

The Impact of Digital Content Exposure on Cognitive and Language Development in Children Aged 4–7: A Parental Perspective



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Spring 2025

**The Impact of Digital Content Exposure on Cognitive and Language Development in
Children Aged 4–7: A Parental Perspective**

A Thesis Submitted to
The Department of English and Humanities
University of Liberal Arts Bangladesh

In Partial Fulfillment
of the Requirements for the Degree of
MA in English

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Spring 2025

CERTIFICATE OF APPROVAL

I hereby declare that this thesis is the student's own work and effort. All sources of information incorporated here have been duly acknowledged. This thesis has been submitted with my approval.



Golam Kader Zilany

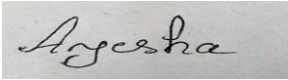
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DECLARATION

This thesis is a presentation of my original research work. Wherever contributions of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions.



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DEDICATION

I dedicate this dissertation to my family for their love and support, and to my supervisor for his guidance and encouragement throughout this journey.

ACKNOWLEDGEMENTS

Above all else, I thank Almighty Allah for His unlimited blessings and guidance throughout.

I express my heartiest thanks to my supervisor, Golam Kader Zilany, especially for his support and guidance with care. He has enabled the research through his guidance.

I also thank the Department of English and Humanities for allowing me to conduct this research.

My loving husband and lovely baby girl, you both are my biggest blessings in the form of love and happiness. Dear Husband, your constant patience and support mean everything to me.

A heartfelt thanks to my parents for always believing in me and loving me unconditionally.

Ayesha Akter

May, 2025

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ABSTRACT

This study investigates the impact of digital content exposure on the cognitive and language development of children aged 4 to 7, with a specific focus on parental perceptions and mediation strategies. As digital media continues to pervade the environment around us, its impact on child development during the early years becomes increasingly significant. The study utilizes a qualitative research design, employing semi-structured interviews with four mothers to examine how digital content influences children's cognitive development, including memory, attention, problem-solving ability, and language development, such as vocabulary and grammar. The management and planning of children's screen time by parents and the balance between digital content and traditional, non-digital ways of learning are also addressed. Findings show while educational and interactive digital media have the potential to promote development of languages and cognition, there are negative effects such as decreased attention span, code mixing, and decreased social interaction if children are exposed to a lot of screen time without monitoring. Parental mediation taking the shape of co-viewing, content selection, and time restriction have proven to have a crucial role in promoting maximum positive effects of digital content and preventing any possible negative effects. This research provides new idea into the existing literature by examining the dual effects of digital content on language development and cognitive development, that have been previously investigated in isolation. The research highlights the crucial role of parental involvement in regulating screen time and provides hands-on recommendations for parents, educators, and policymakers on the use of digital content as a powerful educational instrument for young children.

Keywords: Exposure, Digital Content, Cognitive Development, Language Development, Parental Mediation, Children's Early Education, Screen Time Management, Interactive Media.

CHAPTER 1: INTRODUCTION

1.1 Background of the Study

Digital technology has impacted the ways children interact with their environment in the past few years, which subsequently alters how they learn and develop. The ages of 4 to 7 are particularly important for developmental milestones relating to cognitive and language skills because a child's ability to think, speak, and even solve problems is in rapid development. During this period, children are being exposed to digital content, which includes educational apps, interactive games, videos, and even digital books. Smartphones, tablets, and computers make these tools available and have become part of children's learning experiences (Kabali et al., 2015).

Having access to digital content has been shown to be beneficial for children in enhancing some of the cognitive skills such as memory, problem-solving as well as attentiveness (Anderson et al., 2017; Neumann, 2014). There are also many interactive games and apps designed to assist with language learning that enable children to expand their vocabularies, comprehension of grammar, and communication skills (Sun et al., 2023). For example, children in educational games are taught new words while solving problems which is beneficial for the children's cognitive as well as language development (Neumann, 2014).

But there are concerns, especially when it comes to the consumption of digital content. Certain studies have indicated the dangers associated with excessive use of screens, such as social isolation, increased reliance on devices, and shorter attention spans as potential dangers of screen time (Guerrero et al., 2019; Hosen et al., 2021). These concerns are particularly worrisome as children at this age require interaction with live humans to learn how to

experience, share, and work with others, and take turns. If children are spending excessively long periods glued to screens, they are likely to miss critical opportunities for social engagement (Christakis, 2019).

Closer inspection of the research indicates a few gaps. First, the majority of research focuses on either cognitive or language development, but rarely speaks to how digital content affects both regions concurrently (Yousuf, 2023; Hossain et al., 2023). This is because cognitive and language skills normally develop concurrently at the same time and can support each other. For example, one of the games that encourages problem-solving during new word acquisition may improve language and cognitive skills, but research on this synergistic impact is scarce (Yousuf, 2023; Sundqvist et al., 2021).

The second gap in research is the inability to put a focus on parents and parental involvement in the management of digital content for children. While there is plenty of research on the effects of digital content on children, there are very few studies of how parents perceive these impacts or how parents strike a balance between screens and other forms of learning, such as reading books or outdoor play (Hossain et al., 2023). Parents are responsible for shaping their children's online life, either by active mediation (such as interactions with children and screen use) or restrictive mediation (e.g., limiting television viewing time). However, we do not know much about how parents do this balancing act and how their approach influences children's development (Padilla-Walker et al., 2016; Sundqvist et al., 2021).

These are the gaps this research seeks to bridge by investigating the effects of digital content on both cognitive and language development between 4 and 7-year-olds. Because of its focus on parental mediation, this study will also address how parents can help their children benefit most from digital media while balancing with traditional learning processes. This will

give a realistic picture of how digital content is capable of helping children grow and assisting in child guidance by the parents regarding screen time (Yousuf, 2023; Hossain et al., 2023).

1.2 Research Questions

The study is prompted by two general research questions addressing the dual function of technology in children's language and cognitive development, and the role of mediation by Parents in children's technology use.

1) How does exposure to digital content influence both cognitive and language development in children aged 4 to 7?

2. What are parents' perceptions of the impact of digital content on their children's cognitive and language development, and how do they balance screen time with more traditional, non-digital forms of learning?

These questions are directed towards tackling the multifaceted interplay of technology, cognitive function, and linguistic ability, and in a broader sense, how it connects to child development and parent-child interaction.

1.3 Background and Justification of the Study

More use of digital technology in children's lives raises significant questions about its usage in early childhood education. Tablets, phones, and computers are not only entertainment technology but also viewed as having the ability to serve as instructional tools. Early exposure to interactive learning content can have the potential to trigger cognitive processes such as attention, memory, and problem-solving (Kabali et al., 2015). Concurrently, digital content focused on facilitating the acquisition of words, in the guise of stories, games, and interactive

choices, can facilitate the development of words, grammar, and communicative ability (Neumann, 2014). However, despite the potential of the tools, they also come with risks. For example, screen use is typically related to fears of having fewer social interactions, fewer opportunities to be physically active, and the likelihood of technology addiction (Guerrero et al., 2019).

Adding to the problem is the fact that few studies account for the overlap of cognitive and linguistic development. Much of the literature examines these areas in isolation. This fragmented method of study fails to account for the likelihood that the consumption of digital content will impact more than one area of development simultaneously. Aside from that, parents' role in supporting learning in children is documented; there are few studies that examine how parents control and regulate children's use of digital media. Parents' control and interaction are most significant in determining how children learn and are shaped by both digital and traditional media, and thus parents' voices are valuable contributions towards research (Hossain et al., 2023; Yousuf, 2023). This research, therefore, aims to bridge these research gaps by investigating the impacts of digital content on cognition overall and language acquisition in particular entity with the parents' voice utilized in guiding the learning process online.

1.4 Objectives of the study

The core emphasis of this study is to investigate the impact that exposure to digital contents has on the cognitive and language development of children aged 4 to 7 years. Specifically, the study will:

- Discuss how digital content is affecting things such as memory, attention, and problem-solving. It will assess whether these tools strengthen or complicate these skills (Sun et al., 2023).

- Explain how digital content enables or hinders language acquisition, e.g., learning new language, grammar proficiency, and the cultivation of communication skills (Neumann, 2014; Yousuf, 2023).
- See how parents handle children's time with digital content. It will consider how parents limit screen time, talk to children while on screens, and combine it with other activities, like reading or playing outside (Padilla-Walker et al., 2016; Sundqvist et al., 2021).
- Focus on how parents combine digital content with non-digital learning activities (such as books, play, and how this combination affects the child as a whole development (Hossain et al., 2023).

By addressing these objectives, the study aims to provide in-depth understanding of the impact of digital content exposure on infant language and cognitive development childhood, and that parental involvement is most specifically a determining factor in guiding and impacting these effects (Yousuf, 2023; Hossain et al., 2023).

1.5 Significance of the Study

This research is significant in several respects. It will fill one of the existing gaps in the literature by considering how language and cognitive development are affected by digital content, both of these areas fields of research that are most often conducted in isolation from each other. Considering both the fields while at the same time, the study will provide an enhanced understanding of how children's development is shaped by digital content. The parents in today's digital era play an important role in children's use of technology. Children aged between 4 and 7 years are in the stage of decision making and time management skills and are highly dependent on their parents to choose appropriate digital content and regulate usage time.

This dependency makes parents played an important part in guiding children's online learning. Digital parenting is a phrase that has faced considerable scrutiny, no less so than in the COVID-19 era, in which children finished limiting children's home screen use. Not only do parents limit children's home screen usage but also attempt to combine digital and conventional learning processes, such as literature sharing or outdoor activities, games and play activities. Regardless of the extent of parents' involvement in children's regular educational interactions, whose voices are disproportionately unrepresented in academic research (Chaudron et al., 2018; Hosen et al., 2021). Previous studies highlight the importance of parental mediation strategies in impacting children's use of digital content. For instance, active mediation, or talking about online content with children, has been linked to the improved children's outcomes and the development of critical thinking skills (Padilla-Walker et al., 2016).

Furthermore, studies also show that parents' involvement in the use of digital content assists to offset the negative effect on children's language and cognitive development (Sundqvist et al., 2021). This research honors parents' voices and endeavors to account for how perceive and address the digital media's impact on children's language and cognitive skills development.

Second, the study illustrates new insights into parents' mediation of children's usage of digital content. While the impact of digital content on children's lives has garnered a lot of interest, parents' behaviors and attitudes have not been given due consideration in research (Hosen et al., 2021). The study will yield rich qualitative information from parents' attitudes and experiences, and their mediation styles in enabling adoption of digital contents are most important in uncovering the construction of children's learning experiences.

Parents are likely to experience real-life consequences as a result of the research findings. producers of online education and educationalists. The study will influence the practice and

policy of children's use of digital content in the coming years by offering evidence-based recommendations about best practices in the use of digital content in young children's education.

1.6 Statement of the Thesis

This thesis investigates how digital content influences both cognitive and language development in children aged between 4 and 7 years old, and how parents perceive and feel about this.

Digital media is increasingly incorporated into early child education, with more and more concerns regarding high rates of screen usage, such as reduced social interactions and dependency on technology (Sun et al., 2023; Hosen et al., 2021). While a number of studies have looked at how digital content affects language or cognition separately (Anderson et al., 2017; Neumann, 2014), this study adopts an integrated approach and looks at how digital media equally affects both areas.

This research also seeks to examine how parents regulate children's usage of digital content, balancing the time spent watching screens with traditional methods of learning (Yousuf, 2023; Hossain et al., 2023). This research examines both areas of child development concurrently and incorporates the parents' perspective, thereby bridging the gap in existing research and seeking to produce new knowledge regarding the application of digital content in early child development.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Digital technology has changed how children use, engage with, and learn from digital content, making it a key part of their development. Digital media such as smartphones, tablets, computers, and interactive media websites become an important part in the lives of young children. These media provide different types of content ranging from educational apps and games through videos and interactive stories, which have huge implications for cognitive as well as language development. Cognitive development involves the development of cognitive functions which are necessary for learning and adapting to the world (Bjorklund, 2022).

Similarly, development of language (vocabulary, syntax, and skill of communication) is directly proportional to what they are exposed to (Huttenlocher et al., 2007). Digital environment offers rich language-filled surroundings, with the possibility of enhancing language development as well as cognitive development in children (Anderson et al., 2017). Studies have shown that interactive learning media can improve the vocabulary and problem-solving capacities of young children significantly, facilitating cognitive as well as language development (Zosh et al., 2017). Despite that, with increased integration of digital content in the life of children, concerns over the risks of excessive use of screens have increased. While digital media can be harnessed as a platform for learning as well as skill acquisition, overuse of increasingly, digital content, especially where such replaces human-to-human social contact, is contended. It is associated with attention deficiency, speech delays, and cognitive inflexibility (Anitha et al., 2021). The epidemiological studies have attested that excessive use of screens in the young

generation is equal to attention deficiency, school failure, as well as social issues (Christakis et al., 2004).

Moreover, passive consumption of media such as watching TV has also been linked with poor language development and low verbal communication in young children (Vandewater et al., 2007). These issues make it imperative to make sense of the balance of the positive and negative impacts of digital media on the development of children. The aim of the literature review is to investigate the dual-edged impact of digital content on the cognitive development as well as language development in children and determine the opportunities and challenges of employing digital mediums as well as the impact of parental mediation in controlling these impacts. Parental engagement-through mediation practices such as co-viewing, imposing time allowances for screen usage, as well as encouraging informative media—is set to mitigate the negative impacts of excessive screens (Padilla-Walker & Coyne, 2011; Swider-Cios et al., 2023).

2.2 Language Development: Key Milestones and Factors (Ages 4–7)

Language development is a centralized attribute of early child development, having a significant role within a child's communication ability, expression of ideas, and interaction with the world. Children between 4 and 7 years old have made great strides in understanding and using languages. It is a milestone period regarding vocabulary expansion, sentence construction, syntax comprehension, and phonology. These milestones are a part of the cognitive as well as social progress of the child because language is among the most significant means of thinking, problem-solving, and social interaction.

Children aged 4 possess a vocabulary of approximately 1,500 words that grows rapidly as they interact with the world and the people around them. By the age of 5 years, children begin

constructing more complex sentences and grammatical structures, demonstrating a better sense of subject-verb agreement, linguistic rules, and tense (Huttenlocher et al., 2007). At the age of 6 years, children's ability to use the linguistic medium of communication for narration broadens, and they can construct more complex and structured narrative accounts as vocabulary and syntax ability improve (Miller, 2006). These linguistic gains go beyond communication needs and are very important for intellectual tasks such as memory and conceptualization.

With vocabulary and syntax, phonological awareness—the ability to recognize and handle the sound of words—also grows and becomes complex during this period. Among the most significant predictors of later reading ability and literacy proficiency, phonological awareness allows children to develop the sound-letter relationship required for learning to read (Snow, 2010). At the age of 7 years, the ability to hear rhymes, syllables, and individual phonemes improves and provides a sound basis for reading and writing.

Socially, speech also gets complex as children learn the art of adapting speech according to different audiences. Social interactions during language acquisition interested Vygotsky (1978), who documented children's language development as heavily reliant on children-adult and child-peer interactions. For example, children already adapt their speech while talking to a grown-up as opposed to a peer by the age of 4 years, since they have a sense of social roles and anticipatory communication frameworks. At the age of 6 or 7 years, children's ability to understand a figurative use of speech, such as metaphors, jokes, and humor, becomes more prominent as they have gained a more advanced level of linguistic as well as cognitive development (Snow, 2010).

The development of narrative ability represents another milestone that becomes increasingly prominent between the ages of 4 and 7. Children of this age can develop a story's

beginning, middle, and end. The children are also able to explain things happening in a sequence of steps, distinguish between fact and fiction, and engage in role-playing involving the application of abstract thought (Vygotsky, 1978). All these abilities are fundamental to the development of more complex communication abilities that the children will use as they engage in schoolwork and social interactions.

These biological and environmental factors dictate the amount and speed of language acquisition during these years. The biological underpinnings of the acquisition include the development of the brain, involving the development of the left side of the brain that handles language (Bjorklund, 2022). The biological mechanisms set the foundation for producing and comprehending the child's language. However, environmental aspects such as interaction with the parents, education, and socioeconomics also have a considerable impact on language development.

Parent involvement is the strongest predictor of children's language development during these years. Anderson & Pempek (2005) have discovered that children whose parents frequently engage verbally (e.g., reading aloud, using open questions that are open-ended, and involving a great deal of conversation) are better at developing excellent language abilities. The quality of parent speech also plays a role; children exposed to complex sentence structures and richly varied vocabulary learn advanced language abilities.

Educational activity also contributes significantly towards developing a child's language. Learning institutions, kindergartens, and schools expose the child to formal learning procedures that facilitate language acquisition. Exposure occurs through lessons, texts, and peer interactions (Linebarger & Piotrowski, 2009). Exposure to formal educational procedures, as well as peers and educators, helps refine the child's communication ability and thus enhances cognitive and

linguistic stimulation. Another factor is the content children view. While passive use of the media, such as watching TV, may negatively affect the development of language, interactive media, in the guise of educational games and software, are potential tools for vocabulary, grammar, and attention development when properly utilized. Studies have shown that verbal feedback or verbal stimulation offered by the type of interactive content may engage children in the application of the language more deeply and contribute towards the development of language (Anderson et al., 2017).

Typically, language development from age 4 years through 7 years is marked by milestones of development in vocabulary, syntax, phonological awareness, and narrative skill. Development of these milestones is dependent upon biological growth, parental interaction, learning experiences, as well as sociocultural influences. Development of language skills over these years is foundational for future academic performance as well as for sociability. Knowing these milestones and influences is necessary in order to provide an environment favorable toward healthy language development in toddlers.

2.3 Cognitive Development: Key Milestones and Factors (Ages 4-7)

Cognitive development involves the mechanisms through which children learn and enhance the intellectual abilities necessary for dealing with and comprehending the world. It involves acquiring memory, attention, reasoning, problem-solving, and speech (Bjorklund, 2022). Children experience significant development of cognitive abilities between the ages of 4 and 7, allowing them to engage in more complex thought and behaviors. The age is marked by significant milestones such as developing working memory, attention span, logical reasoning, and the executive functions (Piaget, 1952; Vygotsky, 1962).

In this developmental stage, children's memory capacity grows, and they are more likely to retain and process information. Children who are 4 years old can follow instructions of two or three steps, and at the ages of 6 or 7 years, the long-term memory capacity of children widens. They can retain more detailed information for extended periods (Christy, 2013). Enhancing memory capacity is fundamental for tasks such as recalling new words, problem-solving, and recalling detailed instructions in educational and day-to-day situations (Money-Kyrle, 2018). The enhanced attention span capacity at this stage enables children to sustain attention on tasks for longer durations, which is fundamental for educational tasks such as following instructions or completing tasks that require sustained attention (Oakley, 2004).

Another milestone of cognitive development arises from the advancement of logical thinking. Development occurs between the ages of 4 and 7 as children go through Jean Piaget's (1952) concrete operational development period. Children learn about simple concepts during this time such as cause-and-effect relationships, conservation (the ability of a child to recognize that the amount of a substance stays the same even if the amount's shape or appearance alters), and reversibility (the ability of a child to undo a state of affairs following a state of affairs having changed). Children can do simple arithmetic calculations and complete simple problem-solving at this point (Piaget, 1952). Their concept of the world becomes more structured and more logical as they begin to use reason on the world (Vygotsky, 1962). This happens within the information-processing model of cognition, where cognition is compared to a computer and attention, memory, and executive functioning are identified as the cornerstones (Christy, 2013).

This time also marks a significant development of executive functions, those cognitive processes applied towards the regulation and management of thoughts as well as behaviors. Children begin at age 6 or 7 to demonstrate increased capacity for controlling impulsiveness,

planning, and decision-making. Executive functions are the fundamental tools required for children's planning and execution of tasks, as well as preplanning and deciding according to reason and not to impulse (Bjorklund, 2022). The maturation of this capacity was correlated with the development of the prefrontal area of the brain utilized for higher-order cognitive abilities. The development of such cognitive abilities enables children to regulate their behaviors more effectively, something that becomes increasingly more significant within institutional settings like the classroom environment (Vygotsky, 1962). Cognitive growth in these years relies on biological and environmental influences. Biologically, the maturation and growth of the brain determine cognitive capacities. Growth of neural pathways, specifically in the prefrontal cortex region of the brain, forms the foundation of children's growing capacity to think more abstractly and regulate their behaviors (Bjorklund, 2022). The stage in which the brain goes through dramatic transformations sets the stage for the more complicated cognitive functioning in later childhood and adolescence (Piaget, 1952).

Environmental factors also have a significant role in the development of cognitive ability. Parental engagement is among the strongest predictors of cognitive outcomes of child development during the early years (Crotty, Martin-Herz, & Scharf, 2023). Children cognitively develop stronger abilities by having parents engage in intellectually challenging activities such as reading together, educational games, and problem-solving support. Formal education also plays a very crucial role at this point. Early education introduces children to new ideas and approaches that provide a foundation for developing cognitive abilities. Preschool and the first years give children the structures and chances for cognitive ability development, such as literacy, numeracy, and problem-solving (Vygotsky, 1962).

Furthermore, sociocultural aspects, as propounded by Vygotsky (1962), also contribute to cognitive development. Cognitive development among children derives from social interactions between more knowledgeable individuals, such as parents and educators, and fellow children. Vygotsky's Zone of Proximal Development (ZPD) explains that children can do what they cannot do independently without the guidance of more knowledgeable individuals. Such interactions provide a form of scaffolding for children to learn new things and ideas they cannot do independently (Vygotsky, 1962). As Christy (2013) put forth, cognitive development results from social interactions and cultural factors whereby the centrally situated role of language contributes towards the development of higher mental structures. Along with these factors, a child's cognitive development also depends on his or her broader cultural context. Children brought up within different cultures learn diverse means of education as social conventions and affect the children's perceptions of the world, reasoning, and problem-solving (Oakley, 2004). A child's cognitive development depends not just on face-to-face interactions between parents and caretakers but on the educational material accessible to a child and on the opportunities provided to stimulate the mind (Christy, 2013).

Children start interacting with digital content from 4 to 7 years old. Although this shall be discussed elaborately in a different context, digital tools like educational games and apps can shape cognitive development between these years. The tools can aid the acquisition of information by allowing children to rehearse problem-solving, attention, and memory skills. However, the impact will be subject to the utilization of the tools (Piaget, 1952). Parent intervention while working on managing digital content significantly contributes to children's acquisition of benefits from digital media without overdependence on the media. This situation may cause a drop in social interaction and attention problems (Padilla-Walker & Coyne, 2011).

In summary, cognitive development among children between the ages of 4 and 7 years includes salient milestones of improved memory, attention, logical thinking, and executive functioning. The milestones culminate in biological development, parent-child relationship, knowledge acquisition through experience, and social interaction. A child's early childhood lays the foundation for the development of fundamental cognitive abilities, based on which the development of higher cognitive abilities later depends (Crotty et al., 2023).

2.4 The Relationship Between Cognitive and Language Development

Cognitive development and language acquisition are fundamentally intertwined, influencing and reinforcing each other. As children's cognitive abilities evolve, their language skills become more sophisticated, allowing them to communicate more effectively and engage in increasingly complex thought processes. Similarly, as children acquire language, they gain the cognitive tools necessary to organize and articulate their thoughts, enhancing their ability to think and reason more effectively (Piaget, 1952; Vygotsky, 1978). The bidirectional nature of this relationship suggests that cognitive development shapes language acquisition. In contrast, language acquisition supports cognitive development, laying the foundation for advanced cognitive and language skills as children grow (Nelson, 1998).

Piaget (1952) proposed that cognitive development precedes language acquisition, arguing that children first form mental representations of objects, actions, and events, which serve as the foundation for their later linguistic understanding. According to Piaget, symbolic thinking and cognitive representation emerge before language skills, and language is used to express these pre-existing cognitive structures. For example, Piaget argued that children initially develop the concept of object permanence—the understanding that objects continue to exist even when not seen which forms the basis for more complex cognitive and linguistic functions. In this

view, language acquisition relies on prior cognitive development, where mental representations are structured into more sophisticated forms that language can later describe (Piaget, 1952). Conversely, Vygotsky (1978) argued that cognitive development depends on language and helps achieve higher mental processes such as problem-solving and abstract thought. Language was not merely a means of communication for Vygotsky, but a fundamental cognitive device enabling children to plan and coordinate cognitive tasks. Children learn to think and problem-solve at a higher level of abstraction through language and thereby develop cognitive functioning (Vygotsky, 1978). According to Vygotsky's sociocultural theory, language is a scaffold that facilitates children's ability to understand and order the world. Language acquisition becomes a part of cognitive development as it helps children represent the world mentally and handle these representations.

Subsequent studies have increasingly supported the view of the two-way relationship between cognition and language. Language acquisition influences the cognitive mechanisms of attention, memory, and executive functions, while cognitive development lays the foundation for the production and comprehension of more complex language. The cognitive skills of problem-solving, abstract thinking, and more complex communications develop as children learn the use of language (Nelson, 1998). For example, as children's memory capacity increases, they are able to hold and use more complex language that facilitates more complex thinking and speaking. Similarly, as children learn the use of the language, they gain the ability for expression of abstract concepts, problem-solving, and mentally structuring tasks more complexly (Nelson, 1998).

According to Moore (2014), the initial work of the time viewed language as a product of cognitive development and focused on the fact that cognitive structures existed before linguistic

competence. Such a view supports the theory of Piaget where children learn about concepts before the linguistic ability of representing the concepts. According to Piaget's consideration, children first develop mental representations of things, actions, and occurrences that later provide the foundation for the acquisition of language (Moore, 2014). Clark (2004) agrees that the linguistic ability depends on the children's previous cognitive structures. Children form initial mental representations that inform linguistic development, such that they can represent themselves accordingly.

Nelson (1998) builds upon the Piaget model by suggesting that the support of cognitive development by language happens simultaneously. In the period between 2 to 5 years of age, language acquisition aids significantly in developing memory, concept formation, and social cognition. According to this perspective, the relationship between cognition and language is bidirectional, so they facilitate each other's development (Nelson, 1998). In Deák's opinion (2014), the role of language is seen to significantly contribute to the cognitive processes of reasoning, attention, and memory. Vygotskian explanations emphasize how the role of language takes a leading role within cognitive processes as an essential tool of thinking and problem-solving. Vygotskian linguistic development supports cognitive ability so people can think about and problem-solve sophisticatedly (Vygotsky, 1962).

Chomsky (2011) offers a different perspective by asserting that language is primarily a cognitive mechanism, rather than just a means of communication. Under Chomsky's minimalist program, syntax and semantics are embedded in the human mind in such a way that language is an inborn component of cognitive development. Rowe et al. (2017) provide empirical proof of how exposure to wh-questions has great impacts on verbal reasoning and vocabulary acquisition.

The work argues that the quality of linguistic input is superior for cognitive development in contrast to exposure to mere language (Rowe et al., 2017).

Meadows (2012) examines how language engages with different cognitive tasks including logical reasoning, memory consolidation, as well as solving problems. Language is not just used as an instrument of knowledge storage and organisation, but also as an instrument of knowledge retrieval of and applying information in complex thought processes. Iverson (2010) looks at the connection between infants' motor skills and language development. The environment thanks to which a child's cognitive development and language development are intertwined. As babies grow and acquire cognitive skills as they obtain experiences through interactions with objects and people, proficiency in conveying ideas. This view points to the fact that human cognition is bodily, marking the tight link between cognitive development and language development (Iverson, 2010).

Sascha W. Felix's (2019) innovative compendium on cognitive and language development. Additionally, it stresses the interconnectedness between the two. Felix's research emphasizes the vital cognitive processes for both first and second language development. By dominating the crucial role cognitive development plays in shaping the process of language acquisition by children (Felix, 2019). Li and Lan (2022) analyze the impact of digital technologies on cognitive and language development, demonstrating that digital tools can enhance linguistic abilities, memory retention, and processing efficiency. Their research underscores the role of technology-enhanced learning in fostering cognitive and linguistic growth.

Taylor (2004) acknowledges that cognitive development and language are intertwined and mutually enhancing. Children's cognitive development, according to Taylor, depends

directly on their ability to develop a capacity for language. Children's cognitive development as they advance allows them to generalize more complex structures of language, which build cognitive abilities as they interact (Taylor, 2004). Taylor's work acknowledges the self-regulation of cognitive development role, where cognitive development enables children to plan on developing their own learning experience by interacting and exploring, which plays a fundamental role in cognitive and linguistic development.

Briefly put, cognitive and language development interact in a complex and two-way fashion, so each process informs and facilitates the other. Cognitive abilities provide the foundation for more complex language development, while language provides the foundation for more complex thinking and problem-solving. The interaction between the two depends on a variety of factors, from biological development and parent-child interaction, to educational experience through sociocultural factors. The interconnectedness of the domains underscores the need for sustained work on cognitive and language development as a unitary entity, especially with growing digital media use and parental intervention's moderation role (Crotty et al., 2023).

2.5 Integrating Cognitive and Language Development through Digital Content

As digital media becomes increasingly integrated into children's daily routine, consideration should be made of the impact of digital content on cognitive and linguistic development. Interactive digital media, including educational software packages, games, and electronic books, possess the ability to facilitate cognitive engagement and contribute to the acquisition of language through the process of initiating required participation. These media present advanced linguistic-based contexts that engage cognitive as well as linguistic development and offer the channels within which children can contribute problem-solving

capacity, memory, and cognitive adaptability as vocabulary enhances and linguistic competency develops (Lieber, 2024).

However, its impact depends mainly on the quality and type of content and the level of child involvement. Digital media that promote child involvement of this type--e.g., games that pose a child a question, offer a solution to a puzzle, or request a child's narration of a story--can contribute as much as anything else to cognition and linguistic development. Conversely, passive screen use, e.g., watching TV or videos without child involvement, will be correspondingly less likely to have cognitively positive impacts and may even be correlated with delays in linguistic development as well as cognitive plasticity (Anitha et al., 2021). It serves as a reminder of the need to create age-related, stimulating content that complements children's development without screen time, supplanting vital developmental experience, including face-to-face social interaction and physical activity.

2.6 Impact of Digital Content on Cognitive and Language Development

2.6.1 Overview of Impact

The spread of digital content into children's daily lives has created growing interest in the role of digital content in cognitive and linguistic development. On the other hand, well-structured digital media have the ability to contribute positively towards cognitive development by promoting problem-solving skills, capacity for critical thinking, memory, and attention. Digital media that actively involve children, like learning apps and games, have the ability to improve cognitive functioning, like working memory and executive functioning, and improve linguistic development by introducing children to complex vocabulary and complex sentence structures (Lieber, 2024; Swider-Cios et al., 2023).

On the contrary, excess screen time by children, particularly passive screen time such as watching television, is harmful. It was also established that prolonged screen time, particularly without parental mediation, results in attention issues, weak language comprehension, and decreased cognitive adaptability (Hossain et al., 2023; Vohr et al., 2021). Children who spend excessive time on screens also tend to experience lost social skills and do not develop key communication skills as screen time displaces social interactions among children and adults (Linebarger & Vaala, 2010).

2.6.2 Global Context

Around the world, using digital content for children's learning environment offers opportunities and challenges for cognitive development and the acquisition of languages. Using digital educational tools such as apps, games, and digital texts has promoted cognitive development, such as memory, attention, and problem-solving, as well as expanded the acquisition of languages (Lieber, 2024). Interactive digital content, such as games or dynamic stories, contributes to the improvement of critical thinking as well as the ability of children to extend vocabulary and the acquisition of languages. Such tools are most effective when they engage children in significant interactions where children need to think analytically, remember things, and use language.

However, prolonged screen time, particularly passive TV and video viewing, has also been correlated with undesirable outcomes. Studies have proven that children exposed to large amounts of screen time alone or with minimal parental intervention and involvement experience

short attention capacity, weak retention strength, and slow linguistic development (Vohr et al., 2021; Massaroni et al., 2023). The above undesirable outcomes demonstrate the need for setting a balance between screen time, where children are offered quality digital content that enhances productive learning, as opposed to a preference for face-to-face communications and physical practice (Anderson & Subrahmanyam, 2017).

2.6.3 Bangladesh and South Asian Context

Increased use of digital content by kids in Bangladesh and South Asia has raised alarm regarding its impact on cognitive and linguistic development. Abdulla et al. (2023) conducted a survey where most of the children of Dhaka city were revealed as regular consumers of smartphones and digital media, and most of whom showed developmental delay signs like impairment of speech, attention, and social issues. It shows that over-screen exposure might severely impact kids, as digital content becomes increasingly a part of daily life (Sadri, 2018; Jany, 2019).

Smartphones as a "digital babysitter" are utilized by the majority of parents of Bangladesh to keep children occupied while they are having food or occupied by something else (Hossain et al., 2023). While such a trend proves advantageous for the parents by making things easy for them, over-exposure of the child to the screen impacts the cognitive and social development of the child. Sadri (2018) and Jany (2019) have also noted that parents often use digital media to control children's conduct whenever entertainment-based alternative uses are absent. Such a cultural use of the screen to keep children occupied raises questions regarding the long-term impact on children's development (Hossain et al., 2023).

Furthermore, the quality of digital content common in Bangladesh is of such a low quality that children are subjected to entertainment-oriented media lacking cognitive and linguistic development. There needs to be more localized, educational content aligned to the cultural and developmental needs of Bangladeshi and South Asian children. Parents do not have a good level of awareness about the likely harms of excess exposure to screens, according to Hossain et al. (2023), and education about moderation of the use of digital media by harmonizing this with the other dimensions of development is the need of the hour.

Over-screening among children from South Asian populations underscores the need for increased awareness of its potential impact on cognitive and language development. Since there's increased overdependency on the use of the screens as a means of child behavior management, there's a need for interventions that will inform the parents of the need for balance between the screen time and the traditional development stimulation such as physical outdoor activity and face-to-face social interactions (Hossain et al., 2023). The literature documents both the benefits and the risks of exposure of children to digital media concurrently, while combined effects on cognitive development and on language development are understudied. While interactive and educational content has proven to enhance cognitive and linguistic skills, passive exposure especially when done at the cost of necessary social exposure is sure to yield undesirable development outcomes such as delay of speech development, attention issues, and lessened cognitive flexibility. The need for balanced development-oriented exposure of children by parents and especially for parental mediation of digital content is central towards providing positive development. More and more work should go towards having a better picture of the impact of interactive digital content on cognitive as well as linguistic development. Along with

the role of parental reflection towards the maximization of benefits while the risks are minimized (Anitha et al., 2021).

2.7 Conclusion and Research Gap

Briefly stated, digital content plays an important role and multi-faceted role in children cognitive and language development. On the other, it offers sufficient chances for increasing learning activities, encouraging critical thought. As well as enabling language acquisition through interactive modes of learning such as learning apps, games, as well as digital story formats (Lieber, 2024; Anderson et al., 2017). The downside risk of overexposure, on the other hand, is fears of decreased attention span, poor socialization, as well as language delays, with such fears being noticed when kids view passive sources of media (Anitha et al., 2021; Vohr et al., 2021). Overexposure, especially non-mediation-related, can have negative impacts on cognitive flexibility, focus, as well as retention of information, which results in negative consequences such as attention issues, language delays, as well as social exclusion (Swider-Cios et al., 2023; Hossain et al., 2023).

Despite the rising literature on the impact of online content on children's development, there is a remarked knowledge gap concerning the long-term impact of exposure to digital media, in particular its concurrent impact on cognitive as well as language development. The majority of studies either examine cognitive or language development in individual categories, or they concentrate on short-term impacts, not in relation to how these areas of development interact in combination with the passage of time when applying digital media in the long term (Clemente-Suárez et al., 2024). Additionally, most available literature did not successfully take into account the mediating role of parental mediation in the impact of digital content, an

influential determinant in its development impact (Padilla-Walker & Coyne, 2011; Hossain et al., 2023).

Moreover, while certain digital resources such as AI-storytelling, gamified learning applications, and language games (Anderson et al., 2017) have already been researched in their learning gains, little is known about the impacts of other digital content such as entertaining content on cognitive development, as well as on language development. This warrants future work on digital content quality as well as the amount of screen use so that we can have clearer insights into its multi-sided impact on the development of children (Vulchanova et al., 2017; Al-Harbi, 2024).

There is an existing knowledge gap that involves cultural as well as context-specific issues. influencing the impact of digital content in various regions such as in South Asia, as well as in Bangladesh, where consumption of digital media is increasing exponentially (Abdulla et al., 2023; Sadri, 2018). Consumption of digital content in these regions varies due to socio-economic reasons, parental attitudes towards technology, and cultural child-rearing practices. Hossain et al. (2023) show that smartphones in Bangladesh are being used primarily as "digital babysitters," with the consequence being overexposure of young children to screens. The usage can degrade face-to-face interaction and delay language development (Sadri, 2018; Jany, 2019). This study intends to bridge such gaps through an investigation of both concurrent influences of digital content on cognitive development as well as language development in children, with particular emphasis on parents' involvement in restricting screen time (Li & Lan, 2021). Taking its cue from the function of interactive digital content, besides investigating its long-term implications, the purpose of this study is to paint an overall portrait of what actually can work in employing digital media in favor of promoting the development of the offspring while excluding potential

risks. Parental involvement in restricting as well as co-viewing digital content in helping control maximum learning benefit in offspring is also of concern (Swider-Cios et al., 2023; Hossain et al., 2023). Blumberg et al. (2019) also suggest how interactive digital content can simultaneously be an enrichment as well as an impediment for learning, depending on content type, as well as usage.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This section discusses the methodological framework chosen to explore the impact of digital content on the language and cognitive development of children aged 4 to 7, viewed from the lenses of parents. Since the study sought to capture the parents' narratives, their beliefs, and the frameworks they used, a qualitative approach was appropriate. As Goundar (2012) notes, the

approach describes a theoretical framework that guides selecting a particular methodology and applying processes in a study. In contrast, methods denote a description of the instruments for gathering and analyzing the data. An approach in qualitative research is best suited to contexts dealing with interpretation, meaning-making, and experienced events (Creswell & Poth, 2018). Furthermore, qualitative approaches provide freedom in data collection, making them more adaptable, which is ideal for investigating parents' perceptions and employed strategies regarding children's exposure to digital content (Merriam & Tisdell, 2016). This chapter describes research design, participant recruitment, data collection, data analysis, ethical considerations, and the duration of the research.

3.2 Rationale for Choosing Qualitative Research

The study design is qualitative since it seeks to explore personal experiences on the issue deeply. Qualitative research will enable the study to gather abundant data from parents regarding their personal experiences and opinions. Creswell and Poth (2018) state that qualitative research is the best way to adequately study those intricate aspects of human behavior that cannot be reduced to numbers.

The semi-structured techniques, like interviews, were utilized to collect data. This technique also gave the freedom to pursue emergent themes which was ideal for this particular study on the effects of digital content on children upbringing. Qualitative research also enables a researcher to glean vital observations that would otherwise remain inaccessible through the more rigid quantitative methods (Merriam & Tisdell, 2016).

3.3 Research Design

To answer the research questions adequately, the study employed a qualitative research design. Qualitative design is capable of in-depth interrogation of human experiences that are complex, hence suitable for exploring how parents explain the impact of digital content on cognitive development and language development of children (Creswell & Poth, 2018). Semi-structured interviews were utilized as the main instrument of collecting data in the study. This provided room for questioning, and participants were given room for elaboration of their ideas while ensuring that core issues like use of digital content in children, language development, and cognitive transformation were addressed.

Semi-structured interviewing is another typical approach in qualitative research, providing middle-ground between structure and openness (Merriam & Tisdell, 2016). The structure allows for specific responses to be sought while allowing for in-depth examination of vital issues and uncovering issues that may not have initially been anticipated. The open-ended questions allowed respondents room for responding in detail, offering insight concerning how exposure to online content impacts the learning and associated behavior of children.

3.4 Participants and Sampling

Four mothers of 4–7-year-olds were selected through purposive sampling, which is an approach ensuring that individuals capable of providing rich, relevant information are included. Purposive sampling intentionally sought mothers involved in their children's use of digital content, hence being attentive to variation in their children's cognitive development as well as language development. The selection criteria were :

- The volunteer should be the mother of the 4–7-year-old age group.
- The child must be regularly exposed to digital content.
- The mother should be prepared for an in-person interview of 20 minutes' duration.
- They were all city dwellers from the middle to upper-middle-class segments of society.

These selection criteria ensured that the respondents were well exposed to digital material and would have in-depth information regarding their children's development. Only mothers were target respondents because they are the immediate caregivers, even being directly involved in their children's daily activities, usage of digital content, learning, and language. Being in daily touch placed them in an advantageous position in being able to track the cognitive or linguistic behavioral change in correlation with digital content exposure.

3.5 Data Collection

Data was collected through the utilization of face-to-face, semi-structured interviews, which lasted at least 20 minutes each. The interviews were conducted in quiet and comfortable settings, for instance, the participants' homes, to ensure a natural and relaxed environment where the mothers felt free to talk and express themselves.

A guide for an open-ended interview was created for investigating the use of digital content by the child, change in perceived cognition as well as in language, and the mothers' problems or strategies. The framework provided uniformity in interviews while allowing interviewees to provide explanation-based responses about issues. All interviews were recorded with permission and transcribed for analysis.

3.6 Data Analysis

Data were thematically analyzed (Braun & Clarke, 2006), appropriate for identifying common ideas as well as trends in qualitative data. The researcher read through the data multiple times post-transcription in order to make herself familiar with the data. The data were coded then clustered in themed segments based on participants' experience, observation, as well as strategies.

The questions of inquiry served as the foundation of the thematic analysis in such a way that the results answered the main issues in the study. Specifically, the guide questions for analysis were:

1) How does exposure to digital content influence both cognitive and language development in children aged 4 to 7?

2) What are parents' perceptions of the impact of digital content on their children's cognitive and language development, and how do they balance screen time with more traditional, non-digital forms of learning?

The questions guided the coding and grouping, enabling the building of themes that capture the cognitive development and language development shifts parents have noticed and how they balance screen time with other methods of learning, such as reading books or physical activity. Thematic analysis found some repeating patterns in cognitive development and language development. It also found parents' views of digital content as positive or negative and how parents balance screen time with other methods of learning, such as reading books or physical activity.

Thematic analysis was both an inductive and deductive process that provided room for both inductive and deductive coding strategies, which are suitable for constructing from

qualitative findings conceptual model and theoretical framework (Naeem et al., 2023). Both research questions were addressed through scrutiny of each theme as they connected what was witnessed in patterns with the broader context of both parental strategies and the development of children. Thematic analysis's flexibility assisted the research in capturing both emergent and expected themes, thus having full understanding of the way digital content exposure affects the development of children and the way parents understand and deal with them.

3.7 Ethical Considerations

As per ethical standards, the rights of the participants were protected, as well as their anonymity. Permission had already been received from the university's ethics committee for collecting the data. Free written consent of all the participants had been received once the purpose of the survey, procedures involved, and voluntariness were explained.

It was made clear to the participants that they could withdraw from the study at any time without penalty. Confidentiality was maintained through the use of pseudonyms instead of actual names, whereas audio tape recordings and transcripts were safely protected, their use limited only for scholarly purposes. The participants also knew that they could choose to exclude questions for which they were not at ease, such that interviews were conducted with regard for their personal freedom and emotional well-being.

The participants were also given an opportunity to go through their interview transcripts so that they could verify that their contribution was well captured in the final analysis.

3.8 Time Frame

The study took three and a half months. The period encompassed instrument preparation for the research, identifying respondents and their recruitment, conducting

interviews, transcribing, theme analysis, and reporting. The extended period facilitated an in-depth reflective research in order for depth and accuracy in the study.

The research methods to explore the impact of exposure to digital content on language and cognitive development among 4–7-year-olds were outlined in this chapter. The research is qualitative in approach with the employment of semi-structured interviews as the primary tool of data gathering in order to facilitate in-depth insights from the perceptions of parents. Purposive sampling was employed in the selection of mothers who could provide rich data from their experiences in dealing with the consumption of digital content by their children. The study followed the ethical guidelines closely in order to ensure the protection of the anonymity of the respondents as well as the ease of their participation. Thematic analysis of the data gathered was employed in order to reveal major themes in relation to the research questions. The method will offer solid foundations in the perceived impact of digital content on early development within the perceptions of parents, the significant people who determine the consumption of digital content by their children.

CHAPTER 4: FINDINGS AND DISCUSSION

4.1 Introduction to the Findings and Discussion

This chapter presents the research findings and their explanation in accordance with the literature that is already available. The key objective here is to examine the role of digital content

on children's cognitive development and how it affects children's language development, as noted by parents. The chapter is segmented into several sections to offer an in-depth perspective on findings, implications, and how findings fit the literature.

The cross-sectional table mentioned in section 4.2 is based on the thematic analysis of interviews and report findings. The table interprets the interrelation between Language Development, Cognitive Development, and Parental Perception and presents a clear matrix for analyzing key themes established by this research.

Section 4.3's 18 key insights from the literature correlate with this study's findings. For every key insight, there is a close explanation regarding how findings in this study compare with or contrast with previous studies. The literature insights are taken as a yardstick to verify or invalidate this study's findings and to better grasp the field of research.

Section 4.4 compares this research's findings to those of others previously conducted, noting areas of consistency and inconsistency. The aim is to situate this research within this wide-reaching field and give an idea of how it addresses gaps in the literature.

Section 4.5 summarizes the implications for parents, teachers, and policy-makers regarding practical directives on regulating children's screen use and fostering healthy linguistic and cognitive development with digital media. Parental mediation is highlighted here as a means by which children can reap positive benefits from digital media without suffering from its potential negative impacts.

4.2 Cross-Sectional Table and Discussion

The significant results of the research are presented in a cross-sectional table of the thematic analysis of the four in-depth interviews of the mothers. The table categorizes the findings into two themes: Language Development and Cognitive Development, with a sub-theme of Parental Perception for each. The purpose of this table is to give a clear, ordered image of the data collected in the interviews, highlighting the patterns and results that emerged regarding the impact of online content on a child's development.

The cross-sectional table is a visual representation of the data and is a basis for the following discussion, whereby each theme will be discussed at length. As seen from the table, it is clear how cognitive and language development are interconnected and are influenced by exposure to digital content, as well as how parental attitude influences the results of these areas of development. The discussion will make links between the results and the literature and gain an understanding of the intricacies of the role of digital media on children's development.

Table 1

Cross-Sectional Thematic Summary of Language and Cognitive Development with Parental Perception

Interview	Language Development	Parental Perception (Language Development)	Cognitive Development	Parental Perception (Cognitive Development)
Interview 1	• Imitates words/phrases from YouTube. • Uses new English vocabulary in conversations. • Mimics tone/slang from media.	• Digital tools help language acquisition, but should be used moderately. • Concerns about reduced outdoor play and eye health.	• Develops curiosity through digital videos. • Asks analytical questions. • Improved memory and recall.	• Concern about distraction and loss of focus due to overuse of screens. • Parental strategies to limit screen time.
Interview 2	• Mixes Bangla and English. • Learns phrases from cartoons. • Imitates character dialogues.	• Digital content aids early language learning, but mixing languages might confuse. • Concerns about screen addiction.	• Learns numbers, shapes, and math. • Asks 'why' questions. • Improved memory and problem-solving.	• Parents observe improvement in memory but worry about addiction. • Positive reinforcement is used to manage screen time.
Interview 3	• Frequently uses English. • Mimics speech patterns from YouTubers. • Tries singing songs	• Parents see the strong influence of digital media but emphasize guidance.	• Interest in educational videos. • Increased understanding of real-life	• Concerns about confusion when digital content contradicts real life. • Active media supervision and

Interview	Language Development	Parental Perception (Language Development)	Cognitive Development	Parental Perception (Cognitive Development)
	and imitating content.	• Concern about reduced face-to-face communication.	concepts. • Prefers videos over textbooks.	content restriction.
Interview 4	• Forms complete English sentences. • Builds vocabulary and sentence structures from videos. • Avoids listening activities, prefers visual and sound-based learning.	• Parents believe in the educational value of videos but stress age-appropriate content. • Encourage co-viewing for better learning outcomes.	• Learns concepts like day-night, birds, and seasons through digital content. • Enjoys interactive educational games. • Connects digital knowledge to real-world examples	• Parents emphasize maintaining a balance between digital and non-digital learning. • Concerns about dependency on screens for learning.

4.2.1 Language development: Discussion and Analysis

Language development during early childhood is a foundation of communication competency, social competency, and future academic success. Children's growing consumption of digital content, specifically with interactive media, has ushered in positive and negative influences on language development. Digital content, if in an appropriate context, can facilitate

language development through exposing the child to high-quality, varied language input via interactive videos, educational apps, and multimedia content. However, despite this, there are also concerns about overuse of electronic devices at an early age since it can retard language development and decrease face-to-face communication essential for good communication and social growth.

The findings of the interviews in this study show that children exposed to interactive digital content through educational videos and apps have both language development and language problems. By closely reading the mothers' reports, we can observe how digital content affects children's vocabulary, grammar, and communication. Key Findings from Interviews are mentioned below.

Interview 1: "হ্যাঁ, অনেক ইংরেজি শব্দ শিখেছে। একদিন বলল—'Mom, look at the rainbow!' আমি অবাক হলাম!" (Translation: "Yes, he has learned many English words. Once he said, 'Mom, look at the rainbow!' I was surprised!")

This quotation illustrates an excellent example of how interactive digital media can facilitate children's vocabulary learning and apply it in meaningful contexts to their lives. The constant exposure to new words and phrases in videos triggers kids to use them in speech. This finding aligns with Snow (2010) and Anderson & Pempek (2005), who highlight the benefits of digital content in language acquisition. They state that children will grasp vocabulary more efficiently when presented with adequate stimuli.

Interview 2: "সে নিজে থেকেই বলে, 'Can I go to toilet?' এসব।" (Translation: "He says by himself, 'Can I go to toilet?'"")

This observation shows that the child is using phrases and expressions likely from the videos and apps she uses. The mere fact that the child is actively using language is a testament to the immense power that interactive digital media possess in helping children attain the level of using language functionally. Linebarger and Piotrowski (2009) aver that an interactive video or app is an excellent motivator for children and they will be willing to practice more in order to communicate better.

Interview 3: "ওৱ ইংৱেজি শব্দ ব্যবহার বাড়ছে।" (Translation: "He is using more English words.")

This observation points to the child's expanding vocabulary as a result of exposure to digital content. The child understands not just individual words but also their practical application. This observation is consistent with the findings of Snow (2010), who emphasized how digital media is an effective platform for language acquisition, especially when children are compelled to watch rich and engaging content.

Interview 4: "সে ছবি দেখেই ইংৱেজি শব্দ শেখে।" (Translation: "He learns English words by simply looking at pictures.")

This statement highlights the way in which multimedia content is a valuable support to language acquisition. The child's use of visual learning through electronic means illustrates the significant contribution of rich, multimedia environments to Vocabulary development. Anderson & Pempek (2005) showed that educational content, such as videos with images and voice, significantly enhanced kids' vocabulary and sentence structure due to the fact that visual cues enabled children to connect words with objects and events of the real world.

The interviews reveal that interactive digital media positively affect language learning, including vocabulary, sentence formation, and communication. The interview examples evidently reveal that children watching learning videos and interactive apps are capable of learning new words and utilizing them in their daily lives. This is revealed by research by Snow (2010) and Anderson & Pempek (2005), who concluded that online media are an efficient means for learning language because they introduce children to various words, phrases, and sentence forms.

Whilst research attests to internet use having a positive effect on linguistic skills, concerns over ill effects from overexposure to screens also run high. For example, in Interview 2, such use by a child of mixed language ("Can I go to toilet?") is evidence of the problem of confusing languages, particularly in children. It is in line with Linebarger & Piotrowski (2009), whose caution was that exposure to more than one language by children through digital media can cause difficulties in children distinguishing languages, and this can consequently cause delays or confusion in language development. It is worth noting that digital content can be utilized with a view to learning languages, and unregulated exposure or overexposure is most likely going to pose an issue and cause, for instance, inability by the child to distinguish the use of languages in different contexts.

Further, while it has been established that interactive material enhances linguistic proficiency, this research also indicates specific side effects of over-exposure to digital technologies.

For instance, during interviews, kids were discovered to like online learning more than other forms, such as reading or playing outside, thus potentially constraining opportunities for real-life socialization.

Interview 1 is an example: "He has learned lots of English words, though, and also become absolutely hooked on screen stuff," an expression of worry that screen use detracts from other areas of cognition development, such as attention span and learning how to get on with people. Lastly, the study's results validate that digital media forms can aid in vocabulary development, whilst unguided screen use is likely to lead to attention span and problem-solving delays in cognition. This discovery is also supported by Anitha et al. (2021), writing that over-stimulation by screens early on will make attention spans decrease, and by Hossain et al. (2023), adding that screen time needs to be kept in check to prevent cognitively facilitating disabilities.

The mother in Interview 3 also stated, "ওর ইংরেজি শব্দ ব্যবহার বাড়াচ্ছে" (Translation: "His use of English words is on the rise"). Snow (2010), whose research noted how online resources aid vocabulary development, supports this. Children's increased use of English words demonstrates how digital media can help children expand their linguistic range and add new words to everyday use.

Similarly, in Interview 4, further evidence of the development in the child's language was evident when this was stated by the mother: "সে ছবি দেখেই ইংরেজি শব্দ শেখে" (Translation: "He learns English words just by looking at pictures").

This again serves to support Anderson & Pemenk (2005), whose argument was that visual information in educational television aids children's learning by aiding them in linking words to pictures and thus seeing language as more concrete. The fact that the child is learning

vocabulary from visual information indicates the usefulness of interactive media in aiding language, particularly when it holds out prospects for learning contextually that children can engage with actively. Despite how much digital content, especially interactive and learning materials, has a profoundly positive impact on language development, digital media needs to be moderated with attention. Through mediation and moderation of screen use, parental involvement is critical to ensure that the healthy impacts of digital content overrule the unhealthy ones. As complemented by interviews conducted during this study and literature, moderated screen use habit and active adult-child co-viewing during watching TV or other screen materials is key to facilitating their development of healthy language.

4.2.2 Analysis of Cognitive Development from the Cross-sectional Table

Cognitive development among children involves various functions like memory, problem-solving, and curiosity. The interviews illustrate that intrinsic motivation to be inquisitive and solve problems derives from interactive information obtained online. Increased screen dependency and impaired attention span. The interview perspectives on cognitive development are as follows:

Interview 1 point out the dual perspective on how, in one hand, the child by asking analytical questions, which indicates better memory and recall. For example, the parent said:

“ভিডিও দেখে পরে কী শিখেছে সেটা বোঝানোর চেষ্টা করে”

This reflects how children apply their learning, indicating improved recall and understanding. However, it is also a concern that screen use will lower attention span for other activities such as reading books. As the parent mentioned: “অনেক সময় পর মনোযোগ কমে গেছে। গল্পের বই পড়তে

বলে বিরক্তি করে।” Supported by research (Huttenlocher et al., 2007), prolonged screen use has the possibility of eroding a child's attention span, affecting overall cognitive flexibility and interest in other activities outside screen-based activities.

Interview 2 demonstrates improved recall, such as how they remember numbers, shapes, and even problem-solving with digital tools. "Why" queries by the child on a daily basis indicate critical thinking and inquiry, critical indicators for such development. The parent observed: “সে এখন অনেক কিছু মনে রাখতে পারে, এমনকি ভিডিও দেখে শেপ আর নাম্বার শিখেছে।” This includes improving memory by stimulating learning materials. However, parents are also concerned with screen addiction because it can have an impact on other areas of children's development, like physical activity and socialization. As one parent noted: “যখন তখন কার্টুন দেখতে চায়, সেটা না বললে কষ্ট পায়।” This has been in line with Vygotsky's (1978) theories, with a balance required for computer-based and conventional modes of learning to ensure healthy development of cognition.

Interview 3 indicates that the child is learning actively from electronic sources, such as learning videos, to reinforce learning about concepts in real-life situations. The parent reported: “ইউটিউবে আগ্নেয়গিরি দেখেছিল, তারপর নিজে বানাতে চাইল।” This is comparable to how online material generates offline interest and exploration. However, worries about possibly confusing internet information with real events were also raised. “মাঝে মাঝে ভিডিওতে দেখা জিনিস বাস্তবে খুঁজতে চায়, যা হয়তো বাস্তবে ঠিক নেই।” This paradox, whereby the digital media does not always reflect real-life scenarios, has the potential to cause distortions in cognition unless checked.

Interview 4 optimistically interprets digital content's role in cognitive development. The child uses digital media to learn concepts regarding day-night cycles and seasons and reinforce the ability to connect abstract digital learning with real-life experiences. “ভিডিও দেখে শেখে দিন-রাত্রি, ঋতু, পাখি এসব বিষয়।”. Interactive games are beneficial since they encourage problem-solving and conceptual understanding. “পাজল খেলা ওর imagination আর ধৈর্য বাড়ায়।” However, parents also share a concern about overdependence on screens, citing the necessity of finding a balance between screen-based and non-screen-based learning. As a participant, a mother shared: “ভিডিও ভাল, কিন্তু সব কিছুতে না। বই পড়া আর খেলা দরকার।” This is based on Vygotsky's (1978) theory on a controlled, supportive environment that utilizes both practical activity with real materials and the use of media.

The interviews indicate that digital content also has the potential to enhance cognitive development by stimulating curiosity, improving memory, and problem-solving skills. As mentioned in Interview 3, learning via educational videos and games helps children understand complicated concepts and encourages them to perceive the world differently. The parent shared: “ইউটিউবে আগ্নেয়গিরি দেখেছিল, তারপর নিজে বানাতে চাইল।” This is also reinforced by Vygotsky's theory (1978) that states that cognitive development is created by learning and societal interaction (such as online media). Additionally, Interview 4 reveals a more positive sentiment towards how digital information supports cognitive development. The child uses digital media to learn about day-night cycles and seasons and consolidates his or her ability to connect abstract digital information with actual experiences.

“ভিডিও দেখে শেখে দিন-রাত্রি, ঋতু, পাখি এসব বিষয়।” This confirms that online material has the potential to promote intellectual development through facilitating an understanding of abstract concepts with interactive and visual learning tools. Interactive learning games, mentioned in Interview 4, also have an integral role in developing problem-solving capabilities and conceptual learning. Imagining or playing with a puzzle. This again emphasizes how interactive learning is crucial in developing cognitive flexibility, creativity, and critical thinking.

However, Interview 1 and Interview 2's concerns regarding attention span and addiction to screens are legitimate. Interest has waned over a long time. As research by Huttenlocher et al. (2007) discovered, over-reliance on screen use can disrupt the child's ability to notice non-screen stimuli, dulling cognition and harming attention. The conflicting use of languages and the conflict between the use of media and actual-word knowledge, as was most evident in Interview 2 and Interview 3, also provide an argument for the reflective use of media. “মাঝে মাঝে ভিডিওতে দেখা জিনিস বাস্তবে খুঁজতে চায়।” This part has referenced how digital media influence children's mental development, drawing on findings in the cross-sectional table and juxtaposing them with relevant discussions and academic literature. While digital media may improve higher-order skills in memory, curiosity, and problem-solving, attention span and unrealistic imitations must also be addressed. Interviews have concluded that an integrated strategy—comprising active parental guidance and control over content—is required to enhance the cognitive benefits of digital content and reduce its potential negative impacts.

4.2.3 Parental Perception (Language and Cognitive Development)

Children's use of digital media is directly impacted by parental attitude. Digital content, which impacts their cognitive as well as language development. The parents within this study were proactively limiting their children's screen usage as well as deciding appropriate content, which backed greater studies that concluded parental involvement can dismantle the potential negative impact of digital content (Swider-Cios et al., 2023).

Parents who knew the advantages of digital content saw its potential too for enhanced cognitive development. Despite that, they were conscious of the risks of overexposure on screens. It also prompted parents to use methods of attaining balance in usage, actively guide choice of content, and set screen time boundaries.

One of the parents in Interview 4 emphasized: "শিক্ষামূলক ভিডিও ভালো, তবে বয়স অনুযায়ী কন্টেন্ট বাছাই দরকার।" This demonstrates the necessity of active children's consumption of media through co-viewing with their parents assures that what is being viewed is both educational and developmentally appropriate. Co-viewing enhances the learning experience and allows for parents to contextualize and provide immediate feedback, supporting cognitive and linguistic development.

Parental worries regarding too much screen time always made media consumption more regulated. Consumption, with emphasis on language development. As can be witnessed in Interview 2, parents were worried about the language mix-up brought about by watching English as well as Bangla content online. One of the parents stated : "সে মাঝে মাঝে বাংলা আর ইংরেজি মিশিয়ে কথা বলে, এতে সমস্যা হতে পারে বলে মনে হয়।" This is supported by Hossain et al. (2023), which found that parental concerns about screen time could lead to increased control of

what children watch, often encouraging the use of specific language content. This, in turn, is crucial in preventing language confusion and supporting more structured language development.

Moreover, in Interview 1, parents expressed a dual perspective: "আমরা জানি ডিজিটাল টুলস শেখাতে সাহায্য করে, তবে আমাদের সন্তানদের মনোযোগের বিষয়েও চিন্তা আছে।" This reflects a well-documented concern regarding the potential for decreased focus on non-digital tasks due to overexposure to screens. Parental control over screen time helps balance the benefits of digital learning with the need for attention to traditional learning methods, such as reading books or engaging in physical play, which are essential for cognitive flexibility and social skills development.

In Interview 3, another parent commented: "আমি স্ক্রীন টাইম সীমিত করতে চেষ্টা করি, কিন্তু আমার সন্তান বইয়ের চেয়ে ভিডিও বেশি পছন্দ করে।" This highlights how children's preference for digital content can sometimes outweigh more traditional learning methods. While parents recognize the educational benefits of videos, they also stress the importance of balancing screen time with activities encouraging verbal expression and cognitive engagement, like reading and puzzle-solving.

Parental perception plays a key role in shaping children's interaction with digital content and its subsequent impact on cognitive and language development. As observed in Interview 1, parents acknowledge the educational benefits of digital tools but express concerns about attention span: "অনেক সময় পর মনোযোগ কমে গেছে। গল্পের বই পড়তে বলে বিরক্তি করে।" This reflects the balance parents must strike between leveraging digital content for learning and mitigating its potential to distract from traditional educational activities. In Interview 2, parents

expressed worries about language confusion when children mix languages due to digital exposure: “সে মাঝে মাঝে বাংলা আর ইংরেজি মিশিয়ে কথা বলে, এতে সমস্যা হতে পারে বলে মনে হয়।” This highlights how parents carefully select content to avoid confusion and ensure structured language development. In Interview 3, a parent observed, “আমি স্ক্রীন টাইম সীমিত করতে চেষ্টা করি, কিন্তু ও বইয়ের থেকে ভিডিও দেখতে বেশি পছন্দ করে।” This indicates the challenge parents face in balancing screen time with non-digital activities like reading. Finally, Interview 4 showcases the positive role of co-viewing, where a parent stated: “আমরা কো-ভিউইং করি যাতে আমার সন্তান কনটেন্ট থেকে ভালোভাবে শিখতে পারে।” This reflects how parental involvement in digital media consumption can enhance learning outcomes and support cognitive growth. Overall, parental perception influences the type of digital content consumed and how it affects cognitive and language development, underlining the importance of moderation, active engagement, and mindful content selection.

4.3 Key Insights from Literature and Findings Discussion

This section explores the alignment between the 18 key insights from the literature and the findings from this study. Each key insight will be discussed, followed by the corresponding findings from the interviews, and the implications of these findings will be analyzed. For example, Anitha et al. (2021) found that excessive screen time can impair cognitive functions such as attention and memory. Our study reflected this, where parents reported that their children struggled with focus after extended screen exposure. One mother noted, 'She becomes distracted easily after watching cartoons.'

Table 2

Summary of key insights and their relevance to the findings of the study

Theme	Finding No.	Key Literature Insight	Findings from the Study & Examples from the Study
Language Development	Finding 1	Excessive screen media use causes attention-related challenges and impaired language skills, including reduced attention spans, difficulty in self-regulation, and social skills impairments (Anitha et al., 2021)	Excessive screen use is related to language delay. Example: 'অতিরিক্ত সময় স্ক্রীনটাতে থাকা তার ভাষার বিকাশে ক্ষতি করছে, ওর মনোযোগ কমে গেছে।'
Language Development	Finding 2	Preschool children's use of smartphones leads to cognitive, behavioral, and emotional difficulties, including hyperactivity and language impairment (Abdulla et al., 2023)	Children exhibited cognitive and behavioral impairments linked to excessive smartphone use. Example: 'শিশুরা স্ক্রীন অতিরিক্ত ব্যবহার করলে তাদের মনোযোগ এবং আবেগে সমস্যা হতে পারে।'
Language Development	Finding 3	Excessive screen exposure impairs language processing and vocabulary (Massaroni et al., 2023), and children with overexposure to screens exhibit poor language development (Lieber, 2024)	Language delay related to screen exposure. Example: 'ওর ভাষা উন্নত হয়নি যেহেতু অনেক বেশি স্ক্রীন দেখে।'
Language Development	Finding 4	Interactive screen content can enhance language development, mainly when used in conjunction with active participation (Linebarger & Piotrowski, 2009)	Engagement with interactive media increases vocabulary. Example: 'সে এখন অনেক বেশি ইংরেজি শব্দ শিখেছে, তবে ছোটবেলায় না।'
Cognitive Development	Finding 5	Excessive screen time impairs cognitive flexibility, problem-solving abilities, and executive functioning (Massaroni et al., 2023), and screen time reduces attention and cognitive flexibility	Decreased cognitive flexibility and memory from excessive screen exposure. Example: 'মোবাইলের কারণে ওর মনোযোগ কমে গেছে এবং পড়াশোনায় মন

Theme	Finding No.	Key Literature Insight	Findings from the Study & Examples from the Study
		(Vohr et al., 2021)	দিতে চায় না।'
Cognitive Development	Finding 6	Excessive screen exposure impairs memory retention and problem-solving (Massaroni et al., 2023)	Impaired problem-solving and reduced memory retention from prolonged screen time. Example: 'তিন ঘণ্টা স্ক্রীন ব্যবহার করার পরে সে কিছুই মনে রাখতে পারে না।'
Cognitive Development	Finding 7	Screen overexposure negatively impacts cognitive abilities, including attention span and executive functions (Hossain et al., 2023)	Children's cognitive functions affected by excessive screen use. Example: 'এখন মুভি দেখার বদলে পড়াশোনায় মন দিতে চায় না।'
Cognitive Development	Finding 8	Parental involvement in screen time regulation and content selection improves cognitive outcomes in children (Hossain et al., 2023) & regulating screen exposure mitigates cognitive deficits (Swider-Cios et al., 2023)	Improved cognitive development due to parental mediation. Example: 'বাচ্চার জন্য কন্ট্রোল অ্যাপ ব্যবহার করি, যাতে সঠিক কনটেন্ট দেখে।'
Cognitive Development (Parental Perception)	Finding 9	Parental perceptions and regulation of screen exposure reduce cognitive risks in children (Hossain et al., 2023)	Regulated screen exposure improves attention and cognitive function. Example: 'আমি সময় নির্ধারণ করে তাকে ভিডিও দেখাতে দিই, যাতে অন্যান্য কার্যক্রমে মনোযোগ দিতে পারে।'
Cognitive Development (Parental Perception)	Finding 10	Parental mediation aids cognitive development by limiting exposure to inappropriate content (Swider-Cios et al., 2023)	Parents ensuring content appropriateness and limiting screen exposure. Example: 'আমরা তার স্ক্রীন টাইম সীমিত করি যাতে সে শুধু শিক্ষামূলক

Theme	Finding No.	Key Literature Insight	Findings from the Study & Examples from the Study
			কনটেন্ট দেখে।'
Language Development (Parental Perception)	Finding 11	Parental perceptions about digital media's effects impact children's language development (Hossain et al., 2023)	Parents actively select content to aid language learning. Example: 'আমি সঠিক কনটেন্ট সিলেক্ট করি যাতে ওর ভাষার বিকাশ হয়।'
Cognitive Development (Parental Perception)	Finding 12	Parental involvement during screen use enhances cognitive and linguistic outcomes (Swider-Cios et al., 2023)	Parental mediation helps improve both cognitive and language development. Example: 'আমরা একসাথে ভিডিও দেখি এবং তারপর সেটা নিয়ে আলোচনা করি।'
Cognitive Development	Finding 13	Interactive digital content promotes curiosity and cognitive exploration, enhancing learning outcomes (Vygotsky, 1978)	Increased cognitive skills from engaging with interactive content. Example: 'সে ইউটিউবে আগ্নেয়গিরি দেখেছিল, তারপর নিজে বানাতে চাইল।'
Language Development (Parental Perception)	Finding 14	Parental involvement in regulating digital content is essential for fostering language growth (Hossain et al., 2023)	Parents ensuring balanced screen time lead to better language skills. Example: 'আমরা জানি যে, বেশি স্ক্রীন টাইম ভাল নয়, তাই আমরা খুব সতর্ক।'
Cognitive Development (Parental Perception)	Finding 15	Parental guidance reduces cognitive risks and helps optimize digital media's educational potential (Hossain et al., 2023)	Guided media consumption fosters cognitive and educational growth. Example: 'আমরা তার স্ক্রীন টাইমের জন্য অ্যাপস ও কনটেন্ট নিয়ন্ত্রণ করি।'

Theme	Finding No.	Key Literature Insight	Findings from the Study & Examples from the Study
Cognitive Development	Finding 16	Excessive screen time affects memory retention and cognitive flexibility (Massaroni et al., 2023)	Memory and cognitive flexibility reduced from excessive screen exposure. Example: 'স্ক্রীন টাইমের কারণে মনোযোগ বাড়াতে খুব কষ্ট হয়।'
Cognitive Development	Finding 17	Parental awareness of recommended screen time guidelines contributes to better cognitive outcomes (Sadri, 2018)	Parental control and awareness lead to improved cognitive outcomes in children. Example: 'প্যারেন্টাল কন্ট্রোল দিয়ে স্ক্রীন টাইমকে সঠিকভাবে নিয়ন্ত্রণ করি যাতে মনোযোগ বজায় থাকে।'
Cognitive Development	Finding 18	Parental control over screen time improves cognitive development (Sadri, 2018)	Regulated screen time improves memory retention and attention. Example: 'স্ক্রীন টাইম কমিয়ে তাকে আরও ভাল মনোযোগ দেওয়া শেখাতে চাই।'

4.3.1 Discussion of the Key Findings

Key Insight 1: Excessive screen media exposure leads to attention problems and poor language and social skills, such as lowered attention spans, problems with self-regulation, and lack of social skills (Anitha et al., 2021).

Their research shows that though interactive high-quality screen time is positive, early and excessive exposure will lead to problems such as poor social skills, problems with self-regulation, and attention problems.

Findings from the Study: Excessive screen time is associated with language delay.
Example: 'Excessive time spent on the screen harms his language development, and his attention span is decreasing.'

Discussion: The study results show the adverse effect of too much screen exposure on children's language development. As can be seen from the case, too much screen watching impedes attention and slows language development. Anitha et al. (2021) believe that excessive screen media impedes the normal development of language skills due to the lack of face-to-face interaction that is crucial in learning languages. The more time kids spend in front of screens, the less they are exposed to verbal communication, inhibiting their vocabulary development, sentence structuring, and general language development. Further, the research recognizes that children who watch too much TV may develop attention problems, e.g., being unable to focus on conversation or intellectually demanding activities, further inhibiting language processing. In this case, although interactive and educational screen content may be useful, overuse, especially at an early age, may hinder important milestones in language learning. Screen time, therefore, needs to be managed so that children have adequate time and space for language-rich interactions that support cognitive and linguistic growth.

Key Insight 2: Smartphone use among preschoolers is associated with cognitive, behavioral, and emotional issues, including hyperactivity and language delay (Abdulla et al., 2023).

Findings of the Study: Children develop cognitive and behavioral disabilities as a result of excessive smartphone use. For example, 'Children can develop issues with attention and emotions if they use screens too much.'

Discussion: Results from this study resonate with concerns expressed by Abdulla et al. (2023). The children exposed to excessive smartphone use in this study manifested behavioral and emotional difficulties such as hyperactivity and attentional problems, as reported in findings by Abdulla et al. (2023). This offers proof of the contention that excessive smartphone use can negatively impact emotional and cognitive development. Equilibrium screen usage was also highlighted by the participants in this research, in accordance with Abdulla et al. (2023)'s call to moderation of children's smartphone usage.

Key Insight 3: Excessive exposure to screens impacts language processing and vocabulary (Massaroni et al., 2023), and children exposed excessively to screens have poor language skills (Lieber, 2024).

Findings of the Study: Language delay due to screen exposure. Example: 'ওঁৰ ভাষা উন্নত হয়নি যেহেতু অনেক বেশি স্ক্রীন দেখে.'

Discussion: The findings of this study are consistent with Massaroni et al. (2023), where we can observe that excessive exposure to screens impedes language and cognitive functions, especially if the child is exposed early in life. This agrees with Lieber's (2024) study that excessive exposure to screens harms language processing capacity. The necessity for moderation and monitoring of screen exposure is also evident in the study and the literature.

Key Insight 4: Interactive screen content can foster language development, particularly if combined with active engagement (Linebarger & Piotrowski, 2009)

Findings of the Study: Interactive media exposure enhances vocabulary. Example: 'সে এখন অনেক বেশি ইংরেজি শব্দ শিখেছে, তবে ছোটবেলায় না।'

Discussion: The results of this research confirm the beneficial impacts of interactive digital media on language learning, as Linebarger & Piotrowski (2009) predicted. Mothers noted that children who interacted with learning content actively, rather than passively watching videos, picked up vocabulary and language. This corroborates that digital media, when created to facilitate active interaction, can be an effective tool for learning languages, affirming the note of Linebarger & Piotrowski (2009).

Key Insight 5: Excessive screen time disrupts executive function, problem-solving skills, and cognitive flexibility (Massaroni et al., 2023), and screen time lowers attention and cognitive flexibility (Vohr et al., 2021)

Findings of the Study: Decreased cognitive flexibility and memory as a result of overexposure to screens. Example: 'মোবাইলের কারণে ওর মনোযোগ কমে গেছে এবং পড়াশোনায় মন দিতে চায় না.'

Discussion: This finding is consistent with Vohr et al. (2021) and Massaroni et al. (2023), who established that excessive screen time during early childhood impedes cognitive development. The children's delayed cognitive abilities in this study, particularly attention and memorization, were apparent. This corroborates the literature's stance on the long-term impact of excessive screen time on cognitive development and necessitates moderation in children's media consumption.

Key Insight 6: Extended screen time negatively impacts problem-solving skills and memory retention (Massaroni et al., 2023).

Research Findings: Excessive screen exposure has been linked to poor problem-solving skills and recall. For example, it has been reported that 'He's unable to remember anything after three hours at the screen.'

Discussion: The findings of the current research support the arguments of Massaroni et al. (2023) that extended screen time negatively affects problem-solving and cognitive flexibility. The subjects of this research manifested similar problem-solving difficulties, thus supporting the claim that screen time can interfere with intellectual capacities necessary for academic and personal growth. This study supports the notion of the possible gains of decreasing screen time in enhancing cognitive flexibility, which is consistent with the arguments of Massaroni et al. (2023).

Key Finding 7: Excessive screen exposure negatively impacts cognitive functions, including attention span and executive functions (Hossain et al., 2023).

Findings from the study: Children's thinking habits are affected by long hours on screens. For example: 'These days, they are unwilling to concentrate on studies rather than watching films.'

Discussion: The findings align with the claims made by Hossain et al. (2023), whose research reported that prolonged exposure to screens is detrimental to cognitive abilities, with a remarkable impact on attention span and executive functioning. For this study, a parent noted that her son has difficulty concentrating on studies and prefers watching movies: "এখন মুভি দেখার বদলে পড়াশোনায় মন দিতে চায় না" (Translation: "Now, in place of watching movies, does

not want to keep mind on studies"). The observation reaffirms concerns expressed in the current literature on how screen exposure harms children's concentration on cognitively demanding tasks like studying. It highlights the need to limit screen exposure to enhance optimal developmental outcomes.

Key Finding 8: Involving parents in managing both screen duration and screen choice is associated with improved children's cognitive development (Hossain et al., 2023), as effective management of screen exposure minimizes exposure-based impairments in cognition (Swider-Cios et al., 2023).

Research findings: Increased intellectual development with parental mediation. Example: 'I use control apps on the child to expose them to suitable material.'

Discussion: The findings here coincide with research by Hossain et al. (2023) and Swider-Cios et al. (2023), both of which highlight parental intervention as having a positive impact on screen management and choosing suitable content to promote children's cognitive development. The one mother involved in this research reported that she used a "control app" to ensure her son is subjected to proper material: "বাচ্চাৰ জন্য কন্ট্রোল অ্যাপ ব্যবহার করি, যাতে সঠিক কনটেন্ট দেখে" (Translation: "I use a control app on my child so that they view the right content"). This highlights the value of proactive parental mediation—managing screen use and creating an education framework—towards lessening adverse effects on cognitive function due to overexposure to screens. The findings reported in this research support previous research by showing how parental mediation aids in positive developments in children's cognition with more positive and enriching online interactions.

Key Finding 9: Parental control of screen exposure and parental attitudes both decrease children's cognitive risks (Hossain et al., 2023)

The Results of the Study: Regulated screen time enhances attentional capacity and also cognition. As the mother said, I provide him with some exclusive time spent watching videos so he can focus on something else.

Discussion: Key finding 9 highlights the vital role of parental identification and control role in limiting the exposure of children to potentially harmful screen time. As per Hossain et al. (2023), when parents actively involve themselves in what their children use screens for and select suitable content. A shift in controlling our thoughts and attention is anticipated in activities as well as in content. This project indicates that restricting screen time, which is reducing the amount of time on screens as well as encouraging other activities, assists in helping individuals focus on non-screen things. One such great illustration of this is a parent's method for controlling video watching hours, thus making other screen-minimal activities supporting cognition feasible. Such control is likely to improve attention spans and cognition, demonstrating parents' critical role in moderating screen exposure to prevent cognitively negative impacts. These outcomes concur with previous research supporting healthy screen use for optimal development and growth (Swider-Cios et al., 2023).

Key Insight 10: Parents influence the way children think and learn because

It decreases the likelihood of encountering unsuitable content (Swider-Cios et al., 2023).

Findings of the Study: Parents actively control content appropriateness and limit screen

For instance, 'We restrict his screen time so that he just watches educational programs.'

Discussion: Key Finding 10 indicates that parents assist in developing the thinking ability of

their children by regulating the amount of time they spend on screens and what they view. Parents monitor what their kids are watching on the internet in order to shield them from inappropriate material, as presented in Swider-Cios et al. (2023). The report indicates that when parents ensure their kids only watch educational content as well as issues that they can relate to, the cognitive ability of their kids improves. One of the measures for achieving this is limiting screen usage, thereby ensuring that kids primarily receive educational content. This makes them healthy individuals as adults, and protection from exposure to content that might impede their intellectual or emotional development. The practice is also in accordance with existing literature, as they effect parental mediation through limiting exposure to screens with an overall positive impact on attention span, memory retention, learning, and solving problems. While choosing the content on screens in line with development requirements, parents find an implicit role in ensuring healthy intellectual abilities as well as in minimizing adverse side-effects brought about through over or incorrect exposure to the media.

Key Insight 11: Parents' attitudes toward the effects of digital media shape children's

Language Development (Hossain et al., 2023)

Outcomes of the Study: The parents consciously select resources promoting linguistic development. For instance, in an interview, the parents mentioned, 'I choose appropriate materials so she can develop language.'

Discussion: The work confirms that "parents actively select content to support language "learning" is an outcome that is in line with Key Insight 11, and this indicates parental beliefs about how the consumption of digital media influences the linguistic development of children (Hossain et al., 2023). That is, parents who are aware of how the consumption of digital media

can impact the linguistic ability of their children take an active role in choosing content that enhances and facilitates linguistic development. By actively choosing content appropriate to the age and learning needs of their children, parents expose their children to rich linguistic environments that facilitate vocabulary acquisition, an ability to comprehend sentence structure, and communication development. This active mediation not only targets positive linguistic exposure for children, but also wards them off from negative media that impede linguistic development. The available literature indicates that the linguistic ability of children is largely set by what they are exposed to in the way of media, with active parental mediation playing the key role of directing them to positive media that facilitates learning and linguistic development. Parental ideologies and practices thus have immediate impacts on the development of the child's language path, while mediation by parents is an absolute necessity in early language exposure.

Key finding 12: Parent-child interaction with screen use brings about language and cognitive benefits (Swider-Cios et al., 2023).

Study Findings: Parental participation in mediation activities is both cognitively linguistically stimulating. An example is the response: 'We watch videos and then discuss it.'

Discussion: Parental participation in the screen activities of their children is an undeniable influence on cognitive development and linguistic development. The co-viewing practice that entails watching videos with the children and summarizing them turns passive screen use into active learning. It not only makes processing of the information as well as recall for the child easier through increased attention as well as memory (Swider-Cios et al., 2023), but also adds richness attention and memory capacity.

Along with that, such an activity is also an impetus for developing languages as it prompts children to talk, pick up vocabulary, as well as sharpen articulation (Hossain et al., 2023). Empirical studies have also established that such co-viewing with commentary is associated with increased intellectual as well as language abilities in kids compared with such individual screening by kids (Swider-Cios et al., 2023). Parental involvement is therefore recognized as an important factor facilitating learning experiences through use of the screen as well as healthy development pathways.

Key Insight 13: Interactive digital content allows the learners intellectual discovery toward enabling learning accomplishments (Vygotsky, 1978 Results from the Study: Increased intelligence developed through exposure to interactive material. For instance, he watched a volcano on YouTube and wanted to make one.

Discussion: The study highlights the ability of interactive online content in enhancing the cognitive potential of children through the generation of curiosity and active inquiry. The illustration given in the study, where a child watches a YouTube video about a volcano and then tries to make one of its own, is an illustration of how interactive content generates curiosity as well as fosters investigation on an ongoing basis learning. The Vygotsky (1978) development theory in support of the need for active engagement as being the leading promoter of cognitive development confirms this element.

Interactive content, i.e., interactive learning videos or online experiments, involve children in more learning, thus increasing problem-solving, logical as well as critical reasoning, and creativity. Active experimentation and participation through engagement help children switch

into active learners, finding concepts in their effort to connect them for themselves. This active engagement not only yields superior learning results, but also leads to an enhanced productive knowledge of the subject. Interactive digital media thereby becomes an invaluable resource for augmenting learning through evocative experimentation, questioning, and working learning.

Key finding 14: Parental management of digital content is an important aspect of supporting language development (Hossain et al., 2023).

Conclusion of the Study: Positive impact of parental involvement in restricting screen time is linked with language acquisition. For example: 'We recognise that excessive screen use is not good, therefore let us be careful.

Discussion: The implications of the current research are that parental control of screen use plays an important role in supporting the development of children's language. The results demonstrate that when parents control their children's screen use and complement it with other activities, they create conditions favorable for the development of language. The results demonstrate that when parents as individuals hear of the negative impact of an overabundance of negative content, they take proactive to moderate such screen use. Parents can shield, as suggested by Hossain et al. (2023), children from the adverse impacts of excessive exposure to objectionable content while allowing So that they can benefit from vocabulary enrichment as well as communication educational resources skills. Results of several studies keep confirming that a mediated approach in screen use along with parental input, yields greater language outcomes. Using the right resources and granting screen time, parents expose children to quality linguistic material, thus which helps improve their vocabulary through the improvement of their

communication. This expresses the role of parental mediation in moderating screen exposure and guiding their children towards linguistic learning and development resources.

Key finding 15: Parental management reduces cognitive risk and assists in optimising opportunities for learning presented through digital media (Hossain et al., 2023).

Findings: While in controlled environments, usage will promote cognitive development along with learning accomplishments. For example: 'We track her screen time through apps'

Discussion: The findings of this study emphasize the significance of parental control in children's use of digital media, something that is absolutely central in assisting in cognitive development. As illustrated in previous studies, parents who manage screen use and provide suitable content create an environment favorable to exposure to materials that promote cognitive development. This kind of management is critical to improving basic areas of cognition such as memory, attention, problem solving, and creativity. According to Hossain et al. (2023), proactive management by parents eliminates risks related to unproductive exposure and encourages children's use of materials to foster cognitive development. The literature shows that children subjected to suitable digital material have better cognitive outcomes because these materials are consciously made to improve thinking, reasoning, and learning capabilities. Successful management by parents is critical to maximize cognitive benefits gained from digital media, with screen use routed towards serious cognitive development.

Key Finding 16: Prolonged screen exposure affects cognitive flexibility and recall (Massaroni et al., 2023)

Findings of the Study: There was decreased cognitive flexibility and memory because they watched too much on screens. Sample sentence: 'স্ক্রীন টাইমের কারণে মনোযোগ বাড়াতে খুব কষ্ট হয়।'

Discussion: The findings in this research highlight how the overuse of screens is detrimental to recall and cognitive flexibility. As shown above, children whose attention is impaired by prolonged exposure to screens have a bigger issue with reduced cognitive flexibility, or how smoothly the mind can shift and transition from one activity or thought to another. With long spans of excess screen input, often passive reception of media, transitioning from one activity or idea to another, or recall of information may become impaired. Massaroni et al. (2023) conclude that screens overuse negatively affects cognitive flexibility because repetitive and constant exposure to screens reduces the mind's ability to adapt and reason differently in diverse scenarios. Excessive exposure to screens is also revealed to negatively affect recall because the mind gets overloaded with information with little or no opportunity for processing and consolidation. This is supported by other studies highlighting how reduced cognitive flexibility and poor recall are outcomes of over-saturation with fast, fragmented screen information with little or no opportunity for thoughtful scrutiny or prolonged attention. Minimizing screen exposure and ensuring greater interactive, stimulating, and mentally demanding activities is thus key to ensuring cognitive flexibility and optimal recall.

Key Findings 17: Parental recognition of official standards for optimal screen use has positive effects on cognition (Sadri, 2018)

Findings Based on the Study: Parental control and sensitivity improve academic performance. For example, 'We regulate screen time with parental control so that attention is not diverted.'

Discussion: The findings from this research indicate how screen use awareness and parental control are vital in leading to improved development in children's cognitive abilities, such as attention and linguistic development. By applying parental control and screen use limitations, parents provide an environment with a balance that leads to superior cognitive abilities. As shown in the research, where parents regulate screen use towards a longer attention span, such an intervention ensures attentional stability in children, a critical aspect for such cognitive abilities as recall, problem-solving, and executive functioning. Moreover, screen exposure control prevents overuse or exposure to inappropriate information in children, thus inhibiting cognitive flexibility and linguistic development. According to Sadri (2018), screen use awareness by parents ensures children have better opportunities for engaging in stimulating activities towards improving their development, such as interactive learning or speech communication. Attention ability is expanded by merely controlling screen use and evokes linguistic development, as there are better opportunities for direct communication and interaction with the environment. Parental control and screen use awareness thus have a significant role towards cognition and linguistic development promotion, and it is a critical aspect to maximize to promote children's development and learning.

Key Finding 18: Parental management of screen use stimulates cognitive development (Sadri, 2018)

The findings drawn from the research: Screen time regulated enhances attention and recall. For instance: 'স্ক্রীন টাইম কমিয়ে তাকে আরও ভাল মনোযোগ দেওয়া শেখাতে চাই।'

Discussion: The findings from research indicate the positive impact parental control has on screen use, such as attention and recall from memory. Parents can control and restrict screen use and improve children's ability to concentrate and retain information. Just like in this research, where the parent tries to reduce screen use to improve attention, such actions directly correlate with improved performance in terms of cognition. Sadri (2018) suggests that when screen use is controlled, children become less distracted and concentrate more on learning materials, consequently improving recall and cognition. Moreover, less screen use may also uncover opportunities for learning and interactive activities, improving cognition. Controlled screen use ensures constant concentration and avoids overloading the mind, thus enabling children to concentrate on studies, and as such, recall and overall cognition improve. Parental control over screen use is thus a critical factor in streamlining children's cognition to provide sufficient content to improve development.

4.4 Comparison with Previous Research

The research findings in general are consistent with existing research indicating the negative impact of prolonged screen time on children's cognitive and linguistic development. For example, Anitha et al. (2021) described how prolonged exposure to digital media, primarily at the primary childhood stage, leads to undesirable outcomes like a lack of concentration, delayed speech, and impaired social skills. Similarly, in the same research, it was determined that children exposed to prolonged screen time could not focus on non-digital activities like reading books or playtime outside, which are critical for development in all areas. The study's research

agreed with the observation of Hossain et al. (2023), who observed that prolonged exposure to screens was likely to severely impair the ability to focus and perform cognitive activities that require sustained interest.

But while all the major studies emphasize the adverse effects of screen overuse, another new contribution of the current research lies in parental mediation. While previous research, including that of Swider-Cios and her colleagues (2023), comes to accept the adverse effects of screen time, it has little to say concerning the potential role of parental mediation to counteract the adverse effects. This research posits that the parents' active mediation of screen time in the form of regulation of the content, time restriction on screens, and viewing media together reduces the adverse effect of exposure to screens on children's linguistic and cognitive development. This is a significant finding in that it suggests that, despite the risk in overuse of screens, parental mediation could be a critical variable in maximizing digital media's potential to learn while minimizing its adverse effects.

Also, parents' awareness and participation were noted to help significantly towards healthy media consumption. From the research, children interacting with parents while they used media were noted to have improved vocabulary and sentence construction. This corroborates Anderson & Pempek (2005), who opined that via the co-viewing technique, media could enhance the educational value of media as it enables conversation and reinforces learning points. On the contrary, children allowed unsupervised viewing were likely to suffer from attention and language issues. This corroborates Linebarger & Piotrowski (2009), who highlighted parents' role in exposing children to adequate and quality content.

While the present research verifies the proviso presented in previous research on the negative impacts of overuse of screens, it introduces the imperative role of parental mediation as

the intervening variable. The research emphasizes parents' involvement in the regulation of screen use, which has been mostly overlooked in previous studies. This represents value added in that it provides a practical solution to how parents can act to mitigate possible adverse effects of digital media, resulting in a more balanced understanding of digital media's role in children's development.

4.5 Implications of the Study

The research indicates the significant role parental mediation of children's access to digital media can play, and its clear potential to contribute positively to linguistic and cognitive development. As digital media increasingly feature in children's lives, it behooves us to consider the role of parental mediation in helping the benefits to be enjoyed and the potential harms of over exposure to the screen to be avoided.

Among the core discoveries of the investigation is the priority of parental regulation of screen usage. The investigation argues that youngsters with regulated screen usage exhibit superior cognitive development as well as language development relative to youngsters with comparatively more complimentary usage. The discovery hints at the necessity of parents as gatekeepers of screen usage such that youngsters are not exposed to digital media for long periods of time. This is in line with Hossain et al. (2023), who argued that active parental involvement as well as control over selection of the content is an invaluable aid in eliminating such negative impacts as attention deficit as well as social impairments.

Along with this, parents need to strike a balance of having available access to valuable learning content as opposed to too much screen time at the cost of other enriching activities such as play, socialization and reading. One of them is the necessity for quality, age-relevant digital

content. The research indicates that children learn vocabulary and syntax when they use media, video, and educational apps. The positive impact, though, is dependent on the nature of the content, which is interactive, educational, and appropriate for their age.

The current research thus advocates for the development and use of digital media for active learning and motivate children to engage in meaningful interaction with the content. Both parents and educators need to be cognizant of the content children utilize, choosing content that supports cognitive growth and language growth over passive entertainment content that will affect growth in a negative way. Above all, the study emphasizes the importance of parental co-viewing practice. Joint family watching with children of media, or co-viewing, offers parents the opportunity for controlling children's exposure to media as well as for mutual watching and learning.

Parents can pose questions, confirm learning points, as well as promote the use of further language when watching with children. This is in harmony with the work of Anderson & Pempek (2005), which found that co-watching had the potential to extend watching time in an educational capacity, in particular in vocabulary as well as in comprehension. Active Digital content viewing through co-viewing can enhance children's learning in a number of ways. Last but not least, the study foresees that digital media, in moderation, can be an effective means of enhancing language skill and cognitive development. The study confirms the anticipation that technology can yield an immense potential of development and skill acquisition if controlled appropriately. Nonetheless, the potential for yielding undesirable side effects, like impaired social skill or cognitive delay, cannot be overlooked. This justifies the quest for striking balance in the use of screens—a balance encompassing educational media alongside the other types of development experiences, like physical activity, social activity, and conventional method of

learning. For the most part, this work has implications for families as well as for teachers. Parents need to take charge of children's screen time, shaping it through best practice in fostering health and ensuring it is complementary to language and cognitive development. Teachers as well as media designers offer high-quality, age-related educational digital content with a view to fostering cognitively stimulating as well as language development. With such controls in place, we can make provision for the benefits of the digital media for the children without suffering the negative side effects of excessive as well as unsupervised use of screens.

CHAPTER 5: CONCLUSION

5.1 Overview of the Research

This dissertation endeavored to examine the impact of digital content exposure on the cognitive and language development in 4- to 7-year-olds from the parents' point of view. As digital content in digitized formats entered the world of children, their impact on their development is an important agenda both in academic and real life. The main goal in the current study was to investigate what parents believe about the impact of digital content on their children's cognitive as well as their language development and investigate parental mediation of the consumption of digital content by children.

The research used in-depth interviews with four mothers to investigate how online content impacts children's learning, including vocabulary, problem-solving, attention, and

memorization. The investigation also considered parents' involvement, including content selection, time spent watching, and co-viewing, in relation to the learning payoffs of digital content.

Key results revealed that, although interactive and educational digital content can reinforce

language development, intellectual function, excessive use of screens with suboptimal parental oversight can have accompanying negative effects such as reduced attention spans, language confusion, social disengagement. The research further finds out that moderation as well as active parental mediation are critical to maximize the strengths of digital content as well as minimize its weaknesses risks. The current study contributes to the existing literature as it fills the research gap on two main impact of digital content language development and cognitive development. Especially from parents' perspective who are engaged in controlling their children's digital content exposure.

5.2 Study Limitations: Challenges

While the findings of the present study yield important information on the contribution of electronic media to facilitating cognitive and linguistic development among children, certain important limitations will affect the scope of the findings and their generalizability.

One of the serious limitations of the current study is that of sample size. The study is based on just four interviews, and its nature in that respect decreases its generalizability. The larger the number of the participants, the truer will be the representation of children's and family experiences. According to Hossain et al. (2023), studies with large numbers of participants provide tighter results and improve reliability and validity of results. The same will be able to

motivate the diversity of children's response towards digital media in terms of socio-economic status, culturally relative issues, and parents' perceptions. Increased numbers of the participants in the study will make it robust and capable of being generalized in a group of populations, thus capable of portraying the wider impact of digital media on children's development.

One of the constraints of the analysis stems from the fact that parents' data are self-reports. Although it is a standard approach in qualitative studies to use self-reported data in such research to obtain participants' perceptions and explanations, it is not without limitations. Self-reported data are susceptible to bias, with parents possibly unintentionally overestimating or underestimating the children's screen time and its impact. It can be evoked through parents' own orientations, social desirability, or self-presentational concerns to be more educated or responsible. Parental knowledge of their children's use of media may be discrepant from reality, just like parents can rationalize the activity in order for it to be consistent with the parents' educational attainment, as suggested by Swider-Cios et al. (2023). Additionally, Massaroni et al. (2023) observed that self-reported data may be susceptible parents' lack of knowledge of the extent of children's screen use, especially when children use several devices or digital media platforms unknown to the parents. These can introduce error in the data and hence the generalizability of results of the study. Additionally, observations in the study were comparatively brief, reducing the research's ability to derive long-term implications of exposure to digital media. While the research offers us with information regarding short-term or immediate impact of screen exposure on cognitive as well as language development in children, it is not able to offer us with the long-term implications that may last. Long-term follow-up in the form of longitudinal studies must be accomplished to verify the long-term effects of early exposure to digital media on children. Such studies will allow researchers to observe how

children's cognitive abilities, such as attentiveness, remembering things in the mind, and solving problems, are affected by prolonged exposure to screens. As per Anitha et al. (2021) and Vohr et al. (2021), the digital media implications on cognitive development will also depend on the duration and type of exposure, and it will only become possible to know the long-term outcomes of the exposure to children's developmental patterns by long-term tracking. By observing children over long intervals, researchers might ascertain whether the exposure to screens at the onset of life becomes a cause of long-term cognitive or language delays, or whether the impacts diminish as children grow older.

In summary, although the study offers valuable information regarding the role of digital media in children's development, the limitations mentioned here that the study was conducted with a small sample of participants, self-report data, and brief follow-up mean that the findings must be interpreted cautiously. Follow-up research, especially research with longer follow-up and larger samples of participants and objective measures, would be necessary to replicate the findings and to offer a fuller picture of the role of digital media in children's cognitive and language development.

5.3 Recommendations for Future Research

The outcomes of the current research have been significant in ascertaining the effects of digital content on the cognitive and language development of children in the presence of parental mediation. Additional research needs to be done in a range of areas, however, to grasp the long-term effects of exposure to digital content.

First, future research should be centered on longitudinal research. While in the current research, short-term or immediate effects of screen exposure in children are reported, it is unclear

what the long-term effects of exposure to screens in children will be. Long-term exposure to digital media in the pre-school years could have long-delayed cumulative effects. A longitudinal research design will allow researchers to consider long-term intervals of children's development and analyze the long-term effects of exposure to digital media in the pre-school years on the development of concentration ability, knowledge retention, and problem-solving skills in children after they finish school and become teenagers. This will allow for greater understanding of whether effects of exposure to screens endure in the long term or wear off over time, in agreement with previous research by Hossain et al. (2023), who noted the importance of understanding long-term developmental effects.

Also, the follow-up studies should be done in larger populations that reflect the broader diversity of children across the different demographic factors, such as socioeconomic status, culture, and access to technology. This will make the results generalizable and not limited to some specific subset of children. This will also reveal the impacts of digital content on children across different backdrops because children's interaction with technology depends significantly on factors including parental involvement, world and family beliefs, and education systems. Cross-cultural research will particularly be valuable to conduct in order to reveal the universality as opposed to the specificity of the observed impacts of digital content on cognitive and language development, such as Abdulla et al. (2023) and Sadri (2018) have done in research on the impacts of digital media in children across different varied cultures.

Future research should also examine different types of digital content and their specific effects on children's development. While this research was on general digital media use, not all digital content is created equal. Educational digital software, educational television, and video gaming each have unique designs and different types of content that affect children's language

development, cognitive skills, and social interaction in ways different from one another. For instance, some digital content enables active learning, while some digital content enables passive viewing. Knowledge of the effects of different media forms—whether the media’s role was education, entertainment, or interactivity—is used to make more informed recommendations about media use. Lieber (2024) described that educational and interactive digital media were more likely to enhance cognitive engagement and language development than passive screen time.

In addition, the contribution of parental mediation should also be investigated in depth. This research confirmed parental control of the time spent on screens and restriction of content type as being helpful in shaping the development of the children. However, it is important to specify the different types of mediation as like ,co-viewing routines, time constraints on screen use, as well as active discussion of content viewed, in influencing the impact of the use of the media by the children. According to Swider-Cios et al. (2023), parents' control is also an important factor in preventing the negative impacts of screen use. It is also possible for studies to investigate whether some of the parenting practices are superior in promoting safe consumption of media as well as desirable development outcomes. This will help in developing individualized guidelines as well as recommendations for adoption by parents on use of digital media in children. Additionally, parents' knowledge as well as awareness of digital content can be the areas of focus for studies. The parents may not be fully knowledgeable about the potential negative impacts of excessive digital content use or the need for creating boundaries. Studies can examine the role of parental training programs or awareness-raising activities in strengthening parents' control over screen use as well as selecting suitable content in promoting healthier media consumption patterns in the children. According to Hossain et al. (2023), awareness generation

as well as knowledge development in parents concerning the risks emanating from the excessive use of screens can be an invaluable input in the management of use of the digital content on the children.

Lastly, future work should also investigate the influence of such emerging technological advancements as virtual reality (VR) and augmented reality (AR) on the development of children. Such emerging technologies are being used with increasing frequency in digital content for children. Therefore, we should investigate their influence on children's language development, their cognitive development as well as their socialization. With learning environments that are increasingly interwoven with such technologies, we will need to learn on the long term impact of such technologies have on the growth of children in order to be able to plan and create learning devices in the optimal manner possible in order to optimize learning outcomes. Follow-up research on the utilization of VR and AR technologies in order for them to facilitate cognitive and language development in children can use the work of Li and Lan (2022) as the baseline reference of such research.

Although this study provides useful insights about the consumption of digital content by children, there is much to discover about language development. Larger-scale, longer-duration investigations representative samples, as well as examination of the function of different types of content and parental Interaction will tell us more about the long term impact of digital content use by the child. All such studies will ultimately lead us to provide parents, educators, and policymakers with evidence-based advice so that they will be able to maximize digital content benefits as well as its harms. To summarize, the studies have told us more about the role of digital content in cognitive as well as language development in children and the risks as well as benefits of screen exposure. Digital content with interaction, when used in the correct manner,

can be helpful in developing language abilities, vocabulary, as well as cognitive functions. Children who have been exposed to educational software, interactive media, video, and digital media have shown improvement in the use of language as well as in other cognitive activities.

But the same study also identifies the risks of excessive screen exposure particularly in social competence, cognitive adaptability, and attention. Parents in the interviews complained about children's declining concentration spans and the difficulty of traditional, non-digital forms of entertainment such as reading and outdoor play. This contradicts existing research by Anitha et al. (2021) and Hossain et al. (2023), who mention the risks of overexposure to digital media, particularly for young children.

One of the most powerful aspects of this research is the emphasis placed on parental mediation. While previous research has centered on the adverse effects of digital media, the research has highlighted the role of parents in controlling and balancing screen time and choosing media. Based on the research, children with parents who manage and regulate screen time and media choice have better language and cognitive development. Parental involvement in co-viewing, restricting screen time, and discussing the media reduces the potential adverse effects of high media consumption.

In addition to the positive effect of digital media on language and cognitive development, the same studies suggest that moderation will be the key. Enabling children's exposure to screens will need to be moderated by alternative activities involving social interaction, active play, and traditional ways of learning, like reading. For Snow (2010) and Linebarger and Piotrowski (2009), however, interactivity of digital media, in conjunction with parental guidance, holds the promise to be a helpful instrument in language learning. Excessive usage without moderation will harm children's social development and ability to focus on analogue activities.

In short, while digital media holds great promise for learning, its effect on children's development, particularly in the first five years, must be managed carefully. Parents and caregivers must take responsibility for ensuring that screen exposure serves to supplement learning and not replace traditional development experiences. Future longitudinal studies with larger and more varied participant samples will continue to sort out the long-term effects of digital media on children's cognitive and language development. At last, we need a critical examination of digital content and we need to be aware of the limits balanced with the possibilities for learning. Through investigating the converged areas of digital content, parental interaction and children's development we might be able to find ways how to use technology for the maximum benefit of children development.

5.4 Conclusion

This study has investigated the impact of exposure to digital content upon the cognitive development and language development on children aged 4 to 7. The work points towards the fact that interactive as well as educative digital media contribute positively towards cognitive capacities such as memory, attention, as well as linguistic development in the context of increased vocabulary as well as sentence formation. Over use of passive digital content can reveal negative impacts on children such as attention deficit, delays in the development of speech as well as decreased social interaction.

To answer the first question of how exposure to digital content influences cognitive and language development, digital content in the form of interactive educational digital content contributes positively towards cognitive and language development. While digital content opens

the door for the possibility of learning, excessive use or development-inappropriate content violates development, so the role of moderation comes to the fore.

For the second research question, what do parents' views of the influence of digital content consist of, and in what ways do they balance it with traditional learning? the study affirmed that parents are aware of digital content's learning potential but do struggle to balance screen time with conventional activities like outdoor playing and reading. Parental active engagement such as co-viewing, limiting screen time, and choosing suitable content is of significant value in reducing the maximum effects of excessive screen time.

The report also supports for balanced use of screen time, where digital content is used as an addition to learning activities. With digital media as an integral part of the daily routine of children, parents and educators, as well as policymakers, have an important collective role in determining standards for. As well as practices that can facilitate, the children getting benefit from digital content without hindering their development.

Although this work contributes to what is known about the effects of digital content in important ways, it also invites answering key questions through Interview. These are the long-term impact of screen use, the impact of parental mediation in limiting screen use, and the impact of various kinds of digital content. Subsequent work of this type will help us learn more about how digital content can help promote cognitive and language development in healthy ways in young children, as well as inform best practices in the introduction of digital content in young children's lives in a way that will promote their well-being.

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APPENDICES

Appendix A: Informed Consent

Title of the Study

The Impact of Digital Content Exposure on Cognitive and Language Development in Children Aged 4–7: A Parental Perspective

Researcher

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Supervisor: Golam Kader Zilany

Course: ENG 599: Dissertation

Date: April 2, 2025

Purpose of the Study

You are invited to participate in a research study that will explore "The impact of exposure to digital content on the cognitive and language development in children aged 4 to 7. " The survey invites parents' opinions regarding the use of digital content by their kids as well as what they feel about the impact.

Participant's Initials: _____

Procedures

If you are available, you will be contacted in order to participate in an interview. The interview will take approximately 20–25 minutes of your time and will discuss your child's consumption of digital content, their learning, and what you have observed in their cognitive as well as their language development. The interview will be audio recorded and transcribed. Your participation is completely voluntary.

Confidentiality

Your individual details as well as identity will not be disclosed in publications or presentations. The information will be made anonymous, and the responses will be used for educational purposes only.

Voluntary Participation and Withdrawal

Your participation is voluntary, and you can withdraw from it as your will. You can also decline to answer anything that makes you uneasy.

Potential Risks and Benefits

There are no risks involved in this investigation other than minimal risks. There are no specific benefits, although your involvement will contribute to our knowledge about how digital media influences the language development of young children as well as their cognitive development.

Participant's Initials: _____

Consent Statement

I have read and understood the purpose of the current study and agree to participate. I acknowledge that my responses will remain anonymous, and I can withdraw from the survey at any time free of penalty.

Participant Information

Participant's Name: _____

Signature: _____

Date: _____

Researcher Information

Researcher's Name: Ayesha Akter

Signature: _____

Date: _____

Contact Information

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Appendix B: Interview Questions

1. আপনার বাচ্চার বয়স কত? (How old is your child?)
2. আপনার শিশু প্রতিদিন কতক্ষণ ডিজিটাল কন্টেন্ট দেখে, এবং কোন ধরনের কন্টেন্টে সে বেশি আগ্রহী? (How much time does your child spend watching digital content each day, and what type of content is he or she most interested in?)
3. ডিজিটাল কন্টেন্ট কীভাবে আপনার শিশুর ভাষা ও চিন্তাশক্তির (কগনিটিভ) বিকাশে সহায়তা করছে বলে আপনি মনে করেন? (How do you think digital content is helping your child's language and cognitive development?)
4. আপনি কি লক্ষ্য করেছেন যে ডিজিটাল কন্টেন্টের কোনো নেতিবাচক প্রভাব আপনার শিশুর ভাষা বা চিন্তাভাবনার ওপর পড়েছে? যদি হ্যাঁ, তাহলে কী পরিবর্তন দেখেছেন? (Have you noticed any negative effects of digital content on your child's language or thinking? If yes, what changes have you seen?)
5. আপনার শিশু যখন ডিজিটাল থেকে অ-ডিজিটাল (non-Digital) কন্টেন্টে পরিবর্তন করে, তখন তার আচরণ বা শেখার ধরনে কোনো পরিবর্তন লক্ষ্য করেন? (Do you notice any changes in your child's behavior or learning style when they switch from digital to non-digital content?)
6. আপনি কীভাবে আপনার শিশুর ডিজিটাল কন্টেন্ট ব্যবহারের ওপর নিয়ন্ত্রণ বা গাইডলাইন প্রদান করেন? (How do you provide control or guidelines over your child's use of digital content?)
7. আপনি কি চান আপনার শিশু ডিজিটাল বা অ-ডিজিটাল কন্টেন্টে বেশি সময় কাটাক? কেন? (Do you want your child to spend more time on digital or non-digital content? Why?)
8. দীর্ঘমেয়াদে ডিজিটাল কন্টেন্ট আপনার শিশুর ভাষা ও চিন্তাশক্তির বিকাশে কী ধরনের প্রভাব ফেলতে পারে বলে আপনি মনে করেন? (What kind of impact do you think digital content can have on your child's language and thinking development in the long term?)