However, PCA is in fact not considered a common factor analysis approach, and rather serves as an item reduction approach. This PCA approach has been criticized in the literature as it has been found to overestimate factor loadings, which in turn inflates the number of factors that are retained (Kuldas, 2021). Binary data also raise issues conceptually within the context of parental mediation. Generally, the strategies that parents use are not best understood as

dichotomous, as the frequency with which parents apply strategies can vary from day to day and is important to consider when trying to evaluate how and when parental mediation strategies are effective in mitigating risks. As such, items that generate ordinal data are likely most appropriate in the context of parental mediation scales.

As our understanding of child development more broadly evolves, it is also essential to apply and adapt these constructs in the context of parental mediation of screen media use. For example, while engaging with screen media, it is possible that children and youth may not recognize various decision-making possibilities or opportunities to make judgements (Toplak, 2022). As such, screen media use may be a domain where parent modeling and scaffolding of decision-making skills could be relevant and useful. This parental approach may help to build insight and recognition and help children and youth develop more independent and healthier relationships with screen media use. To date, this possible parent mediation skill has not been described or characterized in existing parental mediation scales, though it may constitute an important parental mediation skill to consider.

Study One

The goal of this study was to develop an updated Parental Mediation Scale by adapting and creating items that reflect the current technological landscape of children and youth. This endeavor was important, as the screen media landscape quickly evolves, and it is essential to have measures that best reflect current parenting practices that parents may use. To assess how well the items measure the constructs of interest, we then examined the underlying dimensional structure of the scale among parents of children aged 6-18, using Exploratory Factor Analysis (EFA). For the purposes of developing this scale, we intentionally recruited parents of children without neurodevelopmental or neurological conditions and screened for attention difficulties, to

capture a typically developing community sample. We also assessed the reliability of the overall scale and individual factors of the model that presented with best fit. We then examined the associations of the factor scores with age and sex, to better understand developmental trends of different parental mediation approaches. Based on these study aims the following hypotheses were generated:

H_1: The factor structure of the Parent Mediation Scale will be assessed and will be consistent with existing parental mediation strategies from the literature. The overall scale and the individual factor scores will demonstrate good to excellent reliability.

H_2: Age will be significantly negatively related to each of the PMS factor scores, such that parents of younger children will engage in significantly more strategies across all domains than parents of older children.

H_3: Child sex will be related to PMS domains. Specifically, parents of girls will endorse using significantly more active kinds of mediation than parents of boys, and parents of boys will endorse using significantly more restrictive kinds of mediation than parents of girls.

Method

Procedure

This study underwent ethics review and received appropriate institutional ethics approval prior to commencing data collection. Parents of children aged 6-18 residing in North America (i.e., United States and Canada) were invited to complete an online survey about their child's screen media use and their parenting around screen media use. Eligible parents were contacted via email directly from the Qualtrics panel program (i.e., purchased participant panel program) and were prompted to complete the survey via Qualtrics. All participants were first instructed to

complete informed consent. Once consent was obtained, participants were asked to complete the study questionnaires. Once all study questionnaires were complete, participants were asked to answer demographic and health history questions about their family and child. Due to the online nature of this study, attention checks were used throughout. Four attention check questions were created that asked participants to respond to visual stimuli with five response options such as "select the arrow going up" among five arrows options. All participants received monetary compensation for their time directly through the Qualtrics panel service.

Participants

386 parent participants were included in the final sample for analyses. Initially, four hundred parents of children aged 6-18 screened for attention difficulties were recruited through Qualtrics panels. Participants who met the following criteria were included: (1) English language proficiency, (2) currently living in North America (Canada or United States of America). Participants who met the following criteria were excluded: (1) duplicate IP addresses, (2) response pattern indicating poor data (e.g., extremely low variability within answers, selecting same rating across items), (3) response time indicating poor data (i.e., completed the survey in less than 7 minutes), (4) participant failed any of the attention check questions.

Data from this community sample were further evaluated for exclusion based on likelihood of reported attentional difficulties meeting the clinical threshold for ADHD, to represent a typically developing community sample without significant attention difficulties. First, parents of children with a previously diagnosed neurodevelopmental disorder (e.g., ADHD, ASD, ID) or significant medical history that would put them at risk for attention difficulties (e.g., stroke, cancer, epilepsy or other neurological condition, extremely preterm birth) were excluded. Additionally, parent participants were excluded who reported that their child: (1) had at least

"moderate" severity of inattention problems on the SNAP-IV and; (2) had impairment due to inattention as "a medium amount" or "a lot" in at least two domains (e.g., school, home, leisure). Based on these criteria 14 participants were excluded and 386 participants were included in the final sample.

All participants completed a brief demographics form (Appendix A). Briefly, the mean child age was 11.59 years old, with 55% being female, and primarily white/Caucasian (73.3%). Most of the parents who completed the questionnaires identified as being their child's mother (76%). The mean age of caregivers completed the questionnaires was 40.59 years old, and most of the sample had either completed high school (27.7%), some university/college (25.9%), or a university/college degree (29%). Key participant demographics are summarized in Table 1.

Table 1

Study 1 participant demographics.

	Percentage/*M(SD)*
Variable	Total sample (*n*=386)
Age of child (years)	
Mean (SD)	11.59(3.5)
Range	6-18
Sex of child	
Female	55%
Male	45%
Child race/ethnicity/cultural identity	
White/Caucasian	73.3%
Black/African American	11.1%
Indigenous	1.6%
American	5.2%
Canadian/French Canadian	0%
Asian	1.3%
Hispanic/Latino	11.9%
Middle Eastern	0.3%
South Asian	0%
European	5.7%
Jewish	0%
Hawaiian	0.5%

Biracial	4.9%
Multiracial	0.8%
Prefer not to say	0.3%
Caregiver completing questionnaire	
Mother	76%
Father	13%
Grandparent	5%
Step-parent	3%
Other	3%
Age of caregiver (years)	
Mean (SD)	40.59(9.78)
Range	20-72
Caregiver level of education completed	
Did not complete high school	4.4%
High school graduate	27.7%
Partial college/university (at least one year)	25.9%
College/university education	29%
Graduate/professional degree	12.7%
Would rather not say	0.3%

Measures

Parental Mediation Scale (PMS). 31 items were developed that assess parenting strategies used to mediate their child's screen media use. Iqbal et al. (2021) extended theoretical framework of parental internet mediation was used as a guiding framework for the development of this scale. Several pre-existing parent mediation scales were reviewed, totalling 57 items (Livingstone & Helsper, 2008; Nikkelen et al., 2014; Nikken & Jansz, 2014). 25 items were adapted and updated from these various pre-existing parental mediation scales to ensure that they were reflective of the current screen media landscape. The adapted items fell into the following parental mediation categories according to Iqbal et al. (2021) framework: active co-use (e.g., "I look at websites and other online information with my child"), active mediation of internet safety (e.g., "I talk to my child about how to protect their personal information online"), restrictive mediation (e.g., "I set time limits on how long my child is allowed to use their devices for"), monitoring (e.g., "I check in with my child when they are using their devices"), and technical

mediation (e.g., “I use parental controls that filter the apps that my child can download”). An additional 6 items were developed in consultation with experts in child psychology and development to reflect the parental mediation approach of skill building to increase awareness (e.g., “I help my child recognize when they have been using their device for too long”). Participants rated their level of engagement with various parenting strategies on a five-point Likert-type scale (1= “never”, 5 = “always”). A full list of the items that were adapted and developed is included in Appendix B.

Screening for Attention Difficulties (SNAP-IV). The Swanson, Nolan, and Pelham Rating Scale – Fourth Version (SNAP-IV) was used as a screening questionnaire for attention difficulties in this study. The SNAP-IV is a parent questionnaire used to assess inattention, hyperactivity/impulsivity and oppositional behaviours. There are 26 items in total, which can be divided into three scales: inattention (9 items), hyperactivity/impulsivity (9 items), and oppositional (8 items). In this study, only the items from the inattention and hyperactivity/ impulsivity scales were included, for a total of 18 items (Appendix C). Participants were asked to rate their child’s behaviour on a four-point Likert-type scale (1= “not at all”, 4 = “very much”). Higher total scores on the SNAP-IV indicate more problem behaviours. Subscale scores for the inattention and hyperactivity/impulsivity domains were created by calculating a total score for the items in each domain, for a possible maximum score of 27 in each domain. Clinically significant symptoms were determined using the suggested cut-off score of 13/27 in the inattention and hyperactivity domains (Swanson et al., 2012). The SNAP-IV was administered to participants to help rule out parents of children who may be at-risk for attention difficulties, meaning that if their child’s score was above the suggested clinical cut-off score in either domain, they were removed from subsequent analyses.

Statistical Analyses

An exploratory factor analysis (EFA) of the parental mediation items was conducted using the unweighted least squares (ULS) method of extraction, with the oblique rotation method being Oblimin, as it was anticipated that factors may be correlated (Browne, 2001). All models were estimated using R software with the lavaan package (Rosseel, 2012). First, we calculated item-level descriptive statistics to understand the most and least endorsed items. Visual inspection of the distributions of each item as well as indices of skewness and kurtosis were calculated for each item to examine the distribution of each item and determine appropriateness for inclusion in subsequent factor analytic analyses. Assumptions for EFA were verified using Bartlett's Test of Sphericity and the Kaiser-Meyer-Olkin test. Reliability of the items was also calculated using Cronbach's alpha. Correlations between all items were also examined to assess suitability for EFA. Following this, a scree test and parallel analysis were computed to determine the number of factors to extract. Once the possible models were specified, model fit was evaluated using the standardized root mean square residual (SRMR), the root mean square error of approximation (RMSEA), and the Tucker-Lewis index (TLI). Hu and Bentler (1998) suggest that SRMR values less than .08 indicate good fit, RMSEA values less than .08 indicate reasonable fit, and TLI values greater than .90 indicate good fit. The most parsimonious model with appropriate fit indices was then selected for oblimin rotation and subsequent interpretation. Item loadings were examined to ensure that each item had a minimum loading of at least .32 on its respective factor. Additionally, each item was examined for cross-loading (i.e., item that loads at .32 or higher on two or more factors; Tabachnick & Fidell, 2001). Items that met either of these criteria were deleted, and a subsequent EFA model was specified and estimated with the remaining items, following the same procedure to establish the scale's structure.

Results

Inspection of Parametric Properties of Parental Mediation Items

First, the parametric nature of each item was examined to ensure normal distribution to proceed with further analyses. Means, standard deviations, and indices of skewness and kurtosis were calculated for all items. Results from these analyses are summarized in Appendix D. All the items demonstrated acceptable skewness and kurtosis indices (Hair et al., 2022). Box plots, histograms and Q-Q plots were then visually inspected for all variables to identify any irregularities in the data. Upon visual inspection, it was identified that items 20 (i.e., "I turn off the Wi-Fi router at certain times of day to restrict internet access") and 27 (i.e., "I install software on my child's devices to prevent junk/spam mail") did not appear normally distributed due to low endorsement. That is, the majority of participants endorsed a response of "1 – Never". As such, these 2 items were removed from subsequent analyses, and the remaining 29 items were retained for factor analysis.

Assumption Verification, Reliability Analysis and Correlations Between Items

Results from the Bartlett's Test of Sphericity, $B(385)=8949.96$, $p<.001$, and from the Kaiser-Meyer-Olkin test, $KMO=0.96$, suggested that the data were appropriate for EFA. Reliability was also examined, and the items in the scale were found to have excellent internal consistency ($\alpha=.97$). Correlations between all items were calculated and were found to range from 0.25 to 0.78.

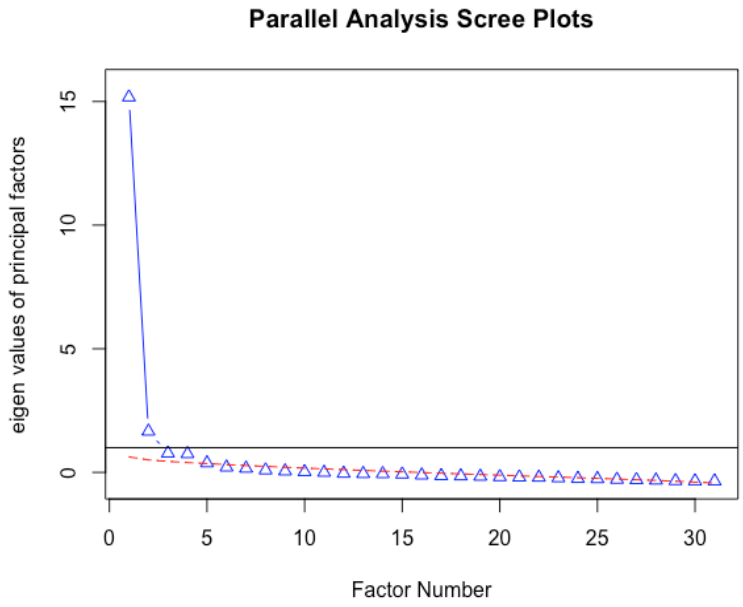
Exploratory Factor Analysis

First, a scree plot was generated to help determine the number of factors to be retained (Figure 2). This plot suggests that a two-factor or a four-factor model may best represent this data, as the eigenvalues of the reduced correlation matrix appear to level off after these points. A

parallel analysis was then conducted and suggested that four factors may accurately represent this data.

Figure 2

Scree plot of initial 29 parental mediation items.



The SRMR, RMSEA and TLI values of a 2-factor, 3-factor, 4-factor and 5-factor model were then computed and compared (Table 2). Based on these values, both the four-factor and five-factor models met criteria for acceptable fit. Following the principle of parsimony, it was indicated that a four-factor model be retained. As such, all the evidence (i.e., Scree plot, parallel analysis, fit indices) pointed towards a four-factor model, which was subsequently estimated and interpreted.

Table 2

Fit indices for EFA models of 29 parental mediation items.

Model	SRMR	RMSEA	TLI
2-factor	.05	.09	.84
3-factor	.04	.08	.87

4-factor	.03	.07	.91
5-factor	.02	.06	.93

To better interpret the four-factor model, an Oblimin oblique rotation was used. We estimated several different rotation weights, including .5, .2, .1 and .01. The .01 weight was retained as it was the most easily interpretable due to its simple structure (as assessed by reasonable column and row parsimony). Results from this four-factor model, using ULS estimation, are summarized in Table 3.

Table 3

Exploratory Factor Analysis of 29-item PMS (N=386).

	Factor Loadings				Communality
Subtest	1	2	3	4	
1. Talk to child about people they don't know online.	-.02	.85	-.24	.14	.62
2. Browse social media sites with child.	**-.21**	**.26**	**.36**	**.35**	.37
3. Set time limits on devices.	**.41**	**-.03**	**.09**	**.56**	.72
4. Check in with child when using devices.	**.34**	**.22**	**.08**	**.42**	.65
5. Visit child's social media pages to monitor.	.11	.37	.16	.25	.45
6. Use parental controls to block some websites.	.78	-.03	-.10	.24	.69
7. Collaborate with child to create limits and expectations.	**.35**	**.14**	**.13**	**.42**	.63
8. Help child recognize when using device for too long.	**.32**	**.20**	**.18**	**.35**	.64
9. Encourage child to explore and learn on the internet.	-.25	.20	.46	.28	.35
10. Talk to child about what to do when something online bothers them.	-.02	.64	.18	.19	.66
11. Explain why some websites are appropriate/inappropriate.	.20	.75	-.02	-.05	.70
12. Engage child in discussions about positives and negatives of content they see online.	.04	.71	.16	.03	.72

13. Watch shows, movies, videos, with child.	-.02	.19	.45	.18	.41
14. Tell child when they are allowed to use devices.	.62	.01	.07	.24	.63
15. Tell child what kinds of shows/videos they can watch.	.72	.21	-.05	.08	.73
16. Check child's browser history.	.55	.18	.18	.06	.65
17. Create "child-friendly" accounts.	.77	.03	.05	.02	.68
18. Share strategies with child that I use.	.26	.01	.58	.07	.62
19. Talk about benefits and consequences of screen media.	.31	.28	.40	-.04	.66
21. Talk to child about activities they engage in online.	.28	.40	.31	-.09	.69
22. Talk to child about protecting personal information online.	.04	.63	.25	-.15	.62
23. Tell child what online games they can play.	.77	.10	.10	-.11	.72
24. Read messages child sends and receives.	.49	.16	.27	-.06	.58
25. Use parental controls that filter apps child can download.	.87	-.10	.06	-.01	.73
26. Help child notice how they engage with device can affect mood or behavior.	.29	.14	.48	-.04	.63
28. Talk to child about what to do if bullied/harassed online.	.10	.65	.21	-.15	.66
29. Look at websites with my child.	.17	.13	.61	.02	.66
30. Tell child which social media sites they can use.	.71	.21	.05	-.08	.72
31. Stay close to child when using devices.	**.43**	**-.17**	**.46**	**.16**	.61

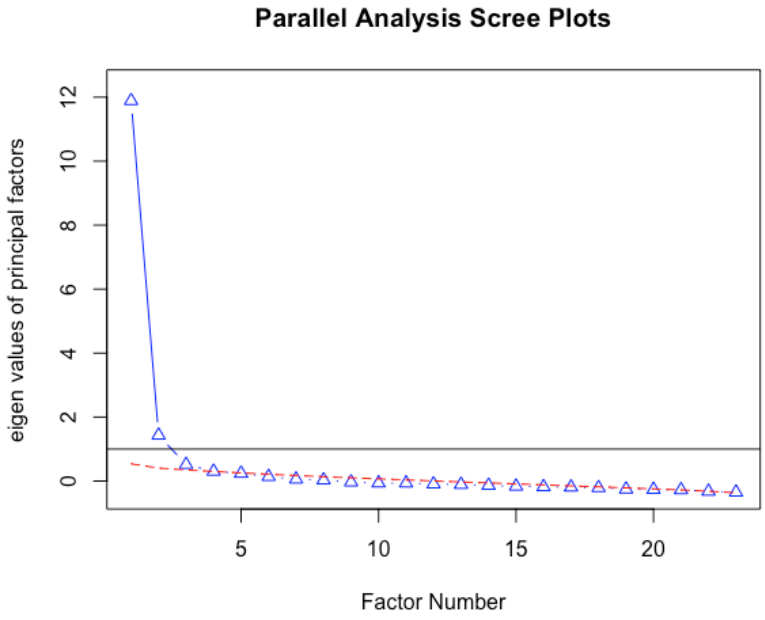
Note. Items that are bolded demonstrate those which contain cross-loadings >.32.

All the items met the criteria of having a factor loading of at least .32 on at least one of the factors. However, several items demonstrated significant cross-loadings above .32, namely items 2, 3, 4, 7, 8, and 31. As a result, these items were eliminated and a second EFA was run on the remaining 23 items in the scale. The scree plot for the 23 items suggested that a 2-factor or 3-

factor solution may best fit the data (Figure 3). A parallel analysis was then conducted and suggested that three factors could accurately represent this data.

Figure 3

Scree plot of remaining 23 parental mediation items.



The SRMR, RMSEA and TLI values of a 2-factor, 3-factor, and 4-factor model were then computed and compared (Table 4). Based on these values, both the three-factor and four-factor models met criteria for acceptable fit. Following the principle of parsimony, it was indicated that a three-factor model be retained. As such, all the evidence (i.e., Scree plot, parallel analysis, fit indices) pointed towards a three-factor model, which was subsequently estimated and interpreted.

Table 4

Fit indices for EFA models of 23 parental mediation items.

Model	SRMR	RMSEA	TLI
2-factor	.04	.09	.88
3-factor	.03	.08	.91

4-factor	.03	.08	.92

To better interpret the three-factor model, an Oblimin oblique rotation was used. We estimated several different rotation weights, including .5, .2, .1, .08, .05 and .01. The .08 weight was retained as it was the most easily interpretable due to its simple structure (as assessed by reasonable column and row parsimony). All the items met the criteria of having a factor loading of at least .32 on at least one of the factors, and none of the items demonstrated cross-loadings >.32. The items were then examined based on their content, and the following three factor names were generated: (1) restriction/monitoring, (2) internet safety, (3) active mediation. Table 5 presents the standardized factor loadings and the proportion of item-level variance explained by the revised model.

Table 5

Exploratory Factor Analysis of 23-item PMS (N=386).

General Factor Item	**Standardized factor loadings**	**Proportion of variance explained**
Factor 1. Restriction/monitoring		
Use parental controls or other means to block or filter some types of websites.	.89	.64
Tell my child when or at what time of day they are allowed to use their devices.	.68	.57
Tell my child what kinds of shows or videos they are allowed to watch or not watch.	.78	.73
Check what websites my child has visited by looking at their browser history	.59	.66
Create “child-friendly” accounts on certain platforms (e.g., Netflix) for my child to use.	.83	.69
Tell my child what online games they are allowed to play and not play.	.75	.70
Read the messages that my child sends and receives from friends.	.48	.57
Use parental controls that filter the apps that my child can download.	.92	.75

Tell my child what social media sites they are allowed to use and not use.	.71	.70
Factor 2. Internet safety		
Talk to my child about what to look out for when talking to people they don't know online.	.88	.58
Visit my child's social media pages to monitor what they are posting online.	.35	.40
Talk to my child about what to do when something they've seen online bothered them.	.63	.64
Explain to my child why some websites are appropriate and inappropriate.	.74	.70
Engage my child in discussions about the positive and negative aspects of content they view online.	.71	.72
Talk to my child about how to protect their personal information online.	.59	.59
Talk to my child about what to do if they are being bullied/harassed online.	.60	.63
Factor 3. Active mediation		
Encourage my child to explore and learn things on the internet.	.51	.28
Watch shows, movies, or videos with my child online.	.49	.38
Share strategies with my child that I use to manage my own screen media.	.65	.62
Talk with my child about benefits and consequences that can come from using screen media.	.51	.67
Talk to my child about what kinds of activities they engage in online.	.42	.68
Help my child notice that the way they engage with their devices can affect their mood or behavior.	.56	.64
Look at websites and other online information with my child.	.67	.65

Overall, all the items loaded well onto their respective factors and the interpretation of the model was consistent with well-known parental mediation strategies from the literature. The internal consistency of the 23-item scale was found to be excellent (α=.96). Three domain scores were then generated by summing all the items within each domain. The internal consistency of

the restriction/ monitoring factor (α=.95), the internet safety factor (α=.92) and the active mediation factor (α=.89) were all found to be very good. Correlations between the scale factors ranged from 0.57 to 0.68 (Table 6).

Table 6

Final factor inter-correlation matrix for the PMS.

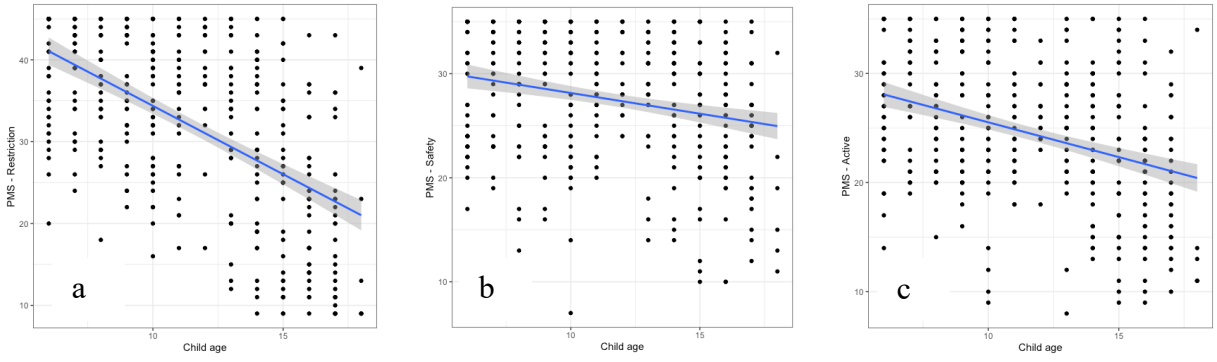
Factor	1	2	3
1	1.00		
2	.57	1.00	
3	.68	.62	1.00

Relationship with child age and sex

Child age was found to be significantly related to all PMS domains, namely restriction/monitoring (r=-.55, p<.001), internet safety (r=-.22, p<.001), and active mediation (r=-.35, p<.001), such that parents use significantly fewer strategies in all domains as their children get older (Figure 4).

Figure 4

Correlations between PMS factors and child age.



Note. Graph a shows the relationship with restriction. Graph b shows the relationship with internet safety mediation. Graph c shows the relationship with active mediation.

When looking at child sex, no significant differences were found between sexes in the PMS domains of internet safety (t=.14, p=.89) and active mediation (t=.72, p=.47). However,

parents of male children reported using significantly more restriction/ monitoring than parents of female children (t=1.98, p=.05).

Discussion

In the current study, we developed and examined the underlying factor structure of the Parental Mediation Scale (PMS) in a community sample of 386 parents of children aged 6-18 years. The 23-item PMS was found to have excellent internal consistency. Using EFA, a 3-factor structure was found to fit the data well according to the following parental mediation strategies: (1) restriction/monitoring (2) internet safety, and (3) active mediation. All factors demonstrated good internal consistency and were found to be significantly related to one another. We also assessed the relationship of these factors to child demographic variables (i.e., child age and sex). Child age was significantly related to all PMS domains, such that parents reported using less strategies as their child gets older. Child sex was only significantly related to the restriction/monitoring domain, such that parents of male children reported using this strategy more than parents of female children.

This study contributed to the literature by empirically developing and validating an updated measure of parental mediation. While many parental mediation scales focus on either childhood or adolescence separately (Kuldas, 2021), this scale was developed and tested across development (i.e., from age 6 to 18). This wider age range confers several advantages, including being able to assess and track developmental trends. Additionally, there is more research to suggest that children from our current “digital age” are accessing screen media at a younger age and are engaging in more complex online activities at younger ages (e.g., using social media) that historically would have been more common in older children or adolescents (Barr, 2019; Gerwin et al., 2018; O'Keeffe et al., 2011). These trends in screen media use call for parents to

rethink their mediation strategies and may call for parents of younger children to use mediation strategies that they historically may not have needed to consider until their children were adolescents. As such, the current PMS tool may be especially helpful to characterize the kinds of strategies that parents may be using across their child's developmental stages.

The PMS tested in this study also demonstrated many statistical strengths. First, the PMS in this study was found to have excellent internal consistency across the full measure and within each factor. Additionally, using ordinal data allowed for a greater spread of scores and better reflected the continuous nature of a lot of these parenting behaviours, as opposed to limiting it to a binary option. With this ordinal data, we were able to conduct an EFA to uncover the underlying factor structure, which has been recommended as a more appropriate statistical approach than many prior studies have taken, such as PCA (Kuldas, 2021).

The factor analysis on the PMS revealed a three-factor model of parental mediation strategies, though slightly different than the initial parental mediation trichotomy that was supported by Valkenburg et al.'s (1999) original work in television and video games. Interestingly, two of the three parental mediation strategies from this initial model were still identified in the present study, namely active mediation and restriction. The third parental mediation factor identified in our study was mediation around internet safety. It is clear that it is important to consider this unique factor as a key approach that parents take in mediating their child's screen media use, particularly as the internet becomes more and more central in the lives of children and youth.

Some developmental trends related to the implementation of parental mediation were also examined in this study, namely by looking at child age and sex. As predicted, child age was related to all the factors on the PMS, such that parents tend to use more strategies across all

categories at a younger ages, but this tends to decrease as their child enters adolescence. This relationship with age was strongest in the restriction domain, and weakest (though still significant) within the internet safety domain. These trends are in keeping with the broader literature, which suggests that parents tend to rely more on restriction when their child is younger, and their shift focuses to internet safety as their child enters adolescence and may encounter riskier content (Dedkova et al., 2022).

With regards to child sex, the sample only differed in the domain of restriction, such that parents of boys engaged in more restrictions than parents of girls. Many studies have suggested that child sex is not a particularly important factor in predicting parental mediation strategies, and that other child characteristics such as child self-control may be more relevant (Lee, 2013; Livingstone & Helsper, 2008). However, other studies have identified that parents of boys may use significantly less active mediation and more restriction, particularly during early childhood (Ine Beyens et al., 2018). The types of activities that boys and girls engage in online tend to differ, such that girls are more likely to spend time on social media, while boys are more likely to send time gaming (Kutrovátz, 2022). Following the hypothesis that parents use their perception of their child's risk of online behaviours to guide the parental mediation strategies they select (Cingel & Hargittai, 2018), it could be hypothesized that parents of boys may engage in more restriction as this seems like a more appropriate strategy to mediation video game use. These findings highlighted the importance of considering child factors such as developmental stage and sex when exploring parental mediation strategies, which were importantly considered in the subsequent studies within this project.

Summary of Findings in Study One

In Study One, we developed the PMS and evaluated its factor structure using EFA. This analysis revealed the following three correlated factors: (1) restriction/monitoring (2) internet safety, and (3) active mediation. We also demonstrated that age was significantly related to all of the parental mediation factors, and that child sex differences were only found in the PMS domain of restriction. In Study Two, we compared the PMS across a community sample and at-risk samples (i.e., ADHD and neurological risk), and examined correlates of the PMS in these groups.

Chapter 3. Characterizing Parental Mediation in Children At-Risk of Attention Difficulties: A Quantitative Study of Children and Youth with ADHD and Early Neurological Risk

Parental mediation has been identified as an important avenue to help children and youth develop healthy relationships with screen media and mitigate the risks associated with screen media use. While children at-risk of attention difficulties have been identified as being particularly susceptible to difficulties with screen media use, parental mediation and other parent-related factors have not been systematically investigated in these populations. Characterizing parental mediation in these populations will help us better understand the strategies that parents of children with attention difficulties are using and subsequently support parents in using mediation approaches that help their children develop healthy relationships with screen media. The aim of this study was to assess parental mediation in parents of children aged 6-18 years with attention difficulties (i.e., children with ADHD and children with early neurological risk) and compare the use of parental mediation strategies to parents of children without attention difficulties (i.e., community sample). We also aimed to assess the associations of parental mediation with relevant child factors (i.e., child age and sex, ratings of attention, child screen media use, negative and positive impact of screen media use on the child) and parent factors (i.e., comfort with screen media, parent screen media use, parent stress about screen use) through correlational and regression analyses.

Attention difficulties in children and youth

Attention-deficit/hyperactivity disorder (ADHD) is a neurodevelopmental condition that is characterized by difficulties with attention, hyperactivity, and impulsivity, which cause clinical levels of impairment across settings (American Psychiatric Association, 2013). ADHD is the most common neurodevelopmental condition diagnosed in childhood and adolescence, with

worldwide prevalence estimated at 5.3%, as well as one of the costliest childhood conditions to society (Doshi et al., 2012; Polanczyk et al., 2007). Individuals with ADHD have been found to be at a higher risk of engaging in risky behaviours across various domains, including driving, gambling, and substance use (Shoham et al., 2021). As such, researchers in the field of screen media have wondered whether similar risks may present themselves in the online environment. As hypothesized, youth with higher ADHD symptoms have been found to be at higher risk of overuse of screen media devices as well as engagement in risky online behaviours, such as speaking with strangers online, risky online sexual behaviours, and cyberbullying (Dawson et al., 2019; Ozdag et al., 2023; Vural et al., 2015).

While ADHD is the most studied childhood condition associated with attention difficulties, problems with attention are reported across several childhood conditions. For example, children with early neurological insult from neonatal brain injury, serious congenital conditions, or early medical conditions have been identified as a group of children at-risk of developing subsequent attention difficulties. Some of the most common etiologies include neonatal or perinatal stroke, epilepsy, congenital heart disease (CHD), hypoxic ischemic encephalopathy (HIE), preterm birth and early traumatic brain injury (Dimitropoulos et al., 2013; Keenan et al., 2007; Miller et al., 2005; Perez et al., 2013). Within these populations, there continues to be a high rate of neurocognitive, socio-emotional and behavioural difficulties that persist throughout development (Williams et al., 2017). One of the most common neurocognitive impairments includes difficulties with attention and executive functioning. In fact, there is a high proportion of children with early neurological risk who will go on to meet criteria for ADHD, often referred to as “secondary ADHD” (Roberts et al., 2019; Williams et al., 2018).

While these cognitive and behavioural impairments have been well-documented in this population, screen media use has been less well studied. However, there is some early evidence to suggest that children with early neurological risk may encounter difficulties with screen media use. For example, a study of extremely preterm children by Vohr et al. (2021) found that screen media overuse was significantly related to more difficulties with cognition, executive functioning, and behaviour in this population. Like children and youth with ADHD, some studies have also documented that children with early neurological risk may be at higher risk of exhibiting risky behaviours later in life (Kennedy et al., 2017). Due to all the risk factors that children with early neurological risk are documented to have, it is important to further investigate screen media use in this population. Additionally, it would be beneficial to compare screen media use in this group to children without this early neurological risk to better characterize how their difficulties may be unique or similar to the broader population.

Parental mediation of screen media use in children with attention difficulties

Considering the potential difficulties with screen media that have been identified in the literature for children with attention difficulties, there is a clear need to systematically investigate factors that could help to mitigate these difficulties such as parental mediation. Broadly speaking, parenting has been found to be an important avenue for affecting the development of a child's self-regulation and behaviour via various pathways, such as by fostering a safe and healthy relationship with their child (Claussen et al., 2022). Outside of the context of screen media, there is a substantial literature on the effect of parenting variables in the context of children with attention difficulties. For example, parenting factors and styles have been found to predict ADHD symptoms, such that a harsher and more reactive parenting style significantly predicted a higher endorsement of ADHD symptoms (Claussen et al., 2022). Similarly, Haack et

al. (2016) found that negative parenting mediated the relationship between symptoms of inattention and impairment across domains. Parents of children with ADHD also report higher levels of parenting stress than parents of children without ADHD (Hutchison et al., 2016; Theule et al., 2010). Within children with early neurological risk, researchers have found a significant correlation between parents self-reported mental health concerns and parenting stress with higher levels of externalizing behaviours in their child (Peterson et al., 2021). Due to this association, parenting interventions have proven to be very successful in improving child and parent outcomes in parents of children with ADHD and early neurological risk, suggesting that targeting parents in these vulnerable populations could lead to desirable changes in behaviour (Burek et al., 2021; Coates et al., 2014; Theule et al., 2018).

Within the context of screen media use, parental mediation has been less systematically studied in children with attention difficulties, though parenting has been suggested as an important avenue of intervention to mitigate the risks of screen media use (Good & Fang, 2015). To date, only a few studies have investigated parental mediation of screen media use in adolescents with ADHD. In a study by Arrizabalaga-Crespo (2010), adolescents reported that their parents used more restrictive and active mediation than adolescents without ADHD. There has also been evidence to suggest that adolescents with ADHD who consume more screen media tend to have parents who apply parental mediation strategies more inconsistently (Nikkelen et al., 2016; Sebre et al., 2020). Parental self-efficacy has also been found to play an important role, such that lower parent ratings of self-efficacy in managing their adolescent's internet use was significantly related to higher ratings of internet addiction in a sample of adolescents with ADHD (Hsieh et al., 2020). To date, there have not been any studies that have systematically investigated parental mediation in children with early neurological risk. Nonetheless, the

research in children with attention difficulties more broadly suggests that this is an important area of study for further investigation.

Study Two

The goal of this study was to characterize parental mediation in parents of children at-risk of attention difficulties, and to compare this to parents of children from a community sample. To address this goal, three groups of parents completed online questionnaires: (1) a community sample of parents of children without attentional difficulties, (2) parents of children diagnosed with ADHD, (3) parents of children with early neurological risk (e.g., stroke, epilepsy, cardiac conditions, traumatic brain injuries, etc.) that may put them at risk for attention difficulties. In each of these groups, parents completed questionnaires that assessed parental mediation of screen media use, parental stress related to their parenting around screen media use, and the negative/positive impacts of screen media use on their child. First, we compared scores on these questionnaires across the three groups of participants by creating a matched sample. Then, we examined relationships between these variables within each group to better understand how these screen media and parenting related variables relate to one another. We also estimated regression models to better understand how parental mediation strategies may predict screen media outcomes in the community sample, ADHD sample, and early neurological risk sample. Based on these aims and the current literature, the following hypotheses were generated.

Table 7

Study 2 hypotheses

Aim 1: Comparisons between groups	
Hypothesis 1a	Parents of children in both at-risk groups (i.e., ADHD and early neurological risk) will endorse using significantly more parental mediation across all the domains (i.e., restriction/monitoring, internet safety and active mediation) than parents of children in the community sample.

Hypothesis 1b	Parents of children in both at-risk groups (i.e., ADHD and early neurological risk) will report significantly more negative impacts of screen media use, less positive impacts of screen media use, and more parental stress than parents of children in the community sample.
Hypothesis 1c	Average daily child screen media use will be significantly higher in at-risk groups (i.e., ADHD and early neurological risk) than the community group, though average daily parent screen media use will not differ significantly between groups.
Aim 2: Correlations among variables	
Hypothesis 2a	In all three samples (i.e., community, ADHD, and early neurological risk), increased use of all parental mediation strategies will be significantly related to less parental stress, less negative impact on the child, increased parent comfort with screen media, lower child use and lower child age.
Hypothesis 2b	In all three samples (i.e., community, ADHD, and early neurological risk), higher ratings of parental stress about managing child screen media use will be related to lower parent comfort with screen media, higher child screen media use, and higher ratings of the negative impact on the child.
Hypothesis 2c	In all three samples (i.e., community, ADHD, and early neurological risk), higher problems with inattention will be related to more negative impact of screen media on the child, more parental stress about screen media, and higher child use.
Hypothesis 2d	Among children aged 6-12 in the community sample, greater use of restriction/monitoring and internet safety parental mediation will be significantly related to less parent stress, less negative impact on their child and lower child screen media use.
Hypothesis 2e	Among adolescents aged 13-18 in the community sample, greater use of active mediation and internet safety parental mediation will be significantly related to less parent stress, less negative impact on their adolescent, and increased parent comfort with screen media.
Aim 3: Predicting screen media outcome variables	
Hypothesis 3a	In the community sample, more use of active mediation and internet safety mediation will predict lower parent stress, lower negative impact on the child and higher positive impact on the child. More use of restriction will predict lower child screen use.
Hypothesis 3b	In the ADHD sample, more use of restriction will predict lower parent stress, lower negative impact on the child, higher positive impact on the child and lower child screen.
Hypothesis 3c	In the early neurological risk sample, more use of restriction will predict lower parent stress, lower negative impact on the child, higher positive impact on the child and lower child screen use.

Method

Procedure

This study received appropriate institutional ethics approval prior to commencing data collection. Eligible parent participants were invited to complete an online survey about their child's screen media use and their parenting around screen media use. For sample 1 (i.e., Qualtrics community sample), eligible parents were contacted via email directly from the Qualtrics panel program and were prompted to complete the survey via Qualtrics. For sample 2 (i.e., CADDAC ADHD sample), parents were sent an email through the Centre for ADHD Awareness Canada (CADDAC) listserv and were invited to complete the survey via Qualtrics. For sample 3 (i.e., early neurological risk sample), parents who had previously participated in research within the NeuroOutcomes lab at SickKids were invited via email to complete the survey via RedCAP. All participants were first instructed to complete informed consent. Once consent was obtained, participants were asked to complete questionnaires related to screen media use, parenting approaches and child behaviour. Once all study questionnaires were complete, participants were asked to answer demographic and health history questions about their family and child. In the community sample, all participants were compensated for their time through the Qualtrics panel program. In the at-risk samples (i.e., ADHD and early neurological risk), all participants were eligible to be entered in a draw for the chance to win one of four $50 Amazon gift cards.

Participants

In this study, three samples were recruited. The first sample consisted of the community sample of 386 parents described in Study 1. The second sample consisted of 66 parents of children aged 6-18 with a previous diagnosis of ADHD, recruited in collaboration with the

Centre for ADHD Awareness Canada (CADDAC). Participants who met the following criteria were included: (1) English language proficiency, (2) currently living in Canada, (3) child has been previously diagnosed with ADHD, (4) child had at least "moderate" severity of inattention problems on the SNAP-IV and; (5) child had impairment due to inattention as "a medium amount" or "a lot" in at least two domains (e.g., school, home, leisure). The third sample consisted of 65 parents of children aged 6-18 at-risk for attention difficulties secondary to neurological/medical risk (e.g., stroke, congenital heart disease, extremely preterm birth, brain injury, etc.), recruited through the Neuropsychology department at the Hospital for Sick Children (SickKids). Participants who met the following criteria were included: (1) English language proficiency, (2) currently living in Canada, (3) child has a significant medical history that would put them at risk for attention difficulties (e.g., stroke, cancer, epilepsy or other neurological condition, extreme prematurity). Across all three samples, participants who met the following criteria were excluded: (1) duplicate IP addresses, (2) response pattern indicating poor data (e.g., extremely low variability within answers, selecting same rating across items), (3) response time indicating poor data (i.e., completed the survey in less than 7 minutes), (4) participant failed any of the attention check questions.

All participants completed a brief demographics form (Appendix A). Key participant demographics are summarized in Table 8. Briefly, the mean child age in the community sample was 11.59 years old (55% female, 73.3% white/Caucasian). In the ADHD sample, the mean child age was 12.03 years old (27% female, 69.7% white/Caucasian). In the early neurological risk sample, the mean child age was somewhat younger, at 8.55 years old (32.3% female, 69.2% white/Caucasian). The majority of parents who completed the questionnaires across all three samples identified as being their child's mother. The mean age of caregivers completed the

questionnaires ranged from 40.43 – 46.89 years old across the three samples. There was a higher proportion of parents who endorsed having completed a university/college degree in the ADHD sample (59.1%) and the early neurological risk sample (63.1%) than in the community sample (29%).

Table 8

Study 2 participant demographics.

	Percentage/*M(SD)*		
Variable	Community sample (*n*=386)	ADHD sample (*n*=66)	Early neurological risk sample (*n*=65)
Age of child (years)			
Mean (SD)	11.59(3.5)	12.03(2.98)	8.55(2.36)
Range	6-18	6-17	6-16
Sex of child			
Female	55%	27%	32.3%
Male	45%	73%	64.6%
Child race/ethnicity/cultural identity			
White/Caucasian	73.3%	69.7%	69.2%
Black/African American	11.1%	4.5%	4.6%
Indigenous	1.6%	9.1%	0%
American	5.2%	0%	0%
Canadian	0%	24.2%	21.5%
French Canadian	0%	6.1%	0%
Asian	1.3%	4.5%	15.4%
Hispanic/Latino	11.9%	4.5%	1.5%
Middle Eastern	0.3%	1.5%	1.5%
South Asian	0%	0%	6.2%
European	5.7%	31.8%	20%
Jewish	0%	3%	0%
Hawaiian	0.5%	0%	0%
Biracial	4.9%	7.6%	6.2%
Multiracial	0.8%	4.5%	0%
Prefer not to say	0.3%	3%	1.5%
Caregiver completing questionnaire			
Mother	76%	89%	95.4%
Father	13%	0%	5.6%
Grandparent	5%	2%	0%

Step-parent	3%	2%	0%
Legal guardian	0%	2%	0%
Other	3%	5%	0%
Age of caregiver (years)			
Mean (SD)	40.59(9.78)	46.89(5.83)	40.43(5.95)
Range	24-72	32-64	29-56
Caregiver level of education completed			
Did not complete high school	4.4%	0%	0%
High school graduate	27.7%	0%	9.2%
Partial college/university (at least one year)	25.9%	6.1%	4.6%
College/university degree	29%	59.1%	63.1%
Graduate/professional degree	12.7%	34.8%	21.5%
Would rather not say	0.3%	0%	1.5%

Participants in the two at-risk samples also provided information about their child's psychological and medical diagnoses (Table 9). In line with the inclusion criteria for this sample, 100% of participants in the ADHD sample endorsed their child having been previously diagnosed with ADHD. There was also a high proportion of parents in this group who endorsed that their child had been previously diagnosed with a Learning Disability (33.3%) or an anxiety disorder (33.8%). Most of the participants in the ADHD group reported that their child did not have any significant medical diagnoses or events, except for some endorsing preterm birth (9.1%). In the early neurological risk group, all participants endorsed that their child had at least one major medical diagnosis or event, with the most common being congenital heart disease (20%), stroke (16.9%), traumatic brain injury (16.9%) and preterm birth (13.8%). Consistent with the literature on children with early neurological risk, many of the parents in this sample also endorsed that their child had a prior psychological diagnosis. The most common psychological diagnoses endorsed included ADHD (35.4%), Learning Disability (24.6%), Autism Spectrum Disorder (24.6%), Intellectual Disability (21.5%) and an anxiety disorder (18.5%).

Table 9

Psychological and medical diagnoses for participants in the at-risk groups in Study 2.

	Percentage	
	ADHD sample (n=66)	Early neurological risk sample (*n*=65)
Variable		
Psychological diagnosis		
ADHD	100%	35.4%
Learning Disability	33.3%	24.6%
Intellectual Disability	4.5%	21.5%
Autism Spectrum Disorder	9.1%	24.6%
Tourette Syndrome/Tic Disorder	1.5%	0%
Fetal Alcohol Spectrum Disorder	3%	0%
Anxiety disorder	33.8%	18.5%
OCD	6.2%	4.6%
Depression	7.7%	1.5%
Substance use disorder	0%	0%
Psychosis	0%	0%
ODD/Conduct disorder	1.5%	1.5%
Eating disorder	1.5%	0%
PTSD	1.5%	0%
Developmental coordination disorder	4.5%	0%
Sensory processing disorder	1.5%	0%
Medical diagnosis		
Stroke	0%	16.9%
Epilepsy	0%	7.7%
Congenital Heart Disease (CHD)	0%	20%
Hypoxic Ischemic Encephalopathy	0%	1.5%
Thyroid disease	0%	1.5%
Cancer	0%	1.5%
Preterm birth	9.1%	13.8%
Traumatic brain injury	0%	16.9%
Cerebral palsy	0%	3.1%
Hydrocephalus	0%	1.5%
Moyamoya disease	0%	1.5%
Loeys-Dietz syndrome	0%	1.5%
Kidney disease	0%	1.5%

Measures

Parental Mediation Scale (PMS). The 23-item Parental Mediation Scale that was developed and described in Study 1 was administered to parents in all samples. A full list of the

final included items in each domain are included in Appendix D. The domain scores (i.e., sum of items within each domain) on the PMS were used in the analyses in this measure, namely the domain scores of restriction/monitoring (9 items), internet safety mediation (7 items), and active mediation (7 items).

Screen Media Use and Impact Questionnaire. Several items were developed and administered to assess child and parent screen media as well as its impacts on children and parents across several domains. All items are found in Appendix E. The following four domains were examined.

Child screen media use. Parents reported on their child's access for the following types of screen media: smartphone, laptop computer, desktop computer, iPad/tablet (or similar device), handheld video game player (e.g., Gameboy, PSP, Nintendo Switch), video game console, television and "other." Parents were also asked to estimate their child's average daily screen time on weekdays and weekends, and how much their child uses screen media for school/homework. The dependent variable used in analyses was the average daily screen time (i.e., ((5*weekday use) + (2*weekend use))/7) in number of hours.

Parent screen media use. Parents then reported which screen media devices they use. They were also asked to estimate their own average daily screen time on weekdays and weekends, and how much they screen media for work. Parents' comfort with technology was assessed by rating their comfort level in using screen media (e.g., searching for information online, downloading, using email, using social media, learning how to use new programs/apps). Response options ranged from *Very Uncomfortable (1)* to *Very Comfortable (10)*. Two dependent variables were used in analyses, namely average parent use (i.e., average daily screen

time that parents self-reported in number of hours; ((5*weekday use) + (2*weekend use))/7)) and parent comfort with technology (i.e., rating of their own comfort with technology from 1 – 10).

Impact of screen media use on child. Parents were asked to rate the degree of impact screen media has on their child across various child life domains including, schoolwork, family, mental health, physical health and exercise, sleep, peers/social life, and recreation and hobbies. Parents rated the negative impact and positive impact on a 5-point Likert scale from "1 = None" to "5 = A lot." A total score for negative impact was calculated by summing scores across all domains of functioning, which was used as a dependent variable in analyses. The internal consistency of these items was found to be excellent (α=.96). A total score for positive impact was calculated by summing scores across all domains of functioning, which was used as a dependent variable in analyses. The internal consistency of these items was also found to be excellent (α=.94).

Parental stress about child screen media use. The impact of child screen media use on parent stress and sense of competency was assessed using 12-items. These items were developed in consultation with experts in developmental psychology. Items assessed parent stress and worry related to their child's screen media use (e.g., trying to manage my child's screen media use causes me stress), wanting the amount or manner of screen media use to be different (e.g., I wish I could reduce the amount of time my child uses screen media devices), sense of competency parenting around screen media use (e.g., other parents are better able to manage their children's screen media use), and parent-child relationship (e.g., my child's screen media use negatively affects our relationship). Parents were asked to rate how much they agree with each item on a 6-point Likert-type scale from "1= Strongly Disagree" to "6 = Strongly Agree." A

total score was calculated by summing all items and was used as the dependent measure in analyses. The internal consistency of these items was found to be excellent (α=.93).

Swanson, Nolan, and Pelham Rating Scale – Fourth Version (SNAP-IV). The SNAP-IV is a parent questionnaire used to assess inattention, hyperactivity/impulsivity and oppositional behaviours. There are 26 items in total, which can be divided into three scales: inattention (9 items), hyperactivity/impulsivity (9 items), and oppositional (8 items). In this study, only the items from the inattention and hyperactivity/impulsivity scales were included, for a total of 18 items (Appendix C). Participants were asked to rate their child's behaviour on a four-point Likert-type scale (1= "not at all", 4 = "very much"). Higher total scores on the SNAP-IV indicate more problem behaviours. Subscale scores for the inattention and hyperactivity/impulsivity domains were created by calculating a total score for the items in each domain, for a possible maximum score of 27 in each domain. Clinically significant symptoms were determined using the suggested cut-off score of 13/27 (Swanson et al., 2012). The inattention domain score was also used in correlational analyses within each group.

Statistical Analyses

All analyses were conducted using SPSS software. First, we calculated item-level descriptive statistics of all the variables in the dataset. Visual inspection of the distributions of each measure as well as indices of skewness and kurtosis were calculated for each variable to assess the normality of each variable and determine appropriateness for subsequent parametric analyses. Comparative analyses were conducted on matched samples (age and sex). The decision to create matched samples was guided by the following considerations for possible confound variables within the full samples: (1) significant age and sex differences were detected between groups, and (2) sample size of groups differed significantly. To compare scores across the three

samples, the samples were first matched on age (within 1 year of each other) and sex (same sex). With these matching criteria, 36 participants from each group were identified and matched. Demographic and psychological/medical diagnostic information of this matched sample is presented in Table 10. Comparative analyses with post-hoc analyses were then conducted on the PMS, reported parental stress, reported positive and negative impact of screen media on their child, and daily parent and child screen use to compare scores on these measures across the three groups. Significance was reported using corrected p-values (i.e., Benjamini-Hochberg adjusted p value), computed with 5% false discovery rates (FDR) to account for multiple comparisons.

Table 10.

Demographic information and psychological/medical diagnoses for participants in the matched sample (n=36 per group).

	Percentage/*M(SD)*		
Variable	Community sample (*n*=36)	ADHD sample (*n*=36)	Early neurological risk sample (*n*=36)
Age of child (years)			
Mean (Swanson et al.)	9.97(2.34)	10.03(2.36)	9.75(2.33)
Range	6-16	6-16	6-16
Sex of child			
Female	25%	25%	25%
Male	75%	75%	75%
Child race/ethnicity/cultural identity			
White/Caucasian	75%	75%	72.2%
Black/African American	5.6%	0%	2.8%
Indigenous	2.8%	11.1%	0%
American	2.8%	0%	0%
Canadian	0%	30.6%	19.4%
French Canadian	0%	8.3%	0%
Asian	0%	8.3%	13.9%
Hispanic/Latino	16.7%	5.6%	2.8%
Middle Eastern	2.8%	0%	0%
South Asian	0%	0%	2.8%
European	2.8%	19.4%	22.2%
Jewish	0%	2.8%	0%
Hawaiian	0%	0%	0%

Biracial	2.8%	8.3%	5.6%
Multiracial	0%	0%	0%
Prefer not to say	0%	2.8%	2.8%
Caregiver completing questionnaire			
Mother	69.4%	88.9%	95.4%
Father	16.7%	8.3%	5.6%
Grandparent	8.3%	2.8%	0%
Step-parent	5.6%	0%	0%
Legal guardian	0%	0%	0%
Other	0%	0%	0%
Age of caregiver (years)			
Mean (SD)	38.25(10.84)	45.19(6.22)	42.22(5.91)
Range	25-62	32-64	31-56
Caregiver level of education completed			
Did not complete high school			
High school graduate	5.6%	0%	0%
Partial college/university (at	16.7%	0%	5.6%
least one year)	36.1%	0%	5.6%
College/university degree	27.8%	58.3%	72.2%
Graduate/professional degree	13.9%	41.7%	13.9%
Would rather not say	0%	0%	2.8%
Psychological diagnosis			
ADHD	0%	100%	33.3%
Learning Disability	0%	25%	27.8%
Intellectual Disability	0%	2.8%	25%
Autism Spectrum Disorder	0%	8.3%	30.6%
Tourette Syndrome/Tic Disorder	0%	2.8%	0%
Fetal Alcohol Spectrum Disorder	0%	2.8%	0%
Anxiety disorder	0%	27.8%	13.9%
OCD	0%	8.3%	2.8%
Depression	0%	2.8%	0%
Substance use disorder	0%	0%	0%
Psychosis	0%	0%	0%
ODD/Conduct disorder	0%	2.8%	0%
Eating disorder	0%	0%	0%
PTSD	0%	2.8%	0%
Developmental coordination disorder	0%	5.6%	0%
Sensory processing disorder	0%	0%	0%
Medical diagnosis			
Stroke	0%	0%	16.7%
Epilepsy	0%	0%	8.3%
Congenital Heart Disease	0%	0%	19.4%
Hypoxic Ischemic Encephalopathy	0%	0%	2.8%
Thyroid disease	0%	0%	2.8%
Cancer	0%	0%	2.8%
Preterm birth	0%	8.3%	11.1%

Traumatic brain injury	0%	0%	11.1%
Cerebral palsy	0%	0%	5.6%
Hydrocephalus	0%	0%	2.8%
Moyamoya disease	0%	0%	2.8%
Loeys-Dietz syndrome	0%	0%	2.8%
Kidney disease	0%	0%	0%

To address the second study aim, correlations were calculated within each of the full three samples independently. Specifically, the relationships between the PMS domains, parental stress, parent comfort with screen media, child daily use, negative and positive impact of screen media on the child, ratings of child inattention and child age were assessed. These correlations were calculated within the full community, ADHD and early neurological risk samples separately. They were also separately calculated within age groups of the community sample (i.e., 6-12 years old and 13-18 years old) in order to detect any trends related to age group. It was decided to calculate these correlations separately within sample groups and within age groups in order to generate interpretable correlation coefficients for each of these groups, to better understand trends that emerge within groups. Significance was reported using corrected p-values (i.e., Benjamini-Hochberg adjusted p value), computed with 5% false discovery rates (FDR) in order to account for multiple comparisons.

To address the third aim, regression analyses were conducted within each of the full three samples independently (i.e., community, ADHD, and early neurological risk). Four multiple linear regression models were estimated within each sample to predict screen media outcomes (i.e., parent stress, negative impact on child, positive impact on child, child screen use) from parental mediation strategies (i.e., restriction, active mediation, internet safety mediation) while controlling for child age and sex.

Results

Aim 1: Group comparative analyses

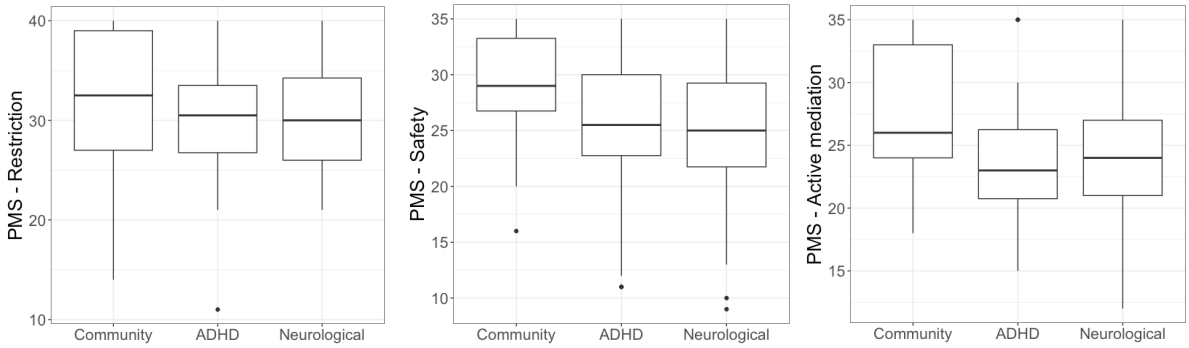
Assumption verification for group comparisons. An examination of the variables used in the group comparative analyses was conducted to ensure that assumptions were met before proceeding with further analyses. First, the parametric nature of each variable for each group within the matched sample was examined to ensure normal distribution to proceed with further analyses. Histograms and Q-Q plots for all variables were visually inspected. Means, standard deviations, indices of skewness and kurtosis were calculated for all variables by group within the matched sample. Shapiro-Wilks tests of normality were also conducted to assess the normality of the distribution of all variables by group. Levene's test was also conducted for each variable to assess the homogeneity of variance of all variables. Results from these analyses are summarized in Appendix G. These analyses revealed that for all the variables in this study, at least one of the groups did not meet the assumption of normality. As such, non-parametric analyses were used for the subsequent group comparisons, namely Kruskal-Wallis tests and Mann-Whitney U tests (post-hoc).

Hypothesis 1a: Parental mediation. First, domains on the PMS were compared by group (Figure 5). A Kruskal-Willis H test revealed that there was not a statistically significant difference in the restriction/monitoring domain on the PMS between groups, $\chi^2(2)=1.47$, $p=.48$. A statistically significant difference in the internet safety domain on the PMS was identified between groups, $\chi^2(2)=9.26$, $p=.01$. Post-hoc analyses identified that the parents in the community group ($M_{rank}=67.43$) reported using internet safety mediation significantly more than the ADHD group ($M_{rank}=48.01$, $p=.03$) and the neurological group ($M_{rank}=48.06$, $p=.03$), though the ADHD group and the neurological group were not significantly different from one another.

Finally, a statistically significant difference in the active mediation domain on the PMS was also identified between groups, $\chi^2(2)=11.93$, $p=.003$. Post-hoc analyses identified that again parents in the community group ($M_{rank}=68.99$) reported using significantly more active mediation than the ADHD group ($M_{rank}=45.19$, $p=.004$) and the neurological group ($M_{rank}=49.32$, p=.02), though the ADHD group and the neurological group were not significantly different from one another.

Figure 5

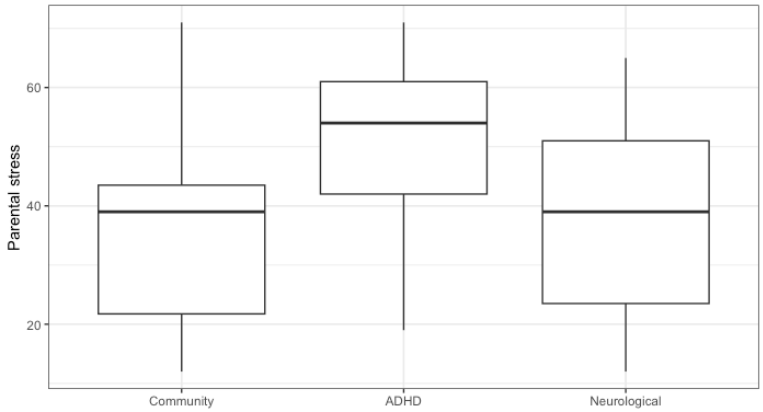
Comparisons between groups on domains of the PMS



Hypothesis 1b: Impact of screen media use on parents and children. First, ratings of parental stress about their child's screen media were compared by group (Figure 6). A Kruskal-Willis H test revealed that there was a statistically significant difference in parental stress between groups, $\chi^2(2)=22.13$, $p<.001$. Post-hoc analyses identified that parents in the ADHD group ($M_{rank}=73.32$) reported significantly more parental stress than the community sample ($M_{rank}=40.43$, $p<.001$) and the neurological sample ($M_{rank}=48.09$, $p=.002$), though the community group and the neurological group were not significantly different from one another.

Figure 6

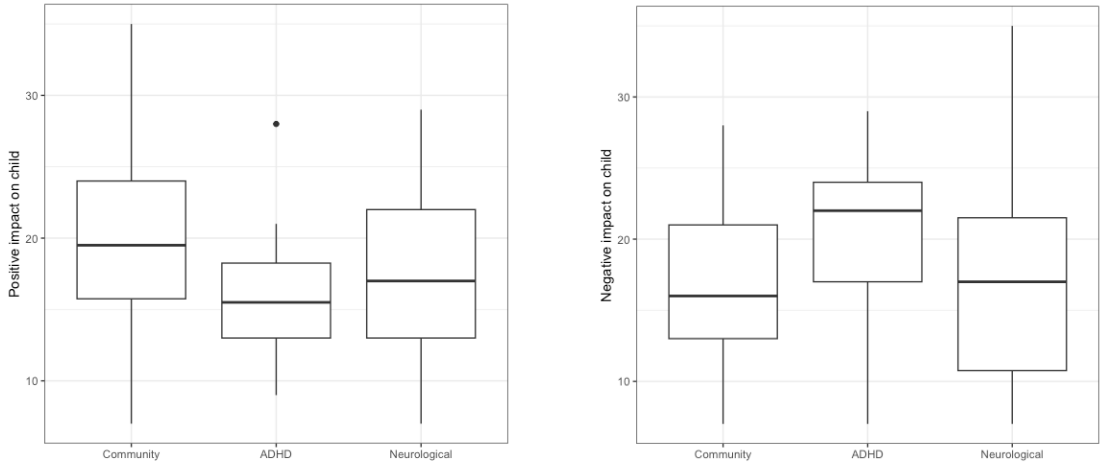
Comparisons between groups on parental stress about child screen media use



Second, ratings of the impact of screen media use on the participants' child were compared by group (Figure 7). A Kruskal-Willis H test revealed that there was a statistically significant difference in parent ratings of the positive impact of screen media on their child, $\chi^2(2)=7.30$, $p=.03$. Post-hoc analyses identified that parents in the ADHD sample ($M_{rank}=45.17$) reported significantly less positive impact of screen media on their child than parents in the community sample ($M_{rank}=64.63$, $p=.02$), though not significantly less than parents in the neurological sample ($M_{rank}=52.16$, $p=.27$). The community sample and the neurological sample were not significantly different from one another in terms of positive impact. A statistically significant difference in ratings of the negative impact of screen media use on their child was also identified between groups, $\chi^2(2)=8.95$, $p=.01$. Post-hoc analyses identified that parents in the ADHD sample ($M_{rank}=67.06$) reported significantly more negative impact on their child than parents in the community sample ($M_{rank}=46.40$, $p=.01$), though not significantly more than parents in the neurological sample ($M_{rank}=50.04$, $p=.06$). The community sample and the neurological sample were not significantly different from one another in terms of negative impact.

Figure 7

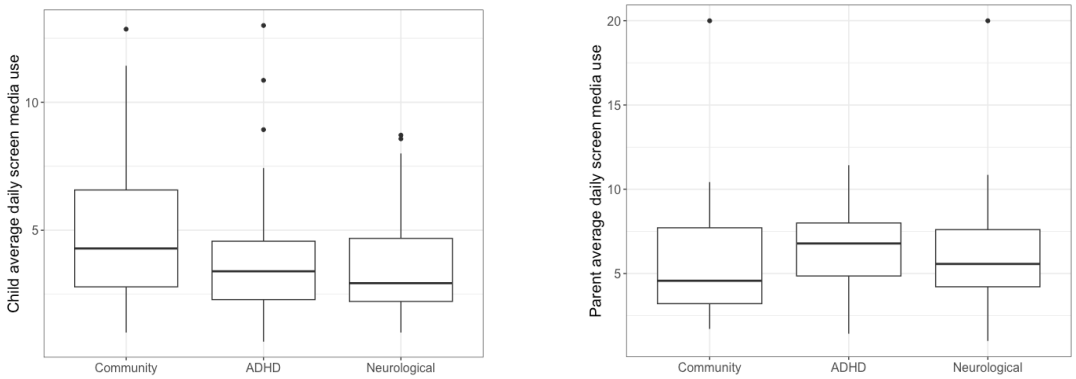
Comparisons between groups on the reported positive and negative impact of screen media use on the child



Hypothesis 1c: Average daily child and parent screen media use. The daily average number of hours of child and parent screen media use were compared by group (Figure 8). A Kruskal-Willis H test revealed that there was not a statistically significant difference in average daily child screen media use between groups, $\chi^2(2)=4.68$, $p=.09$. Additionally, there was no statistically significant difference found in average daily parent screen media use between groups, $\chi^2(2)=3.56$ $p=.17$.

Figure 8

Comparisons between groups on average daily child and parent screen media use.



Summary of comparative analyses. Participants in the three groups (i.e., community, ADHD and early neurological risk) were compared on several outcome measures. While parents did not differ in terms of their use of restriction/monitoring, parents in the community sample reported using significantly more internet safety mediation and active mediation than the clinical groups. However, parents in the ADHD group reported the most parental stress and negative impact on their child, as well as the least amount of positive impact on their child. The three groups did not differ significantly in terms of child or parent screen media use. Because the groups were significantly different on many of the outcome measures, the subsequent correlational and regression analyses were conducted separately within each group.

Aim 2: Correlational analyses

Assumption verification for correlational analyses. An examination of the variables used in the correlational analyses in the full community sample, ADHD sample, and early neurological risk was conducted to ensure that assumptions were met before proceeding with further analyses. First, the parametric nature of each variable for each group was examined to ensure normal distribution to proceed with further analyses. Histograms and Q-Q plots for all variables were visually inspected. Means, standard deviations, indices of skewness and kurtosis were calculated for all variables within each sample. Shapiro-Wilks tests of normality were also conducted to assess the normality of the distribution of all variables (Appendix H). These analyses revealed that most of the variables within all three samples did not meet the assumption of normality. As such, non-parametric analyses were used for the subsequent correlational analyses, namely Spearman correlations.

Hypothesis 2a: Correlates of the PMS within all groups. Correlations among all variables were assessed separately within the full community sample, ADHD sample, and the

early neurological risk sample (Table 11). The domains on the PMS were found to be significantly correlated positively with one another in the community sample (r_s=.71-.77), the ADHD sample (r_s=.35-.60) and the early neurological risk sample (r_s=.65-.78). As predicted, higher endorsement of using restriction/monitoring was significantly related to lower parental stress, though only in the ADHD group (r_s=-.30, p=.02) and the neurological group (r_s=-.38, p=.002). Increased parent comfort with technology was significantly related to increased use of restriction/monitoring in the community sample, though the relationship was quite small (r_s=.11, p=.03). While increased use of restriction/monitoring was only significantly related to reduced child daily use of screens in the community sample (r_s=-.21, p=<.001) and the ADHD sample (r_s=-.44, p<.001), it was only significantly related to less negative impact on the child in the neurological group (r_s=-.33, p=.01). Greater use of restriction/monitoring was not significantly related to positive impact on the child in any of the groups. Younger child age was also significantly related to more restriction/monitoring, though only in the community sample (r_s=-.51, p=<.001) and the ADHD sample (r_s=-.48, p<.001).

As predicted, increased internet safety mediation was significantly related to lower parental stress, though only in the community sample (r_s=-.25, p=<.001) and the ADHD sample (r_s=-.25, p=.05). Only in the community sample, higher endorsement of internet safety mediation was significantly related to higher rated parent comfort with screen media (r_s=.18, p<.001). While increased internet safety was not significantly related to reduced child daily use, it was significantly related to lower negative impact on the child, though only in the community sample (r_s=-.12, p=.02). Greater use of internet safety mediation was not significantly related to positive impact on the child in any of the groups. Younger child age was only significantly related to more internet safety mediation in the community sample (r_s=-,22 p=<.001).

Table 11.

Correlations between PMS domains and all variables in the community sample (N=386), ADHD sample (N=66), and early neurological risk sample (N=65)

	PMS – Restrict	PMS – Safety	PMS – Active	Parental stress	Parent comfort	Child daily use	Negative impact	Positive impact	SNAP Inattention	Child age
PMS – Restrict										
Community	1.00	.71*	.77*	-.07	.11*	-.21*	-.08	-.04	-.06	-.51*
ADHD	1.00	.50*	.35*	-.30*	.06	-.44*	-.11	-.18	.02	-.48*
Neurological	1.00	.70*	.65*	-.38*	.16	-.23	-.33*	-.13	-.08	-.19
PMS – Safety										
Community	-	1.00	.77*	-.25*	.18*	-.10	-.12*	.03	-.14*	-.22*
ADHD	-	1.00	.60*	-.25*	-.03	.03	-.20*	.02	.02	.09
Neurological	-	1.00	.78*	-.18	-.09	-.10	-.08	-.01	-.12	.21
PMS – Active										
Community	-	-	1.00	-.11*	.12*	-.11*	-.05	.10	-.09	-.33*
ADHD	-	-	1.00	-.21	.18	-.12	.02	.02	-.07	-.14
Neurological	-	-	1.00	-.29*	.02	-.26*	-.14	.06	-.12	-.02
Parent stress										
Community	-	-	-	1.00	-.30*	.08	.65*	.09	.62*	.01
ADHD	-	-	-	1.00	-.09	.33*	.63*	-.05	.20	.16
Neurological	-	-	-	1.00	-.40*	.46*	.79*	-.37*	.31*	.24
Parent comfort										
Community	-	-	-	-	1.00	.03	-.22*	-.01	-.19*	-.05
ADHD	-	-	-	-	1.00	.09	-.23*	.12	-.19	-.01
Neurological	-	-	-	-	1.00	-.20	-.39*	-.16	-.16	-.30*
Child use										
Community	-	-	-	-	-	1.00	.23*	.12*	.18*	.21*
ADHD	-	-	-	-	-	1.00	.05	.28*	-.04	.48*
Neurological	-	-	-	-	-	1.00	.46*	.50*	.31*	.48*
Negative impact										
Community	-	-	-	-	-	-	1.00	-.19*	.52*	-.03

ADHD	-	-	-	-	-	-	1.00	-.16	.33*	.09
Neurological	-	-	-	-	-	-	1.00	-.56*	.37*	.24
Positive impact										
Community	-	-	-	-	-	-	-	1.00	.05	.16*
ADHD	-	-	-	-	-	-	-	1.00	.01	.27*
Neurological	-	-	-	-	-	-	-	1.00	-.27*	.23*
SNAP - Inattention										
Community	-	-	-	-	-	-	-	-	1.00	-.03
ADHD	-	-	-	-	-	-	-	-	1.00	.06
Neurological	-	-	-	-	-	-	-	-	1.00	.14
Child age										
Community	-	-	-	-	-	-	-	-	-	1.00
ADHD	-	-	-	-	-	-	-	-	-	1.00
Neurological	-	-	-	-	-	-	-	-	-	1.00

*Note: *indicates a significant association (p=.05 or smaller).*

In the domain of active mediation, increased endorsement of this strategy was significantly related to lower parental stress, though only in the community sample (r_s=-.11, p=.03) and the neurological sample (r_s=-.29, p=.02). In the community sample, higher endorsement of active mediation was also significantly related to higher rated parent comfort with screen media (r_s=.12, p=.02), reduced child daily use (r_s=-.11, p=.03), and younger child age (r_s=-.33, p<.001). In the neurological sample, higher endorsement of active mediation was significantly related to lower child daily use (r_s=-.26, p=.04). However, in the ADHD sample, active mediation was not significantly related to any of the other correlates. Greater use of active mediation was not significantly related to positive or negative impact on the child in any of the groups.

Hypothesis 2b: Correlates of parental stress within all groups. Increased parental comfort with screen media was found to be significantly related to lower parental stress in the community sample (r_s=-.30, p<.001) and the neurological sample (r_s=-.40, p=.001). Additionally, higher child daily screen media use was significantly related to higher parental stress in both the ADHD sample (r_s=.33, p=.01) and the neurological sample (r_s=.46, p=<.001). Finally, higher negative impact on the child was significantly and strongly related to more parental stress across the community sample (r_s=.65, p<.001), ADHD sample (r_s=.63, p=<.001) and the neurological sample (r_s=.79, p=<.001). In the neurological group, higher parental stress was also significantly associated with lower positive impact of screens on the child (r_s=-.37, p=.01)

Hypothesis 2c: Correlates of child inattention within all groups. Higher ratings of child inattention were significantly related to higher ratings of parental stress in the community sample (r_s=.62, p=<.001) and the neurological sample (r_s=.31, p=.01). Higher daily child use was also significantly related to higher ratings of child inattention in both the community sample

(r_s=.18, p<.001) and the neurological sample (r_s=.31, p=.01). Finally, more negative impact on the child was significantly related to higher ratings of child inattention across all samples, namely the community group (r_s=.52, p<.001), ADHD group (r_s=.33, p=.01) and the neurological sample (r_s=.37, p=.01).

Hypothesis 2d and 2e: Correlations within age groups in the community sample. The community sample was then split into two age groups (i.e., 6-12 years old and 13-18 years old) to examine whether these patterns of correlations differed among parents of younger children and parents of adolescents. In the community sample, 217 children were aged 6-12 years old and 169 children fell in the 13-18 years old range (Table 12). The domains on the PMS were found to be significantly and strongly correlated with one another in both the child group (r_s=.72-.73, p<.001) and the adolescent group (r_s=.71-.81, p<.001).

As predicted, differences in the correlation patterns emerged between age groups when looking at the relationships between PMS domains and outcomes on parents and children. Generally, increased use of PMS strategies was related to lower negative impact on parents and children in the child group, but not in the adolescent group. In the child group, lower parental stress was significantly related to increased use of restriction/ monitoring (r_s=-.25, p<.001), internet safety mediation (r_s=-.37, p<.001) and active mediation (r_s=-.23, p<.001), but not in the adolescent group. In fact, increased use of restriction/monitoring in the adolescent group was associated with higher parental stress (r_s=.16, p=.04). Only in the child group, increased restriction/monitoring was significantly associated with less child daily use (r_s=-.15, p=.04) and negative impact on the child (r_s=-.15, p=.03), increased internet safety mediation was significantly associated with less negative impact on the child (r_s=-.15, p=.03), and increase active mediation was significantly associated with more positive impact on the child (r_s=.13,

Table 12. *Correlations between PMS domains and all variables in the community sample, split by children (n=217) and adolescents (n=169).*

	PMS – Restrict	PMS – Safety	PMS – Active	Parental stress	Parent comfort	Child daily use	Negative impact	Positive impact	SNAP Inattention	Child age
PMS – Restrict										
Child	1.00	.72*	.73*	-.25*	.17*	-.15*	-.15*	.02	-.15*	-.13
Adolescent	1.00	.81*	.71*	.16*	-.05	-.09	.12	-.01	.02	-.42*
PMS – Safety										
Child	-	1.00	.72*	-.37*	.19*	-.07	-.15*	.08	-.20*	.01
Adolescent	-	1.00	.76*	-.10	.16*	-.03	.06	.06	-.07	-.32*
PMS – Active										
Child	-	-	1.00	-.23*	.14*	-.07	-.09	.13*	-.16*	-.08
Adolescent	-	-	1.00	.02	.07	-.04	.05	.12	-.03	-.31*
Parent stress										
Child	-	-	-	1.00	-.22*	.19*	.64*	-.12*	.61*	.07
Adolescent	-	-	-	1.00	-.41*	.29*	.66*	-.03	.64*	-.10
Parent comfort										
Child	-	-	-	-	1.00	.04	-.15*	.01	-.21*	.01
Adolescent	-	-	-	-	1.00	.03	-.29*	-.04	-.18*	.02
Child use										
Child	-	-	-	-	-	1.00	.22*	.19*	.13	.14*
Adolescent	-	-	-	-	-	1.00	.21*	.09	.28*	.01
Negative impact										
Child	-	-	-	-	-	-	1.00	-.24*	.50*	.12
Adolescent	-	-	-	-	-	-	1.00	.07	.56*	-.07
Positive impact										
Child	-	-	-	-	-	-	-	1.00	.07	.15*
Adolescent	-	-	-	-	-	-	-	1.00	-.08	.06
SNAP - Inattention										
Child	-	-	-	-	-	-	-	-	1.00	.01
Adolescent	-	-	-	-	-	-	-	-	1.00	-.04

Child age										
Child	-	-	-	-	-	-	-	-	-	1.00
Adolescent	-	-	-	-	-	-	-	-	-	1.00

*Note: *indicates a significant association (p=.05 or smaller).*

p=.01). Overall, this suggests that while increased use of parental mediation is associated with less negative impacts on parents and younger children, the same is not true amongst adolescents.

In contrast, many of the other correlation trends that were found in the full community sample (Table 11) were found to be consistent across age groups (Table 12). For example, increased parental stress was significantly related to lower parent comfort with screen media (r_s=-.22 – -.41), higher child daily use (r_s=.19 – .29) and more negative impact on the child (r_s=.64 – .66) across both the child and adolescent group. Additionally, higher ratings of inattention were strongly related to higher parental stress about screen media use (r_s=.61 – .64) and greater negative impact of screen media on the child (r_s=.50 – .56) in both age groups.

Aim 3: Regression analyses

Assumption verification for regression analyses. All variables used in the regression analyses within the full community sample, ADHD sample, and early neurological risk were examined to ensure that assumptions were met before proceeding with further analyses. To assess that the partial relationship between each outcome variable (i.e., parent stress, negative impact on the child, positive impact on the child, child screen use) and each predictor (i.e., PMS – restriction, PMS – active mediation, PMS – internet safety, child age, child sex) was linear, the model's residuals were plotted against each predictor. Upon visual inspection, there did not appear to be any patterns that would indicate a non-linear trend between variables. Next, histograms of the residuals for each of the dependent variables (i.e., parent stress, negative impact on the child, positive impact on the child, child screen use) were examined. The distributions seemed to be unimodal and generally normally distributed, suggesting no concerns about the assumption of the normal distribution of errors in the dependent variables. Studentized residuals of the dependent variables were also plotted against predicted values, and no concerns

regarding homogeneity of variance were detected. Finally, multicollinearity was assessed by calculating VIF values, none of which were identified as problematic within this data.

Hypothesis 3a: Predicting screen media outcomes in the community sample. Four separate multiple linear regression models were estimated to predict screen media outcomes (i.e., parental stress, negative impact on the child, positive impact on the child, child screen use) from parental mediation strategies on the PMS (i.e., restriction, active mediation, internet safety), child age and child sex in the community sample (Table 13). First, the overall model predicting parental stress about child screen media use was found to be significant, such that the combined effect of PMS strategies, child age and child sex explained a significant proportion of variance in parental stress, R^2=.06, F(5, 380)=4.62, p<001. Greater use of the PMS strategies of restriction (t=-3.13, p=.002) and internet safety mediation (t=-3.63, p<.001) were found to be significant unique predictors of lower parental stress. Second, the overall model predicting negative impact of screen media on the child was not found to be significant, R^2=.01, F(5, 380)=1.51, p=.19, though higher child age emerged as a unique predictor of greater negative impact (t=2.18, p=.03). Third, the overall model predicting positive impact of screen media on the child was found to be significant, such that the combined effect of PMS strategies, child age and child sex explained a significant proportion of variance in positive impact on the child, R^2=.09, F(5, 380)=7.26, p<001. Greater use of the PMS strategy of active mediation (t=4.20, p<.001) and higher child age (t=3.17, p=.002) were found to be significant unique predictors of greater positive impact on the child. Finally, the overall model predicting average daily child screen use was found to be significant, such that the combined effect PMS strategies, child age and child sex explained a significant proportion of variance in daily child screen media use, R^2=.04, F(5,

380)=3.11, p=.009. Greater use of the PMS strategy of restriction (t=-2.06, p=.04) was found to be a significant unique predictor of lower daily child screen use.

Table 13.

Community sample (N=386): Results from regression models predicting screen media outcome variables from parental mediation strategies, child sex, and child age.

Dependent variable Independent variables	β	SE(β)	*t*	*p*
Parental stress about child screen media use				
PMS – Restriction	-.39	.13	-3.13	.002*
PMS – Active mediation	-.15	.19	-.81	.42
PMS – Internet safety	.-62	.17	-3.63	<.001*
Child sex	-.16	1.31	-.12	.91
Child age	.27	.23	1.19	.23
Negative impact of screen media on the child				
PMS – Restriction	.06	.06	1.16	.25
PMS – Active mediation	.04	.08	.44	.66
PMS – Internet safety	-.13	.08	-1.73	.09
Child sex	.39	.58	.68	.50
Child age	.22	.10	2.18	.03*
Positive impact of screen media on the child				
PMS – Restriction	-.09	.05	-1.72	.09
PMS – Active mediation	.34	.08	4.20	<.001*
PMS – Internet safety	-.08	.07	-1.09	.28
Child sex	.92	.57	1.62	.11
Child age	.31	.10	3.17	.002*
Average daily child screen use				
PMS – Restriction	-.07	.04	-2.06	.04*
PMS – Active mediation	.04	.05	.77	.45
PMS – Internet safety	.01	.05	.27	.79
Child sex	.01	.35	.03	.98
Child age	.09	.06	1.47	.14

*Note: *indicates a significant finding (p=.05 or smaller).*

Hypothesis 3b: Predicting screen media outcomes in the ADHD sample. Four multiple regression models were then estimated to predict screen media outcomes (i.e., parental stress, negative impact on the child, positive impact on the child, child screen use) from parental mediation strategies on the PMS (i.e., restriction, active mediation, internet safety), child age and child sex in the ADHD sample (Table 4). First, the overall model predicting parental stress about child screen media use was not found to be significant, R^2=.13, F(5, 60)=1.80, p=.13, and no unique predictors emerged. Second, the overall model predicting negative impact of screen media use on the child was not found to be significant, R^2=.09, F(5, 60)=1.13, p=.36, and no unique predictors emerged. Third, the overall model predicting positive impact of screen media use on the child was not found to be significant, R^2=.12, F(5, 60)=1.56, p=.19, and no unique predictors emerged. Finally, the overall model predicting average daily child screen use was found to be significant, such that the combined effect of PMS strategies, child age and child sex explained a significant proportion of variance in daily child screen media use, R^2=.31, F(5, 60)=5.28, p<.001.Greater use of the PMS strategies of restriction (t=-2.97, p=.004) and internet safety (t=-2.53, p=.01) were found to be significant unique predictors of lower daily child screen use in this sample. Higher child age was also found to be a significant unique predictor of higher daily child screen use (t=3.83, p<.001).

Table 14.

ADHD sample (N=66): Results from regression models predicting screen media outcome variables from parental mediation strategies, child sex, and child age.

Dependent variable Independent variables	β	SE(β)	*t*	*p*
Parental stress about child screen media use				
PMS – Restriction	-.29	.22	-1.33	.19
PMS – Active mediation	-.56	.38	-1.45	.15
PMS – Internet safety	.05	.31	.16	.87

Child sex	.70	2.94	.24	.81
Child age	.21	.44	.48	.64
Negative impact of screen media on the child				
PMS – Restriction	.01	.10	.11	.92
PMS – Active mediation	-.18	.18	-.96	.34
PMS – Internet safety	-.13	.15	-.91	.37
Child sex	1.25	1.39	.90	.37
Child age	.10	.21	.50	.62
Positive impact of screen media on the child				
PMS – Restriction	-.13	.07	-1.83	.07
PMS – Active mediation	-.06	.13	-.48	.63
PMS – Internet safety	.16	.10	-.48	.63
Child sex	-.73	.98	-.75	.46
Child age	.11	.15	.78	.44
Average daily child screen use				
PMS – Restriction	-.14	.05	-2.97	.004*
PMS – Active mediation	-.10	.09	-1.20	.24
PMS – Internet safety	-.17	.07	-2.53	.01*
Child sex	.07	.32	.22	.83
Child age	.40	.11	3.83	<.001*

*Note: *indicates a significant finding (p=.05 or smaller).*

Hypothesis 3c: Predicting screen media outcomes in the early neurological risk sample. Four multiple regression models were then estimated to predict screen media outcomes (i.e., parental stress, negative impact on the child, positive impact on the child, child screen use) from parental mediation strategies on the PMS (i.e., restriction, active mediation, internet safety), child age and child sex in the early neurological risk sample (Table 15). First, the overall model predicting parental stress about child screen media use was found to be significant, such that the combined effect of PMS strategies, child age and child sex explained a significant proportion of variance in parental stress, R^2=.18, F(5, 58)=2.38, p=.04. Greater use of the PMS strategy of restriction (t=-1.91, p=.05) was found to be a significant unique predictor of lower parental

stress. Second, the overall model predicting negative impact of screen media on the child was found to be significant, such that the combined effect of PMS strategies, child age and child sex explained a significant proportion of variance in negative impact on the child, R^2=.19, F(5, 58)=2.76, p=.03. Greater use of the PMS strategy of restriction (t=-2.33, p=.02) was found to be a significant unique predict of lower negative impact on the child. Third, the overall model predicting positive impact of screen media use on the child was not found to be significant, R^2=.08, F(5, 58)=.98, p=.46, and no unique predictors emerged. Finally, the overall model predicting average daily child screen use was found to be significant, such that the combined effect of PMS strategies, child age and child sex explained a significant proportion of variance in daily child screen media use, R^2=.29, F(5, 58)=4.69, p=.001. Only higher child age was found to be a significant unique predictor of higher daily child screen use (t=3.83, p<.001).

Table 15

Early neurological risk sample (N=65): Results from regression models predicting screen media outcome variables from parental mediation strategies, child sex, and child age.

Dependent variable Independent variables	β	SE(β)	*t*	*p*
Parental stress about child screen media use				
PMS – Restriction	-.91	.48	-1.91	.05*
PMS – Active mediation	-.32	.56	-.58	.57
PMS – Internet safety	.39	.53	.73	.47
Child sex	-1.66	2.80	-.59	.56
Child age	.97	.95	1.02	.31
Negative impact of screen media on the child				
PMS – Restriction	-.44	.19	-2.33	.02*
PMS – Active mediation	-.02	.22	-.07	.95
PMS – Internet safety	.27	.21	1.30	.20
Child sex	-.70	1.14	-.62	.54
Child age	.45	.37	1.21	.23

Positive impact of screen media on the child				
PMS – Restriction	-.07	.17	-.41	.67
PMS – Active mediation	.15	.20	.75	.47
PMS – Internet safety	-.04	.19	-.19	.85
Child sex	.04	1.03	.04	.97
Child age	.55	.34	1.62	.11
Average daily child screen use				
PMS – Restriction	.01	.05	.22	.83
PMS – Active mediation	-.05	.06	-.84	.40
PMS – Internet safety	-.01	.06	-.25	.80
Child sex	.07	.32	.22	.83
Child age	.40	.12	3.83	<.001*

*Note: *indicates a significant finding (p=.05 or smaller).*

Discussion

In the current study, parents completed online questionnaires about parental mediation of screen media use from three samples, namely a community sample, an ADHD sample, and an early neurological risk sample. Specifically, parents completed questionnaires that assessed parental mediation (PMS), parental stress about screen media use, parent comfort with technology, the positive and negative impact of screen media use on the child, daily average screen time (parent and child), and ratings of child inattention (SNAP-IV). Following this, we created a sample matched on age and sex to calculate group comparisons, and then examined the relationships between these variables within each group.

While it was hypothesized that parents of children at-risk for attention difficulties (i.e., ADHD sample and neurological sample) would endorse using significantly more strategies across all domains of the PMS, this was not supported by our findings. In fact, no significant group differences were found in the restriction/monitoring domain, and parents of the community sample actually reported using significantly more internet safety and active

mediation strategies than both at-risk samples. Though research characterizing parental mediation in children with attention difficulties is limited to date, initial findings from another study suggested that parents of adolescents with ADHD use more restrictive and active mediations with their children (Arrizabalaga-Crespo, 2010). However, that previous study only included parents of adolescents, whereas our study recruited parents of children from a larger age range (i.e., 6-18 years). Additionally, to our knowledge, this study constitutes the first to assess parental mediation in children with attention difficulties following the COVID-19 pandemic, which brought about many changes in the screen media landscape and may explain some differences in more current findings (Sciacca et al., 2022). More broadly, it is also possible that parents of children with other neurodevelopmental needs may have reduced parental capacity to consistently implement parental mediation strategies, as their children likely have a variety of needs across domains of their lives. For example, it has been found that children with ADHD are more likely to have difficulties across a wide array of domains, such as family functioning, school and peer relationships (Anastopoulos et al., 2009; Dupaul et al., 2001; Harpin et al., 2016). As a result, parents of children with ADHD may have competing demands to address, which in turn may reduce their capacity to reflect on and adapt their parenting approaches within the domain of screen media use.

As expected, parents of children in the ADHD group did report significantly higher levels of parental stress regarding their child's screen media use, as well as significantly less positive impact and significantly more negative impact of screen media on their child. However, contrary to our hypothesis, parents of children in the early neurological risk sample did not report significantly more parental stress or impacts of screen media on their child than the community sample. This finding suggests that while parents in both of these at-risk groups both have

children with unique neurodevelopmental needs, children with ADHD may have specific neurodevelopmental or behavioural needs that uniquely predispose them to being at higher risk of negative outcomes related to screen media use.

Correlational analyses within the full community sample revealed inconsistent relationships between parental mediation strategies and child outcomes. For example, while restriction/monitoring and active mediation were significantly related to reduced child screen time, only internet safety was related to less negative impact on the child. It is important to note that all of these relationships were small in size and warrant further study to replicate these findings. Consistent with prior research, child age was significantly related to all domains of parental mediation, such that parents tend to use less strategies across domains as their children get older (Brito et al., 2017; Nagy et al., 2023). These relationships looked somewhat different in the community sample when split by age group. For example, in the community sample of children (age 6-12), restriction was related to less child screen time and less negative impact, and internet safety was related to less negative impact, but active mediation was not related to either variable. In contrast, in the community sample of adolescents (age 13-18) none of the parental mediation strategies were related to child screen media use or negative impact, and only active mediation was related to positive impact on the child. This is consistent with prior findings that have suggested that while restrictive mediation approaches may help to mitigate screen media related challenges in earlier childhood, active mediation is likely more suitable as children get older (Symons, Ponnet, et al., 2017b; Symons, Ponnet, Walrave, et al., 2017). This developmental trend is consistent with what is known about independence building in adolescence more broadly and supports autonomy building parental mediation approaches for parents in helping to support their adolescents.

In the ADHD group, greater use of restriction/monitoring was significantly and moderately associated with lower child screen time, while greater use of internet safety mediation was found to have a small but significant association with lower negative impact on the child. In the early neurological risk group, greater use of restriction/monitoring was significantly and moderately associated with lower negative impact on the child, while greater use of active mediation had a small but significant association with lower child screen time. In the neurological risk group, use of internet safety mediation was not related to any of the child outcome variables, which is different than what was found in the community sample. Additionally, group comparison analyses revealed that both the at-risk groups used this strategy less than the community sample. This may suggest that parents of children at-risk of attention difficulties may not be perceiving the potential difficulties around internet safety in their children, and in turn may not be implementing mediation around this topic as frequently. Considering that both of these at-risk groups are known to be more prone to risky behaviours (Kennedy et al., 2017; Shoham et al., 2021), this area may warrant further study to ensure that children with attention difficulties are adequately prepared to navigate the internet safely.

Another important variable of interest in this study was parental stress about their child's screen media use. Across both at-risk samples, use of restriction/monitoring was significantly associated with lower parent stress. In the community group and the ADHD group, internet safety mediation was significantly associated with lower parent stress. Finally, active mediation was significantly associated with lower parent stress in the community group and the neurological group. While the pattern of correlations across groups was found to be different, this suggests broadly that implementing more parental mediation strategies helps parents feel less stressed about their child's screen media use. It is also important to note that the three groups

were quite different in size, with the community sample (*N*=386) being much larger than the two at-risk groups (*N*=66 and *N*=65). As such, the differences in correlation patterns should be interpreted with caution and replicated with larger at-risk samples to confirm whether these differences are due to differences in sample size, or true effects of the different group characteristics. Across all groups, higher parent stress was also significantly and strongly associated to more perceived negative impact of screen media use on their child and less parent comfort with technology. This suggests that parents may benefit from receiving psychoeducation about technology to help reduce their feeling of stress about screen media, and hopefully increase their sense of agency in being able to manage their child's screen media.

Parent ratings of child inattention proved to be significantly related to several study variables across various samples. For example, we found that higher ratings of child inattention were significantly and moderately associated with higher ratings of negative impact on the child across all samples. Additionally, higher ratings of child inattention were also found to be significantly related to higher levels of parent stress about child screen media in both the community and at-risk neurological group, highlighting the impact that this child-focused variable may also have on the parent and family system more broadly. This provides further evidence that child attention abilities are likely an important consideration when assessing the potential risk that a child may have in the domain of screen media, and how it may impact parental perceptions (Nikkelen et al., 2014).

Finally, several regression models were estimated within each of the three samples, to predict screen media outcomes from parental mediation strategies while controlling for child age and sex. In the community sample, findings from the regression models suggested that parental mediation strategies differentially predicted screen media outcomes. Namely, restriction

predicted less parental stress and child screen use, active mediation predicted more positive impact on the child, and internet safety mediation predicted lower child screen use. However, in both at-risk groups only restriction was found to be a significant predictor, such that more restriction predicted less child screen use in the ADHD group, and less parental stress and negative impact on the child in the early neurological risk group. This appears to be consistent with findings from the literature that restriction/monitoring may be particularly relevant in mitigating screen media-related risks in children at-risk of attention difficulties (Arrizabalaga-Crespo, 2010; Pollak et al., 2017). However, the different patterns that emerged between the community sample and at-risk groups should again be interpreted with caution due to the large difference in sample size between groups, which calls for replication of these findings with larger at-risk samples.

Summary of Findings in Study Two

In Study Two, we administered an online questionnaire about parental mediation to three samples of parents: (1) parents of a community sample, (2) parents of children with ADHD, (3) parents of children with early neurological risk. Contrary to hypotheses, we identified that parents in the community sample used more parental mediation strategies (i.e., internet safety and active mediation) than the clinical groups, though the ADHD group was found to have higher levels of parent and child negative consequences of screen media use. We also examined the pattern of correlations amongst all variables within each sample, highlighting how PMS domains were differentially related to parental stress, parent comfort with technology, impacts of screen media on the child, parent and child use, child inattention and child age across different samples and age groups. Finally, we estimated regression models to predict screen media outcomes from parental mediation strategies, suggesting that parental mediation strategies may

differentially predict screen media outcomes. In Study Three, we completed follow-up interviews with a subset of parents of children with ADHD to better understand their experiences of parenting around screen media use.

Chapter 4: Understanding Parents' Lived Experiences of Managing Screen Media in Children and Youth with ADHD: A Qualitative Exploratory Case Study

Childhood screen media use and parental mediation are complex and multifaceted topics of study with many aspects to consider in order to develop a fulsome understanding of the challenges and benefits that can emerge. One important factor to consider is a child's neurodevelopment, including the presence of neurodevelopmental conditions like ADHD, as this may predispose children to having greater difficulties with screen media. In the literature, there have been limited studies to date that have investigated parents' experiences of implementing parental mediation of screen media use in children with ADHD. While quantitative approaches to answer this question are extremely valuable, it has been suggested that a qualitative data approach may provide added value to help us better understand complex phenomena, such as parental mediation of screen media use. To date, there have been no qualitative studies conducted on parental mediation in parents of children with ADHD, which has limited our understanding of what parents of children with ADHD experience when attempting to mediate their child's screen media use. The aim of this study was to conduct semi-structured interviews in a sample of parents of children with ADHD. This study was designed as a qualitative exploratory case study, by recruiting six parents of children with ADHD from different age and sex groups. The interview data was then coded using inductive content analysis (ICA) to uncover content classes that emerged from parents' perspectives.

Qualitative approaches to understanding parental mediation of screen media use

While most studies investigating parental mediation to date have been quantitative in nature, qualitative examinations of parental mediation have also begun to emerge. Qualitative methodologies can provide several unique advantages, which may help to further characterize these skills and parenting approaches. Specifically, qualitative research can allow for a deeper

understanding of real-world phenomena by gathering individuals' experiences and perspectives through open-ended questions (Moser & Korstjens, 2017). This type of approach may be particularly relevant for complex phenomena that can be difficult to fulsomely capture numerically. Due to these advantages, qualitative research has been increasingly used to understand phenomena in the field of psychology (Rennie et al., 2002). It has been proposed that qualitative methodologies could be helpful to further understand the process of parental mediation, including how parents navigate selecting and applying mediation strategies as well as their experience of doing so (Grizólio & Scorsolini-Comin, 2020; Symons, Ponnet, Walrave, et al., 2017).

As such, there's been an increasing number of studies that have applied qualitative methodologies to help understand parental mediation of screen media use. First, there have been a few initial qualitative studies that have investigated parental mediation in young children (i.e., age 2-8 years). From these studies in younger children, parents have described parental mediation as a dynamic process that evolves based on what parents perceive as their child's needs (Kotrla Topić et al., 2023; Zaman et al., 2016). Similar to what's been found in quantitative studies, qualitative studies have suggested that parents tend to use more restrictive mediation when their child is younger, and shift towards conversation-based active mediation as their child ages (Bakó & Tőkés, 2018; Sekarasih, 2016). In these studies, many parents expressed having a desire to adapt their mediation practices developmentally, in order to promote more autonomy building as their children age. However, parents have also expressed having concerns about allowing for increased autonomy, including issues of privacy and trust in an online environment (López de Ayala López et al., 2020). These studies have provided valuable insights

into the process of adapting mediation practices developmentally, and why this process may be challenging to many.

In qualitative studies of school-aged children, parents have provided additional insight into parental mediation strategies and the process that they use to navigate implementing these strategies. For example, Huang et al. (2024) completed a qualitative study where they explored the most common parental mediation strategies that parents endorsed. While three of the most common mediation strategies were endorsed by parents in this study (i.e., restriction, monitoring, active mediation), parents also generated a fourth, less commonly studied strategy: activity substitution (i.e., providing children with another activity option other than screen media use). This study highlighted the importance of designing studies that allow parents the opportunity to discuss their mediation practices in a more open-ended format, as it can provide insight into additional approaches that may warrant further investigation.

Qualitative studies in school-aged children have also examined how parents navigate the process of selecting the mediation strategies that they employ. For example, Shin (2015) studied how parent factors affect their media practices. Although active mediation was found to positively affect their child's relationship to screen media use, it was found that parents who had a higher level of confidence in their mediation skills tended to seek out less information about screen media use and consequently use less active mediation (Shin, 2015). Octaviani et al. (2017) studied child factors that influence parental mediation practices, finding that parents expressed using more restrictive mediation when they perceived that their child had weaker self-control abilities.

Finally, qualitative studies have also provided valuable insights into the construct of parental mediation in adolescents. For example, Kutrovátz (2022) found that parents of

adolescents tended to express more worries about the risks of screen media use, and minimally spoke to the opportunities that screen media use can present. Consequently, parents of adolescents who expressed a lot of concerns tended to rely on using primarily restrictive mediation practices in an effort to decrease the amount of time their adolescent spent on their devices (Kutrovátz, 2022). While restriction may be successful in decreasing the amount of screen media use, a qualitative study by Vaterlaus et al. (2014) highlighted that the implementation of restrictions can often make adolescents feel as though their parents don't trust them, which can cause disruptions in the parent-child relationship. In contrast, Symons, Ponnet, Walrave, et al. (2017) described many parents of adolescents as having a dynamic approach to mediation, which involved parents observing the successes or challenges and adapting their practices in response. This dynamic approach is in line with many theoretical descriptions of the process of regulating parental mediation (e.g., see Iqbal et al. (2021)).

Qualitative approaches to understand parental mediation of children and youth ADHD

To date, there have been no qualitative studies to explore parental mediation of children and youth with ADHD. However, many studies have applied a qualitative approach to understanding parenting children with ADHD more broadly as unique parental challenges have emerged among this group. Laugesen and Groenkjaer (2015) conducted a systematic review of qualitative studies that have explored parents' experiences of having a child with ADHD. They identified that many studies explored themes related to parental stress and stigmatization, noting that parents often experience feelings of hopelessness and self-blame when it comes to their parenting. Across studies, a core theme that was identified was the challenges that emerge in navigating day-to-day routines. Namely, parents identified having to implement a higher degree of structure for their child with ADHD, which in turn was described as causing increased stress

and burnout in the parent. While parents often aimed to grant their adolescents greater independence in these activities of daily life, many expressed having to maintain a higher level of control over their adolescent's routines due to their challenges with attention and behaviour regulation (Laugesen & Groenkjaer, 2015). While these studies have not directly addressed the experiences of parenting children with ADHD around screen media, it can be hypothesized that many of these themes could be relevant in the context of parenting around screen media.

Study Three

The goal of this study was to develop a more nuanced understanding of parents' lived experiences of parental mediation in the context of children with ADHD by utilizing a qualitative approach. To address this goal, we conducted semi-structured interviews with parents of children with ADHD of different ages and sexes. These interviews aimed to explore topics related to parental mediation, such as parents' experiences and challenges, the parental mediation strategies that they select and implement, as well how developmental stage and ADHD-related challenges can impact their strategy selection and success. As this consisted of the first qualitative study of this topic, we followed a qualitative exploratory case study design. Following completion of the interviews, we conducted a qualitative analysis on transcripts of these interviews using inductive content analysis (ICA).

Method

Study Design

The present study was a qualitative exploratory case study design, following guidelines from Baskarada (2014). An exploratory case study design was deemed appropriate for the present study as, to our knowledge, there have not been any previous studies to date that have investigated parental mediation in children/youth with ADHD from a qualitative approach.

Based on the current literature's findings that child age and sex may impact parental mediation, we aimed to purposefully sample based on different child age groups and child sex, to obtain case studies from these different groups.

Procedure

This study received appropriate institutional ethics approval prior to commencing data collection. Parents of children in the ADHD sample in Study 2 (i.e., sample 2, CADDAC) who consented to be recontacted for future research with our team were recontacted via email with information about participating in the present study. Participants who expressed interest were then provided information about the study and invited to complete an informed consent form in advance of their scheduled interview. Recruitment continued until all six intended participants were recruited according to the stratified sampling approach described above. Interviews occurred approximately 6-9 months after the completion of Study 2. Participants then completed a 30–60-minute virtual semi-structured interview with one of the study coordinators via the Zoom videoconferencing platform. Participants were oriented to the present study and were asked a series of eight semi-structured questions regarding their child's screen media use and their experience managing this as a parent of a child with ADHD (please find full semi-structured interview script in Appendix I). Following participation in the interview, participants were compensated with a $20 Amazon gift card.

Participants

Parents of children who participated in Study 2 in the ADHD sample (i.e., recruited via CADDAC) were recontacted to participate in the present study. As in Study 2, the same inclusion criteria were retained in the present study: (1) English language proficiency, (2) currently living in Canada, (3) child has been previously diagnosed with ADHD, (4) child had at

least “moderate” severity of inattention problems on the SNAP-IV and; (5) child had impairment due to inattention as “a medium amount” or “a lot” in at least two domains (e.g., school, home, leisure). Stratified sampling was used to ensure that parents of children from different age groups (i.e., 6-10-year-old, 11-14-year-old, and 15-18-year-old) and sex groups (i.e., male and female) were recruited. In total, 6 participants were recruited to participate, including parents of a 6-year-old female, a 10-year-old male, a 13-year-old female, a 12-year-old male, a 16-year-old female and a 15-year-old male. All parent participants were female, identified as their child’s mother, and parent age ranged from 41-57-years-old (*M*=46, *SD*=6.03).

Measures

Semi-structured interview. All participants completed a semi-structured interview with one of the study coordinators. Both study coordinators were closely involved in the project’s design and conception and were graduate students in clinical-developmental psychology (including this author). As this consisted of the first qualitative interview-based study to examine parental mediation of screen media use in children with ADHD, the questions were developed by the researchers based on gaps that have been identified in the literature. The following questions were specifically designed by this author to address parental mediation in this population: #4a, #4b, #5d, #7a (see Appendix I). As a result, only responses from these questions were included in the subsequent content analysis described below.

Data analysis

The semi-structured interviews were audio-recorded and transcribed verbatim by a research assistant on the study team. All transcripts were verified against recordings and imported into NVivo10 for analysis. Data from the relevant questions (see above) was analyzed using a qualitative inductive content analysis (ICA) approach. ICA has been recommended as an

appropriate type of analysis when there is little existing research in the area of study and when the goal is to describe and understand a certain phenomenon, situation or experience (Vears & Gillam, 2022). As such, ICA was deemed an appropriate qualitative analysis approach for the current study. Vears and Gillam (2022)'s guidelines for ICA were used to guide the iterative coding process, which involved 3 phases of coding. The first phase of coding aimed to identify broad classes of content to be further analysed. The second phase of coding involved developing subcategories within each content class identified in phase 1. The third phase of coding involved reviewing all transcripts with the finalized coding scheme to identify whether any codes had been missed and code them accordingly. Based on this, the refined coding scheme was finalized, and the data was interpreted.

Results

Following the coding process for all parent interviews (*N*=6), four broad content classes were identified, namely (1) concerns about parenting around screen media use, (2) parental mediation strategies and approaches, (3) adapting mediation practices based on developmental stage, and (4) unique parenting considerations in the context of ADHD and screen media. These broad content classes were then further analysed, and several subcategories emerged, as summarized in Table 16.

Table 16

Content classes and subcategories from the qualitative inductive content analysis

a. Concerns about parenting around screen media use
i. Constant accessibility of screens
ii. Feeling out of parent's control
iii. Sneaking screens
iv. Child hiding their experience online
v. Navigating co-parenting across multiple households
vi. Supporting transitioning off from screens
vii. Helping children manage social dynamics online

viii. Child falling behind their peers because of parenting approach
ix. Always having to think and plan ahead
x. Feeling defeated as a parent

b. Parental mediation strategies and approaches
i. Active mediation
ii. Internet safety mediation
iii. Restrictive mediation
iv. Child-parent collaboration on rules
v. Incorporating visual supports
vi. Providing reminders about limits
vii. Using distractions
viii. Empathy and validation
ix. Contingency management: Using screens as a reward or punishment
x. Despite best efforts, unsuccessful mediation strategies

c. Adapting mediation practices based on developmental stage
i. Using more active mediation as they get older
ii. Implementing stricter restrictions with age
iii. Granting increased access and losing parental control
iv. Giving up as they get older

d. Unique parenting considerations in the context of ADHD and screen media
i. Addictive nature of screens in children with ADHD
ii. Use of screens for entertainment
iii. More challenges with screen media use in the school environment
iv. Making environmental modifications to minimize difficulties
v. Modeling and normalizing struggles with screen media
vi. Providing additional support with transitions
vii. Considering their child's level of maturity
viii. Approaching with compassion and understanding of neurodevelopment

a. Concerns about parenting around screen media use

Broadly, parents were asked about the challenges that they experience in managing their child's screen media use. All the parents in this sample (100%) endorsed having important challenges in this area of their parenting. Despite best parental intentions to limit screen media time or provide coaching and support to their child when faced with challenging situations, parents noticed that they continue to worry that this may not be sufficient to mitigate the risks due to the unique properties of screen media devices.

i. Constant accessibility of screens. Some parents described having concerns about properties of screen media devices that pose unique challenges in their role as parents. For example, one parent explained that the constant accessibility of screen media devices can be challenging for parents to manage: *It's a struggle. It's very different from when I was younger. We had to wait till Thursday night at eight o'clock, but these are problems they don't have to deal with at all. It's all right there when you want it. It's very different now*. (Parent 4 – 13-year-old male).

ii. Feeling out of parents' control. As their children gain increased ownership of these devices, particularly in adolescence, this further decreases the amount of control that parents feel they have over their child's screen media use: *Well, it's not within my control. I accept the fact that she's of an age where she's going to be steering the ship and this is more so than I am and eventually she'll be steering at 100% when we're not paying the bill. That removes me a little bit from ownership*. (Parent 5, 16-year-old female).

iii. Sneaking screens. Similarly, despite parents' best intentions, the mobile nature of many screen media devices can make them easier to sneak around without parents knowing, which poses a challenge to mediation practices. This seemed particularly relevant to parents of the younger children in this sample: *I don't let her sit in front of the TV all day, that's not my intention. But she will sneak it in whenever she can. I turn my back and she will be watching TV*. (Parent 1 – 6-year-old female).

iv. Child hiding their experience online. One parent described that because screens are easier to "sneak around", they feel concern about whether their child shares difficult online situation with them or not: *I just worry that if he were to do something he was a little bit*

ashamed or embarrassed about he would not talk to me about it, that we could not discuss what he found and explain and support him. Do damage control. (Parent 2 – 10-year-old male).

v. Navigating co-parenting across multiple households. Another parent raised an important feature of their family that amplifies these challenges, which is when a child lives in multiple households: *She lives in this split-parent home so I can only control what TV she's watching here. I don't have control over the other 40% of her time*. (Parent 1, 6-year-old female).

vi. Supporting transitioning off screens. Several parents (*n*=4) also highlighted that one of the most challenging situations to navigate is supporting their child to transition off from screens: *Getting off I find is always a challenge. It's always "five more minutes, five more minutes"*. (Parent 2 – 10-year-old male). In particular, one parent highlighted the challenge that exists in transitioning their child to then engage in other household responsibilities: *If I want him to go out and walk the dog, which is his responsibility, his desire is to sit at the computer. He pushes off the things he needs to do, we have a real hard time with that.* (Parent 6 – 15-year-old male). Another parent highlighted that these kinds of challenges will even occur when they are asking their child to transition to a fun, extracurricular activity: *Transitioning him off, to do anything else even to come to dinner, or to go to hockey practice. He has other things he has to do; he has homework, he has to eat, he has hockey sometimes.* (Parent 4, 13-year-old male).

vii. Helping children manage social dynamics online. Managing social dynamics in the online world was also raised as a recurring parental concern. A parent of a 10-year-old child described her concern with the risk of cyber-bullying that may be present in platforms such as social media:

When you said social media it got me thinking. He has the Messenger app to

communicate with friends. If they're going to play video games together. I can imagine that might put him at risk for bullying. I tried to explain that content is out there. If you make a ridiculous video of yourself and send it to a right now. Things can change over the course of middle school. I tell him "Don't send videos that you wouldn't want your whole school to watch". I have a background in studying bullying, and I just always think of that. […] It's a vulnerable age. (Parent 2, 10-year-old male)

vii. Child falling behind peers because of parenting approach. Amongst parents of older children, some expressed concern that their parental mediation strategies, such as restriction, actually has had a negative impact on their child's social development:

My daughter is 13 and only this year has gotten access to a smartphone with no SIM card. I know she's behind her friends in terms of technology and social media. She still doesn't have social media and I think that was a challenge for me. I think not having access to social media has kept her a little bit young. Not naive, but still interested in younger things. (Parent 3, 13-year-old female)

ix. Always having to think and plan ahead. Finally, several parents expressed the burden that parenting around screen media places on themselves. For example, one parent raised that she feels the need to constantly be predicting and anticipating potential challenges her child may experience: *One of the things that's a real challenge is figuring out all of the things that can happen and then trying to mitigate them in advance.* (Parent 2, 10-year-old male).

x. Feeling defeated as a parent. Some parents expressed feeling that they always have to be "on" when managing screen media use, which in turn can lead to feeling defeated at times: *I was really a much better parent before I actually had to be a parent, I knew everything. It's always a negotiation and a balance.* (Parent 6, 15-year-old male).

b. Parental mediation strategies and approaches

Parents also spoke about the kinds of parental mediation strategies that they have tried to employ, with varying degrees of success. All three of the parental mediation strategies that were identified in Study 1 and Study 2 (i.e., active mediation, internet safety, restriction) were spontaneously raised by parents during their interviews. Parents raised additional approaches that they implement with their children as well.

i. Active mediation. Half of the parents in the sample described using active mediation with their child, mostly in the form of conversations about what their child is doing on their screen media devices. Active mediation seemed to be especially popular and helpful among parents of the older youth in our sample: *Talking about it, I think is the most effective*. (Parent 5, 16-year-old female).

ii. Internet safety mediation. In this sample, only one parent spontaneously raised speaking with her child about internet safety when asked about her mediation strategies: *My child is very honest. He came to me once and said "I saw this thing and there was like an ad, and you can see a lady's breasts. I'll show you where it is. You should report it so that kids don't see that"*. (Parent 2, 10-year-old male). While this suggests that this parent is having conversations with her son about navigating the internet safely, it is important to note that the example given suggests that the conversation was child initiated.

iii. Restrictive mediation. Across the sample, the most common strategy that was spoken about was restrictive mediation, which was mentioned by 5/6 participants. The restrictions that parents spoke about seemed to fall into two general categories. First, several parents spoke about setting rules and expectations around how screen media devices would be used at home. Most commonly, parents spoke about setting limits around how long children

could use devices for and at what time of day: *We have boundaries about times of day, that's the biggest one. I say to him "we're going to have some limits on the amount of time on the screen, you can decide how you spend it, but two hours is a lot of screen time in a day. It's very generous, but that's the max. After that, the screens go off. You do other things"*. (Parent 2, 10-year-old male). Second, many parents spoke about implementing stricter restrictions which aim at targeting access, where they would physically or technologically restrict their child's access to devices or device capabilities. This included removing devices from the child's access, shutting down the WiFi router, creating child accounts that limits access to certain content, and removing data capabilities from their child's phone. One parent remarked that this approach has been quite effective for them: *A couple of weeks ago I removed the TV from the house, which was effective since she doesn't have access to it*. (Parent 1, 6-year-old female).

iv. Child-parent collaboration. Parents mentioned several supplementary strategies they used to aid in the implementation of their rules or limits, such as encouraging parent-child collaboration on the rules: *He's free to weigh in on whether he thinks it's reasonable or not. I listen receptively and we can negotiate*. (Parent 2, 10-year-old male).

v. Incorporating visual supports. Another parent spoke about her attempt to incorporate visual supports to bolster the rules or limits that are set: *I have tried making a visual schedule so she can clearly see the time she gets to watch TV. Again, it's not effective because she sneaks it in at other times*. (Parent 1, 6-year-old female).

vi. Providing reminders about limits. Finally, another parent spoke about providing her child with frequent reminders about the limits: *I give him lots of warnings […] I try to preload what he has to do*. (Parent 6, 15-year-old male). However, this same parent did add that the limit and rule setting approach isn't consistently successful in their household despite her attempt to

provide reminders: *I try saying he has a certain time limit like 40 minutes to an hour and then I need him to turn it off and go do something else. That works like 50/50, depending on if we can transition him to something else that's similar in preference*. (Parent 6, 15-year-old male).

vii. Using distractions. In addition to these three core mediation approaches, parents raised some additional approaches that they have tried. One parent mentioned trying to use distractions with their child: *I think a lot of times, I try to distract her [from screen] and build up other activities. It's hard because you can't be on top of her 24 hours a day, but it is helpful*. (Parent 1, 6-year-old female).

vii. Empathy and validation. This same parent also spoke about trying to use validation and helping her child notice her feels when she experiences difficulties with not having screen media devices: *When she gets off and she's really grumpy, I like to point that out to her; "look, this is not how you are and I know you're missing your time on the computer, remember how you're feeling". I try to bring it back to how she's reacting to not having it but then she typically gets more upset about it*. (Parent 1, 6-year-old female).

ix. Contingency management: Using screens as a reward or punishment. Parents also described using screen media devices as a contingency for other behaviours, with varied success. Some described using screen media access as a reward (e.g., *There are certain times of the day where I'll save funny videos for her on Instagram that we can look at together and she really looks forward to that. I'll use it more as an incentive, but we need to get this stuff done first.* Parent 3, 13-year-old female). Others described using the loss of screen media privileges as a punishment (e.g., *We tried "give it to me or else", "if you don't do this, you won't get to use your phone". We've tried all those things, they don't work. It just creates like an explosion, and you quickly realize it's ineffective*. Parent 5, 16-year-old female).

x. Despite best efforts, unsuccessful mediation strategies. When reflecting on the effectiveness of their mediation practices overall, 4/6 parents in this sample expressed that they don't feel they have been successful in managing their child's screen media use adequately, with some feeling quite negatively about the success of their mediation practices (e.g., *Nothing was really successful*. Parent 6, 15-year-old male). One parent remarked that while the strategies she implements may go well in the moment (e.g., active mediation), she wonders whether it actually has an influence on her child's behaviour and screen media use in the long run:

> *It's funny, so I wouldn't say they are successful. I guess it depends how you measure success, right? Some days they work better than others, you pick your battles, and sometimes you stand down and sometimes you don't. But I would say that we generally have positive conversations about it and it doesn't always mean anything is different either*. (Parent 5, 16-year-old female).

c. Adapting mediation practices based on developmental stage

Parent participants reflected on the impact that their child's age and developmental stage has on their mediation practices and their role as a parent. Across our sample, all the parents endorsed noticed having to adapt or change the mediation strategies that they use as their child has gotten older. However, the way in which parents described how these strategies have been adapted or modified as their child aged was not unanimous across the sample.

i. Using more active mediation as they get older. Some parents described using more active mediation approaches that encouraged parent-child collaboration as their child aged: *I'm just trying to think over like the last 12 months. Mostly just more conversations with him. We usually make a plan together*. (Parent 2, 10-year-old male).

ii. Implementing stricter restrictions with age. In contrast, other parents expressed trying needing to set more limits or stricter restrictions as their child aged:

> *The last couple of weeks, I removed the TV from the house. Initially, I brought it into the basement but then she would sneak into the basement, and she would plug it in and put it on whenever she got a chance. In times like this I just don't know what else to do. I don't want to do this, but this was becoming such a big problem and I had to do something.* (Parent 1, 6-year-old female).

iii. Granting increased access to devices with age. A common experience that parents spoke to was that their children generally gained greater independent access to screen media devices as they got older (e.g., getting their own phone, computer, tablet, etc.). In turn, this seemed to make several parents feel as though they have less of a prominent role in mediating screen media use: *It's almost like as she gets older, we become less involved in the management of it*. (Parent 5, 16-year-old female). Several parents raised that they face increased challenges with effective parental mediation due to this, leading them to feel as though they have lost control of managing their child's screen media use: *When he was younger, I had some control. I would turn things off; the Wi Fi went off at night, but now he's got data. With data it doesn't really make a difference anymore*. (Parent 6, 15-year-old male).

iv. Giving up as they get older. One parent of an adolescent in our sample expressed feeling as though she has given up as her son aged, and particularly as she noticed the effects of increased screen media use affect other aspects of their family life:

> *As he's gotten older, I think that I've given up. Another feature of his "teenagerness" is that he suddenly doesn't like to eat with us as a standard family. It's just three of us in the house. The standard time where we sat down and ate together has really gone off the*

rails. There's the odd time but for the most part it has shifted and he'd rather be on his screens. I'm kind of concerned. (Parent 6, 15-year-old male).

d. Unique parenting considerations in the context of ADHD and screen media

Many parents also spoke to their experiences of the unique challenges of parenting around screen media use in children with ADHD, and how they have had to adapt their mediation practices as a result.

i. Addictive nature of screens in children with ADHD. A topic that emerged amongst several parents in this sample is that their child's relationship with screen media often felt quite addictive in nature, which they perceived as particularly challenge in the context of ADHD: *I have compassion for the fact that they are very addicting and that they do play a role for him in terms of dopamine seeking and relaxing. Especially with having ADHD*. (Parent 2, 10-year-old male).

ii. Use of screens for entertainment. Several parents also noted that screens play an important role as a form of entertainment in their child with ADHD, which can pose unique challenges: *I think the unique challenge with him has been that he is not, even as a small child, capable of entertaining himself. He always needed somebody to play with and he didn't have friends because nobody understood his behavior. So screens can actually give him that constant entertainment.* (Parent 6, 15-year-old male).

iii. Managing screens in the school environment. One parent also described that her child seems to struggle with managing her screen media devices across different settings, which can be challenging to intervene in as a parent:

I would say at school, she has gotten into much more trouble than her peers have for more screen use in the classroom. Her ability to keep it in the bag or turn it over on her

> *desk is like nil. From the teachers, I have heard that this is something she struggles with immensely. Some rules that might be applied to the classroom in general, that might be fine for others, but it seems more challenging for her considering everything that is going on. I think in school, they don't understand why it's not simple. I would say that's a huge obstacle. We have a different way at home of how we move with our lives which doesn't carry over well into a very structured environment. What it does is it creates points of conflict because we just don't get each other and some of the battles the school wants to pick I'm not willing to pick. You introduced some inconsistencies, and everybody gets frustrated. So, you can see how it doesn't always translate.* (Parent 5, 16-year-old female).

iv. Making environmental modifications to minimize difficulties. Based on these unique challenges that parents identified in the context of their child's ADHD, many also described how they have adapted or modified their parenting practices in response. Several parents described how they utilize strategies that are usually recommended to parents of children with ADHD and apply them in the context of screen media use. For example, one parent spoke about making environmental modifications to support her child: *The console is in the basement, we don't have it centrally located. So easy to see and pick up. Structural supports for not being on it all the time, and then support for getting off*. (Parent 2, 10-year-old male).

v. Modeling and normalizing struggles with screen media. One parent also spoke about using parental modeling to help normalize her son's experience: *I try to model or at least talk out loud about our own struggles as adults with screens. I don't want him to feel like it's something about him*. (Parent 2, 10-year-old male).

vi. Providing additional support with transitions. This same parent also spoke about the need to provide increased support with transitions in the context of her son's needs: *I do recognize that he needs multiple reminders to get off. He needs advanced warning. Most of those are true of now, but when he was younger, I would help them with the transition a bit more. I would go down and engage him in a conversation about what he was playing. Then the scaffold of leaving the game would be our chat*. (Parent 2, 10-year-old male).

vii. Considering level their child's level of maturity. When reflecting on adapting her parental mediation practices, one parent reflected that she tends to have to use strategies that would typically be appropriate for a younger child to her son's immaturity and difficulties with independence:

> *I don't know if my strategies are unique. I think the fact that I still use them shows that he is very immature. I feel like I'm still parenting a 10-year-old or nine-year-old. He's 13 and will be 14 in May, I feel like I am still in the safety net. I am the constant voice of reason. He cannot be independent with things, and he cannot be trusted with things*. (Parent 4, 13-year-old male).

vii. Approaching with compassion and understanding of neurodevelopment. Finally, one parent highlighted that the biggest change to her approach to her parenting strategies has been to approach her child with compassion and understanding, within the context of his neurodevelopmental profile:

> *Compassion would be the biggest change in parenting strategy. I really take into consideration that there's a reason I don't use screens as rewards. We're not an ABA household, we don't do that. Because he loves them so much, when I'm very frustrated, it's always the threat, "maybe we need to have less screen time" because of some*

completely unrelated thing. Sometimes I'm like "maybe we need lessen screen time because you're too rambunctious at dinner and you don't sit down and eat". Just acknowledging that it's difficult to get off. (Parent 2, 10-year-old male)

Discussion

In the current study, we completed semi-structured interviews about parents' lived experiences of managing screen media use with six parents of children with ADHD. We followed an exploratory qualitative case study design in this study, as this consisted of the first qualitative study on this topic with parents of children with ADHD. Specifically, we asked parents about the parental mediation strategies that they use, the challenges and successes that emerge, as well as how their child's attentional difficulties may impact this experience. We then completed an inductive content analysis of the transcripts, and four broad categories emerged: (1) concerns about parenting around screen media use, (2) parental mediation strategies and approaches, (3) adapting mediation practices based on developmental stage, and (4) unique parenting considerations in the context of ADHD and screen media. From this, many subcategories emerged to help understand parents' experiences in this sample.

As anticipated, all the parents in this sample endorsed having challenges in managing their child's screen media use. The concerns that they raised spanned many different areas, including the properties of mobile screen media devices, transitioning out of screen media time, managing social dynamics online, and the burden that is placed on parents' own well-being and sense of competence. Many of the concerns that were raised by parents may be particularly relevant within the context of childhood ADHD and the challenges that are well-understood outside of the context of screen media. For example, children with ADHD tend to struggle more generally with shifting or transitioning between activities (Castellanos et al., 2006) and are also

documented to have greater social difficulties (Aduen et al., 2018; Humphreys et al., 2016). Considering these pre-existing challenges are more prevalent in children with ADHD, it is possible that parents observe these challenges being exacerbated in the context of screen media use. This speaks to the increased vulnerability that children with ADHD may have in the domain of screen media use due to their broader profile of challenges. Like our findings in Study 2, many parents in this sample also expressed feeling overwhelmed and stressed by their experience of managing screen media use in their children. This highlights that it is important to consider the impact of parental mediation on the parents themselves, as this will likely in turn affect their capacity to continue effectively implementing mediation practices.

Consistent with the broader parental mediation literature, parents in our sample expressed using many of the commonly reported parental mediation strategies, such as active mediation, internet safety, and restriction. Interestingly, the most commonly endorsed strategy in this sample was restriction. Many parents spoke to the need to set firm rules and limits that physically limited access to the devices, as setting self-managed boundaries about screen media use was often not enough to be successful. This increased use of more intensive restrictions in children with ADHD is consistent with what has been previously found in the literature (Arrizabalaga-Crespo, 2010). It will be important for future research to determine whether this increased use of restriction in children and youth with ADHD has a positive impact on their child's relationship with screen media, or whether parents of children with ADHD would benefit from expanding the types of mediation strategies that they rely on.

Parents also spoke to the impact that their child's age and development has on their mediation practices. Overall, parents reported a variety of developmental adaptations that they implemented, which weren't always consistent between participants. Due to our small case study

design, it is possible there are unique features or challenges that exist amongst these children, which prompts parents to then adapt their mediation approaches in unique ways. This also may be particularly relevant within the context of children with neurodevelopmental differences (i.e., ADHD), as it is well-known that development can be impacted in several ways. However, one common experience that many parents spoke to was the difficulty in navigating how to adapt their mediation practices as their child gained more independence with their screen media devices. It is known, for example, that children with ADHD often require more assistance with tasks of daily living and household chores than children without ADHD (Dunn et al., 2009), and it is interesting to consider whether this may also be the case in terms of screen media use. Pending further investigation of this area, this could potentially be important feedback to provide to parents so that they can appropriately tailor the level of independence that they grant their child with ADHD in their screen media use, as well as the level of assistance that they provide in support.

Finally, parents in our sample also spoke to the unique considerations they have in terms of their parental mediation for their child with ADHD. In line with the addiction framework of screen media use (Eppright et al., 1999; Kurniasanti et al., 2019), many of the parents highlighted that screen media seems to be especially addictive in their child with ADHD, which in turn causes challenges in their ability to mediate. Parents noted that this can more severely affect their child with ADHD across different settings (e.g., school), which is important to consider when supporting parents with their mediation approaches. Many parents also spoke to the strategies or approaches that they use with their child, such as environmental modifications, parental modeling, supporting transitions, and approaching their child with compassions. All these strategies are parenting strategies that are commonly taught in parenting programs for

children with ADHD (Murray et al., 2018). This underscores the value of helping parents apply strategies they already know in other contexts to the domain of screen media use to best support their child with neurodevelopmental differences.

Summary of Findings in Study Three

In Study Three, we conducted semi-structured interviews about parents' experiences of parenting around screen media use with parents of children with ADHD. In total, 6 parents of children with ADHD from different age and sex groups completed these interviews. Interviews were transcribed and analyzed using a qualitative inductive content analysis approach. Four broad content classes emerged, namely (1) concerns about parenting around screen media use, (2) parental mediation strategies and approaches, (3) adapting mediation practices based on developmental stage, and (4) unique parenting considerations in the context of ADHD and screen media. Within each content class, sub-classes were also generated that helped to understand parents' experiences within the context of having a child with ADHD.

Chapter 5: General Discussion

Overall, the present studies aimed to better understand, characterize, and describe parental mediation of screen media use in children at-risk of attention difficulties. In order to address this broad aim, three studies with complementary goals and methodologies were conducted. First, we conducted a factor analytic study to validate the structure of an updated scale of parental mediation. Second, we conducted a quantitative study of parental mediation and related factors in parents of children with various attention presentations (i.e., community sample, ADHD sample, and early neurological risk sample). Finally, we conducted a qualitative study in parents of children with ADHD to better understand parents' lived experiences of mediating their child's screen media use within the context of attention difficulties. These three complimentary approaches allowed for a more fulsome understanding of the principle of parental mediation in children at-risk of attention difficulties, which has been a largely understudied topic to date.

Summary of all study results

In Study One, we updated and developed the Parental Mediation Scale (PMS), which was then completed by a large community sample of parents of children aged 6-18 years without attention difficulties. Overall, this scale demonstrated good psychometric properties and a three-factor model fit the data well, representing the parental mediation strategies of active mediation, internet safety mediation, and restriction/monitoring. Additionally, we examined age and sex differences within domains of the PMS, which were largely consistent with the findings to date in the literature in this area. All primary study hypotheses and results of this first study are summarized in Table 17.

Table 17

Summary of Study 1 hypotheses and results

Hypotheses	Results		
	Active mediation	Internet safety	Restriction
H_1: Excellent reliability of all factors	X	X	X
H_2: Age related to all factors	X	X	X
H_3: Sex differences in some factors	No difference	No difference	Males > Females

Note. X indicates a significant finding.

In Study Two, we administered the PMS and related measures (e.g., parental stress about screen media use, impact of screen media on child, child attention problems) to three samples of parents, namely a community sample, an ADHD sample, and an early neurological risk sample. In our first study aim, we examined group differences in the study variables, which are summarized in Table 18. In our second study aim, we examined associations between PMS domains (i.e., restrictive mediation, internet safety mediation, and active mediation) and all study variables (i.e., parental stress about child screen use, negative impact of screens on the child, parent comfort with technology, daily child screen use, child age) in the three samples as well as within different age groups within the community sample (Table 19). In our third study aim, we estimated regression models to predict screen media outcomes (i.e., parental stress about child screen use, negative and positive impact of screens on the child, daily child screen use) from parental mediation strategies, while controlling for age and sex (Table 20).

Table 18

Summary of Study 2 (aim 1) hypotheses and results

Hypotheses	Results
H_{1a}: PMS domains (ADHD and Neurological > community)	
- Active mediation	Community > ADHD and Neurological
- Internet mediation	Community > ADHD and Neurological
- Restriction	No significant difference

H_{1b}: Impact on parent and child (ADHD and Neurological > community)	
- Negative impact on child	ADHD > Community and Neurological
- Positive impact on child	ADHD < Community and Neurological
- Parental stress	ADHD > Community and Neurological
H_{1c}: Child and parent screen media use (ADHD and Neurological > community)	
- Child screen media use	No significant difference
- Parent screen media use	No significant difference

Table 19

Summary of Study 2 (aim 2) hypotheses and results.

Correlation patterns within community, ADHD, and neurological samples

Hypotheses	Results		
	Community	ADHD	Neurological
H_{2a}: Higher reported use of PMS strategies related to			
- Lower parental stress about screens	ISM, AM	RM, ISM	RM, AM
- Lower negative impact of screens on child	ISM	-	RM
- Higher parent comfort with screens	RM, ISM, AM	-	-
- Lower daily child screen media use	RM, AM	RM	AM
- Lower child age	RM, ISM, AM	RM	-
H_{2b}: Higher parental stress related to			
- Lower parent comfort with screens	X	-	X
- Higher child screen media use	-	X	X
- Higher negative impact of screens on child	X	X	X
H_{2c}: Higher problems with child inattention related to			
- Higher parental stress about screens	X	-	X
- Higher negative impact of screens on child	X	X	X
- Higher daily child screen media use	X	-	X

Correlations in children (6-12 y.o.) and teens (13-18 y.o.) in the community sample

Hypotheses	Results		
	Lower parental stress	Less negative impact on child	Lower child screen use
H_{2d}: In children, use of RM and ISM will be related to better outcomes:			
- Restriction (RM)	X	X	X
- Internet safety (ISM)	X	X	-
- Active mediation (AM)	X	-	-
H_{2e}: In teens, use of AM and ISM will be related to better outcomes:			
- Restriction (RM)	X	-	-
- Internet safety (ISM)	-	-	-
- Active mediation (AM)	-	-	-

Note. RM = restrictive mediation; ISM = internet safety mediation; AM = active mediation. X indicates a significant finding. - indicates a non-significant finding.

Table 20

Summary of Study 2 (aim 3) regression models and results.

Regression model (outcome and predictor variables)	Results		
	Community	ADHD	Neurological
Outcome: parental stress			
- PMS: Restriction	X	-	X
- PMS: Active mediation	-	-	-
- PMS: Internet safety mediation	X	-	-
- Child age	-	-	-
- Child sex	-	-	-
Outcome: negative impact on child			
- PMS: Restriction	-	-	X
- PMS: Active mediation	-	-	-
- PMS: Internet safety mediation	-	-	-
- Child sex	-	-	-
- Child age	X	-	-
Outcome: positive impact on child			
- PMS: Restriction	-	-	-
- PMS: Active mediation	X	-	-
- PMS: Internet safety mediation	-	-	-
- Child sex	-	-	-
- Child age	-	-	-
Outcome: daily child screen use			
- PMS: Restriction	X	X	-
- PMS: Active mediation	-	-	-

- PMS: Internet safety mediation	-	X	-
- Child sex	-	-	-
- Child age	-	X	X

Note. X indicates a significant predictor. - indicates a non-significant predictor.

In Study Three, we conducted semi-structured interviews with parents of children with ADHD, allowing for parents to share their experiences of navigating parental mediation within the context of childhood ADHD. Results from an inductive content analysis generated four broad themes that parents spoke about: (1) concerns about parenting around screen media use, (2) parental mediation strategies and approaches, (3) adapting mediation practices based on developmental stage, and (4) unique parenting considerations in the context of ADHD and screen media. While many of the subcategories that emerged were consistent with what was endorsed in Study 1 and 2, parents also raised several novel considerations (e.g., different mediation strategies, unique considerations in the context of ADHD), that provide important additional insight into these parents' experiences, and may helpfully guide future research in this area.

The dimensional structure of parental mediation

One of the broad aims of this project was to assess the dimensional structure of parental mediation. In order to accurately determine the factor structure of parental mediation, it was first deemed important to create an updated version of the Parental Mediation Scale (PMS) with items that represent the updated screen media landscape. It has been well-documented that parental mediation strategies evolve quickly in response to the ever-changing technologies that children and youth have access to (Livingstone & Helsper, 2008; Sciacca et al., 2022), creating an important need to continually update our measures in response. In our current context, it is especially relevant to consider the parental mediation approaches that are required to manage

how children use mobile screen devices, as this poses new and unique challenges (Nagy et al., 2023).

Some of the most common parental mediation strategies that have been endorsed over the past decades of research include active mediation, technical mediation, monitoring, restriction, and internet safety mediation, as summarized by Iqbal et al. (2021). As such, we updated and included items on the PMS that reflected these primary domains of parental mediation. However, we found that a three-factor model of parental mediation fit the data well, namely representing active mediation, internet safety mediation and restriction/monitoring. Despite the vast changes that have emerged in the screen media landscape due to the increasing presence of the internet in childhood, active mediation and restriction have persisted throughout the literature as being relevant parenting practices in the modern digital age (Nikken & Schols, 2015; Sciacca et al., 2022). While co-use was proposed as a separable parental mediation domain in original findings in this field (Valkenburg et al., 1999), it did not emerge as a unique domain in our study. Most of the items on the PMS that addressed co-use of screen media (e.g., “I look at websites and other online information with my child”) were found to fit best within the active mediation factor. This is consistent with more recent models of parental mediation, which specify that it is quite hard to delineate the practice of active mediation from that of co-use in the context of internet use and mobile devices (Garmendia et al., 2012; Symons, Ponnet, et al., 2017a).

In contrast, internet safety mediation did emerge as a separable factor in this study. This parental mediation strategy has been increasingly studied over the past decade to address the mediation approaches and conversations that parents navigate specific to safety on the internet (Dedkova et al., 2022). It has long been documented that children and youth can encounter significant psychological and social risks on the internet, including exposure to violent,

pornographic or hateful content, unwanted (or unintended) interactions with strangers, and risks related to privacy of information (Alsehaima & Alanazi, 2018). While these internet safety risks were often thought of being a difficulty that primarily emerged in adolescence, it is now better understood that as children engage with screen media devices from a younger age, they are also susceptible to many of these risks from a younger age. This was supported in the current work, as internet safety mediation was identified as a separable factor in our sample of children and adolescents (ages 6-18), which is consistent with Iqbal et al. (2021) model of parental mediation.

Another novel contribution of our factor analytic study (Study 1) was the development and addition of PMS items that were inspired by the construct of parent modeling and scaffolding to build child insight and awareness. However, these items did not emerge as a separable factor within the PMS in this study. Rather, these items seemed to best fit within the domain of general active mediation. Active mediation more broadly is often describe as including critical conversations between parents and their child about screen media use, which is hypothesized to help develop critical-thinking skills (Dedkova et al., 2022). As a result, it is possible that conversations and approaches that parents use to help their child build insight/awareness into their screen media use can appropriately be conceptualized within this broader factor of active mediation. Nonetheless, it is important to consider this specific aspect of active mediation in future studies and measures of parental mediation. While the construct of parent modeling and scaffolding to build child insight and awareness didn't emerge as a separable domain, the items were still retained within the active mediation domain and many parents throughout our different samples endorsed engaging in some of these behaviours (e.g., "share strategies with my child that I use to manage my own screen media", or "help my child notice that the way they engage with their devices can affect their mood or behavior"). These

kinds of items have not been traditionally incorporated in most measures of parental mediation, though it will be important to continue to do so in future work in this area.

In our qualitative study (Study 3), parents were also asked more generally about the parental mediation strategies that they use. Consistent with our factor analytic work, parents did endorse all three of the strategies of active mediation, restriction and internet safety mediation, with restriction being the most endorsed within this sample of parents of children with ADHD. A unique advantage of employing this complementary qualitative approach in this study is that the semi-structure interviews allowed parents to self-generate strategies that they have tried or are relevant to them and they were not limited to only responding to pre-determined items (such as on the PMS). This more flexible methodology allowed parents to bring forward additional mediation strategies that were not included in the PMS or in typical conceptualizations of parental mediation, such as use of distracting/alternative activities (i.e., offering none-screen based activities as an alternative). Interestingly, this same strategy was recently described in another qualitative study of parents of children with no attentional difficulties, and was named "activity substitution" (Huang et al., 2024). Our qualitative study also highlighted that parents may use additional "supplementary" strategies that can be used to augment some of the core mediation strategies they use. For example, several parents spoke about the helpfulness of using visual supports and/or systematic reminders about limits when implementing restrictive mediation. Future research in parental mediation may benefit from including these types of novel mediation practices that have been uncovered in qualitative research, to ensure that we are appropriately asking parents about all possible mediation strategies that they could be using when administering scale-based measurement tools.

Overall, the current research partly supported the dimensional structure of parental mediation that was proposed by Iqbal et al. (2021). Namely, three of the five domains proposed by Iqbal et al. (2021) were identified on the PMS (i.e., restriction, active mediation, internet safety). However, the final two domains they proposed (i.e., technical mediation and monitoring) did not emerge as separable domains and were best represented under the broader category of restriction. An important strength of Iqbal et al. (2021) model is the dynamic process of parental mediation that they propose, which involves parents continuously re-assessing their child's level of risk and re-adjusting their mediation approaches consequently. While some of the participants in our qualitative study (Study 3) spoke to their process of adjusting their parenting approaches based on their child's age, it would be interesting in future research to examine multiple child, parent and context factors that would require parents to re-adjust their approaches on an ongoing basis. Future studies would also benefit from taking a longitudinal approach to studying parental mediation in order to be able to test this key component of Iqbal et al. (2021) parental mediation framework, as the process of re-adjusting mediation practices may importantly and positively affect screen media outcomes for children and families.

Comparing parental mediation and related variables across samples

Another overarching aim of this project was to compare parental mediation strategies and related variables in children and youth from a community sample to those at-risk for attention difficulties (i.e., ADHD and early neurological risk). Additionally, we aimed to compare these variables across the two at-risk groups to see whether they would fare similarly, or whether differences may emerge between the two at-risk groups. It was hypothesized that parents of children in both the at-risk groups would have a greater need to apply mediation practices more regularly because their children may have greater risks related to screen media use due to their

higher risk of attention difficulties (Beyens & Eggermont, 2014). However, contrary to what was hypothesized, parents of children in both at-risk samples reported using significantly less active mediation and internet safety mediation than parents of children in the community sample, and no significant differences were found in the restriction domain.

One possible explanation for why parents of children at-risk for attention difficulties may be using parental mediation strategies less often could be due to parental stress or burnout, which could limit their capacity to respond appropriately and consistently to their child's evolving screen media demands. It is well-documented that parents of children with attention difficulties generally experience more parental stress and burnout broadly (Hutchison et al., 2016; Peterson et al., 2021; Theule et al., 2010), and this may also apply to the screen media domain. In fact, in our study, parents of children in the ADHD group did report significantly higher levels of parental stress regarding their child's screen media use, which may support this hypothesis. While parents of children in the neurological sample did not report higher levels of parental stress about their child's screen media use, it is possible that these parents would report a higher level of more general parental stress and burnout (i.e., outside of the domain of screen media), which has been found previously in the literature (Kelada et al., 2021; Parkes et al., 2009; Spratt et al., 2007). In future studies, it would be helpful to also include a more general measure of parental stress/burnout to answer this question more directly.

It is also possible that parents of children with ADHD and early neurological risk are using other mediation strategies or approaches more frequently that weren't asked about in the PMS that better meet their children's needs. For example, parents of children with ADHD in our qualitative study (Study 3) endorsed using complimentary approaches, such as activity substitution, providing reminders, and using visual supports. These kinds of strategies were not

asked about directly on the PMS, though may be more relevant to children with neurodevelopmental differences and would be important to consider included in measures of parental mediation in the future.

Parents of children in the ADHD group reported significantly less positive impact of screen media on their child and significantly more negative impact of screen media on their child, compared to both the community and the early neurological risk samples. Taken together, this signals that even though parents of children with ADHD are employing less parental mediation strategies, they are reporting significantly more difficulties within their child and within their own level of parental stress. This is consistent with what has previously been found in the literature regarding the increased difficulties that children with ADHD may have with screen media use (I. Beyens et al., 2018), and contributes to the literature by adding information regarding reduced use of parental mediation strategies despite the presence of increased challenges.

We hypothesized that the early neurological risk clinical group would also be susceptible to similar negative outcomes related to screen media use as the ADHD group due to their susceptibility to attention difficulties (Roberts et al., 2019; Williams et al., 2018). However, to meet eligibility criteria in our study, children only had to have confirmation of early neurological risk (e.g., perinatal stroke, significant cardiac condition, extremely preterm birth, etc.) and did not need to meet a minimum threshold of inattention difficulties. As a result, our early neurological risk sample included both children with and without significant attention difficulties, which may explain why this group exhibited lower levels of negative outcomes related to screen media overall compared to the ADHD group. In fact, in the subsequent correlational analyses (Study 2) for this early neurological risk group, we found that increased

reported child inattention was significantly related to increased parental stress, negative impact on the child, and child screen time. Taken together, these findings suggest that even amongst children with neurological risk, those with higher levels of difficulties with inattention may be especially and differentially vulnerable to difficulties with screen media.

Considering the relationship of parental mediation with parent and child outcomes

Two primary parent-focused variables were also included in our quantitative study (Study 2), namely parental stress about their child's screen media use and parent's self-rated comfort with technology generally. In the community sample, higher parent self-rated comfort with technology was related to an increase in parental mediation strategy use, which is consistent with the broader literature that suggests that parents tend to engage in more mediation and more diversified mediation practices when they have stronger digital skills themselves (Dedkova et al., 2022).

The correlation patterns between parental stress and PMS domains were mixed between the different groups in our quantitative study. Generally, greater use of PMS strategies was associated with lower parental stress, though some differences emerged between groups. However, it is essential to note that the community sample (*N*=386) was much larger than both the ADHD sample (*N*=66) and the early neurological risk sample (*N*=65). As a result, the statistical power to detect significant associations was likely different between these samples, with the community sample having greater statistical power. Because of differential power between samples, comparisons about significant correlations between groups should be interpreted with caution. In the community sample, only restrictive mediation was not associated with lower parental stress. It has been suggested that broader parenting practices that include the consistent implementation of appropriate limits and boundaries can be helpful in children who

struggle with behaviour regulation, such as those with ADHD (McLaughlin & Harrison, 2006; Zwi et al., 2011). As such, it is possible that parents in our at-risk samples apply this type of restrictive parent more broadly to manage challenging behaviours, which in turn reduces their stress about the behaviour.

In the ADHD sample, only active mediation was not associated with lower parental stress. It is important to consider that active mediation typically requires children to attend to and engage in a conversation with their parent, which may be more challenging for children with ADHD due to difficulties with sustained attention, executive functioning, and increased risk of communication/language difficulties (Westby & Watson, 2021). In future studies, it would be interesting to conduct observational studies of active mediation between parents and children with ADHD to better understand what barriers may exist for this population in accessing this strategy.

Finally, in the neurological group, only internet safety mediation was not associated with lower parental stress. Here, it is important to consider the broader neurocognitive profiles of this group. In our study, the early neurological risk group was designed to be quite transdiagnostic and heterogeneous in nature and so we included children with a wide range of cognitive profiles, including those with broader intellectual and developmental delays. Due to this heterogeneity in developmental level, it is possible that there is a proportion of children in this sample who do not encounter the same kinds of risks on the internet due to lack of exposure to risky content. Similarly, the neurological risk sample was significantly younger than the other groups in this sample, and so they may not be exposed to the same level of mature internet content which reduces the need for internet safety mediation practices. Nonetheless, this highlights the

importance of considering cognitive and developmental needs of children when interpreting the usefulness of various parental mediation practices.

The correlations between PMS domains and outcomes for the child were also assessed within each sample in our quantitative study (Study 2). In the community sample, internet safety mediation was significantly related to lower negative impact of screen media on the child, whereas restriction and active mediation were significantly associated with lower daily screen media use. The regression analyses conducted in the community sample also found similar patterns, which suggested that restriction predicted reduced parental stress and daily child screen use, internet safety mediation predicted reduced parental stress, and active mediation predicted greater positive impact on the child. This suggests that different parental mediation strategies may differentially impact outcomes on the child and parent. For example, enforcing further restrictions may have a positive impact on reducing daily screen media use as the child will have less access to their devices, however this strategy may not be sufficient to mitigate the negative impacts and risks that children face when they are in an online environment. In fact, there is some research to suggest more broadly that while restriction does help to reduce screen time, it is also linked to children developing fewer skills in the digital world (Chen & Shi, 2018; Duerager & Livingstone, 2012). As such, it is important for parents to consider balancing these different kinds of strategies based on their goals, rather than to select a single kind of strategy to implement with their child.

In the ADHD group, none of the PMS domains were significantly related to negative impact of screen media on the child, and only restriction was related to lower daily child screen media use. In the early neurological risk sample, restriction was associated with lower negative impact on the child while active mediation was associated with lower daily child screen use.

Regression analyses in these groups were fairly consistent with these findings as well, suggesting that increased use of restriction was most commonly predictive of positive screen media outcomes, including lower parental stress, negative impact on the child, and daily child screen use. Once again, it is important to highlight that the at-risk samples had less statistical power to detect significance due to their smaller sample size, and these findings would need to be replicated within larger samples to determine whether these different trends are due to unique features of the at-risk groups or due to sample size. Nonetheless, these findings may also reflect unique neurodevelopmental needs of the children within these at-risk samples, or the fact that parents may be using additional strategies that are not well captured within the items on the PMS.

It was also anticipated that higher levels of parental stress would be significantly related to worse child screen media outcomes, including more parent-rated negative impact of screen use on the child as well as higher child screen media use (i.e., average # of hours per day). Across all groups, it was found that higher parental stress was strongly and significantly related to higher negative impact of screen use on the child. Higher parental stress was also significantly associated to more daily child screen use, in the ADHD and early neurological risk groups. It is possible that as parents notice more problems with their child's screen media use, their own stress increases and they feel less capable of managing their child's screen media use. This relationship between parent stress and negative child screen media outcomes has been found to be especially true within children with a higher degree externalizing behaviour problems (McDaniel & Radesky, 2020). It has also been found that higher levels of parenting stress can predict higher levels of child screen media use, which may support the hypothesis of parent burnout affecting their capacity and ability to mediation their child's use (Brauchli et al., 2024;

Seguin et al., 2021; Tang et al., 2021). Regardless of the mechanism of the relationship between these variables, this highlights the need to continue to consider parent-focused factors, such as parental stress, in order to more fulsomely understand the development of negative screen media outcomes in children.

Understanding the impact of child attention problems

In addition to comparing parental mediation and related variables across samples of children with a range of attention presentations, we also examined associations between these variables and parent-rated problems with child inattention within each sample in our quantitative study (Study 2). As predicted, higher problems with child inattention were related to higher parental stress about screens, higher negative impact of screens on their child, and higher daily child screen media use in both the community sample and the early neurological risk sample. While these same patterns weren't found in the ADHD sample, this may be due to a smaller range of scores on the parent rating of inattention, as all children in this sample had to demonstrate elevated attention problems to be included in the sample. This finding provides an indication that child attention problems may be an important risk factor for developing negative outcomes related to screen media use, which is largely consistent with the broader literature (Santos et al., 2022).

In our qualitative study (Study 3), one of the broad themes that emerged was the unique parenting considerations and concerns in the context of ADHD and screen media. Specifically, all parents in this sample endorsed that they believe their child's attention abilities affects the way in which they interact with screen media. In line with the increased risk difficulties with addiction that individuals with ADHD may experience more broadly (Schellekens et al., 2020), many parents spoke to the addictive quality that their child's relationship has to screen media,

which raises additional challenges in their ability to implement effective parental mediation practices. Taken together, this information suggests that it is essential to consider a child or youth's attentional profile in order to best understand and support their relationship with screen media.

Developmental trends: The importance of considering age and stage

Throughout all the studies in this project, it was deemed important to assess the impact of child age and developmental stage on parental mediation practices. When developing the updated PMS, one of the goals was to develop and validate a scale that could be applied broadly across development. To date, many of the parental mediation scales that have been developed and validated have inconsistently targeted different age groups, which creates challenges when comparing across different scales and studies (Kuldas, 2021). In the present factor analytic study (Study 1), the PMS was successfully applied and validated in a large community sample with a wide age range (i.e., 6-to-18-years-old). This allows for a more direct comparison between children and youth at different stages, and also creates increased opportunity for longitudinal work to track how parental mediation is applied and evolves across development.

Nonetheless, the literature strongly supports that there are important developmental trends in the implementation of parental mediation practices, namely that parents tend to intervene with parental mediation strategies less frequently as their child ages (Nagy et al., 2023). This finding was replicated in our factor analytic study (Study 1), such that higher child age was significantly related to decreased use of active mediation, internet safety mediation, and restriction. This relationship was found to be strongest in the domain of restriction, which is consistent with prior findings that parents tend to implement restriction more with younger children and that this becomes less possible as their child enters adolescence and develops a

more independent relationship with screen media (Brito et al., 2017; Symons, Ponnet, et al., 2017a). In contrast, this relationship was found to be weakest (though still significant) within the domain of internet safety mediation. This is also consistent within what is known more broadly about internet safety, such that adolescents are more likely to encounter risky online situations as they gain more independence in their screen media use (Vanwesenbeeck et al., 2016).

Child age and developmental stage was also importantly considered in the larger quantitative study, which included children at-risk for attention difficulties in our ADHD and early neurological risk samples (Study 2). Interestingly, lower parental mediation as children get older was not found consistently in the at-risk samples. For example, older child age was only significantly related to less use of restrictive mediation in the ADHD sample. Additionally, child age was not significantly related to any of the PMS domains within the neurological sample. One possibility for this finding is that it may be linked to the neurodevelopmental profile of children with ADHD and/or early neurological risk. For example, researchers have proposed the maturational lag model of ADHD, which posits that children with ADHD may experience a lag in the normal timeline of the development of their neural pathways (Burke & Edge, 2013). This lag may result in increased socio-behavioural difficulties, as well as an overall slower progression of emotional and behavioural maturity (Gustafsson et al., 2010; Jogsan, 2013). As such, it is possible that children and youth at-risk of attention difficulties in our at-risk samples are being perceived as less mature by their parents, and thus parents continue to employ the same parental mediation strategies into early and later adolescence. It is also again important to note that the two at-risk samples in our study were smaller in size than the community sample and were younger in age on average (especially in the neurological risk sample). As such, it would be important to investigate these trends again in these groups with more adolescents, in order to

assess whether maturational lags may play an important role in parental mediation in these groups.

Within the community sample, we also examined associations between PMS domains and parent/child outcome variables separately within parents of children (i.e., 6-12 years old) and parents of adolescents (i.e., 13-18 years old). As predicted, the patterns of correlations that emerged within these age groups were different, with many PMS domains being significantly associated to better parent and child outcomes in the child group, but not within the adolescent group (see Table 19). In fact, in the adolescent group, the only significant association that emerged was that increased use of restriction was related to less parental stress about their child's screen media use. Contrary to what we hypothesized, active mediation and internet safety mediation were not associated with better outcomes in the adolescent sample. This suggests that in our community sample, parental mediation strategies may be less impactful in mitigating risks in adolescents than in children, though this requires further study to better understand this association.

In the qualitative study (Study 3), many parents also spoke about their experiences of adapting their parental mediation practices based on their child's developmental stage. While this was within the context of parenting a child with ADHD, a core theme that emerged was that parents expressed challenges in navigating how to adapt their mediation practices as their child age, especially when entering adolescence. It is well understood in the broader psychological literature that adolescence is a time of identity development, where adolescents naturally will separate from their parents in order to explore their environment and develop their own identity as they enter adulthood (Crocetti, 2017). This identity formation can cut across multiple domains of adolescents' lives, and is known to be impacted by adolescents' interactions with screen

media devices in the digital world that they so frequently interact with (Granic et al., 2020). In our study, many parents spoke to understanding this idea and having a desire to allow their adolescent to have more independence, but struggling to facilitate this as they often saw negative repercussions when their adolescent was given too much independence. Further qualitative studies to investigate this question in children without attention difficulties would provide added value to understand these complex relationships. Additionally, quantitative longitudinal studies would allow the tracking and study of how parents' mediation practices evolve over the course of development, which may help researchers and families alike better understand how to support these transitional phases in development.

In addition to parents, school systems are grappling with many of these same questions about how to manage screen media use within the school environment, particularly amongst adolescents in high school. Like parents, schools have been faced with the challenge of trying to navigate how to mediate screen media use in the context of a quickly evolving technological landscape. These questions and challenges have led many school boards, globally, to consider implementing smartphone policies for children and youth when at school. Interestingly, while many school systems initially attempted to have broader smartphone policies that allowed for some access to phones during the school day, many have begun to implement stricter restrictions even amongst adolescents. For example, in 2019, school boards in Ontario indicated that students across the province would be allowed to use smartphones for educational, health and special needs purposes, but otherwise they should be limited to lunch or recess times (McGinn, 2024). However, most recently Ontario has updated this policy to create stronger restrictions, such that cell phones will be completely banned in the classroom for elementary-aged students and high school students, beginning in September 2024 (Sandstorm, 2024). This suggests that many

systems that are important parts of children and youth's lives are also trying to navigate how to adapt mediation practices at different stages of development, due to ever-changing needs.

Clinical implications

Clinically, difficulties with screen media use and how parents can respond to these challenges is a topic that is frequently raised by parents of children both with and without attention difficulties (Hale et al., 2018). There is a wealth of information to support the positive impacts that screen media use can have on people's lives, as well as the risks that are associated including overuse, addiction, and engagement in risky online behaviours (Neophytou et al., 2021). As many parents highlighted in our qualitative study (Study 3), difficulties with screen media can also have a significant impact on the daily lives of families and the quality of their interactions, which can have rippling impacts in many areas of daily living. Parental mediation has been raised as an important and tangible avenue for intervention to help children and youth develop healthier relationships with screen media (Iqbal et al., 2021).

Findings from this project may help to inform parent- and school-based interventions that can provide parents and schools with more guidance on how to effectively mediate their children's screen media use. For example, parents may benefit from psychoeducation on how different parental mediation strategies relate differentially to various child outcomes. It is important to inform parents that this will likely vary based on child age (e.g., restriction seems most effective when the child is young, and becomes less effective in adolescence) as well as based on broader neurodevelopmental needs. Additionally, parents may benefit more broadly from psychoeducation about the different kinds of parental mediation strategies at their disposal. For example, parents may benefit from having information about the effectiveness of strategies such as active mediation and internet safety mediation, to help them develop an understanding

that this can help their child develop a healthy relationship with screen media use in the long term.

In order to effectively guide psychoeducation and intervention efforts with parents on parental mediation of screen media use, clinicians may also consider using the Parental Mediation Scale (PMS) updated and validated in the current research (Study 1). The PMS developed in our study has several important advantages, including having updated items that are relevant to current mediation practices, demonstrating statistical reliability, and being validated in children from a wide age range (i.e., 6-18 years old). This tool allows parents to reflect on and rate their current mediation practices, which could serve as an important first step in guiding subsequent psychoeducation and/or intervention. Additionally, because the PMS is validated across a large age range (i.e., 6-18 years old), this tool allows for repeated administration at different points across development, which can helpfully support longitudinal approaches to studying parental mediation.

Findings from this research also suggest that it is extremely important to consider not only the impact that screen media use has on child outcomes, but also on parents. For example, in our quantitative study (Study 2), we found that higher parental stress about their child's screen use was significantly associated with worse child outcomes (e.g., negative impact of screen media on the child, higher child daily screen time). Similarly, in our qualitative study (Study 3), many parents spoke to having difficulties in managing their child's screen media use, which led to feelings of hopelessness and defeat in their role as a parent, often leading parents to feeling like "giving up" on their mediation practices. These findings are consistent with the broader literature that suggests that parent stress is predicted by greater behavioural difficulties with their child (Solem et al., 2011). Clinically, this suggests that it is not only important to provide parents

with education and support on implementing mediation practices, but also providing parents with emotional support in managing their own stress and feelings about this challenging process. When tackling child screen media use, clinicians may consider also speaking with parents about their own feelings, stress levels about this topic. For parents who are struggling with these emotions, clinicians may consider ways to normalize and validate parents' experiences to support their overall coping and well-being. This may help parents manage their own stress and burnout, which, in turn, may increase their capacity to mediate their child's screen media use effectively.

Another contribution of this project was to examine parental mediation and associated outcomes within the context of childhood attention difficulties. An important clinical consideration from findings in the present studies is that children with higher reported attention problems were found to be at higher risk of having associated difficulties with screen media use. Parents of children with ADHD in our sample consistently reported more challenges with screen media use, and higher problems with attention was also quite consistently associated with negative screen media outcomes within the two other samples. Even within the community sample and the neurological risk sample, higher problems with attention were consistently related to worse screen media-related outcomes. This is important for clinicians and parents to consider, as this suggests that it may be helpful to screen children who struggle with attention for difficulties with screen media from an early age, in order to allow for early intervention.

Limitations and future directions

Despite the important findings from this work, there are some limitations and future directions that are important to be considered. First, it is important to note that all the quantitative data in these studies (i.e., Study 1 and 2) were collected via online data collection. While this

approach was favourable to collect a larger and more diverse sample, there can be concerns with online data collection with regards to data quality. It is important to note that to date there is ample research in psychology and related fields that utilizes data collection, with research confirming that findings from online data collection are comparable to data that is collected via paper and pencil (Blumenberg & Barros, 2016; Casler et al., 2013; Weigold et al., 2013). We also created several data quality parameters to try to limit these potential difficulties (e.g., attention checks, screening data for quality), and as such are confident in the quality of the data that was collected. Nonetheless, it is important to consider more broadly that online data collection can raise concerns regarding participant engagement, including the attention that participants pay to completing questionnaires thoughtfully as well as a potential selection bias with regards to the characteristics of individuals who are able to complete these questionnaires independently. Future projects should consider replicating these findings in an in-person sample to increase confidence in the quality of the data collected.

It is also important to consider the sample characteristics of participants in our study. First, there is a noticeable difference in sample size between the community sample as well as the at-risk samples. As mentioned, the differences in sample size between the community group and the at-risk groups is particularly important to consider with regards to the differences in statistical power that could result from differences in sample size. As such, it is important to interpret not only statistical significance, but also effect size. While it is typically expected that at-risk samples will be smaller in size, it would be helpful in future to continue studying these phenomena in these special populations with larger samples to replicate the findings in the current studies.

The early neurological risk sample in our study was designed to be a transdiagnostic, heterogeneous group of children with a variety or medical and psychological presentations. However, in future research it may be beneficial to consider recruiting intentionally according to certain patient-specific characteristics (e.g., medical diagnosis, cognitive/intellectual functioning, co-occurring attention, intellectual or learning diagnoses, cultural/family factors, etc.) in order to better understand whether there are certain unique child qualities that are especially relevant to parental mediation. Parents in the early neurological risk sample were also asked to self-report regarding their children's medical conditions and diagnoses. In future, it would be helpful to have more detailed information about children's medical diagnoses (e.g., via medical chart review) in order to more confidently interpret the information shared by families.

Additionally, it would be beneficial to collect information from the parents responding to the questionnaires about their own attentional profile (e.g., whether they have difficulties with attention and/or have a diagnosis of ADHD). This is especially relevant within the context of children with ADHD, as it is well-understood that ADHD is highly heritable, with some estimates close to 80% (Grimm et al., 2020). To date it is not well understood whether parental ADHD affects their process of implementing parental mediation strategies, however some broader research does suggest that parental ADHD can impact more general parenting behaviours (Friedrich et al., 2017; Park et al., 2017). As such, this would be an interesting and important variable of study in future research of parental mediation in the context of ADHD. Should parental ADHD be found to be an important factor in understanding the implementation of parental mediation approaches, this could in turn importantly inform interventions for parents with ADHD.

It is also important to note that there were some differences in parent characteristics between our community and clinical samples. Many characteristics were quite similar across samples, including parent age, relationship of parent to the child, and child race/ethnicity. However, caregiver level of education was fairly different between samples, with a much higher proportion of parents in the clinical samples (59.1%-63.1%) endorsing having college/university education compared to parents in the community sample (29%). This may be due in part to the different methods of recruitment used for the community samples vs. the clinical samples. Nonetheless, parental level of education has been found to be a relevant factor to consider when studying parental mediation of screen media use (Nagy et al., 2023; Totland et al., 2013), and should be considered more fulsomely in future research.

One of the strengths of the current research was developing and validating an updated measure of parental mediation (PMS) that is reflective of the current digital landscape. However, it is essential to highlight that one of the challenges with research and measurement development in this area is the quickly evolving nature of digital technologies. For example, since the initial design and data collection for the current project, children and youth are gaining more access to more advanced technologies such as virtual reality and artificial intelligence. It's anticipated that these revolutionary technological advancements will quickly change the level of risk that children could experience digitally, which in turn should impact parents' mediation approaches. In future studies, researchers should importantly consider the relevant technological advancements that are at children and youth's disposal, and critically evaluate the measurement tools that they select based on this.

Finally, in this study we only collected information about parental mediation based on one parent's self-report. In future, it would be helpful to gather this same information from all

the child's caregivers (rather than only one), in order to develop a more comprehensive understanding of the broader mediation practices that occur in the child's life. It is also important to consider the impact that variables such as social desirability (and how this interacts with cultural norms/values) may have on self-reporting, which has been found to be particularly relevant in the context of parent reports of child behaviour and their own behaviours (Runge & Soellner, 2022). As such, future research may consider using various methodologies (e.g., observational studies) in order to collect more fulsome information on these parent and child screen media behaviours. This may be especially relevant when measuring constructs such as time spent on screen media devices, as research has shown that individuals will often under-estimate the amount of time they spend on screen media devices compared to direct technology-based measures (Perez et al., 2023).

Additionally, some studies have suggested that it could be helpful to gather this same information from the child/youth perspective as well, to better understand how children perceive the implementation of parental mediation practices at home (Lwin et al., 2021). In future studies it may be of interest to develop and administer a youth-perspective version of the PMS to contribute further to our understanding of parental mediation. Similarly, future studies could also consider conducting semi-structured interviews with children and youth on these topics. To our knowledge, there is very limited information about parental mediation and related variables from the perspective of youth with ADHD and other attention-related concerns, which may provide valuable insight into better understanding these complex phenomena in children and youth with attention difficulties.

Conclusion

Overall, parental mediation of screen media use is a complex and important phenomenon of study that can help researchers, clinicians, and families better understand the role that parents and families have in managing their child's screen media use. Child screen media use has become more prevalent over the past decades, and there is clear indication that it will continue to be an important part of children's lives for the decades to come. Better understanding factors that can help understand how children develop certain relationships with screen media, such as parental mediation, can help inform ways to mitigate risks that they may encounter. To our knowledge, this was the first study to comprehensively study parental mediation using different methodologies (i.e., factor analysis, quantitative study and qualitative study) in parents of children with various attention profiles (i.e., children with no attention problems, children with ADHD, and children at-risk of attention difficulties due to early neurological risk). Broadly, our study supported a three-factor model of parental mediation, which includes active mediation, internet safety mediation and restrictive mediation. Parents of children without attention difficulties reported using parental mediation strategies more often, though parents of children with ADHD reported more challenges with negative outcomes associated with child screen media (i.e., increased parental stress, more negative impact on the child). In semi-structured interviews, parents of children spoke to these challenges in greater detail and shared unique strategies and considerations they have within the context of their child's attentional profile. In our study, children with early neurological risk did not seem to be prone to the same level of difficulties as children with ADHD, though those with a higher degree of attention problems did seem to fare worse. Correlational analyses also indicated that child attention problems, child age, parental stress about screen media and the impact of screen media on the child are important

factors to consider to better understand screen media use in childhood. Regression analyses suggested that parental mediation strategies differentially predict screen media outcomes, including parental stress, negative and positive impact on the child, and daily screen use.

In conclusion, this research contributed to the literature by helping to better understand the complex phenomenon of screen media use in childhood, and the critical role that parents and families can have in this process. This project importantly demonstrated that children with attentional difficulties have unique needs with regards to screen media use, and parents can play an important role in mitigating the risks associated with screen media use. In future, we hope that this work can help support families to navigate this complex process and guide the development of parent-based interventions that help parents navigate the multi-faceted, ever-changing domain of parental mediation.

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Appendix A

Participant demographics form

Please fill out this questionnaire as completely as you can about you and your child. You may skip any questions that you do not feel comfortable answering or are unable to answer.

The definition of a caregiver means an individual(s) who is/are looking after a child's daily basic needs and ensure that they are safe and healthy.

We understand that families may come in all shapes and sizes. Kindly please reflect on your child's caregiver(s) and complete the following questions as it best fits your family structure.

Caregiver filling out this form: (e.g., mother, father, step-parent, grandparent, aunt/uncle)
_____

Questions about your family
How many caregivers does your child live with?

- Two caregivers
- One caregiver
- Other; Please specify: _____

Please describe your living arrangement with your child (e.g., child lives with me full time, lives with me every other week, on weekends, etc.): _____

Your current age: _____

Your highest level of education completed:

- Less than 7th grade
- Junior high/middle school (9th grade)
- Partial high school (10th or 11th grade)
- High school graduate
- Partial college/university (at least one year)
- College/university education
- Graduate/professional degree
- Would rather not say

Your employment status:

- Not currently employed
- Part-time
- Full-time

Is there another caregiver: Y or N

Please specify other caregiver relation TO CHILD (e.g., mother, father, grandparent, aunt, uncle): _____

Please specify YOUR relation to other caregiver (e.g., husband, wife, common-law partner, ex-spouse, mother, father, brother, sister, etc.): _____

Other caregiver's current age: _____

Other caregiver's highest level of education completed:

- Less than 7th grade
- Junior high/middle school (9th grade)
- Partial high school (10th or 11th grade)
- High school graduate
- Partial college/university (at least one year)
- College/university education
- Graduate/professional degree
- Would rather not say

Other caregiver's employment status:

- Not currently employed
- Part-time
- Full-time

How many siblings does your child have?

- None
- 1
- 2
- 3
- 4
- 5
- More than 5

Where does your child rank in birth order (1st, 2nd, etc.)? _____

Is the primary language (strongest/main language) at home English?

- Yes
- No

Primary language spoken at home: _____

Is English your child's first language (first language the child learned)?

- Yes
- No

What is your child's first language? _____

Does your child have any diagnosed medical or neurodevelopmental diagnoses? Please check all that apply:

____Attention Deficit Hyperactivity Disorder (ADHD)

____Learning Disability (LD)

____ Intellectual Disability (ID)

____ Autism Spectrum Disorder (Swanson et al.)

____ Tourette's or other tic disorders

____ Stroke

____ Epilepsy

____ Diabetes

____ Heart/Cardiac Condition (Please specify: _____)

____ Thyroid Condition

____ Cancer (Please specify: _____)

____ Premature Birth

____ Fetal Alcohol Spectrum Disorder (FASD)

____ Traumatic Brain Injury

____ Psychosis

____ Anxiety

____ Obsessive Compulsive Disorder (OCD)

____ Depression

____ Substance Use Disorder

____ Oppositional Defiant Disorder

____ Conduct Disorder

____Other (Please specify: _____)

If your child has been diagnosed with ADHD, please answer the following questions:

What type of health professional diagnosed your child with ADHD?

_____ Family doctor

_____ Pediatrician

_____ Psychologist

_____ Psychiatrist

_____ Other (Please specify: _____)

At what age was your child diagnosed with ADHD? _____

At what age did you notice that your child had difficulties with attention, impulsivity and/or hyperactivity? _____

Does your child have difficulties with attention, impulsivity and/or hyperactivity in the following settings:

_____ home

_____ school

_____ extra-curricular activities

_____ socially with peers

_____ other: (please specify:_____)

Does your child's difficulties with attention, impulsivity and/or hyperactivity interfere in the following life domains:

	Not at all	Only a little	A medium amount	A great deal
HOME LIFE	☐	☐	☐	☐
FRIENDSHIPS	☐	☐	☐	☐
CLASSROOM LEARNING	☐	☐	☐	☐
LEISURE ACTIVITIES	☐	☐	☐	☐

Does your child take any prescription medications? Please list any medication(s) that your child is currently taking: _____

What is your child's sex (assigned at birth)?

- Female
- Male
- Intersex

What is your child's MONTH of birth? _____

What is your child's YEAR of birth? _____

How old is your child? _____

Is your child adopted?

- Yes
- No
- Unknown/Prefer not to answer

In what country was your child BORN? _____

In what country does your child CURRENTLY live? _____

In what city and province/state does your child CURRENTLY live? _____

What is your child's ethnicity (Ethnicity is defined as an identity based on shared attributes, such as traditions, ancestry, language, history, society, culture, nation, religion, or social treatment.)? _____

What race does your child best identify with (Race is defined as a concept used to group people according to various factors including ancestral background and social identity.)? _____

On average, my child's current grades in academic subjects are:

- A's (exceeds expectations)
- B's (meets expectations)
- C's (working towards meeting expectations)
- D's (is not meeting expectations)

Does your child receive formalized accommodations or additional support at school?

- Yes; Please describe: _____
- No

Appendix B

Parental Mediation Scale – Initial items developed

	Never	Rarely	Sometimes	Very Often	Always
Active co-use: parents encourage, share and discuss mutually					
Watch shows, movies, or videos with my child online. (item 13)	1	2	3	4	5
Browse social media sites with my child. (item 2)	1	2	3	4	5
Talk to my child about what kinds of activities they engage in online. (item 21)	1	2	3	4	5
Encourage my child to explore and learn things on the internet. (item 9)	1	2	3	4	5
Look at websites and other online information with my child. (item 29)	1	2	3	4	5
Active mediation of internet safety: parents guide towards safer online practices					
Talk to my child about what to look out for when talking to people they don't know online. (item 1)	1	2	3	4	5
Talk to my child about how to protect their personal information online. (item 22)	1	2	3	4	5
Talk to my child about what to do if they are being bullied/harassed online. (item 28)	1	2	3	4	5
Explain to my child why some websites are appropriate and inappropriate. (item 11)	1	2	3	4	5
Talk to my child about what to do when something they've seen online has bothered them. (item 10)	1	2	3	4	5
Restrictive mediation: parents set rules and regulations					
Tell my child when or at what time of day they are allowed to use their devices. (item 14)	1	2	3	4	5
Set time limits on how long my child is allowed to use their devices for. (item 3)	1	2	3	4	5
Tell my child what social media sites they are allowed to use and not use. (item 30)	1	2	3	4	5

Tell my child what online games they are allowed to play and not play. (item 23)	1	2	3	4	5
Tell them what kinds of shows or videos they are allowed to watch and not watch. (item 15)	1	2	3	4	5
Monitoring: parents monitor and supervise their child					
Check in with my child when they are using their devices. (item 4)	1	2	3	4	5
Stay close to my child when they use their devices in case they need help. (item 31)	1	2	3	4	5
Visit my child's social media pages to monitor what they are posting online. (item 5)	1	2	3	4	5
Check what websites my child has visited by looking at their browser history. (item 16)	1	2	3	4	5
Read the messages that my child sends and receives from friends. (item 24)	1	2	3	4	5
Technical mediation: parents use software or control mechanisms to restrict or filter online activities					
Use parental controls or other means to block or filter some types of websites. (item 6)	1	2	3	4	5
Use parental controls that filter the apps that my child can download. (item 25)	1	2	3	4	5
Create "child-friendly" accounts on certain platforms (e.g., Netflix) for my child to use. (item 17)	1	2	3	4	5
Turn off the Wi-Fi router at certain times of day to restrict internet access. (item 20)	1	2	3	4	5
Install software on my child's devices to prevent junk/spam mail. (item 27)	1	2	3	4	5
Skill building to increase awareness regarding tech use and behaviours					
Collaborate with my child to create limits and expectations for their screen media use. (item 7)	1	2	3	4	5
Engage my child in discussions about the positive and negative aspects of content they view online. (item 12)	1	2	3	4	5

Share strategies with my child that I use to manage my own screen media. (item 18)	1	2	3	4	5
Help my child recognize when they have been using their device for too long. (item 8)	1	2	3	4	5
Help my child notice that the way they engage with their devices can affect their mood or behavior. (item 26)	1	2	3	4	5
Talk with my child about benefits and consequences that can come from using screen media. (item 19)	1	2	3	4	5

Appendix C

Swanson, Nolan, and Pelham Rating Scale – Fourth Version (SNAP-IV)

For each item, check the column which best describes this child.	Not at all	Just a little	Quite a bit	Very much
1. Often fails to give close attention to details or makes careless mistakes in schoolwork or tasks				
2. Often has difficulty sustaining attention in tasks or play activities				
3. Often does not seem to listen when spoken to directly				
4. Often does not follow through on instructions and fails to finish schoolwork, chores, or duties				
5. Often has difficulty organizing tasks and activities				
6. Often avoids, dislikes, or reluctantly engages in tasks requiring sustained mental effort				
7. Often loses things necessary for activities (e.g., toys, school assignments, pencils, or books)				
8. Often is distracted by extraneous stimuli				
9. Often is forgetful in daily activities				
10. Often fidgets with hands or feet or squirms in seat				
11. Often leaves seat in classroom or in other situations in which remaining seated is expected				
12. Often runs about or climbs excessively in situations in which it is inappropriate				
13. Often has difficulty playing or engaging in leisure activities quietly				
14. Often is “on the go” or often acts as if “driven by a motor”				
15. Often talks excessively				
16. Often blurts out answers before questions have been completed				
17. Often has difficulty awaiting turn				
18. Often interrupts or intrudes on others (e.g. butts into conversations/ games)				

Appendix D

Means, standard deviations, skewness, and kurtosis indices for all Parental Mediation Scale items (Study 1)

	Mean (SD)	Skewness	Kurtosis
1. Talk to my child about what to look out for when talking to people they don't know online.	4.10 (1.03)	-1.12	0.75
2. Browse social media sites with my child.	2.98 (1.26)	-0.05	-0.89
3. Set time limits on how long my child is allowed to use their devices for.	3.26 (1.37)	-0.28	-1.07
4. Check in with my child when they are using their devices.	3.79 (1.12)	-0.78	-0.02
5. Visit my child's social media pages to monitor what they are posting online.	3.57 (1.40)	-0.62	-0.84
6. Use parental controls or other means to block or filter some types of websites.	3.37 (1.49)	-0.36	-1.26
7. Collaborate with my child to create limits and expectations for their screen media use.	3.41 (1.25)	-0.40	-0.72
8. Help my child recognize when they have been using their device for too long.	3.56 (1.24)	-0.51	-0.60
9. Encourage my child to explore and learn things on the internet.	3.45 (1.12)	-0.31	-0.50
10. Talk to my child about what to do when something they've seen online has bothered them.	3.88 (1.12)	-0.77	-0.13
11. Explain to my child why some websites are appropriate and inappropriate.	4.12 (1.04)	-1.06	0.44
12. Engage my child in discussions about the positive and negative aspects of content they view online.	3.95 (1.02)	-0.76	0.07
13. Watch shows, movies, or videos with my child online.	3.65 (1.04)	-0.45	-0.23
14. Tell my child when or at what time of day they are allowed to use their devices.	3.42 (1.34)	-0.39	-0.98
15. Tell them what kinds of shows or videos they are allowed to watch and not watch.	3.73 (1.31)	-0.71	-0.66
16. Check what websites my child has visited by looking at their browser history.	3.53 (1.38)	-0.49	-0.99
17. Create "child-friendly" accounts on certain platforms (e.g., Netflix) for my child to use.	3.64 (1.41)	-0.69	-0.85
18. Share strategies with my child that I use to manage my own screen media.	3.17 (1.35)	-0.18	-1.06

19. Talk with my child about benefits and consequences that can come from using screen media.	3.58 (1.25)	-0.58	-0.53
20. Turn off the Wi-Fi router at certain times of day to restrict internet access.	2.02 (1.37)	1.03	-0.34
21. Talk to my child about what kinds of activities they engage in online.	3.78 (1.12)	-0.60	-0.36
22. Talk to my child about how to protect their personal information online.	3.97 (1.09)	-1.01	0.42
23. Tell my child what online games they are allowed to play and not play.	3.52 (1.38)	-0.53	-0.98
24. Read the messages that my child sends and receives from friends.	3.31 (1.49)	-0.33	-1.27
25. Use parental controls that filter the apps that my child can download.	3.46 (1.57)	-0.47	-1.33
26. Help my child notice that the way they engage with their devices can affect their mood or behavior.	3.41 (1.22)	-0.35	-0.70
27. Install software on my child's devices to prevent junk/spam mail.	2.68 (1.51)	0.28	-1.37
28. Talk to my child about what to do if they are being bullied/harassed online.	3.92 (1.10)	-0.77	-0.21
29. Look at websites and other online information with my child.	3.46 (1.18)	-0.42	-0.53
30. Tell my child what social media sites they are allowed to use and not use.	3.75 (1.39)	-0.82	-0.63
31. Stay close to my child when they use their devices in case they need help.	2.97 (1.31)	0.14	-0.97

Appendix E

Parental Mediation Scale - Final items included.

General Factor Item
Restriction/monitoring
Use parental controls or other means to block or filter some types of websites.
Tell my child when or at what time of day they are allowed to use their devices.
Tell my child what kinds of shows or videos they are allowed to watch or not watch.
Check what websites my child has visited by looking at their browser history
Create “child-friendly” accounts on certain platforms (e.g., Netflix) for my child to use.
Tell my child what online games they are allowed to play and not play.
Read the messages that my child sends and receives from friends.
Use parental controls that filter the apps that my child can download.
Tell my child what social media sites they are allowed to use and not use.
Internet safety mediation
Talk to my child about what to look out for when talking to people they don’t know online.
Visit my child’s social media pages to monitor what they are posting online.
Talk to my child about what to do when something they’ve seen online bothered them.
Explain to my child why some websites are appropriate and inappropriate.
Engage my child in discussions about the positive and negative aspects of content they view online.
Talk to my child about how to protect their personal information online.
Talk to my child about what to do if they are being bullied/harassed online.
Active mediation/insight building
Encourage my child to explore and learn things on the internet.
Watch shows, movies, or videos with my child online.
Share strategies with my child that I use to manage my own screen media.
Talk with my child about benefits and consequences that can come from using screen media.
Talk to my child about what kinds of activities they engage in online.
Help my child notice that the way they engage with their devices can affect their mood or behavior.
Look at websites and other online information with my child.

Appendix F

Screen media use and impact items

Child Screen Media Use

Please answer the following questions about the different screen media devices that YOUR CHILD uses.

Select all of the screen media devices that your child has access to.

- a smartphone (e.g., iPhone, Android).
- a laptop computer
- a desktop computer
- an iPad, iPod Touch or similar tablet device
- a handheld videogame player like a Gameboy, PSP, or Nintendo Switch;
- a videogame console like xbox or playstation
- a television (including smart TV)
- Other; Please specify _____

Does your child have access to screen media devices in their bedroom DURING THE DAY? Y/N

Does your child have access to screen media devices in their bedroom AT NIGHT? Y/N

On average, how many hours does your child spend using screen media devices per day:

- On a weekday: _____
- On a weekend: _____

Roughly, what percent of your child's screen media use is for school/homework? _____%

Parent Screen Media Use

Please answer the following questions about the different screen media devices that YOU USE:

Select all of the screen media devices that you use.

- a smartphone (e.g., iPhone, Android).
- a laptop computer
- a desktop computer
- an iPad, iPod Touch or similar tablet device
- a handheld videogame player like a Gameboy, PSP, or Nintendo Switch;
- a videogame console like xbox or playstation
- a television (including smart TV)
- Other; Please specify _____

On average, how many hours do you spend using screen media devices per day:

- On a weekday: _____
- On a weekend: _____

Roughly, what percent of your screen media use is for work? _____%

Please rate your comfort level in using screen media (e.g., search for online information, downloading, using email, playing games online, using social media, learning how to use new apps, etc.)

1	2	3	4	5	6	7	8	9	10
Very uncomfortable									Very comfortable

Impact of screen media use on child

Screen media can have both negative and positive impacts in various domains of children's lives. Please rate the impact the use of screen media has on your child in each of the following domains:

How does your child's screen media use impact them in the domain of SCHOOL WORK?

Rate the degree of POSITIVE impact

None	A little	Somewhat	Moderate	A lot
1	2	3	4	5

Rate the degree of NEGATIVE impact

None	A little	Somewhat	Moderate	A lot
1	2	3	4	5

How does your child's screen media use impact them in the domain of FAMILY?

Rate the degree of POSITIVE impact

None	A little	Somewhat	Moderate	A lot
1	2	3	4	5

Rate the degree of NEGATIVE impact

None	A little	Somewhat	Moderate	A lot

1	2	3	4	5

How does your child's screen media use impact them in the domain of MENTAL HEALTH?

Rate the degree of POSITIVE impact

None	A little	Somewhat	Moderate	A lot
1	2	3	4	5

Rate the degree of NEGATIVE impact

None	A little	Somewhat	Moderate	A lot
1	2	3	4	5

How does your child's screen media use impact them in the domain of PHYSICAL HEALTH AND EXERCISE?

Rate the degree of POSITIVE impact

None	A little	Somewhat	Moderate	A lot
1	2	3	4	5

Rate the degree of NEGATIVE impact

None	A little	Somewhat	Moderate	A lot
1	2	3	4	5

How does your child's screen media use impact them in the domain of SLEEP?

Rate the degree of POSITIVE impact

None	A little	Somewhat	Moderate	A lot
1	2	3	4	5

Rate the degree of NEGATIVE impact

None	A little	Somewhat	Moderate	A lot
1	2	3	4	5

How does your child's screen media use impact them in the domain of PEERS/SOCIAL LIFE?

Rate the degree of POSITIVE impact

None	A little	Somewhat	Moderate	A lot
1	2	3	4	5

Rate the degree of NEGATIVE impact

None	A little	Somewhat	Moderate	A lot
1	2	3	4	5

How does your child's screen media use impact them in the domain of RECREATION AND HOBBIES?

Rate the degree of POSITIVE impact

None	A little	Somewhat	Moderate	A lot
1	2	3	4	5

Rate the degree of NEGATIVE impact

None	A little	Somewhat	Moderate	A lot
1	2	3	4	5

Parental stress about child screen media use

Parenting around screen media use can also impact parents. Thinking about the past SIX months, please rate how much you agree with the following statements:

My child's overall use of screen media is concerning to me.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1	2	3	4	5	6

My child's screen media use is manageable, and any problems with it can be easily solved. (R)

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1	2	3	4	5	6

I wish I could change the AMOUNT my child uses screen media devices.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1	2	3	4	5	6

I wish I could change WHAT my child is doing when they are using screen media devices.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1	2	3	4	5	6

Trying to manage my child's screen media use causes me stress.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1	2	3	4	5	6

Other parents are better able to manage their children's screen media use.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1	2	3	4	5	6

I wish I could reduce the amount of time my child uses screen media devices.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1	2	3	4	5	6

Parenting would be easier if my child's screen media use was different.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1	2	3	4	5	6

I spend a lot of time worrying about my child's screen media use.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1	2	3	4	5	6

I meet my own personal expectations for parenting around my child's screen media use. (R)

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1	2	3	4	5	6

I know what works for my child to help them manage their screen media use. (R)

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1	2	3	4	5	6

My child's screen media use negatively affects our relationship.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1	2	3	4	5	6

Appendix G

Means, standard deviations, skewness and kurtosis indices, and results of Shapiro-Wilks and Levene's tests for all variables within the matched sample (N=36 per group).

	Mean (Swanson et al.)	Skewness	Kurtosis	Shapiro-Wilks	Levene's test
PMS Active					1.51
Community	27.61 (5.19)	.15	-1.27	.92*	
ADHD	23.67 (4.36)	-1.27	.96	.92*	
Neurological	23.78 (5.46)	-.16	.09	.98	
PMS Safety					1.64
Community	29.14 (4.78)	-.70	.22	.94*	
ADHD	25.33 (6.15)	-.65	.51	.94	
Neurological	25.14 (7.05)	-.44	-.18	.95	
PMS Restrict					2.51
Community	31.44 (7.61)	-.58	-.65	.91*	
ADHD	30.00 (6.05)	-.73	1.36	.96	
Neurological	30.56 (5.63)	.37	-.87	.94*	
Parental stress					1.94
Community	34.83 (13.62)	.08	-.14	.94*	
ADHD	51.28 (11.62)	-.68	.06	.94	
Neurological	38.51 (16.13)	.03	-1.12	.95	
Parent screen media use (daily average)					1.32
Community	5.74 (3.52)	2.03	6.69	.81*	
ADHD	6.53 (2.33)	-.14	-.31	.99	
Neurological	6.06 (3.38)	1.97	7.23	.85*	
Child screen media use (daily average)					1.56
Community	4.96 (2.94)	1.05	.61	.91*	
ADHD	4.07 (2.72)	1.72	3.19	.84*	
Neurological	3.65 (2.07)	1.06	.43	.89*	
Positive impact of screen media on child					2.58
Community	19.86 (6.24)	.45	.23	.98	
ADHD	16.11 (4.41)	.88	1.25	.94*	
Neurological	17.40 (6.13)	.28	-.88	.96	
Negative impact of screen media on child					2.09
Community	16.36 (5.97)	.15	-.60	.96	
ADHD	20.36 (5.64)	-.77	.01	.94*	
Neurological	17.46 (7.59)	.48	-.58	.95	

Appendix H

Means, standard deviations, skewness and kurtosis indices, and results of Shapiro-Wilks tests for all variables within each sample

Community sample (N=386)

	Mean (Swanson et al.)	Skewness	Kurtosis	Shapiro-Wilks
Parental Mediation Scale				
Active mediation	24.44 (6.32)	-.27	-.41	.98*
Safety	27.34 (6.24)	-.76	.12	.93*
Restrict	28.02 (9.26)	-.50	-.43	.93*
Parental stress	32.96 (12.89)	.18	-.64	.97*
Parent comfort with technology	8.55 (1.76)	-1.53	2.68	.80*
Screen media use (daily average)				
Parent use	5.96 (3.38)	1.28	2.40	.91*
Child use	5.01 (3.20)	1.56	3.27	.88*
Impact of screen media on child				
Negative impact	13.03 (5.58)	.71	.09	.94*
SNAP				
Inattention	5.99 (5.78)	1.01	.28	.89*
Child age	11.71 (3.46)	-.05	-1.18	.95*

Note. * p<.05

ADHD sample (N=66)

	Mean (Swanson et al.)	Skewness	Kurtosis	Shapiro-Wilks

Parental Mediation Scale				
Active mediation	22.69 (4.24)	.15	.90	.97
Safety	24.17 (5.63)	-.34	.03	.98
Restrict	26.64 (7.02)	-.50	-.43	.96*
Parental stress	53.45 (10.62)	-.74	.48	.95*
Parent comfort with technology	8.39 (1.76)	-1.74	4.14	.81*
Screen media use (daily average)				
Parent use	6.02 (2.42)	-.21	-.59	.98
Child use	4.73 (2.63)	.90	.54	.94*
Impact of screen media on child				
Negative impact	18.36 (4.96)	-.39	-.14	.98
SNAP				
Inattention	19.67 (4.63)	-.25	-.33	.89*
Child age	11.97 (3.17)	-.90	1.82	.94*

Note. * p<.05

Early neurological risk sample (N=65)

	Mean (Swanson et al.)	Skewness	Kurtosis	Shapiro-Wilks
Parental Mediation Scale				
Active mediation	24.00 (5.43)	-.32	.27	.97
Safety	24.82 (6.95)	-.59	.09	.95*

Restrict	31.50 (5.95)	-.24	-.94	.95*
Parental stress	37.95 (14.95)	.04	-.79	.97
Parent comfort with technology	8.72 (1.82)	-1.79	3.15	.73*
Screen media use (daily average)				
Parent use	5.76 (3.56)	1.77	5.16	.86*
Child use	3.32 (1.86)	1.15	5.99	.89*
Impact of screen media on child				
Negative impact	14.23 (6.17)	.52	-.59	.95*
SWAN				
Inattention	13.13 (7.50)	-.13	-.90	.96*
Child age	8.58 (2.39)	.88	.61	.90*

Note. * p<.05

Appendix I

Semi-structured interview (Study 3)

Semi-Structured Interview Questions - Interview

Interview Date:_____ Start Time:_____
Interviewer:_____ End Time: _____
Study ID: _____

Introduction: Thank you for agreeing to do this interview with our team. You may remember that you completed a survey about your child's screen media use a couple of months ago. You

completed this survey specifically for your child who has attentional difficulties. We would like you to answer the questions today about this same child.

Today we are going to ask questions regarding your experiences with parenting around your children's use of screen media. As we do this, I'm going to ask you some questions about your strategies, successes, challenges, and concerns. If there is anything you don't feel comfortable answering, you can just let me know. Only members of the research team will see your answers. I would like to remind you that the interview will be audio recorded to allow us to document your responses as completely as possible.

We want to know about how your child uses screen media in this study. Screen media refers to devices that have a screen, including: smartphones, handheld video games, laptops, computers, television, video games, tablets. When you hear the term screen media in the following questions, think of ANY type of screen media or devices that your child uses.

*Remind parents of devices they endorsed on questionnaire and re-establish primary device(s).

Most commonly used device: _____

Items:

1. Overall, how would you describe your child's relationship with screen media? _____
2. Do you have concerns/worries about your child's screen media use? (Y/N)
    a. (If yes) What are your primary concerns/worries? _____
    b. Would your child agree or disagree with your perspective on their screen media use? Why or why not? _____
3. Do you see positive impacts of screen media use for your child? (Y/N)
    a. (If yes) What are they? _____
4. Do you have challenges in managing your child's screen media use (Y/N)
    a. (If yes) What are they? _____
    b. What strategies do you use, successful or unsuccessful, to try to manage your child's technology use? How do they work for you? _____
5. How much time does your child spend on screen media devices on average? _____ approximate # hours per day
    a. Has that changed as they've gotten older? (Y/N)
    b. Has what they do on screen media use changed with age? (Y/N) Please describe how it has changed. _____
    c. Now that your child is XX age, has your degree of concerns about screen media use changed? (Y/N). Please describe. _____
    d. Have you needed to implement different strategies as your child has gotten older? (Y/N) If yes, please provide examples. _____
6. Do you think your child's difficulties with attention impact how they use screen media? (Y/N) If yes, how so? _____
    a. Do you think your child would agree or disagree with your perspective on this? (Y/N). Please elaborate. _____

7. Are there unique parenting challenges or approaches regarding screen media use that you consider /use due to your child's attentional abilities? (Y/N). If yes, please provide examples.
    a. Does your parenting around screen media use differ for your child with attentional difficulties than with other children in your home? (Y/N). Please elaborate.
8. Did your child participate in online learning during the pandemic? (Y/N) – If no, don't ask subsequent questions.
    a. How did your child do with online learning? _____
    b. Were they able to manage accessing online learning materials independently? (Y/N) If no, what kind of support did they require?
    c. Were they able to manage submitting assignments online independently? (Y/N) If no, what kind of and/or how much help did they require?
    d. Was your child's academic progress differentially impacted during online learning? (Y/N) If yes, please describe.

Thank you very much for participating in this project. The information you provided will be most helpful in understanding how screen media use affects families!