

Children's Socio-emotional Understanding of Digital Technology Use

by

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Abstract

Childhood is becoming an increasingly digital experience. Technology use features factors that can simultaneously promote and be a risk for child wellbeing. Despite this, psychological research on children's technology use and wellbeing has been mostly reduced to examinations of screen time, with children in middle childhood largely left out. The aim of the present exploratory study is to capture 7- to 9-years-old children's (N = 49) perspectives on how technology influences their social-emotional wellbeing using multiple measures. Children were asked to report on their technology use, explain why a peer was feeling key emotional states of worry, sadness, happiness, and excitement while using technology, and provide first-person narratives about their own experiences with technology. My study addressed three research questions: 1) how do children characterize their own technology use, 2) how do children view technology use as influencing theirs and their peers' social-emotional wellbeing, and 3) how might children's perspectives change with age? A mixed methods approach was deployed, with a priori thematic coding and exploratory qualitative coding. Point-biserial analyses found that older children reported greater technology use, whereas lower technology use was associated with a greater likelihood of reporting mastery and peer experiences. Qualitative analyses found children were proficient at emotion explanation and sharing their experiences, with emergent themes related to technology consumption, mastery, safety and privacy, and peer and family dynamics. The current work provides insights into children's perspectives while providing novel methodological contributions. It lays the groundwork for future research examining the relationship between technology usage and wellbeing, an area with important implications for legislative, administrative, and technology development related to child wellbeing.

Keywords: children, technology, wellbeing, social-emotional, mixed methods

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Table of Contents

Introduction.....	6
Importance of Children's Perspectives	7
Effects of Technology on Child Wellbeing	9
Children's Perspectives on Technology and Wellbeing	12
Parenting Practices.....	14
The Present Study	15
Methods.....	17
Participants	17
Procedures and Materials	18
Emotions and Technology Task	18
Independent Internet Use Survey	19
Transcription	20
Coding and Analytic Approach	21
Results	22
Approach and Feasibility	22
RSQ 1: How Do children Characterize Their Own Technology Use?.....	24
RSQ 2: How Do Children View Technology Use as Influencing Theirs and Their Peers' Social-Emotional Wellbeing	25
Theme 1: Consumption.....	25
Theme 2: Mastery	28
Theme 3: Safety/Privacy.....	31
Theme 4: Peer Dynamics	33
Theme 5: Family Dynamics.....	36
Theme 6: Other	39
RSQ 3: How Might Children's Perspectives Change with Age?	40
Discussion	40
Methodological Contributions	48

Limitations	49
Conclusion	50

List of Tables

Table 1. Participant Demographic Characteristics	64
Table 2. Distribution of Responses for Independent Internet Use Survey	65
Table 3. Child Emotion Explanation Themes	66
Table 4. Distribution of Theme Frequencies Across Parts One and Two	67
Table 5. Frequency of Emotions Reported in Part Two	68
Table 6. Correlations for Study Themes by Age	69

Appendix

Appendix A. Positionality Statement	70
Appendix B. Stimuli Script	71
Appendix C. Adult Consent Form	76
Appendix D. Child Assent Form	79

Children's Socio-emotional Understanding of Digital Technology Use

Middle and early childhood are becoming an increasingly digital experience. Approximately 81% of children between the ages of 5- and 8-years-old have access to an internet connected device like a tablet or computer (Auxier et al., 2020). The introduction of technology into children's lives comes with risks and benefits. For example, technology provides rich social and entertainment experiences (Rideout & Robb, 2022) but also introduces new risks such as those related to cyberbullying and cyberstalking. Despite the rich lives young children are living online, the majority of psychological research on children's technology use and its related social-emotional impact has been largely reduced to measures related to screen time (e.g., Kerai et al., 2022; Stiglic & Viner, 2019), with a multitude studies in the psychological sciences relying on parental report measures (e.g., Fuller et al., 2017; Kerai et al., 2022; Jabbar et al., 2019).

The goal of this thesis is to capture children's reasoning about the influence of technology on children's own social-emotional functioning. For the purpose of this thesis, I allowed children to define their own technology use. However, technology use is viewed through the broad lens of an internet connect device that can serve many purposes like watching videos, playing games, and/or communicating with others (e.g., cell phone, tablet, laptop). Specifically, children were asked about whatever device they commonly used at home like tablets, iPads and/or cell phones. This focus reflects the types of devices that are documented to be the most used types of technology by children in middle childhood (Brisson-Boivin, 2018).

For this thesis, I explored how children in middle childhood reason about the impact of technology use on their social-emotional wellbeing. To do this, I asked children to explain several common and important emotional states including, worry, sadness, happiness, and excitement. These emotions were chosen as they would allow me to capture a breadth of

influential positive and negative social-emotional experiences. Social-emotional experiences were chosen as they are directly linked to wellbeing (Davern et al., 2007). They are also a concrete influence on well-being that even very young children show competence in explaining and thinking about (Lagattuta et al., 1997; Lagattuta, 2005; Kramer & Lagattuta, 2022). Namely, I wanted to ground my interviews in something I knew children would understand and have the capability to speak about.

To guide the present inquiry, I had three specific focal research goals. First, to add context to the broader study, I sought to understand how children characterize their own technology use using a technology use scale. Second, I explored children's view of technology use as influencing their social-emotional wellbeing by using their explanations and direct experiences. Lastly, I explored potential age-related changes in children's perspectives by exploring the relation among their discussions and their age.

Importance of Children's Perspectives

The Declaration of Human Rights and the Convention on the Rights of the Child (United Nations, 1989) declares that children should be considered in the drafting of policies that impact their lives. Society is at an important point in history where legislation and educational campaigns are being created to support the safe consumption of digital media by young children (Canadian Centre for Child Protection, 2024). For example, in 2026 (this year) Canada started exploring and implementing policies that will decide the future of social media use for young children, as well as broader policies that will decide when and how children's privacy will be protected online (Government of Canada, 2026; Wong, 2026). However, without capturing children's perspectives about technology use and their beliefs about how it influences their lives, it is difficult, if not impossible, to imagine how children's voices will be heard. Notably, parental

report is likely not adequate. Beyond not respecting children's rights, prior work shows that parental report, especially as it relates to social-emotional functioning, can be inaccurate. For example, parents sometimes underestimate children's emotional experiences –mostly as they relate to negative emotional states –as children in daily life worry more than their parents estimate (Lagattuta et al., 2012).

Beyond its importance for elevating children's voices, the present work also has implications for children's ability to navigate and cope with distress online. Rich extant work on theory of mind in non-digital contexts suggests that children use their mental models of emotions to understand the social world, including what motivates their own and other's behaviours (e.g., Lagattuta, et al., 1997; Lagattuta, 2005; Kramer & Lagattuta, 2022). Put differently, this seminal work shows that children use their causal knowledge of what is most likely to cause different emotional states to understand, predict, and interpret their own and others' actions and reactions (Lagattuta, et al., 1997; Lagattuta, 2005; Kramer & Lagattuta, 2022). In the context of distressing emotions like worry or sadness, this casual knowledge of emotions is also critical for navigating and coping with these feelings (e.g., Bensalah et al., 2016; Lagattuta, 1997; Lagattuta, 2005).

The degree to which children's causal models of emotions extend to online environments is not clear from prior work. Indeed, having knowledge of the specific situations that cause negative emotions online is important. This knowledge likely supports important behaviours like the ability to provide social support to our friends when they encounter a distressing situation; help seeking behaviours; and/or the ability to effectively deploy one's own coping strategies. Most vitally for online contexts, if a child perceived no potential negative consequences to being online, then they may struggle to engage in preventative safety behaviours as they may not understand their function. Again, although children clearly have rich theories of emotions in

physical space that guide such behaviours offline, it is unclear to what degree these representations extend to digital spaces. This study seeks to fill this critical knowledge gap by mapping children's reasoning about what causes varied emotional states (positive and negative) in the context of technology use.

This thesis focuses on middle childhood, or children ages 7- to 9-years-old, as their perspectives are most commonly “left-out” of conversations on technology and well-being. Extensive research and supports have been created by large organizations like the Canadian Pediatric Society that provides guidelines for early childhood screen use (Ponti, 2023). Teenagers are often a topic of conversation due to debates around the effects of social media use on their mental health (Rideout & Robb, 2022; Woods & Scott, 2016). However, middle childhood remains left out of the bigger picture. In developmental studies more broadly, middle childhood has been dubbed by some researchers as “the forgotten years” (Mah & Ford-Jones, 2012; Voss et al., 2023). Middle childhood is critical to study as it represents a group of often independent technology users whose decision-making capacities and broader social-emotional development are far from complete (Knudsen, 2004), making them a highly vulnerable group in need of appropriate protections. However, it is difficult to design effective protective measures without a thorough understanding of their lived experiences and perspectives. This thesis aims to document how children use technology in their daily lives and explore how they perceive their experiences within digital environments. Also, as per my first aim, by documenting how they use technology, I also hope to identify areas of vulnerability that they may not perceive themselves.

To ground the present investigation, I next shift my focus and briefly review what is known about child development and technology use as it pertains to the research aims.

Effects of Technology on Child Wellbeing

Technology use can both support and pose risks to healthy development. Technology has positive impacts across social, educational, and identity development domains. For example, technology promotes positive social development in children of all ages through enhancing peer interaction and collaboration (e.g., Hsin et al, 2014; Kardefelt-Winther, 2017). Technology can bridge the educational gap for children in low income and immigrant families (e.g., Jackson et al., 2006; Katz et al., 2017) by promoting literacy and working memory skills (e.g., Elimelech & Aram, 2020). Technology use in educational contexts may be distinctly impactful for adolescents with low self-efficacy as it facilitates information seeking, boosting efficacy beliefs and in turn, academic performance (Zhu et al., 2011). Technology plays an important function to identity development and self-exploration, specifically for adolescents (Granic et al., 2020). For example, technology provides space for exploration of intrapersonal, interpersonal, and cultural levels of identity development (Granic et al., 2020). Lastly, technology is widely used by children for entertainment purposes and moderate use of entertainment technology can reduce boredom while stimulating cognitive development (e.g., Anthony et al., 2021; Haddock et al., 2021).

While technology has a number of positive influences on development, the technology literature has traditionally taken a strong negative focus that limits the depth of our knowledge on how technology positively impacts child wellbeing. Work on young children, including about these negative effects, has mainly relied on parental report, which limits what is known about children's perspectives (but see next section of this thesis for exceptions). Nonetheless, I next provide an overview of this work.

The risk factors associated with technology use has been mainly measured by screentime. There is a great deal of research on the impact of screen time on physical and cognitive health, with negative impacts demonstrated even without prolonged use (e.g., Kerai et al., 2022; Lillard

& Peterson, 2011; Nagata et al., 2023; Smahel et al., 2015; Small et al., 2020; Stiglic & Viner, 2019). Physical concerns related to eye health, headaches, tiredness, and activity levels have been found (e.g., Falkenberg et al., 2020; Rosen et al., 2014), with some of the largest impacts related to sleep quality and duration (e.g., Rideout, & Robb, 2018; Fuller et al., 2017).

There have been mixed findings on the impact of screen time on functional brain organization or maladaptive cognitive functioning in childhood (e.g., Miller et al., 2023; Paulus et al., 2019). For example, studies have found reduced cortical grey matter thickness in regions associated with visual processing, attention, and social cognition in preschool-aged children (Hutton et al., 2022) and children in middle childhood (Paulus et al., 2019), related to mixed outcomes on cognitive performance. Alternatively, in their study of 9- to 12-year-old children, Miller and colleagues (2023) did not find a significant relationship between screen usage and detrimental neurodevelopmental outcomes when measured cross sectionally or longitudinally.

In terms of social wellbeing, screen time has also been shown to be negatively related to pre-adolescent and adolescent psycho-social functioning, such as by promoting unhealthy body image, lower self-esteem, and higher levels of anxiety and depression (e.g., Tiggeman & Slater, 2013; Woods & Scott, 2016). Social and emotional delays have also been found in children with high rates of screen time early in life (e.g., Pagani et al., 2010). Social risks of screen time may be highest for youth with low social-emotional wellbeing (Rideout & Robb, 2018). For example, adolescents with higher rates of depressive symptoms and loneliness are more likely to report negative impacts of online social isolation, such as feelings of exclusion. They also report higher rates of cyberbullying (Rideout & Robb, 2018).

By using interconnected devices, children are also put at risk for experiencing abuse (Slavtcheva-Petkova et al., 2015). For example, some apps commonly used by older children and

adolescents (e.g., 9- to 16-years-old) pose the risk of online sexual exploitation and exposure to inappropriate content (e.g., Ali et al., 2023; Staksrud et al., 2013). Trends show that rates of online sexual violence have increased since the pandemic and are impacting children at younger ages than before (Anderson & Lobb, 2024). Cyberbullying, the act of harassment that takes place via electronic devices, has a variety of detrimental effects on teens and young children's wellbeing (e.g., Hamm et al., 2015; Kowalski et al., 2014; Rideout & Robb, 2018). Altogether, while there is a wide literature demonstrating the various ways technology use may be a risk factor for poor developmental outcomes, much of the research is correlational with small effect sizes, suggesting an imprecise understanding of the mechanisms of these effects (Gottschalk, 2019). Further, the work, as reviewed, often leaves children in middle childhood out of the picture, with the predominant focus being on adolescents and/or younger children with a few exceptions.

Children's Perspectives on Technology and Wellbeing

While there is substantial research on technology use, measured mainly by screentime and similar parental reports (Kerai et al., 2022; Stiglic & Viner, 2019), only handful of studies have examined child perspectives of the effects of technology on their social-emotional wellbeing. These studies often include less than fifteen children of diverse ages, and so they can only offer limited insights into the broader developmental picture (e.g., Mourlam et al., 2020; Newland et al., 2018; Smahel et al., 2015). Moreover, these prior studies also often asked children to reflect on very specific aspects of how technology influences their wellbeing, like overuse (e.g., Ahmad et al., 2021). This approach, although useful for characterizing the specific phenomena the researchers were interested in, is less useful for understanding children's

spontaneous thinking about what factors they think are important for considering when reflecting on day-to-day wellbeing.

Nonetheless, together these studies provide some important insights. They mainly demonstrate that older children and adolescents are aware of technology's negative and positive influences (e.g., Chowdhury & Bunt, 2023; Mourlam et al., 2020; Newland et al., 2018; Žulec et al., 2022). They view technology as important component of their wellbeing, but not essential (Newland et al., 2018). In terms of positive influences, children aged 8- to 13-years old believe that technology positively impacts learning. For example, they view educational technology as exciting and more enjoyable than traditional learning experiences (Mourlam et al., 2020). They also view it as having positive impacts on their sense of self (Mourlam et al., 2020). For example, they note that access to electronic devices and screen time contributes to their happiness and life satisfaction through entertainment and leisure (Newland et al., 2018; Žulec et al., 2022). Children value technology's ability to foster social connections (Newland et al., 2018; Žulec et al., 2022). They also see technology use as instrumental in their mastery and autonomy development (Mourlam et al., 2020; Newland et al., 2018). For example, one such study showed that 8- to 12-year-old children appreciate the independence and freedom of choice provided by technology (Newland et al., 2018).

In terms of negative effects on wellbeing, children recognize that screen time can have negative physical effects like headaches, eye strain, and tiredness (e.g., Cernikova et al., 2018; Smahel et al., 2015; Žulec et al., 2022). By 9-years-old, they recognize that there are also negative mental health effects such as increasing their aggression (Smahel et al., 2015). Indeed, early adolescents are so acutely aware of the potential negative consequences of excessive screen

use across physical and socioemotional domains that they can generate solutions to monitor their own screen time (Chowdhury & Bunt, 2023).

Parenting Practices

A final literature review examines parenting practices related to children's technological behaviours. I only very briefly review it, as it is less related to this thesis. In this section, I am mainly going to talk about restrictive mediation practices, which is a term from the technology literature that describes parenting strategies as limiting or setting rules around technology use. It is often described in contrast to active mediation practices, which involve guidance and discussion with children around their technology use (Clark, 2011; Nielsen et al., 2019). But again, because restrictive parenting is mainly the type used it is the main discussion here. This literature shows that parents are apprehensive about the long-term effects of technology use. Restrictive parenting practices are one of the most common strategies that parents use to manage concerns around their child's use of digital technology (Amjad, 2025; Gür & Türel, 2022). However, evidence of effectiveness of these strategies is varied. Some studies have found that restrictive control can reduce risky behaviours online, while other studies have found that it can increase parent-child conflict and problematic technology use over time (Geurts et al., 2024; Nielsen et al., 2019). Some studies have found that broad restrictions are easier apply and enforce when compared to more nuanced guidelines (Hiniker et al., 2016), though they limit learning opportunities for children (Livingstone & Helsper, 2007; Meng et al., 2023). Restrictive parenting practices may be most effective when they are combined with active mediation strategies, such as open communication and collaboration around technology use (Nielsen et al., 2019). Much of the current research on technological parenting practices is on adolescents and social media. Much less is known about the impacts of practices around technology in younger

children. Children in middle childhood use technology in different ways than adolescence, often through online gaming and interactive play with peers. Given online interactions can differ significantly from face-to-face communication, it is important to understand how children are experiencing these forms of social technology use and how it may be influencing their social-emotional development.

Altogether, prior literature is useful in showing that: i) technology affects children's physical and social-emotional wellbeing; ii) children can reflect on the link between technology and social-emotional functioning; and iii) parents are concerned about childhood technology use. But there are still large gaps in what we know about children's technology use, including children's own perspectives of its effects on their wellbeing, especially during middle childhood.

The Present Study

The present thesis is an exploratory study guided by broad research aims or questions. Exploratory reports are used to examine patterns and relationships of datasets without testing specific hypotheses. They are particularly helpful in early-stage research to identify areas of interest and guide later more focused analyses (Jacobucci, 2022; Rubin & Donkin, 2024). Exploratory reports often include descriptive statistics and basic correlations to find meaningful patterns in the data and highlight potential variables for deeper investigation. These reports suggest relations rather than provide confirmatory evidence, and therefore findings should be interpreted as preliminary and as producing flexible theories that can be more easily replicated in future research (Szollosi & Donkin, 2021).

This thesis was specifically guided by the following research questions:

1. How do children characterize their own technology use? (RQ1)

2. How do children view technology use as influencing theirs and their peers' social-emotional wellbeing? (RQ2)
3. How might children's perspectives change with age? (RQ3)

In the present study, 49 children aged 7- to 9-years-old participated. Children's own mode of technology use was used throughout the study (e.g., iPad, cellphone, tablet). I decided to start at age 7-years because children begin to have very good emotional reasoning capacities at this age – at least in physical contexts (Russell & Paris, 1994; Widen & Russel, 2008). RQ1 was addressed using an adapted version of a technology use scale. In this portion of the study children reported on their own technology use (e.g., how often they use X to ...), and to gain more insights they were sometimes asked to discuss elements of their answers.

RQ2 and RQ3 were addressed in two-parts. In the first part, children were asked to explain why a peer was experiencing varied emotions of happiness, sadness, worry, and excitement while using technology. As discussed, these emotions were chosen to capture a breadth of influences of technology on social-emotional functioning. I chose to ask about third party peers so that children would not be limited by their direct experiences. This method instead allowed them to report on potential and imagined outcomes. Prior work on explanatory reasoning suggest that explanations are useful for eliciting what children view to be the most important or influential factors in producing an outcome (Wellman, 2011). In this case, explanations would be what children view as the most important factor in causing the emotional state. In the second part, children produced narratives about their own technology use. They were asked about two experiences: good and not so good. Although, I expected some overlap between the explanation task and the narratives, including the second part allowed us to also directly ask children about their first-hand experiences.

I deployed a mixed methods approach where exploratory qualitative coding was balanced with descriptive and correlational quantitative approaches that allowed us to statistically analyze relations among age and technology usage, and explanatory patterns.

Methods

Participants

The sample consisted of 49 participants ranging from 7.01 to 9.87 years of age ($M = 8.37$, 56% male). Participants were recruited from an existing database called the Healthy Human Development Database [HE2023-0119] via email about their interest in participating. Additional participants were recruited through study posters shared to parents' groups on Facebook. Most participants were recruited from Manitoba, with two participants recruited from outside of Manitoba, one from New Brunswick and the other from Alberta. Six participants were excluded from the study (two unintelligibility of recording, one technology failure, two parental influence, one child incompleteness). Each family received a \$25 Visa gift card for their participation.

Table 1 presents a summary of participant demographics. Parents/guardians were asked to indicate their child's racial/ethnic identity and gender in a fillable text box. One participant declined to report their racial/ethnic identity. Table 1 shows racial/ethnicity information grouped according to categories defined by the Canadian Census. Of note, although participants were asked to report their child's gender, they instead reported sex and so Table 1 displays binary sex (m/f). Table 1 also reports additional demographic data drawn using postal codes from the most recent census, a commonly used method known as geocoding (Pinault et al., 2020; Shah et al., 2014). Residential postal codes were linked to census tracts. Census data provides neighborhood variables including education attainment and median household income. Census information was unavailable for one participant.

Procedures and Materials

Prior to the study, the researcher collected demographic information and the technological device most used by the child. Participants were tested over the Zoom video platform via a computer. For participants who did not have access to a computer compatible with Zoom, in-person interviews were offered but no participants selected this option. The researcher introduced themselves and confirmed the parent had completed the consent form and answered any questions. The researchers used a short question as a warm-up prior to the study questions. Because there was a risk that children may have experienced negative emotions when asked to remember them, an additional question designed to elicit positive feelings was asked post study questions (e.g., can you tell me something you are excited about?).

A safety protocol was developed for children who experienced distress during the interview. Had a child experienced distress, the researcher would immediately end the interview, debrief with the parent and child, and provide them with a resource sheet supportive to wellbeing that I believe would be beneficial. If children disclosed that they have experienced an online safety concern, I would debrief the parent following the assessment, telling them what the child disclosed and providing them with a resource sheet regarding online safety. No children experienced distress that resulted in termination of the interview.

Emotions and Technology Task

Appendix B contains study scripts and protocols. Prior to starting the research study, children were told "First, I will tell you some stories about some children, and then you will get the chance to share your experiences." Children participated in a brief warm-up where the researcher and the child talked about activities they like to do in nature.

In part one of the study, children were read a series of prompts of children using technology and experiencing an emotion. Different gender-neutral characters were used for each scenario. In each scenario, a peer is using a piece of technology the child is familiar with (as indicated on the pre-study survey) and experiences an emotion. A different peer was used for each of the four emotions: happy, sad, excited, and worried. The child was asked if they can think of a reason why the peer experienced the emotion (e.g., I want to tell you about my friend named Alex. They were using their [technology] and felt worried. Why do you think they felt worried?). Prompting procedures were utilized for situations where the child says “I don’t know” or was silent (e.g., Can you guess what they were doing that made them feel [emotion]?). To allow for the collection of a breadth of social-emotional experiences, following the child’s initial explanation, the researcher asked if they could think of another reason why the child in the story felt the emotion. Thus, ideally, children would provide two explanations or examples per emotion. Story elements were counterbalanced to counteract order effects.

In part two of the study, children were asked to tell the researcher about a time when “using your [technology] made you feel good” and “not so good”. Children were provided 2 minutes for each component. Prompting procedures were developed for children who were silent, say “I don’t know” or provide off topic responses (e.g., “What part of that made you feel good/not so good?”). Following their response, children were asked to identify the exact emotion that the experience elicited. Children were not asked directly about the four emotions from part one as there was no way to ensure they had experienced all of these emotions. Instead, they were simply asked to report the emotion they felt during their experience.

Independent Internet Use Survey

Children were also asked about their internet use using an adapted version of the Internet Experience Questionnaire, I named the Independent Internet Use Survey (Girouard-Hallam et al., 2021). These yes/no questions ask children about various ways they use the internet (e.g., Have you ever used [technology] to play a game or watch a video?). After the last question, which asked about whether the participant used the technology to play with friends, they were asked to tell their researcher more about this (e.g., What types of games do you play?). Table 2 displays the questions and resultant data.

Transcription

Three trained research assistants reviewed, corrected, and formatted Zoom transcripts in Microsoft Word. They also formatted and parsed the utterances for coding using prior work as a guide. For part one, one codable unit was defined as one explanation. For part two, children's narratives were parsed into codable units of speech, which were made up of complete sentences, phrases, or individual words. Utterances are continuous segments of speech devoid of a full stop or a new subject noun phrase, determined through intonation and cadence (Gelman et al., 2004). This parsing allowed for our quantitative interpretation of the data.

The first research assistant reviewed transcripts until no errors were detected in formatting and in interpretation of speech. Next, a second independent research assistant did a final review of the transcripts for formatting and errors. When disagreements occurred between the two research assistants regarding what was said, a third independent research assistant adjudicated. If there was still no agreement, that word was presented as a non-codable utterance in the transcripts (e.g., [xxx]). Once finalized, the transcripts were loaded into Microsoft Excel for further analysis and coding.

Coding and Analytic Approach

Due to the exploratory nature of this project, I adopted a hybrid approach to coding, integrating deductive and inductive strategies. Thematic coding was first conducted as is common in the quantitative social-cognitive explanation literature (e.g., Fereday & Muir-Cochrane, 2006; Nancekivell et al., 2023). In this approach, themes are first developed early in the analytic process (Joffe, 2012). The initial set of themes was based on extant literatures and they provided an initial framework for data analysis. These initial themes were then refined during coding using inductive methods. Hybrid qualitative analysis models, such as the one undertaken in this study, are common approaches (Braun & Clarke, 2013, 2019; Fereday & Muir-Cochrane, 2006). In cases where there is not a strong theoretical framework, such as exploratory studies, these models allow for data-driven decisions while maintaining a links to a broader conceptual framework to ensure links to key research questions.

Specifically, the initial a priori themes of interest were refined using a reflexive thematic approach, which is a flexible and reflective methodology that focuses on identifying and analyzing patterns within data. It emphasizes the researcher's active role in interpreting data (Braun & Clarke, 2013, 2019; Byrne, 2022). This approach involves continuous engagement with the data, allowing themes to emerge, while reflecting on how the researcher's positionality influences the analysis (Braun & Clarke, 2019). Reflexivity was incorporated by examining how my background, experiences, and perspectives may have influenced coding decisions and interpretation (see Appendix A for positionality statement). Both semantic and latent analysis of the transcripts were used in the process of creating the final coding scheme. The initial themes of interest were material, interpersonal, mastery, autonomy, safety, and identity. These themes were then refined after approximately one third of the sample was collected, using preliminary coding.

This preliminary coding was conducted to determine fit with the coding and the thematic coding scheme. Based on this preliminary coding, adjustments were made to the coding scheme. These adjustments included eliminating the “identity” code due to no instances occurring. The “interpersonal” code was separated into “peer dynamics” and “family dynamics” to capture more nuanced distinctions. The “material” code was renamed “consumption” to more accurately reflect its theme. The “autonomy” code was eliminated because each instance related to opinions about parenting practices or access to technology, which were captured by the “family dynamics” and “consumption” themes, respectively.

Once the thematic coding scheme was finalized, a secondary coder was trained in the coding scheme using a structured codebook (Braun & Clarke 2013; Joffe, 2012). The coders aimed to achieve a high level of consensus (Braun & Clarke 2013; Joffe, 2012). The goal of formalizing the coding scheme was to increase replicability and allow for its use in future work. Cohen's kappa was used to measure interrater reliability (see Table 3). Final codes represent coders decisions after their discussion of any conflicts.

Results

Approach and Feasibility

Approach

Results are summarized by research question. As there was overlap in findings from the parts of the study, data from all parts of the study (survey, part one, and part two) are integrated to answer each research question. Exploratory point-biserial analyses were deployed as appropriate to examine technology use and age-related changes. However, as per exploratory studies, descriptives statistics and thematic analyses are mainly used to understand the data.

When presenting the results from the thematic analysis, the goal was to present two to three key patterns or subthemes within each broader theme that exemplified how that theme emerged and to consider similarities and differences between parts one and two. These subthemes were derived using the reflexive thematic approach described above when describing the main coding. These subthemes were identified only by the main coder. An iterative approach was used that involved moving back and forth between the data and developing themes to search for patterns in participant responses. Key quotations were selected to illustrate insights from each subtheme. Some were chosen because they represented common discussions within each theme while others were selected because they represented a particularly notable experience.

Regression analyses were initially planned to examine predictive relationships among variables, however, the models did not achieve adequate fit. This is likely due to the relatively small sample size in combination with the number of codes included in the analyses. Nonetheless, these regressions suggest no strong relation among the emotions children explained and the general frequency of any given theme. As such, the results are typically presented by considering general valence of the experience the child discussed (positive or negative) without specific emotion analyses. The exception was a few cases where there was a notable pattern, such as with the emotion of worry and safety/privacy discussions.

Feasibility

All children answered the technology use questionnaire questions without issue. Across the other two study components, children often provided rich and detailed discussions. In part one, all children were able to provide at least some explanation across the set of questions. However, a small minority of participants (10.20%) did not respond to every item. These children were more likely to generate explanations for complex emotions (i.e., excited/worried),

while providing fewer explanations for basic emotions (i.e., happy/sad). In part two, participants found it easier to generate positive experiences than negative ones, with 14.29% of children not generating responses for negative experiences versus 0% for positive experiences.

RQ 1: How Do Children Characterize Their Own Technology Use?

The five-item technology use questionnaire was first used to characterize how children in the study use technology and to provide context for subsequent analyses. Table 3 shows a breakdown of the survey. All children endorsed using technology in at least one of the five ways. There was a small significant positive correlation between age and average technology use ($r = .164, p = .001$), indicating that older children reported higher levels of technology use. On average, children answered “yes” to 3.17 of 5 questions. Most children in the study used technology to play a game or watch a video (97.95%). A large proportion also used it for epistemic reasons such as learning how to do something new (71.43%) and looking up answers to a question (42.86%). As a reminder, this learning represents independent use.

In terms of social uses, children used their technology to call family and friends (67.35%). Almost half of the sample (44.90%) of children used technology to play with friends. The most common games reported to be played with friends were Roblox and Minecraft, but not all children reported that the type of game they played. Other children reported that while they were allowed to play games on their device, they were not permitted to play online. Notably, one participant who reported that they were allowed to play online and frequently played with strangers (i.e., people who they have not met in-person), reported that they have developed methods to assess new friend requests while playing. They would ask the individual questions prior to accepting the friend request, including: “I’ll ask them like do, like how much friends do

you have? Are you nice to your friends? Are you respectful? Like are you, do you judge your friend if they don't have, have like this?"

Using narratives from part two, the types of digital activities that children reported in their personal experiences were also examined. Compatible with the questionnaire results, among participants who specified the type of activity they engaged in, the majority reported gaming-related experiences (59.74%) or watching device-based videos (24.68%). A small proportion mentioned other activities, including creation (e.g., art, video creation, programming; 6.49%), text and video messaging (6.49%), and e-learning (2.60%).

RQ 2: How Do Children View Technology Use as Influencing Theirs and Their Peers' Social-Emotional Wellbeing?

Table 4 displays the general frequency of each theme in each part of the study. In part two children also reported on their own emotions. In this case, 65.31% reported technology causing a positive or negative basic emotion like happy, sad, or angry, while another 34.69% reported experiencing a non-basic emotion while using technology like excited, worried, annoyed, or frustrated. Table 5 displays emotions children reported.

Theme 1: Consumption

The theme of consumption captured children's explanations about engagement with technology as well as their access to and exclusion from it. In both parts of the study, consumption related discussions were dominated with either accessing content or losing access as highly influential to children's own emotions (part two) and explanations of emotional states (part one). Children's explanations in this theme were broadly distributed over the emotion types.

Correlations suggest that average technology use was not related to discussions of consumption in part one ($r = -.014, p = .78$).

Subtheme 1: Content of Consumption

The content of consumption itself was often discussed as the cause of emotional states in both parts.

Negative content was discussed as eliciting negative emotions:

“They were reading a sad book [on their iPad].” (part one (sad), female, age 9.02)

“They were watching a video of a doggy falling in the pool.” (part one (worried), female, age 9.02)

“Maybe because they didn't think the game was appropriate.” (part one (sad), female, age 7.52)

“I was watching a video and at the, um in the middle part, it showed a abandoned kitty who was sick, eating garbage on the streets.” (part two (not so good), female, age 7.72)

In contrast, positive content was described as leading to a good experience and linked to positive emotions:

“When I was watching a funny show.” (part two (good), female, age 8.29)

“That they were playing like games and doing math stuff.” (part one (happy), female, age 8.91)

“I was looking at pictures to draw, and I saw this one picture, and then it just made me feel really happy. Like, it was just, like, a cheerful photo. Like it was, like, a girl who was

really cheerful, and then she was with her friend, and then just made me feel happy.”

(part two (good), male, age 8.74)

Notably, one participant also discussed emotionality related to collaborating with AI:

“Because AI didn't give them the right answer, and they were so depressed that they felt sad.” (part two (sad), male, age 9.33)

“I was making a painting so I can paint it for my bathroom with AI.” (part two (good), male, age 9.33)

Subtheme 2: Access

In a related manner, children also often discussed how gaining or losing access to technology and how gaining or losing access to in-app features or rewards was influential.

Positive explanations of access were often hedonic consumptive in nature and related to acquisition of something they desired (i.e., either new technology or a new in-game feature or reward).

“Maybe they saw like on the internet that there a new game was coming out, like a new edition of a game was coming out and they were excited about that.” (part one (excited), male, age 8.74)

“Because they, they got um like something new.” (part one (excited), male, age 9.42)

“I was playing Toca, and for some reason the game just glitched and gave me something new. I felt really, like happy. I'm like, “Oh, my gosh! I'm so happy that the game just gave me something for free.” (part two (good), female, age 9.33)

“Well, I felt good because I just got a new game and, I never really played it before, and it was really fun.” (part two (good), female, age 7.52)

In contrast, negative emotions were commonly associated with loss of access to something they desired.

“If you wanted a game and you couldn't get it.” (part one (sad), female, age 7.08)

“Hmm, because they only had 1% on their iPad.” (part one (worried), female, age 9.25)

“So, like, one time I was on this app, but, like um, there kept on popping ads up, and I felt frustrated.” (part two (not so good), female, age 8.17)

“One time I was playing a game, and it was, and it was like a really fun game and it was about to end and I was winning but then my tablet just glitched and then I don't know what happened, it was, it my, it was my old iPad and it just broke down, so I had to get a new one.” (part two (not so good), male, age 8.58)

Summary

Overall, children's discussions emphasized the experiential aspects of technology usage, where both enjoyment and frustration may emerge from their ability to access and use technology in ways they desired.

Theme 2: Mastery

Mastery or failed mastery emerged as a prominent theme in children's explanations and personal narratives of both part one and two. In part one, failed mastery or concern for failure emerged as a common explanation for negative emotions (worry 35.19% and sadness 18.52%)

whereas success and the acquisition of new skills were often discussed for positive emotions (happiness 24.07% and excitement 22.22%).

In part two, mentions of mastery were more common when children described positive emotions (30.61%) than when they described negative emotions (22.45%). Correlational analyses revealed children who reported lower levels of technology use tended to use mastery as an explanation slightly more often ($r = -.132, p = .009$), perhaps due to increased novelty of digital successes for these children.

Subtheme 1: Accomplishments

In both parts, children discussed how different kinds of accomplishments facilitated by technology were highly influential events. These accomplishments were often focused on game-related achievements:

“Because they love playing games and uhh, they won every round.” (part one (happy) female, age 8.46)

“When I was, when I was playing a game and I got the top score.” (part two (good), male, age 9.42)

“Maybe it’s close to the end and they're doing good and they, they were excited that they might, that they might make it through.” (part one (excited), male, age 7.39)

“Hmm because they were getting some answers right.” (part one (excited), male, age 7.39)

Negative emotions were linked to failure and disappointment related to not achieving mastery, usually in the context of losing a game:

“Once when I was like, like so close to finishing this thing and then I died in a game.”

(part two (not so good), male, age 8.74)

“Uh, because they were losing a game.” (part one (worried), male, age 9.33)

Subtheme 2: Skill Development and Effort

Across parts, children's explanations and discussions were complex and often went beyond simply mentioning winning or achievement and highlighted factors like effort and time.

Positive explanations were associated with feelings of satisfaction and accomplishment resulting from the effort:

“Uh maybe because, they had completed a game they've been working on for a long time.” (part one (happy), female, age 9.33)

“Oh, I know, they programed, uh, something that took them uh, days or even months to do, and they finished.” (part one (excited), male, age 9.33)

“Maybe, like, when I won a game. Or, like it took, like, so long to build, but I finally finished it.” (part two (good), male, age 8.79)

“I won in my in my game and I was super happy. And now I keep practicing, and I keep getting really good at my game. I'm always happy cause I usually always win.” (part two (good), male, age 8.58)

In negative contexts, this effort was linked to disappointment. Effort and time were typically described as lost or wasted due to an accident.

“I thought I'd deleted something that I'd spent some time on.” (part two, (not so good) female, age 7.92)

“Uh, I'm in a programming class. And there was a time that I'd have to leave the class immediately because I erased all my things I done.” (part two (not so good), male, age 9.33)

Summary

Overall, children's discussions reflect awareness that mastery develops over time and emphasizes the importance of effort in success. Negative emotions were experienced when effort and time did not lead to the desired outcome. Together, these discussions of both negative and positive emotions highlight how much children care about these digital experiences.

Theme 3: Safety/Privacy

Safety and privacy emerged as an infrequent but important theme. In part one, safety and privacy accounted for a relatively small proportion of the total coded instances (6.63%). However, when safety/privacy were discussed, they were most frequently discussed in the context of worry (69.23%) or sadness (26.92%). Only a single instance occurred in relation to happiness (3.84%), in which the child explained the peer may feel happy their tablet was not being hacked. In part two, when discussing their own experiences, safety and privacy concerns were notably absent from children's narratives as these discussions comprised of only 1.61% of responses. As such, this section will mainly focus on part one discussions. Usage of this theme was not correlated with technology usage ($r = -.132, p = .57$).

Subtheme 1: Concerns About Online Content Exposure

Participants described exposure to online content that was frightening or emotionally upsetting, including violent imagery or distressing news. Some described encountering media that made it challenging for them to figure out if a harm observed online may happen in real life.

“They saw scary stuff and they were wondering, and they were wondering, like if that would happen to them?” (part one (worried), male, age 8.74)

“They might have saw, like, like, a video of a person, like, dying or something?” (part one (sad), male, age 8.79)

“Um like maybe in their game they were scared, they were scared, um maybe they were playing a creepy game and they were scared that, so they didn't want to play it anymore.” (part one (worried), male, age 8.58)

Subtheme 2: Concerns About Privacy and Security

A second pattern that emerged reflected concerns about violations of digital security and privacy. Children showed concerns for digital security threats like “hacking” or viruses:

“Because they did not know if there will be hackers or no hackers and what were the hackers doing.” (part one (worried), female, age 9.67)

“One of their friends could have had, like a bad virus or something.” (part one (worried), male, age 8.79)

Another child showed concern for being contacted by strangers:

“Someone they didn't know was calling them.” (part one (worried), female, age 8.91)

One child showed concern for how digital threats can lead to real-world harm.

“Maybe because there were some people they were chatting to, and then they threatened them, and they said that they were gonna come to their house and do it or something.” (part one (worried), female, age 9.33)

Summary

While less participants discussed safety and privacy overall, these accounts are important, as they provide insight into how children interpret and emotionally respond to perceived digital risk. When children discussed digital risks, their discussions were varied indicating an awareness and concern for a variety of safety and privacy issues.

Theme 4: Peer Dynamics

In exploring the theme of peer dynamics, it was clear that technology plays a significant role in how children connect and interact with their peers, particularly in part one (i.e., 20.67% vs. 11.29% in part two). Several subthemes emerged across part one that highlighted the ways in which technology influences friendships and social inclusion/exclusion. Conversely, participant responses in part two mainly centered around technology serving as a medium for social connection. A modest positive relationship was found between average technology use and peer dynamics ($r = .172, p < .001$), with increased technology use linked to high levels of discussion of peers.

Subtheme 1: Connections With Friends

Many children shared that technology actively facilitated and strengthened their connections with friends. In part two, participants further elaborated this theme by describing experiences of receiving compliments and being given virtual items or rewards by other players. Children discussed how technology was used for connection and conversation including situations where friends could not be seen in person:

“Because they can call people and see their faces.” (part one (happy), female, age 8.29)

“Um, because they were like on a call with a friend and then, they said the friend said they're moving or like they won't see each other for like a year or something.” (part one (sad), female, age 8.17)

“When I was, when I finally got to talk to one of my friends on messenger kids.” (part two (good), male, age 7.58)

“They could call together and they could play games together.” (part one (excited), female, age 8.91)

The importance of technology to connection was emphasized when children expressed concerns about not being able to access their friends online for various reasons (i.e., internet connection, lack of technology):

“They felt worried because they did not know if they could see their friend, it would be glitchy or not glitchy.” (part one (worried), female, age 9.67)

“Um, cause they were worried cause their friends wanted to play, but they didn't have iPads, so they needed to buy one, but they didn't buy them, cause their mom and dad said, “You can't buy iPad, only with your money” after he buyed with his money, but it was 2 billion dollars, and he had only one dollar.” (part one (worried), male, age 7.25)

“When my friend didn't answer a call.” (part two (not so good), male, age 8.17)

Children also discussed opportunities to make new friends:

“Because they were friend requesting each other.” (part one (excited), female, age 9.25)

“Because they gotted to play a game and then they gotted to do cool stuff and meet someone else on Roblox.” (part one (happy), female, age 9.67)

“Because she made a new friend on the Internet.” (part one (excited), female, age 8.92)

Subtheme 2: Feelings of Inclusion and Exclusion

While technology provided opportunities for connection, it also produced opportunities for complex feelings related to peer inclusion and exclusion.

In part one, participants frequently referenced using technology to feel part of and even create new social groups:

“Hmm, cause they were all friends together, never get bored ‘cause they play with each other.” (part one (happy), male, age 8.42)

“Like, like the person who doesn't know how to play can watch them and be like, “Wow! That is so cool. I want to play too”.” (part one (excited), male, age 7.25)

At the same time, the explanations highlight social dynamics, where some children described feeling excluded from social interactions. They used explanations describing online bullying experiences, with incidents related to peers making negative comments about their physical appearance, hurtful messages, or posts. This type of response was more frequent in part one, with only one example emerging in part two.

“Cause she had no friends playing with her.” (part one (sad), male, age 8.42)

“Like, they didn't think they looked pretty, like, didn't think someone would want to be their friend or something.” (part one (worried), female, age 8.92)

“Because people can say mean stuff on the Internet.” (part one (sad), female, age 9.33)

“Because, um, because they saw a video that was really mean to them, that was like a mean video” (part one (sad), female, age 9.67)

Summary

Overall, children's discussions suggest they view technology as an important part of their social networks that leads to positive outcomes for social connectedness, but that can also lead to serious negative social experiences like exclusion and bullying.

Theme 5: Family Dynamics

Family dynamics emerged as a recurring theme but occurred somewhat infrequently. Discussions were most often related to parental rules, restrictions, and control over technology access. References to family dynamics were present across both positive and negative emotional contexts. In part one, they occurred slightly more often in relation to negative experiences (58.33%) than positive ones (41.67%). Alternatively, in part two, responses related to family dynamics occurred more for positive emotions than negative ones. The family dynamics theme was not correlated with technology usage ($r = .097, p = .06$).

Subtheme 1: Restriction and Rules

The most prominent aspect of family dynamics in part one was related to restrictive parenting practices and how parents regulated access to technology. Children described not being allowed to use devices at certain times or being limited in what they could do. In some cases, during explanations of worry, children reported getting around these restrictions by sneaking access to these devices. In part two, references also appeared more frequently for accounts of negative experiences than positive ones.

“Cause their parents were coming and they weren't supposed to be on the iPad.” (part one (worried), male, age 8.71)

“Maybe cause they snuck the iPad without asking.” (part one (worried), female, age 7.52)

“Because, they had to read their books, and they worry about if mom was -- looked in the closet, mmm mom will see them playing video games.” (part one (worried), male, age 7.53)

“Because my mom, my mom um recycled [deleted] my YouTube, then I cannot watch it.” (M, age 7.53, not so good)

In other cases, rules were discussed in more positive terms, particularly when additional access was permitted by caregivers. Positive experiences included parents granting permission to use devices or allowing access to new technology, such as by buying a new game.

“Umm because they were allowed to go on their tablet.” (Part one (happy), male, age 8.74)

“Because maybe oh, their uh, mom or dad let them play for longer than they usually get to.” (part one (excited), male, age 8.68)

“My mom said you can watch a little bit of video game on your TV.” (part two (good), male, age 7.53)

“When my dad downloaded Among Us for me.” (part two (good), female, age 9.33)

Subtheme 2: Conflict and Exclusion

In part one mainly, children provided explanations about technology giving rise to family tensions that involve conflicts and tension over use.

“Because maybe, like, there's, like their like, sister, brother was bugging them when they were watching the show and they missed their favorite song-- part.” (part one (sad), male, age 7.46)

“Well, my sister, sometimes, umm like does some stuff on my tablet that I don't like.”
(part two (not so good), female, age 7.26)

“When I didn't ask to watch a show on my mom's phone, and when I did it, I just watched that, watched it for a long time, and then she got really mad at me.” (part two (not so good, female, age 8.92)

One child also discussed feeling excluded from a family activity.

“Um because my other brothers were playing with my dad. And I think I was a little big for it, but I wanted to play it. So, then I didn't feel very good because I was only watching my show.” (part two (not so good), female, age 8.29)

Subtheme 3: Connection

A less common but notable set of explanations described technology as facilitating social interaction within the family. Some children spoke about playing games together or sharing experiences on devices, which were linked to positive emotions. Across parts, some children also described using technology for communication and to maintain relationships with family members outside of their immediate family.

“Because they were like maybe on a call with a friend they don't see often or like a family member they don't see often.” (part one (happy), female, age 8.17)

“They were, um, happy because they, they were, like together and they were probably playing with their families.” (part one (happy), male, age 8.62)

“When me and my cousin were playing, we had lots of fun. Lots, lots of fun.” (part two (good), male, age 8.42)

“I like to umm I like to play with my sister. I like to play a music game I have called Duet Cats. And I like to share it with her, and then I like to watch her play it, see how she does with it.” (part two (good), female, age 9.00)

“It was a time when ...I gotted to do a group chat with my uncle and my brother. We, somehow, we did a group chat, I don't know how.” (part two (good), female, age 9.67)

Summary

Overall, children called attention to how family rules and restrictions influence their access to their devices which in turn influences common emotional states. They also discussed technology as a source of conflict and connection, highlighting the complex dual nature of technology in families.

Theme 6: Other

The other theme was used to capture codes that fell outside of the primary themes, which represented very few discussions. In part one, there were nine instances and in part two there were seven instances. The only notable subtheme was regarding physical effects of technology:

“Worry about their eyes hurting while watching it.” (part one (worried), male, age 7.53)

“It could hurt their eyes, too, so... like because of the light coming out of the phone.”
(part one (sad), female, age 8.92)

“When I read on it for too long.” (part two (not so good), female, age 9.02)

RQ3: How Might Children's Perspectives Change with Age?

Correlational analyses suggest that age was unrelated to any theme usage in Part one, apart from a small correlation between age and safety/privacy, which likely has little practical significance (see Table 6). Moreover, when conducting inductive coding of subthemes no notable age-related patterns were detected. Together, this suggests that age was unrelated to children's discussions.

Discussion

This thesis explored children's utilization of technology and perceptions of the impact technology has on their social and emotional wellbeing. Explanatory reasoning, or children's explanations, alongside direct narratives, were focused on. These methods were chosen because of how they tap into children's causal reasoning processes. Specifically, children's explanations can reveal insights into what children perceive to be the most important causal force in bringing about an outcome (Baddeley & Hitch, 1993; Wellman, 2011). Indeed, prior work has established that by the preschool years, children construct and draw on their causal theories of emotions and other mental states to help explain and interpret the world around them (Gelman & Legare, 2011). Thus, focusing on children's explanations allowed me to draw out children's perspectives on the common or important contributors to mental states online in a fairly open-ended and unstructured manner. I also collected children's first-person narratives that allowed me to gain insight into their direct experiences. In addition to these explanations and narratives, I also administered a closed-ended internet use survey.

As a reminder, this thesis examined three major research questions:

1. How do children characterize their own technology use? (RQ1)
2. How do children view technology use as influencing theirs and their peers' social-emotional wellbeing? (RQ2)
3. How might children's perspectives change with age? (RQ3)

I next discuss the findings of my thesis and its relation to each of these research questions. I end with a discussion of other important contributions and limitations.

RQ 1: How Do Children Characterize Their Own Technology Use?

First, I consider how children characterize their technology use in middle childhood. I found that children use technology in a variety of ways. Children used technology to play games, watch videos, connect with friends and family, learn, access information, and create digital content. Children's technology use showed a small correlation with age, with older children using it in slightly more diverse ways. Unsurprisingly, most children across the age range self-reported that they used technology passively to play games and watch videos. However, more notably, many children also self-reported engaging in using technology in more active ways such as playing online games with friends. This tension between both passive and active use being present in children's usage patterns is consistent with middle childhood being a developmental timepoint where children begin to independently use technology and whose usage patterns extend beyond the typically passive usage of early childhood.

Many children reported using technology independently to learn new information and/or look up new facts. This suggests that even children as young as 7-years-old are relying on technological informants to learn. It highlights the need to ensure that schools are providing adequate digital literacy curriculums that teach children as young as grade 2 how to appropriately find information using technological sources.

Many children also reported using technology to connect with family and friends in both traditional video chatting methods but also using chat features and digital games. Almost 45% of the sample reported playing games with friends online. This points to how technology use can be both a strength and a vulnerability. In terms of strengths, children are using technology to connect with important others and bond with friends. However, the behaviour of interacting with others online also opens risk to serious harms like online luring. Online luring in Canada increased nearly 20% by the end of 2025 (Statistics Canada, 2026). Indeed, one child's narrative reported in the results of how they "vetted" online friends draws attention to the vulnerability of young children. In the absence of proper guidance children will develop their own ways to assess risk. These methods reflect the developmental perspectives of children in middle childhood. Future work should investigate how widespread such "homegrown" strategies are to better understand children's vulnerabilities.

Of course, not all children engaged with technology in the same ways. Half of our sample did not report using technology to connect with others online. The diversity of access children had to technology was likely driven by parenting practices. One unique property of middle childhood is that parents are often still able to have influence on children's daily lives (as compared to adolescents; Collins et al., 2005). It seems likely that children whose technology use was lower are living in environments with more restrictive parenting practices (e.g., Gür & Türel, 2022).

Together, this discussion raises important topics for future research around the types of guidance, educational resources, and interventions that may be most effective for keeping children safe online. It highlights the need for a wraparound approach, which includes the education system as well as parenting interventions. Future work should investigate how schools

can complement parental guidance to identify the most effective ways to teach both safe and healthy technology use to support child wellbeing.

RQ 2: How Do Children View Technology Use as Influencing Theirs and Their Peers' Social-Emotional Wellbeing?

Next, I consider children's experiences more in depth as it relates to RQ2. Consumption was the dominant theme that children talked about across subthemes and emotion types. As such, many of their responses centered around the use of technology for entertainment. Compatible with the findings in RQ1, I also found that children used technology in more than passive ways. They were not just passively consuming technology, but also actively engaging with it through playing games, digital creation, and interacting with other people. In one child's case, they even interacted with artificial intelligence. The mastery code suggests that this consumption also actively built new skills, which children showed evidence of caring deeply about. These discussions included descriptions of becoming proficient at games, learning new skills, or creating content. Children mainly described this occurring through gameplay, particularly when provided a sustained challenge that they had to work through. Interestingly, a negative correlation emerged between technology use and mentions of mastery, such that participants with lower levels of technology use were more likely to discuss feelings of competence and mastery. This could be because children with more limited access to technology place greater value on the time they spend using it and therefore view their skill growth as more valuable, as suggested in the literature on scarcity (Lynn, 1992; Sehnert et al., 2014). Alternatively, children who use technology less frequently may be more aware of the new skill because those experiences stand out and the change between previous and current level feels larger. This is revealed in

developmental research where younger children report higher levels of mastery experiences compared to older children (e.g., Pajares et al., 2007).

Regardless, the prominence of the consumption and mastery codes establish the significant role that technology plays in everyday lives of children today. Opportunities to experience mastery and competence are important developmental needs during middle childhood (Newland et al., 2018; Seidner et al., 1988). There is converging evidence that digital experiences can enhance feelings of self-efficacy and autonomy (e.g., Shank & Cottin, 2014; Mourlam et al., 2020; Newland et al., 2018), in varied contexts (Leonard et al., 2016; Bonanati et al., 2022). Understanding the specific digital experiences and conditions that contribute to mastery, self-efficacy, and autonomy is therefore important for understanding these outcomes. Further, incorporating children's perspectives and how these factors are linked to overall wellbeing should be a key long-term objective.

An important, though less frequent theme included children's perspectives around online safety and privacy. However, issues of safety and privacy also re-emerged when discussions of negative peers experiences were examined. Together, from the discussions across these two themes, it appears that some children at this young age had already experienced or were concerned about adverse experiences online. Children showed concern for a variety of negative online experiences including consuming inappropriate content, hacking, cyberbullying, and peer exclusion. These discussions demonstrate an emerging awareness that digital environments can involve harm and negative social interactions. Altogether the findings highlight the need for comprehensive digital literacy education that covers a breadth of potentially negative consequences of technology use on children. It also highlights how peer dynamics and their negative consequence extend beyond public spaces and into what parents might believe are safe

private spaces. This calls attention to the need to study how to facilitate open communication in families about technology use.

The contrast to these discussions of negative experiences were the percentage of children who struggled to generate explanations for negative experiences at all (especially in part two). Their difficulty imagining negative consequences of technology use, although positive in some ways, may represent a naivety regarding the effects of technology. For a subset of children, negative consequences of technology use are not salient. This might leave them particularly unprepared for negative events if they were to occur.

One child discussed how they struggled to distinguish between fictional, exaggerated, or unlikely online scenarios and the real world. Prior work suggests this behaviour is common especially when media evokes a strong emotional reaction (Carrick & Ramirez, 2012) and for children in middle childhood who still may still be struggling with understanding possibility and likelihood. Although it was only one child, its discussion importantly underscores how children's interpretations of online experiences are shaped not just by the content, but also by their developmental stage (Marsh et al., 2017).

Finally, I consider children's perspectives on the social context of technology use, captured by the family and peer dynamics themes. To these children, technology use emerged as highly social and impacting their interactions with both of their primary social circles: their family and their peers. In terms of family dynamics, the most frequent and important subtheme that emerged was about children experiencing parental regulation of technology. Participant responses included both instances of allowance and restriction to devices. Discussions of parental regulations were frequently associated with negative emotions. Children likely perceived these parental rules as limiting their autonomy (Hiniker et al., 2016). The mention of

these conflicts demonstrates the need to support families as they navigate technology related issues in an evidence-based manner. For example, respect for children's autonomy can be achieved through involving children in the creation of family technology use plans where they can have a (developmentally appropriate) voice in family technology use. Work on parenting practices suggests that explicit family plans that involve children can help to reduce such conflict (Hiniker et al., 2016; Nielsen et al., 2019). In contrast to this issue, some children discussed positive experiences in relation to co-using technology with siblings and family members. Given the importance of technology to some children (as captured by our own data on consumption and mastery), it is unsurprising that co-use is important to them. Just as parents might watch a soccer game together, parents should consider showing interest in children's technology use, as the findings suggest it can provide meaningful avenues for connection. Future work might examine the ways in which co-use can promote meaningful connections among different populations of children and their families.

Children's discussions of peer dynamics emphasized how digital interactions provided many opportunities for fostering friendships and shared enjoyment. The perspective that technology is an important tool for social engagement is commensurate with findings from child and adolescent studies (e.g., Rideout & Robb, 2018; Newland et al., 2018; Žulec et al., 2022). Around half of participants reported using online gaming features, and these functions appeared to be particularly important for peer relationships for those children. As already discussed, these features can introduce vulnerabilities to young children and should be used with caution or in age-appropriate ways (e.g., many games allow only trusted friends or have parental monitoring features).

As discussed briefly, unfortunately, some children also reported negative peer interactions online. These interactions ranged from being the target of exclusion, to receiving unkind messages, to receiving upsetting content online. Unlike face-to-face bullying, harmful online interactions may persist beyond the moment and allow negative content to be shared or revisited. This can extend the emotional impact of the experiences and amplifying the effects (Ando & Ozarchevici, 2024). This finding demonstrates the need to better understand negative online peer experiences that young children are having and how to best support them.

Together, these findings demonstrate the dual role of technology in children's social-emotional lives. They spotlight how even in middle childhood, children are having complex social-emotional experiences that need to be better understood and supported. These findings show that many children themselves are concerned about their digital experiences and likely do want support that limits them in appropriate ways. The findings also illustrate that technology is incredibly important to children and fulfills important developmental needs for them. Taken together, this thesis highlights how achieving a balance that allows children to flourish online but also protects them is the most important way forward. Through this, researchers and practitioners can create evidence-based strategies to help children engage with technology in meaningful and developmentally appropriate ways.

RQ 3: How might children's perspectives change with age?

While age-related relationships were predicted, correlations found no meaningful differences in children's perspectives. I found consistent and complex technology use among the age range. Findings suggest children as young as 7-years-old are experiencing technology in more than passive ways. In this way, this study contributes to a growing body of child-focused research on digital technology and wellbeing by addressing an important gap. Much of the

existing research has focused on adolescents, with less attention paid to children's experiences in middle childhood (e.g., Jensen et al., 2019). My thesis suggests that across middle childhood, children are living rich lives online that they value and can reflect on. It underlines the importance of future work including this age group. Nonetheless, the relatively small sample size likely limited the analyses' power, making it more difficult to detect statistically significant results (Serdar et al., 2021). Future studies should further examine possible age-related changes using a larger sample and widened age range. Future research might also consider engaging in longitudinal research to more directly examine how children's experiences and perception develop over time. The advantage of longitudinal research is that it could be used to map individual trajectories, especially as it related to technology use or different types of adverse experiences.

Methodological Contributions

My study makes an additional contribution to the broader child development literature by advancing methodology on how to ask children in middle childhood about their experiences. To collect data, I administered three tasks. The first was utilization of a survey adapted from the Internet Experience Questionnaire (Girouard-Hallam et al., 2021). Every child in the study could respond to the survey, indicating this is an effective way to capture independent internet use directly from children. Next, I asked children to explain third-party emotions. This method was chosen in addition to first-person narratives as I sought to reduce recency effects that first-person narratives can be susceptible to, and capture events that children find particularly important or influential (Baddeley & Hitch, 1993; Wellman, 2011). In general, children provided relatively rich and detailed explanations when explaining the target emotions (89.80% response rate). Many of children were able to go beyond just naming the event linked to the emotion and

explained the context that led to it. In a third task, I asked children to provide narratives about their own, good and not-so-good, experiences in an open-ended interview. Such open-ended first-person methods are thought to be best practice when trying to elicit accurate, non-biased information (Laimon & Poole, 2008). In general, I found that third-person explanations tended to elicit richer responses than these first-person accounts. Nonetheless, all children were able to generate responses for positive narratives and most generated responses for negative narratives (i.e., ~85%). Altogether the methods in this thesis should be particularly beneficial to future researchers who wish to capture children's perspectives and/or conduct research where parents are not present such as in school-based research.

Limitations

Several limitations should be considered when interpreting the findings of this study. Because the study and its methodology are exploratory in nature, the discussion of the findings should be considered in this context. The goal of qualitative research is to gain an in depth understanding of experiences, but the downside to qualitative work is it typically utilizes small sample sizes. The relatively small sample size and specific participant characteristics (e.g., primarily White Manitobans) may limit the generalizability of the present study's results. The narrowness of the age range in this study is another limitation and may have restricted age-related findings. Additionally, qualitative analyses involve interpretation from the research team. While steps were taken to reduce bias, such as utilizing two coders, the identification and interpretation of themes are influenced by the researcher's perspectives. Furthermore, because the findings are based on self-report, they may be influenced by factors such as recall, ability, and willingness to share. These factors may be especially relevant in a sample of children in middle childhood, whose language, memory, and emotional understanding are still developing.

The aim of this exploratory study was to delve into the extent and significance of technology on children's social and emotional wellbeing. Through analyzing children's explanations and narratives regarding technology's impact on their emotional states, I gained valuable insight into their perspectives. This topic is largely understudied, with most work focusing on physical impacts of screen time (e.g., Fuller et al., 2017). Few studies ask for child perspectives on how technology impacts their wellbeing, despite children's fundamental right to express their opinion on the matter (Kaesling, 2021). The current study expanded on this work by asking children aged 7- to 9-years-old to explain positive and negative affective states and produce narratives about their own affective states. By asking about affective states, this work yielded primarily qualitative alongside quantitative insights into the daily effects of technology on child social and emotional wellbeing.

Children were proficient at emotion explanation and sharing their experiences (e.g., Kramer & Lagattuta, 2022), with emergent themes related to technology consumption, mastery, safety and privacy, and peer and family dynamics, with usage-related relationships to mastery and peer dynamics. No age effects were found. This study, and future work in the area, carry significant implications for the future direction of legislative, administrative, and technology development related to child wellbeing.

References

- Ahmad, N., Sharmin, T., Akter, J., Tuhin, R. A., & Das, A. K. (2021, January). Behavioral issues of children in terms of internet usages time in Bangladesh. In *2021 15th International Conference on Ubiquitous Information Management and Communication (IMCOM)* (pp. 1-6).
- Ali, S., Haykal, H. A., & Youssef, E. Y. M. (2023). Child Sexual Abuse and the Internet—A Systematic Review. *Human Arenas: An Interdisciplinary Journal of Psychology, Culture, and Meaning*, 6(2), 404–421. <https://doi.org/10.1007/s42087-021-00228-9>
- Amjad, S. (2025). Restrictive digital parenting and its psychological impact on children in Pakistan: A systematic review. *International Research Journal of Social Sciences and Humanities*, 4(4), 145-164.
- Anderson, L. & Lobb, L. (2024, May 16). *Understanding and Reporting Online Harms to Children and Youth: Canadian Centre for Child Protection*. Clinical Health Psychology Grand Rounds. University of Manitoba, Winnipeg, Canada.
- Ando, A., & Ozarchevici, M. (2024). Amplification by anonymity, an unassuming tool of cyberbullying. *International Journal of Legal and Social Order*, 4(1).
- Anthony, W. L., Zhu, Y., & Nower, L. (2021). The relationship of interactive technology use for entertainment and school performance and engagement: Evidence from a longitudinal study in a nationally representative sample of middle school students in China. *Computers in human behaviour*, 122, 106846.
- Auxier, B., Anderson, M., Perrina, A., & Turner, E., (2020). *Children's engagement with digital devices, screen time*. Pew Research Center.

<https://www.pewresearch.org/internet/2020/07/28/childrens-engagement-with-digital-devices-screen-time/>

- Baddeley, A. D., & Hitch, G. (1993). The recency effect: Implicit learning with explicit retrieval? *Memory & Cognition*, 21, 146-155.
- Bensalah, L., Caillies, S., & Anduze, M. (2016). Links Among Cognitive Empathy, Theory of Mind, and Affective Perspective Taking by Young Children. *The Journal of genetic psychology*, 177(1), 17–31. <https://doi.org/10.1080/00221325.2015.1106438>
- Bonanati, S., & Buhl, H. M. (2022). The digital home learning environment and its relation to children's ICT self-efficacy. *Learning Environments Research*, 25(2), 485-505.
- Braun, V., & Clarke, V. (2013). Successful qualitative research: A practical guide for beginners. Sage Publications.
- Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative research in sport, exercise and health*, 11(4), 589-597.
- Brisson-Boivin, Kara. (2018). *The Digital Well-Being of Canadian Families*. MediaSmarts. Ottawa, Ontario, Canada.
- Byrne, D. (2022). A worked example of Braun and Clarke's approach to reflexive thematic analysis. *Quality & quantity*, 56(3), 1391-1412.
- Carrick, N., & Ramirez, M. (2012). Preschoolers' fantasy-reality distinctions of emotional events. *Journal of experimental child psychology*, 112(4), 467–483. <https://doi.org/10.1016/j.jecp.2012.04.010>

- Cernikova, M., Smahel, D., & Wright, M. F. (2018). Children's Experiences and Awareness about Impact of Digital Media on Health. *Health communication*, 33(6), 664–673.
<https://doi.org/10.1080/10410236.2017.1298197>
- Chowdhury, A., & Bunt, A. (2023, April). Co-Designing with Early Adolescents: Understanding Perceptions of and Design Considerations for Tech-Based Mediation Strategies that Promote Technology Disengagement. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (pp. 1-16).
- Clark, L. S. (2011). Parental mediation theory for the digital age. *Communication Theory*, 21(4), 323–343. <https://doi.org/10.1111/j.1468-2885.2011.01391.x>
- Davern, M. T., Cummins, R. A., & Stokes, M. A. (2007). Subjective wellbeing as an affective-cognitive construct. *Journal of Happiness Studies*, 8, 429-449.
- Elimelech, A., & Aram, D. (2020). Using a digital spelling game for promoting alphabetic knowledge of preschoolers: The contribution of auditory and visual supports. *Reading Research Quarterly*, 55(2), 235–250.
- Falkenberg, H. K., Johansen, T. R., & Thorud, H.-M. S. (2020). Headache, eyestrain, and musculoskeletal symptoms in relation to smartphone and tablet use in healthy adolescents. *Scandinavian Journal of Optometry and Visual Science*, 13(2), 8 14. <https://doi.org/10.5384/sjovs.vol13i2p8-14>
- Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International journal of qualitative methods*, 5(1), 80-92.

- Fuller, C., Lehman, E., Hicks, S., & Novick, M. B. (2017). Bedtime Use of Technology and Associated Sleep Problems in Children. *Global pediatric health*, 4, 2333794X17736972. <https://doi.org/10.1177/2333794X17736972>
- Gelman, S. A., Taylor, M. G., Nguyen, S. P., Leaper, C., & Bigler, R. S. (2004). Mother-child conversations about gender: Understanding the acquisition of essentialist beliefs. *Monographs of the society for research in child development*, i-142.
- Gelman, S. A., & Legare, C. H. (2011). Concepts and folk theories. *Annual Review of Anthropology*, 40, 379–398. <https://doi.org/10.1146/annurev-anthro-081309-145822>
- Girouard-Hallam, L. N., Streble, H. M., & Danovitch, J. H. (2021). Children's mental, social, and moral attributions toward a familiar digital voice assistant. *Human Behaviour and Emerging Technologies*, 3(5), 1118-1131.
- Gottschalk, F. (2019). Impacts of technology use on children: Exploring literature on the brain, cognition and well-being. *OECD Education Working Papers*, No. 195, OECD Publishing, Paris, <https://doi.org/10.1787/8296464e-en>.
- Government of Canada. (2026, June 10). *Government of Canada introduces legislation to make social media services and AI chatbots safer for children*. <https://www.canada.ca/en/canadian-heritage/news/2026/06/government-of-canada-introduces-legislation-to-make-social-media-services-and-ai-chatbots-safer-for-children.html>
- Geurts, S. M., Vossen, H. G., Van den Eijnden, R. J., & Koning, I. M. (2024). Bidirectional within-family effects of restrictive mediation practices and adolescents' problematic social media use. *Journal of youth and adolescence*, 53(8), 1928-1938.

- Gür, D., & Türel, Y. K. (2022). Parenting in the digital age: Attitudes, controls and limitations regarding children's use of ICT. *Computers and Education*, 183, Article 104504. <https://doi.org/10.1016/j.compedu.2022.104504>
- Granic, I., Morita, H., & Scholten, H. (2020). Beyond screen time: Identity development in the digital age. *Psychological Inquiry*, 31(3), 195-223.
- Haddock, A., Ward, N., Yu, R., & O'Dea, N. (2022). Positive Effects of Digital Technology Use by Adolescents: A Scoping Review of the Literature. *International journal of environmental research and public health*, 19(21), 14009.
- Hamm, M. P., Newton, A. S., Chisholm, A., Shulhan, J., Milne, A., Sundar, P., Ennis, H., Scott, S. D., & Hartling, L. (2015). Prevalence and Effect of Cyberbullying on Children and Young People: A Scoping Review of Social Media Studies. *JAMA Pediatrics*, 169(8), 770–777. <https://doi.org/10.1001/jamapediatrics.2015.0944>
- Hiniker, A., Schoenebeck, S. Y., & Kientz, J. A. (2016, February). Not at the dinner table: Parents' and children's perspectives on family technology rules. In *Proceedings of the 19th ACM conference on computer-supported cooperative work & social computing* (pp. 1376-1389).
- Hsin, C. T., Li, M. C., & Tsai, C. C. (2014). The influence of young children's use of technology on their learning: A review. *Journal of Educational Technology & Society*, 17(4), 85-99.
- Hutton, J. S., Dudley, J., DeWitt, T., & Horowitz-Kraus, T. (2022). Associations between digital media use and brain surface structural measures in preschool-aged children. *Scientific reports*, 12(1), 19095.

- Jabbar, S. A., Al-Shboul, M., Tannous, A., Banat, S. A., & Aldreabi, H. (2019). Young children's use of technological devices: Parents' views. *Modern Applied Science, 13*(2), 66-80.
- Jackson, L. A., von Eye, A., Biocca, F. A., Barbatsis, G., Zhao, Y., & Fitzgerald, H. E. (2006). Does home Internet use influence the academic performance of low-income children? *Developmental Psychology, 42*, 429-435.
- Jacobucci, R. (2022). A critique of using the labels confirmatory and exploratory in modern psychological research. *Frontiers in Psychology, 13*, 1020770.
- Jensen, M., George, M. J., Russell, M. R., & Odgers, C. L. (2019). Young adolescents' digital technology use and mental health symptoms: Little evidence of longitudinal or daily linkages. *Clinical Psychological Science, 7*(6), 1416-1433.
- Joffe, H. (2011). Thematic analysis. *Qualitative research methods in mental health and psychotherapy: A guide for students and practitioners, 1*, 210-223.
- Kaesling, K. (2021). Children's digital rights: Realizing the potential of the CRC. In *Global Reflections on Children's Rights and the Law* (pp. 183-196). Routledge.
- Kardefelt-Winther, D. (2017, February). How does the time children spend using digital technology impact their mental well-being, social relationships and physical activity? An evidence-focused literature review. *Innocenti Discussion Paper*. UNICEF Office of Research, Innocenti, Florence.
- Katz, V. S., Gonzalez, C., & Clark, K. (2017). Digital inequality and developmental trajectories of low-income, immigrant, and minority children. *Pediatrics, 140*(Supplement_2), S132-S136.

Kerai, S., Almas, A., Guhn, M., Forer, B., & Oberle, E. (2022). Screen time and developmental health: results from an early childhood study in Canada. *BMC Public Health*, 22(1), 310.

Knudsen E. I. (2004). Sensitive periods in the development of the brain and behaviour. *Journal of cognitive neuroscience*, 16(8), 1412–1425. <https://doi.org/10.1162/0898929042304796>

Kowalski, R. M., Giumetti, G. W., Schroeder, A. N., & Lattanner, M. R. (2014). Bullying in the digital age: a critical review and meta-analysis of cyberbullying research among youth. *Psychological bulletin*, 140(4), 1073.

Kramer, H. J., & Lagattuta, K. H. (2022). Developmental changes in emotion understanding during middle childhood. In D. Dukes, A. C. Samson, & E. A. Walle (Eds), *The Oxford Handbook of Emotional Development*, Oxford Academic.
<https://doi.org/10.1093/oxfordhnb/9780198855903.013.24>

Lagattuta, K. H., Wellman, H. M., & Flavell, J. H. (1997). Preschoolers' understanding of the link between thinking and feeling: Cognitive cuing and emotional change. *Child Development*, 68, 1081– 1104. <https://doi.org/10.1111/j.1467-8624.1997.tb01986.x>

Lagattuta, K. H. (2005). When you shouldn't do what you want to do: Young children's understanding of desires, rules, and emotions. *Child Development*, 76, 713– 733. <https://doi.org/10.1111/j.1467-8624.2005.00873.x>

Lagattuta, K. H., Sayfan, L., & Bamford, C. (2012). Do you know how I feel? Parents underestimate worry and overestimate optimism compared to child self-report. *Journal of Experimental Child Psychology*, 113(2), 211-232.

- Laimon, R. L., & Poole, D. A. (2008). Adults usually believe young children: the influence of eliciting questions and suggestibility presentations on perceptions of children's disclosures. *Law and human behaviour*, 32(6), 489–501. <https://doi.org/10.1007/s10979-008-9127-y>
- Leonard, J., Buss, A., Gamboa, R., Mitchell, M., Fashola, O. S., Hubert, T., & Almughyirah, S. (2016). Using robotics and game design to enhance children's self-efficacy, STEM attitudes, and computational thinking skills. *Journal of Science Education and Technology*, 25(6), 860-876.
- Lillard, A. S., & Peterson, J. (2011). The immediate impact of different types of television on young children's executive function. *Pediatrics*, 128(4), 644-649.
- Livingstone, S., & Helsper, E. J. (2007). Taking risks when communicating on the Internet: the role of offline social-psychological factors in young people's vulnerability to online risks. *Information, Communication & Society*, 10(5), 619–644. <https://doi.org/10.1080/13691180701657998>
- Lynn, M. (1992). The psychology of unavailability: Explaining scarcity and cost effects on value. *Basic and Applied Social Psychology*, 13(1), 3-7.
- Collins, W. A., Madsen, S. D., & Susman-Stillman, A. (2005). Parenting during middle childhood. In D. Brodzinsky, W. A. Collins, & M. H. Bornstein (Eds.), *Handbook of parenting: Volume I: Children and parenting* (pp. 73-93).
- Mah, V. K., & Ford-Jones, E. L. (2012). Spotlight on middle childhood: Rejuvenating the 'forgotten years'. *Paediatrics & child health*, 17(2), 81–83. <https://doi.org/10.1093/pch/17.2.81>

- Marsh, J., Hannon, P., Lewis, M., & Ritchie, L. (2017). Young children's initiation into family practices in the digital age. *Journal of Early Childhood Research*, 15(1), 47-60.
- Meng, Q., Yan, Z., Abbas, J., Shankar, A., & Subramanian, M. (2025). Human-Computer Interaction and Digital Literacy Promote Educational Learning in Pre-school Children: Mediating Role of Psychological Resilience for Kids' Mental Well-Being and School Readiness. *International Journal of Human-Computer Interaction*, 41(1), 16–30.
<https://doi.org/10.1080/10447318.2023.2248432>
- Miller, J., Mills, K. L., Vuorre, M., Orben, A., & Przybylski, A. K. (2023). Impact of digital screen media activity on functional brain organization in late childhood: Evidence from the ABCD study. *Cortex; a journal devoted to the study of the nervous system and behaviour*, 169, 290–308. <https://doi.org/10.1016/j.cortex.2023.09.009>
- Mourlam, D. J., DeCino, D. A., Newland, L. A., & Strouse, G. A. (2020). “It's fun!” using students' voices to understand the impact of school digital technology integration on their well-being. *Computers & Education*, 159, 104003.
- Nagata, J. M., Chu, J., Zamora, G., Ganson, K. T., Testa, A., Jackson, D. B., Costello, C. R., Murray, S. B., & Baker, F. C. (2023). Screen Time and Obsessive-Compulsive Disorder Among Children 9-10 Years Old: A Prospective Cohort Study. *The Journal of adolescent health: official publication of the Society for Adolescent Medicine*, 72(3), 390–396.
<https://doi.org/10.1016/j.jadohealth.2022.10.023>
- Nancekivell, S. E., Davidson, N. S., Noles, N. S., & Gelman, S. A. (2023). “She should get her own cat”: Parent-child conversations about ownership and sharing. *Early Childhood Research Quarterly*, 63, 434-445.

- Nielsen, P., Favez, N., Liddle, H., & Rigter, H. (2019). Linking parental mediation practices to adolescents' problematic online screen use: A systematic literature review. *Journal of behavioural addictions*, 8(4), 649–663. <https://doi.org/10.1556/2006.8.2019.61>
- Newland, L. A., Mourlam, D., & Strouse, G. (2018). A phenomenological exploration of the role of digital technology and media in children's subjective well-being. *Child Indicators Research*, 11, 1563-1583.
- Pagani, L. S., Fitzpatrick, C., Barnett, T. A., & Dubow, E. (2010). Prospective associations between early childhood television exposure and academic, psychosocial, and physical well-being by middle childhood. *Archives of Pediatrics & Adolescent Medicine*, 164(5), 425–431.
- Pajares, F., Johnson, M. J., & Usher, E. L. (2007). Sources of writing self-efficacy beliefs of elementary, middle, and high school students. *Research in the Teaching of English*, 42(1), 104-120.
- Paulus, M. P., Squeglia, L. M., Bagot, K., Jacobus, J., Kuplicki, R., Breslin, F. J., ... & Tapert, S. F. (2019). Screen media activity and brain structure in youth: Evidence for diverse structural correlation networks from the ABCD study. *Neuroimage*, 185, 140-153.
- Pinault, L., Khan, S., & Tjepkema, M. (2020). Accuracy of matching residential postal codes to census geography. *Health Reports*, 31(3), 3-13.
- Ponti, M. (2023). Screen time and preschool children: Promoting health and development in a digital world. *Paediatrics & child health*, 28(3), 184–202.
<https://doi.org/10.1093/pch/pxac125>

- Rideout, V., Peebles, A., Mann, S., & Robb, M. B. (2022). *Common Sense census: Media use by tweens and teens, 2021*. San Francisco, CA: Common Sense.
- Rideout, V., & Robb, M.B. (2018). *Social Media, Social Life*. San Francisco, CA: Common Sense Media.
- Rosen, L. D., Lim, A. F., Felt, J., Carrier, L. M., Cheever, N. A., Lara-Ruiz, J. M., ... & Rokkum, J. (2014). Media and technology use predicts ill-being among children, preteens and teenagers independent of the negative health impacts of exercise and eating habits. *Computers in human behaviour*, 35, 364-375.
- Rubin, M., & Donkin, C. (2024). Exploratory hypothesis tests can be more compelling than confirmatory hypothesis tests. *Philosophical Psychology*, 37(8), 2019-2047.
- Russell, J. A., & Paris, F. A. (1994). Do children acquire concepts for complex emotions abruptly?. *International Journal of Behavioural Development*, 17(2), 349-365.
- Sehnert, S., Franks, B., Yap, A. J., & Higgins, E. T. (2014). Scarcity, engagement, and value. *Motivation and Emotion*, 38(6), 823-831.
- Seidner, L. B., Stipek, D. J., & Feshbach, N. D. (1988). A developmental analysis of elementary school-aged children's concepts of pride and embarrassment. *Child development*, 367-377.
- Serdar, C. C., Cihan, M., Yücel, D., & Serdar, M. A. (2021). Sample size, power and effect size revisited: simplified and practical approaches in pre-clinical, clinical and laboratory studies. *Biochemia medica*, 31(1), 010502. <https://doi.org/10.11613/BM.2021.010502>

- Shah, T. I., Bell, S., & Wilson, K. (2014). Geocoding for public health research: Empirical comparison of two geocoding services applied to Canadian cities. *The Canadian Geographer*, 58(4), 400–417. <https://doi.org/10.1111/cag.12091>
- Slavtcheva-Petkova, V., Nash, V. J., & Bulger, M. (2015). Evidence on the extent of harms experienced by children as a result of online risks: implications for policy and research. *Information, Communication & Society*, 18(1), 48–62. <https://doi.org/10.1080/1369118X.2014.934387>
- Smahel, D., Wright, M. F., & Cernikova, M. (2015). The impact of digital media on health: children's perspectives. *International journal of public health*, 60(2), 131–137. <https://doi.org/10.1007/s00038-015-0649-z>
- Small, G. W., Lee, J., Kaufman, A., Jalil, J., Siddarth, P., Gaddipati, H., Moody, T. D., & Bookheimer, S. Y. (2020). Brain health consequences of digital technology use. *Dialogues in clinical neuroscience*, 22(2), 179–187. <https://doi.org/10.31887/DCNS.2020.22.2/gsmall>
- Statistics Canada (2026, July 9). *Table 35-10-0153-01 Police-reported cybercrime, by cyber-related violation, number of incidents and year to date total, preliminary quarterly data, Canada and regions*. <https://doi.org/10.25318/3510015301-eng>
- Stiglic, N., & Viner, R. M. (2019). Effects of screentime on the health and well-being of children and adolescents: a systematic review of reviews. *BMJ open*, 9(1), e023191.
- Szollosi, A., & Donkin, C. (2021). Arrested theory development: The misguided distinction between exploratory and confirmatory research. *Perspectives on Psychological Science*, 16(4), 717-724.

- United Nations. (1989). Convention on the Rights of the Child. *Treaty Series*, 1577, 3.
- Voss, M. L., Claeson, M., Bremberg, S., Peterson, S. S., Alfvén, T., & Ndeezi, G. (2023). The missing middle of childhood. *Global Health Action*, 16(1). <https://doi-org.uml.idm.oclc.org/10.1080/16549716.2023.2242196>
- Wong, J. (2026, June 11). Canada is the latest to try limiting kids' social media exposure — but new bill gives platforms room to change. *Canadian Broadcasting Corporation*. <https://www.cbc.ca/news/canada/online-safety-social-9.7230093>
- Wellman, H. M. (2011). Reinvigorating explanations for the study of early cognitive development. *Child Development Perspectives*, 5(1), 33-38.
- Widen, S. C., & Russell, J. A. (2008). Young children's understanding of others' emotions. In M. Lewis, J. M. Haviland-Jones, & L. F. Barrett (Eds.), *Handbook of emotions* (3rd ed., pp. 348–363). The Guilford Press.
- Woods, H. C., & Scott, H. (2016). #Sleepyteens: Social media use in adolescence is associated with poor sleep quality, anxiety, depression and low self-esteem. *Journal of adolescence*, 51, 41–49. <https://doi.org/10.1016/j.adolescence.2016.05.008>
- Zhu, Y. Q., Chen, L. Y., Chen, H. G., & Chern, C. C. (2011). How does Internet information seeking help academic performance?—The moderating and mediating roles of academic self-efficacy. *Computers & Education*, 57(4), 2476-2484.
- Žulec, A., Varga, V., & Štefanić, L. (2022). Children's and Parents' Perspectives on the Effects of Children's Digital Technology Use. *Interacting with Computers*, 34(3), 73–84. <https://doi.org/10.1093/iwc/iwac035>

Table 1*Participant Demographic Characteristics*

Demographic		<i>n</i>	%
Child sex	Female	21	42.86%
	Male	28	57.14%
Child racial/ethnic identities	White	28	57.14%
	Latin American	3	6.12%
	Chinese	3	6.12%
	South Asian	2	4.08%
	Southeast Asian	1	2.04%
	Filipino	1	2.04%
	Asian	2	4.08%
	Metis	2	4.08%
	Other groups (e.g., Multi-racial)	5	10.20%
	Did not respond	2	4.08%
Median household income of neighbourhood	<\$70,000	8	16.67%
	\$70,000 - \$79,000	4	8.33%
	\$80,000 - \$89,000	4	8.33%
	\$90,000 - \$99,000	11	22.92%
	\$100,000 - \$109,000	7	14.58%
	\$110,000 - \$119,000	3	6.25%
	>\$120,000	11	22.92%
Modal education level of neighbourhood (25 to 64 years)	No certificate, diploma or degree	0	0.00%
	High school diploma or equivalent	3	6.25%
	Postsecondary certificate, diploma, or degree	12	25.00%
	Bachelor's degree or higher	33	68.75%

Table 2*Distribution of Responses for Independent Internet Use Survey*

	Have you ever used your [technology] to play a game or watch a video?	Have you ever used your [technology] to look up the answer to a question?	Have you ever used your [technology] to learn how to do something?	Have you ever used your [technology] to have a video call with someone?	Have you ever used your [technology] to play with friends?
<i>n</i>	48	21	35	33	22
%	97.95%	42.86%	71.43%%	67.35%	44.90%

Table 3*Child Emotion Explanation Themes*

Theme	Definition
Consumption (k = .83)	Consumption captures explanations related to the acquisition or use of technology, including ownership, availability and barriers to access.
Mastery (k = .86)	Mastery referred to explanations that describe growth in skill, effort, or competence. This includes reference to learning, practicing, improving, persisting through challenges, or achieving success.
Safety/privacy (k = .83)	Safety/privacy referred to explanations involving sharing personal information online, privacy concerns, concerns about content seen online, and personal safety during technology use.
Peer dynamics (k = .93)	Peer dynamics include reference to interpersonal factors related to peer dynamics or friendships with same-aged peers, as well as social-emotional consequences such as inclusion/exclusion, reputation management, or perceived judgement.
Family dynamics (k = .92)	Family dynamics includes explanations that reference interpersonal factors related to family, including explicit mentions of family relationships, as well as experiences with family-based rules or punishment.

Note. Values represent inter-rater reliability scores. k = Cohen's kappa.

Table 4*Distribution of Theme Frequencies Across Parts One and Two*

Theme	<i>n</i>	%
Total		
Part one	392	100.00%
Part two	124	100.00%
Consumption		
Part one	210	53.57%
Part two	51	41.11%
Mastery		
Part one	54	13.78%
Part two	26	20.97%
Safety/Privacy		
Part one	26	6.63%
Part two	2	1.61%
Peer Dynamics		
Part one	81	20.66%
Part two	14	11.29%
Family Dynamics		
Part one	28	7.14%
Part two	24	19.35%
Other		
Part one	9	2.30%
Part two	7	5.65%

Table 5*Frequency of Emotions Reported in Part Two*

Emotion	<i>n</i>	%
Total	111	100.00%
Basic		
Happy	37	33.33%
Sad	23	20.72%
Angry	7	6.31%
Scared	1	0.90%
Complex		
Excited	18	16.22%
Worried	7	6.31%
Frustrated	2	1.80%
Nervous	1	0.90%
Confused	1	0.90%
Surprised	1	0.90%
Disappointed	1	0.90%
Non-Emotion		
Good	3	2.70%
Depressed	2	1.80%
Upset	1	0.90%
Silliness	1	0.90%
Over-exaggerated	1	0.90%
Grumpy	1	0.90%

Table 6*Correlations for Study Theme by Age*

Theme	<i>r</i>	<i>p</i>
Consumption	-.007	.887
Mastery	-.083	.102
Safety/Privacy	.052	.031
Peer Dynamics	.089	.078
Family Dynamics	-.088	.081

Appendix A

Positionality Statement

I am a white female who was born and raised in Winnipeg. I grew up during a transitional technology period. My first computer was a large desktop that sat in the corner of the living room. I had limited online gaming experience, and social media was not widespread until I was an adolescent. So, while I grew up alongside these technologies, the digital landscape that children currently exist in differs vastly from the one that I grew up in. My training in school psychology has provided me with methodological frameworks for doing qualitative analyses, and conceptual frameworks for understanding how children develop emotional reasoning and for interpreting research findings broadly. But my lived experiences shape how I interact with and interpret the impacts of technology. I acknowledge how these experiences and my positionality influenced this project and was committed throughout the research process to ongoing reflection on my assumptions, perspectives, and interpretations.

Appendix B

Stimuli Script

Opening

Before we start, do you need anything (a drink of water, bathroom etc.) I want to make sure that you can see me. Can you tell me how many fingers I am holding up?

[wait for child's response]

Would you like to play our research games and listen to our story?

[wait for child's response]

[if yes] Okay great! I am going to start recording the call now. Just let me know if you want to stop for any reason and we will just stop. There are not right or wrong answers, we just want to hear about what you think.

Warm-up task: My first question is Tell me about what you like to do in nature?

If child is silent or says "I don't know": Are there things you like to do when you are outside?

Are there things you do outside with your friends? [Offer suggestions like riding their bike or swimming.]

[Share what you like to do outside]

After they have finished: That sounds super fun!

Next, I will tell you some stories about some children and technology and we will play a guessing game.

Then, you will get to tell me what you think. There are no right or wrong answers, we just want to hear about what you think.

Part one

Let's start our guessing game. You will have 2 guesses for each question.

Happy: I want to tell you about my friend named Riley. They were using their [technology] and felt happy. Why do you think they felt happy?

That's a great idea/thanks for the idea! Let's do another one. Tell me another reason they felt happy?

Sad: I want to tell you about my friend named Avery. They were using their [technology] and felt sad. Why do you think they felt sad?

That's a great idea/thanks for the idea! Let's do another one. Tell me another reason they felt sad?

Excited: I want to tell you about my friend named Mackenzie. They were using their [technology] and felt excited. Why do you think they felt excited?

That's a great idea/thanks for the idea! Let's do another one. Tell me another reason they felt excited?

Worried: I want to tell you about my friend named Alex. They were using their [technology] and felt worried. Why do you think they felt worried?

That's a great idea/thanks for the idea! Let's do another one. Tell me another reason they felt worried?

Prompts:

If silent for more than 20 seconds: Can you think of any reason why they might feel [emotion]?

Do you need some more time to think?

If they say "I don't know": Can you guess what they were doing on their [technology] that made them feel [emotion]?

If they give the same reason: That's the same answer you gave before. Can you think of another reason?

Part two

You did a really good job! Now I want to hear about you and your [technology].

Sometimes when people use their [technology] they feel really good. Tell me about a time when you were using your [technology] and you felt good.

[If they do not exceed 2 minutes] Can you tell me more about that?

After they have finished: That's a really interesting response. Can you tell me what emotion you were thinking about when you were telling me about the time when technology made you feel good?

Sometimes when people use their [technology] they don't feel very good. Tell me about a time when using your [technology] made you feel not so good."

[If they do not exceed 2 minutes] Can you tell me more about that?

After they have finished: That's a really interesting response. Can you tell me what emotion you were thinking about when you were telling me about the time when technology made you feel not so good?

Prompts (good/not so good)

If silent for more than 20 seconds: Can you think of something you do on your [technology] that makes you feel good/not so good? Do you need some more time to think?

If they say "I don't know": There is not right or wrong answer. I want to hear about the things you do on your [technology] that makes you feel good/not so good.

If they exceed 2 minutes: "That's a really good answer, thank you for sharing! In just a second, we will move on to the next question. Is there anything else you want to share before we move on? [wait for response] Great, let's move on to the next question."

When child is not clear with explanation: "What part of that made you feel good/not so good?"

Prompts (emotion description)

If they describe a non-emotion: If you had to give that emotion a name, what name would you call it?

If they say "I don't know": What is your best guess for the emotion you were thinking about?

Independent Internet Use Survey:

Next I have some questions about what you do using your [technology].

Have you ever used your [technology] to play a game or watch a video? Y/N

Have you ever used your [technology] to look up the answer to a question? Y/N

Have you ever used your [technology] to learn how to do something? Y/N

Have you ever used your [technology] to have a video call with someone? Y/N

Have you ever used your [technology] to play with friends? Y/N

If yes, can you tell me about this?

Following the research questions

My last question is can you tell me about something you are excited about?

That is all the questions I have for you! Thank you for sharing your ideas with me. You had some really interesting ideas and I enjoyed talking with you today.

[Ask the parent to return, debrief (if necessary). Ask if parent has any questions and remind them how they can expect to receive the compensation.]

Appendix C

Adult Consent Form



Dr. Shaylene Nancekivell

Department of Psychology

190 Dysart Rd,

Research Project Title: Children's Socio-emotional Understanding of Digital Technology Use

Principal Investigator and Contact Information:

Allyson Paton, Master's Student

Department of Psychology

Supervisor and Contact Information:

Dr. Shaylene Nancekivell, Assistant Professor

Department of Psychology

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

Description of the purpose of the research: Your child is being invited to participate in a Zoom/Teams interview session for the Children's Socio-emotional Understanding of Digital Technology Use project. The following information will describe the purpose of this project and what's involved in your possible participation.

I am asking you to participate in this research study because we are interested in how children think about technology and how technology makes them feel. This project will fill a large gap in what is known about children's emotional wellbeing while using digital technologies.

Procedures involved: This research project will take approximately 30 minutes.

Your child will participate in an interview over a Zoom or Microsoft Teams video call. They will be told a few stories about a child using technology and experiencing an emotion and will be asked why they think the child is experiencing the emotion. They will then be asked to tell us about a time when technology made them feel good and a time that technology made them feel not so good. This call will be audio recorded. You will be asked to help your child set up the video call and may sit with them during the interview. The researcher will get your child's permission to participate, which includes describing the tasks they will do and reminding your child that they can stop at any point. The call will be audio recorded and transcribed. The automated transcription service on Zoom or Teams will be utilized. The company will store your data securely and keep your identity confidential.

You will be asked to complete a short demographic survey about your child.

Participation in this research project is voluntary. It can be ended at any time.

Renumeration: You will be given an electronic gift card for your participation in the research study. You will be provided a \$25 Visa gift card for your child completing the interview. You will be mailed this within 24 hours after participation. We must see your child during the call be able to ask them whether they assent to the study, although your child is not obligated to participate in the study.

Potential benefits: The proposed research aims to increase our understanding of how children reason and feel about technology including how it impacts their wellbeing. This research may directly benefit the scientific community. There are no direct benefits to individual participants in this research study other than the opportunity to meet with a scientist and learn about the scientific process.

Potential risk: When answering questions about emotions while using technology, there is a chance it may prompt bad memories or experiences associated with technology for your child (e.g., bullying). If your child experiences psychological distress, the study will end immediately.

Withdrawal: You can withdraw from this study at any time during the study. If you or your child decides to withdraw from the study, we will delete your data within one business day. Please contact the Principal Investigator or the Supervisor via email if you wish to withdraw from the study. The deadline to request to withdraw will be when data collection ends on 12/2025.

Data confidentiality: Data will be collected in an indirectly identifiable state. Only general descriptors will be used. For example, we might refer to individuals as "one 8-year-old girl" or to an entire age group "50% of children participating". We will be asking for demographic information which includes your child's birthdate, racial identity, and gender identity. If you do not wish to provide any of this demographic information, you may still participate. Transcripts will have any identifying information removed. Audio files will be deleted within 10 years of the end of data collection, or by 2040, whichever comes first.

We will also collect your address to mail you the gift card. Your address will be stored separately from other data collected during the study and will not be linked to the collected data in any way.

Some data will be sent to servers located outside of Canada. We are unable to ensure complete security when data is stored outside of Canada.

All research team members will be trained to follow mandatory reporting regulations that require University employees/staff to report cases of child maltreatment (e.g., abuse, neglect, or endangerment). Should your child volunteer information that leads us to suspect your child, or any other child has experienced or is experiencing maltreatment, we may ask you additional clarifying questions and may be obligated to contact a child welfare agency.

Research Results and Data Sharing: Data from this study is collected for the purpose of completing a Master's thesis. We also hope to publish this data in academic outlets (e.g., journals, conferences). Some data and information from this study may be sent outside of the University of Manitoba to other researchers, organizations, or made publicly available. This is for further analysis, testing, or as part of the research study. Any data files we share outside the University will not contain your personal information.

Debriefing: After the study, the researchers are available to talk about the study and current findings. You may also visit <http://www.youngmindsresearch.com/> to view our findings or email the PI at patona3@myumanitoba.ca Preliminary findings are released within 6 months of participating.

By checking the box on this form, you indicate that you have understood to your satisfaction the information regarding participation in the research project and agree to your participation as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time during the study, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

The University of Manitoba may look at your research records to see that the research is being done in a safe and proper way.

This research has been approved by the Research Ethics Board at the University of Manitoba, Fort Garry campus. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Officer at 204-474-7122 or HumanEthics@umanitoba.ca. A copy of this consent form has been given to you to keep for your records and reference.

I understand to my satisfaction the information regarding participation in the research project and agree to my participation as a subject.

Name: _____ Date: _____

Appendix D

Child Assent Script

"During our visit today, I am going to tell you some stories and ask about your ideas. I'll also ask you some questions about your experiences. There are no right or wrong answers, I just want to hear what you think.

You can tell me whenever you want to stop or if you need to go to the bathroom. Your parent will be next to you while we talk. Does that sound ok? Do you have any questions before we start? Can I get a thumbs up?"

Wait for child's response. If child says "yes", "ok", gives a thumbs up, or nods their head to indicate "yes", this is considered verbal assent.