Effect of using screen time in developing children's speech and language: Bangladesh context

A dissertation submitted to the Department of Communication Disorders, University of Dhaka in partial fulfillment of the requirements for the degree of Masters of Philosophy (MPhil).

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April 2026

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Declaration

I declare that no part of this MPhil thesis titled “Effect of using screen time in developing children’s speech and language: Bangladesh context” has been submitted to any other institution or research journal. It has not been published in any way online or offline.

All the information used in the research has been verified to be accurate and in the right way. I have obtained permission from the concerned authorities for the information used in the research and have followed all the ethical aspects of the research project.

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Abstract

In the current digital age, the impact of screen time on children's daily lives has increased dramatically. Its impact is vital in developing children's language and communication skills. Since children's language and language development occurs from birth to the early years, screen time has become important for their language, social skills, and mental development. It is essential to investigate the impact of screen time on the development of children's language and communication skills in Bangladesh, as the trend of screen time use in this country is increasing daily. This study aimed to determine the impact of screen time on children aged 03-08 years and their language development.

This study was conducted on 50 children aged between 03 and 08. It analyzed children's screen time using patterns, content categories (educational, entertainment, and interactive), and linguistic effects. The participants were parents, teachers, child psychologists, and linguists contributing to children's screen time and language development from different perspectives. In addition, the participants were asked to answer various relevant questions through a survey questionnaire, which provided information about children's screen use.

The study analyzed the type and duration of screen time use, the impact of their use on children's language development, and the relationship between the type of content and its linguistic impact. The study was conducted using a mixed research method, where data was collected through questionnaires and observations. According to the study results, various effects of screen time use were observed in children. Interactive, educational games and cartoons were preferred among children aged 03-08. Such content helps children to develop linguistic skills and actively participate. Children aged 06-08 are more interested in video games and YouTube videos, and their interest in creating social media content is increasing among them.

Children have been shown to have more excellent linguistic skills with educational content, such as word repetition, asking questions, and participating in linguistic activities. Children's passive behavior in entertainment content such as cartoons or games does not improve language skills much but can cause emotional reactions (e.g., laughter, frustration). Children aged 03-05 have improved vocabulary and sentence structure by interacting with educational content. Children aged 06-08 display more content-based dialogue, but their conversations lack structure.

This study revealed that children's screen time usage profoundly impacts their language development, physical condition, and emotional responses. When interactive and encouraging children to actively participate, educational content enhances children's language skills and social communication abilities. However, entertainment content encourages passive viewing and can negatively impact language development. The study suggests that parents should be more careful about screen time and

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maintain a balance in the use of digital content. Children should be drawn to content that promotes education and social development, significantly improving their language skills. In addition, teachers and other caregivers have an important role to play in managing screen time. Governments and social institutions should promote digital educational content and develop guidelines for screen time management so that children can achieve healthy language and physical development in the digital age. The results of this study provide new perspectives on screen time use among children in Bangladesh and lay a solid foundation for future research.

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Acknowledgements

This research has been possible through the contribution and support of many people. I first express my gratitude to my supervisor, Dr Hakim Arif Sir, without whose guidance, support and encouragement, this work would not have been possible.

I express my deep gratitude to my father, Md Almas Hossain Khan, my mother, Mrs Zahanara Yasmin, my nephew Rishov Ahmed, and Fahim Ahmed (CEO, Jamuna TV); my friend, Neshat Unzum Lopa, Prothom Alo and Jamuna TV colleagues, Alimul Hasan's mother-in-law Nilufa Yasmin and others all who have given me support during this research and have always motivated me. List: zhkasshaa.com/mphil

In addition, I also express my deep gratitude to all the children and their family members who participated in this research, without whose contribution this research could not have been successfully implemented.

Finally, I express my gratitude to all the teachers and administrative officers of the concerned departments of the University of Dhaka who provided me with the necessary facilities and support to complete this research.

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Abbreviations

SES	:	Socio-Economic Status
SLT	:	Social Learning Theory
TV	:	Television
PC	:	Parental Control
APP	:	Application
ICT	:	Information and Communication Technology
NLP	:	Natural Language Processing
STEM	:	Science, Technology, Engineering, Mathematics
AI	:	Artificial Intelligence
QR	:	Quick Response Code
PDF	:	Portable Document Format
LMS	:	Learning Management System
ICT4D	:	Information and Communication Technologies for Development
ICTE	:	Information and Communication Technology in Education
CSR	:	Corporate Social Responsibility

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Chapter One
Introduction

> How does a child learn his mother tongue? S/he learns joyfully by listening to his mother's voice, and playing with her. S/he applies whatever s/he learns. Then, her/his words are half-baked and full of grammatical errors. Then, the amount of thought s/he can express in that incomplete language is also minimal. However, still, this is a natural way of learning language at a young age.
>
> -Rabindranath Tagore (Tagore, 1916) (Trans. Khan, 2025)

More than a century ago, poet Rabindranath Tagore tried to analyze the techniques of children learning their mother tongue. He showed that children learn their mother tongue by listening to mother's voice through play and joy. This happens spontaneously, not through any rigorous efforts. But children initially speak incomplete and grammatically incorrect language but gradually acquire skills through practice. Rabindranath believed that the process of a child learning a language should be unhindered so that he can express himself naturally. According to him, if mother tongue education is artificial or imposed, it can hinder the child's natural development (Tagore, 1916). This view is now critical in language education. The influence of the environment on a child's language learning is always important. In this era of the 21st century, the impact of technology on our lives is unimaginable. That impact can be seen in the lives of children. Various digital devices, including smartphones, tablets, laptops, video games, YouTube, and cartoon applications have become our daily companions. Adults and children also use these devices from a very young age. Children are often accustomed to mobile screens before they start to speak. This situation has become a concern not only in our country but also around the world. From smartphones and tablets to televisions and laptops, children are surrounded by screens everywhere — at home, at school, and even during recreational activities. Although digital media offers many educational and entertaining opportunities, various studies have shown that excessive screen time can harm children's overall development, especially in language, communication, and social skills.

Today's children are introduced to digital devices at a very young age (Noor & Islam, 2021). Some are given to screens before they start to talk or walk. While technology can be an excellent tool for learning, early and excessive exposure to screens can hinder important developmental milestones. For example, language development is most effective when children are engaged in real-time, face-to-face interactions (Hen et al., 2025). When children

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spend too much time on screens — whether watching videos or playing games — they miss opportunities to listen, speak, ask questions, and engage in human interaction, which is essential for language growth (Henward, 2015).

Many studies have shown a link between high **screen time**[1] and delayed language learning in children. Children who spend more than two hours a day on screens are likely to score lower on language development tests than those who spend less time on screens (Madigan et al., 2019). Passive screen activities like watching cartoons or scrolling through videos do not encourage active participation or critical thinking. Children can learn words but struggle to use them effectively in real-world conversations. The type of content and how children engage with it makes a significant difference. Educational programs, language-learning apps, and interactive games designed for child development can help build vocabulary and cognitive growth — especially when parents or caregivers watch and discuss the content with the child. Screen time can complement traditional learning methods when used purposefully and in moderation (Ponti, 2017).

Many studies on screen time are being conducted in developed, developing, and underdeveloped countries worldwide. They show excessive screen time that significantly impedes children's natural language and speech development (Hosani et al., 2023). This problem is seen in all children, whether urban or rural, rich or poor. Children who spend a long time in front of digital screens become isolated from real-life face-to-face communication and social experiences. This isolation reduces children's ability to speak, vocabulary, and comprehension.

Smartphone and internet use is also increasing rapidly in Bangladesh. Many families now have young children watching YouTube, Facebook, or cartoons on their phones or tablets regularly. Parents are often busy and hand over the phone to the child to keep them calm. However, the question is, how is this habit affecting the language learning process of children?

Various studies confirm that the first 3 years of a child's life (the first 1000 days) are the most important period for their brain and language development (Draper et al., 2024). The more

[1] Screen time refers to a person's time in front of a digital device, such as a smartphone, tablet, computer, or television. It can be spent for entertainment, learning, socializing, or work (American Academy of Pediatrics, 2016; WHO, 2019).

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face-to-face conversations and stories are given to a child during this time, the stronger their language foundation becomes. However, on the screen, the child is only watching, not talking, not responding. As a result, their language development may stall (Karani et al., 2022).

Excessive screen time has been shown to hinder children's development in several ways. Studies indicate that it can negatively impact language development, leading to children speaking less and forming poorer sentences. This is often accompanied by social difficulties, as children may have trouble interacting with others. Additionally, excessive screen time has been linked to attention deficits (May, 2024; Rayce et al., 2024; Brown, 2019).

Children under the age of two, especially when they are exposed to screens regularly, may have delayed language development. This is because children at this age learn language by listening to the world around them and observing people's facial expressions (McCarthy, 1946). This experience does not occur on screens. Experts recommend limiting screen time according to a child's age to ensure healthy development. The American Academy of Pediatrics recommends no screen time (except video chatting) for children under 18 months of age and no more than one hour of high-quality programming per day for children 02 to 05 years of age. Creating screen-free zones and times — such as mealtimes or before bedtime — can help establish healthy boundaries (American Academy of Pediatrics, 2013).

A child's language learning process depends on interacting with the people around them. When children spend most of their time looking at screens, they are deprived of the necessary human interaction. Listening to stories, reading books, playing games, and playing with other children is important for language development. Spending time on screens reduces these experiences. However, not everything is negative. Some studies have shown that if screen time is limited and children are shown appropriate educational content, it can be helpful for children's language learning (Hosani et al., 2023). When parents engage with their children while watching or using educational content, it can significantly boost a child's interest and ability to learn. For example, watching videos that teach letters, using apps that match words to pictures, or playing language development games can be beneficial for a child's language skills—as long as parents are actively participating and discussing the content with them. For example, when parents are present to discuss the alphabet or use word matching apps, a child's vocabulary and expressiveness increase rapidly. This directly helps transform mechanical learning into an effective social and linguistic learning process.

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1.1. Statement of the Problem

The proliferation of digital devices and the resulting increase in screen time among children has become a global phenomenon, primarily influenced by the advancement of the Fourth Industrial Revolution. This trend is not limited to developed countries; it is also seen in many emerging economies (Stiglic & Viner, 2019). Like many countries, screen time use among children, adolescents, and young adults is increasing in Bangladesh. Initial exposure to screen-based media occurs through smartphones, televisions, computers, and gaming consoles (Zong et al., 2024). This is gradually becoming a normal phenomenon, where children are increasingly familiar with these devices and are using them from a very young age (Tamana et al., 2019). Such prevalence of screen time has generated widespread interest and concern about the impact on various developmental aspects of children, including mental, linguistic, and social. In particular, the impact is seen in important areas such as language and speech skills and learning (Jesmine et al., 2024; Hafiz et al., 2024).

The first few years of a child's life, especially the first 1,000 days (about three years), are critical for brain development and maturation. It is during this stage that children acquire language and speech skills. This is when the foundation for future communication skills is laid (McCarthy, 1946; Rabindran & Madanagopal, 2020). Many factors can influence the quality and quantity of experiences during this sensitive period. It is important to analyze this effect in depth. As children's screen time has increased dramatically, understanding how it affects their language development has become increasingly important (Veldman et al., 2023).

Much recent research discusses the relationship between screen time and children's language development. Different studies paint a complex and sometimes contradictory picture. Some studies suggest excessive screen time is associated with delays in children's language skills (Gath et al., 2023; Duch et al., 2013), while others report positive effects under certain conditions. For example, when educational content is shown to children and parents watch it together, positive effects are seen (Mendelsohn et al., 2010; Belton et al., 2021).

Much of this topic's research is based on Western countries or other Asian countries. There is relatively little specific research on the effects of screen time in the Bangladeshi context (Hafiz et al., 2024). Understanding how social, cultural, economic, and environmental factors in Bangladesh influence children's screen time habits and the developmental trajectory of this

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exposure is imperative. Parents' awareness of the effects of screen time, the types of media available, parenting practices, and the availability of alternative activities may differ significantly from other study populations (Jesmine et al., 2024; Bhutani et al., 2024). A preliminary cross-sectional study in Bangladesh showed that parents generally have limited awareness of the effects of screen time and often provide devices to children at a very young age (Hafiz et al., 2024). In Bangladesh, there is hardly study on the topic of effect of using screen time in children's speech and language development yet.

Overall, there is an urgent need for such research in the Bangladeshi context. This research is needed to provide evidence-based insights for the local population, especially children on the aspect of their speech and language development. The main objective of the study is to examine screen time's effects on children's language and speech development, specifically in the Bangladeshi context.

1.2. Rationale of the Study

Due to the ease of access to technology, children are easily addicted to mobile, tablet, and TV screens these days. Especially in countries like Bangladesh, where families are busy, parents often hand over screens to their children to keep them calm. According to BTRC data, there were 187.97 million mobile subscribers in Bangladesh in November 2025 (TBS, 2025). A part of this number are children who regularly use screens. Studies have shown that excessive screen time causes attention deficit, behavioral problems, anxiety, and delays in language learning in children. This effect is especially noticeable in children under 02 years of age.

There are some important reasons to conduct this study, which highlight the importance of investigating the impact of screen time on children's language and speech development in the Bangladeshi context. First, early childhood is essential for language development. The rapid brain growth and **synaptogenesis**[2] in the first few years of life lay a solid foundation for cognitive and communicative skills (Rabindran & Madanagopal, 2020). This period is highly sensitive for acquiring language and speech skills, and environmental influences and interactions are significant (Bhutani et al., 2024). One potential danger of increased screen

[2] Synaptogenesis is the process by which new synapses, or connections, are formed between neurons in the brain. It is crucial for the development and function of the nervous system. Synaptogenesis occurs extensively in the brain of children from birth, which plays a role in learning, memory, and behavior control (Estrin & Bhavnani, 2020).

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time is that it reduces face-to-face contact and social interaction with caregivers, which is essential for language acquisition. Therefore, it is important to understand how screen time may disrupt these important interactions (Gath et al., 2023).

Second, the worldwide increase in children's screen time calls for contextual investigation. Although children's screen media use has increased worldwide, the type of screen time, duration, content type, and parental mediation strategies may vary across countries (Stiglic & Viner, 2019). Bangladesh's cultural norms, socioeconomic conditions, and technology use may differ in children's screen time exposure and subsequent effects (Hafiz et al., 2024). Findings from studies in other countries may not be directly applicable to the population of Bangladesh, so such research is essential in Bangladesh (Hafiz et al., 2024).

Third, a literature review of various existing studies has found inconsistent and multifaceted results on the relationship between screen time and language development, highlighting the complexity of the relationship and the need for further research emphasizing the complexity of the relationship and the various mediating factors. Screen time duration, active or passive interaction with the screen, characteristics of the videos and content type, parental co-viewing, social presence, child age, and characteristics – all of these factors can play a role in determining the impact of screen time (Mendelsohn et al., 2010; Belton et al., 2021). Examining the relationship between these factors in the Bangladeshi context will provide a more nuanced understanding of the impact of screen time. That perception or impact may be harmful or beneficial for language development (Gath et al., 2023). Fourth, there is a lack of specific research specifically on the impact of screen time on child development research in Bangladesh. The limited evidence currently available may not adequately highlight the problems and opportunities associated with screen media use in Bangladeshi society. Research on parental awareness, access to digital technologies and resources, and child-rearing practices within the local context are essential (Hafiz et al., 2024; Jasmine et al., 2024). A preliminary study in Bangladesh showed that parents are not sufficiently aware of the effects of screen time and often provide devices at a very young age. This creates a need for further research to provide evidence-based insights for local populations (Hafiz et al., 2024).

Finally, the results of this study can help develop guidelines and recommendations for parents, teachers, language and linguists, and clinicians in Bangladesh. This is because, this study aims to understand the specific impact of screen time on language development. This

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study provides an opportunity to learn appropriate language skills and reduce the adverse effects of excessive or inappropriate screen media use. In addition, the results of this study can help shape government health initiatives and education policies on digital media use by children in Bangladesh (Stiglic & Viner, 2019). The rationale for this study stems from the critical period of language development, the global trend of screen-based technology use, the uneven results from the existing literature, the lack of research in Bangladesh, and the potential for analyzing the results of different studies to help formulate new policies.

1.3. Research Aims and Objectives

The aim of this study is to examine how screen time affects children's language and speech development in Bangladesh.

Research Objectives:

1. To analyze the impact of screen time on children's linguistic development.
2. To investigate what kind of words, language, and behavior children learn through screens.
3. To interpret how parents, guardians, teachers, society, and media contribute to this process.
4. To discuss the awareness of screen time and the reactions of parents and teachers to its negative aspects.

1.4. Definition of Key Terms

To ensure clarity and accuracy in this research paper, the following key terms are defined:

a) *Screen time*: In the context of this study, screen time refers to the amount of time that a child interacts with or is exposed to the screen of an electronic device. This includes, but is not limited to, smartphones, tablets, televisions, computers, laptops, video game consoles, and digital versatile disc (DVD) players (Gath et al., 2023). Screen time can be further divided into:

   i. *Active screen time:* Active screen time is defined by mental and/or physical engagement with the content. This type of screen time requires the user to participate, make decisions, create, or solve problems. Examples include playing interactive video games that require strategy and problem-solving, using educational apps, creating digital art or videos, coding, or video chatting with family and friends. Active screen time is often considered more beneficial because it can promote critical thinking, creativity, and social connection. This includes when a child is mentally or physically engaged in

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digital activities. Such as playing educational games, interacting with learning apps, or making video calls (Bhutani et al., 2024).

ii. *Passive screen time:* Passive screen time is characterized by the consumption of information without significant engagement. The user is a sedentary receiver of content, with little to no interaction. This includes activities like watching movies, TV shows, or videos on platforms like YouTube and TikTok for prolonged periods. While passive screen time can be a form of relaxation, excessive use is often associated with negative effects, such as reduced physical activity, decreased attention span, and a lack of social or creative opportunities. This includes screen-based passive activities, such as watching television shows or videos where there is no active interaction. It also includes screen time, where the screen is on in the environment, even though the child is not directly paying attention to it (Mendelsohn et al., 2010; Gath et al., 2023).

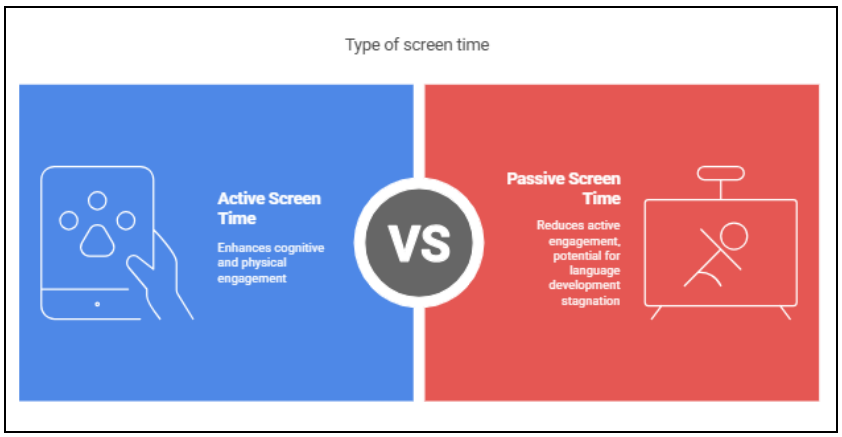


Figure 1: Screen type (Veraksa et al., 2021)

b) *Language development*: Language development is the process by which a person acquires the ability to understand and use a language. It's a foundational part of human development that begins even before birth and continues throughout a person's life. This process enables children to understand and use the language system (receptive language and expressive language). This multifaceted process includes several important areas:

I. Phonology: The understanding and production of the sounds of language (Hafiz et al., 2024).

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II. Lexicon: The acquisition of new words and the ability to understand them (Jesmine et al., 2024).
III. Morpho-syntax: The understanding and using word forms and sentence structures (Rabindran & Madanagopal, 2020).
IV. Pragmatics: Using and understanding language in a social context (Mendelsohn et al., 2010).

c) *Language development:* In this study, language development is considered an age-appropriate set of milestones and overall communication skills. This can be assessed by parent-reported data, observational data, or, where possible, culturally appropriate, standardized assessments (Belton et al., 2021).
d) *Developing children:* For the purposes of this study, developing children are defined as children aged 3 to 8 living in Bangladesh. This age range is critical for language and speech development, which is particularly sensitive to the effects of screen time (Hafiz et al., 2024).
e) *Parental awareness and education level:* Parents' understanding of the potential impact of screen time on children's development and development (Jesmine et al., 2024).
f) *Access to technology and media:* Availability and affordability of various screen devices and internet connectivity in the home (Hafiz et al., 2024).
g) *Parenting styles:* Child-rearing styles include media for relaxation or entertainment (Stiglic & Viner, 2019).
h) *Socio-economic factors:* Household income and parents' occupation can influence the resources and contact time available to children (Jasmine et al., 2024).
i) *Early education and stimulation:* The presence and quality of early learning and development opportunities outside the home.
j) Exclusions: Although the study is focused on general children in Bangladesh, it will not investigate previously identified developmental disorders or disabilities that significantly affect language and speech development. This is where the potential impact of screen time can be better isolated. However, this issue has been carefully considered at the design stage not to exclude relevant participants.

Chapter Two

Literature Review

This literature review aims to bring together the results of several recent studies published worldwide that have examined the relationship between screen time, language skills, mental health (depression, anxiety etc.), sleep patterns, language development, social activities and activities, and physical health in children. This review attempts to understand the complex relationship between screen time and the well-being of children and adolescents from different perspectives.

2.1. Screen Time and Mental Health

The impact of screen time is evident during childhood and adolescence. At the same time, the relationship between mental health problems, especially depression and anxiety, is also evident. A recent meta-analysis of nine prospective cohort studies conducted by Gao & Gao aimed to determine whether increased screen time in adolescents increases the risk of depression (Gao & Gao, 2024). They systematically searched five significant databases (PubMed, Web of Science, Embase, Psychoinfo, and Scopus) to identify studies from inception to May 2024. This meta-analysis of 41,194 participants found a significant association between initial screen time and the incidence of depression (Odds Ratio, OR = 1.20, 95% Confidence Interval, CI: 1.12–1.28). These results suggest that those who use screens for a more extended period are at a statistically significantly higher risk of developing depression than their peers who use screens less frequently (Gao & Gao, 2024).

The meta-analysis also found that the incidence of depression depended on the screen time duration. From this research, we find that users with >2 hours of screen time per day were more likely to have a depressive episode than those with >3 hours. This finding warrants further investigation into the causal relationship and the possibility of a nonlinear association. The researchers found a high degree of heterogeneity (I^2 = 81.0%) across the studies included, suggesting possible differences in study populations, methods, and other factors (Boers et al., 2019). Subgroup analyses were conducted based on study location, baseline depressive status, sample size, and study quality; however, meta-regression analyses did not find any significant factors accounting for this variation. Despite the variation, the results remained relatively stable after excluding low-quality studies.

Screen use may increase the risk of depression. Gao & Gao (2024) and Boers et al. (2019) have proposed several possible mechanisms by which prolonged screen use may increase the risk of depression, particularly among adolescents and young adults. One of the main reasons is that excessive time spent on electronic screens such as smartphones, tablets, and computers decreases social interaction. This subsequently leads to social isolation, a well-established cause of depression. In addition, prolonged exposure to blue light emitted from screens may negatively affect sleep patterns. Sleep patterns have impact on mental development.

2.2. Screen Time and Sleep: A Two-Way Relationship

Another important concern is the impact of screen time on sleep patterns in children and adolescents. A longitudinal study by Salehi et al. (2024) examined the bidirectional relationship between screen time and sleep duration in children aged 05 to 12. The study used data from the longitudinal study of Australian children, which also explored the role of physical activity. Their study took a comprehensive approach by measuring screen time and physical activity across domains at three time points (ages 05, 10, and 12) to understand the complex interactions of children's behavior. The study emphasizes the temporal and potentially bidirectional nature of the relationship between screen time and sleep. Excessive screen time, incredibly close to bedtime, has been shown to suppress melatonin through blue light, increasing cognitive and emotional arousal. Sleep is often thought to be negatively affected by various mechanisms, including sleep disruption. Conversely, poor sleep quality or insufficient sleep may lead to increased screen time as a way to seek entertainment or cope with fatigue. The study by Salehi et al. (2024) has some limitations, such as the data were collected in 2008, 2014, and 2016, when smartphone and social media use was probably less prevalent among young children. Therefore, further examination of the effects of modern technology may be needed. Some methodological considerations must also be considered when using parent-reported data for 5-year-olds and self-reported data for older children. A previous literature review by Hale & Guan (2015) systematically examined the relationship between screen time and sleep among school-aged children and adolescents, finding a consistent association between more screen time, less sleep duration, and poorer sleep quality. A review by Cain & Gradisar (2010) confirms the negative impact of electronic media use on sleep in this age group. Blue light from screens can disrupt circadian rhythms and melatonin secretion, a key physiological pathway in sleep disorders.

2.3. The Impact of Screen Time on Children's Language Development

The impact of screen time on children's language development is a topic of considerable research interest. A review by Bhutani et al. (2024) attempted to investigate the relationship between screen time and language development in children under 12. They found 16 studies that met their inclusion criteria through a systematic search of multiple academic databases. The review found that most of these studies (9 out of 16) reported a negative impact of screen time. These studies included children of different ages, ranging from toddlers (<2 years) to early childhood (02–05 years). Bhutani et al. (2024) also identified several factors that appear to influence the impact of screen time on language development. These include duration of use, characteristics of video content, and the presence of adult interaction. The review concluded that the negative impacts of screen time on language development outweigh the positive impacts. However, the review also noted that some studies (2 out of 16) reported a positive effect of watching video content, mainly when the content was educational and curriculum-based. A study by Linebarger & Walker (2005) found that such programs were associated with improved language skills and increased vocabulary in children aged 06 to 30 months. Similarly, a study by Yang et al. (2017) in China found that children who watched more educational videos had better vocabulary skills. These results emphasize the quality of the content and the potential of educational media to support language acquisition. Some limitations of such positive studies were also noted, such as small sample sizes and reliance on parent reports. Gath et al. (2025) further investigated screen time (television and electronic media) in language development in preschoolers, attempting to understand the underlying mechanisms. Their study aimed to examine screen time's direct and indirect effects, which may be mediated by factors such as parent-child interactions. Systematic reviews and meta-analyses such as Madigan et al. (2020) have investigated the relationship between screen time and children's language skills, often finding negative associations. In children, screen time appears to replace activities related to interactive language skills. A study by Zimmerman et al. (2007) focused specifically on children under 02 years of age and found a link between media viewing and delayed language development. The results of these studies suggest that while high-quality, interactive, and co-viewing educational content may have some benefits, excessive and passive screen time, especially at very young ages, may hinder language development by reducing opportunities for direct human interaction, conversation, and exploration.

2.4. Impact on Executive Function

Recent research also explores the relationship between screen time and the development of executive functions in children. Executive functions are cognitive skills, including working memory, inhibitory control, and cognitive flexibility, that can predict various important outcomes, including academic achievement, social skills, and life success.

Choi et al. (2024) examined the longitudinal relationship between screen time and executive functioning among Canadian children during the Covid-19 pandemic. The pandemic brought about significant changes in children's daily routines, including increased screen time and decreased social interaction and physical activity. Choi et al. (2024) identified distinct levels of screen time (low, moderate, and high) among participants and assessed their executive functioning. Their results provide insight into how different levels of screen time exposure may be related to the development of cognitive skills.

A meta-analysis by Bustamante et al. (2023) found a relationship between executive functioning and screen time exposure, particularly among children under 06. This review synthesizes findings from various studies to provide a quantitative estimate of the association between early screen use and these cognitive abilities. The study examines how the relationship with screens develops during the preschool years. Christakis et al. (2018) examined how early media exposure may affect cognitive functioning. They suggested that early screen exposure may significantly affect brain development and the cognitive processes underlying executive functions. For example, excessive screen time may displace more supportive activities for developing attention, working memory, and inhibitory control. These activities include play, problem-solving, and social interaction. The interplay between sleep and executive functions also adds another layer of complexity to this relationship. Excessive screen time may negatively impact sleep, and adequate and good-quality sleep is essential for optimal cognitive function, including executive functions.

2.5. Screen Time and Physical Health

While mental and cognitive health are the main research areas on screen time, the relationship with physical health is also significant. Nikooharf Salehi et al. (2024) study examined the link between screen time and sleep and the relationship between screen time and physical activity among children aged 05 to 12. Excessive screen time inherently

influences behavior, which is a known risk factor for a variety of physical health problems, including obesity, heart disease, and metabolic syndrome.

A cross-sectional study by Haque et al. (2020) in Bangladesh examined the association between supervised and unsupervised screen time and school-aged children's physical, mental, and social health. Their results indicated that unsupervised children had slightly longer average screen time and a higher prevalence of physical symptoms than supervised children. This suggests that the context of screen use, including parental supervision, may play a role in children's health outcomes. The World Health Organization (WHO) 2020 Guidelines on Physical Activity and Behaviour (Bull et al., 2020) emphasize the importance of promoting physical activity for overall health and well-being, including limiting screen time for children and adolescents.

Replacing excessive screen time with physical activity has been shown to improve lifestyle changes. Some studies have examined the association between screen time and physical health parameters such as body mass index (BMI) and sleep quality. Vizcaino et al. (2019) found associations between different levels of screen use and perceived stress scores in adults, suggesting a possible link between screen time and physiological stress responses. Although this study focused on adults, it highlights the broader impact of screen time on physical health beyond just behavior.

2.6. Impact of Digital Media and Children's Language Acquisition

Hakim (2022) said that speech is the vocal organ's sound collection. He talks about two speech characteristics: speech must be produced by the vocal tract and must be meaningful. The process of speech production can be seen as a complex process. Speech is produced due to the coordinated activities of the speech organs. The use of digital media and its prevalence is increasing rapidly, which is having a significant impact on children's language acquisition. Researchers have identified positive and negative effects related to various digital platforms for children, especially since it has become an integral part of modern life. Many studies have highlighted the benefits of digital media for language learning. Digital technology can help improve children's literacy skills when appropriately integrated into a child's learning environment. For example, Timotheou et al. (2022) found that language learning outcomes have improved in various digital tools studies. Mahesh et al.(2024) also claim that the quality and nature of digital content for preschoolers can profoundly impact their cultural and

linguistic development. They state that diverse digital environments provide opportunities for language exposure and interactive learning experiences. Several types of digital media, such as educational applications and storytelling platforms, can support language development. According to one study, formats such as digital storytelling help improve children's language skills, as it engages them in rich and contextual stories, which increases their vocabulary and comprehension (Eslit, 2023). Engaging online content, such as the YouTube platform, can effectively support young learners in second language acquisition, as demonstrated by the work of Misbahuddin & Setiyawan (2023), where the Arabic language was acquired through YouTube.

However, the potential adverse effects of digital media use should also be considered. McKean et al. (2015), noted that excessive screen time and incredibly passive television viewing can crowd out other important activities, such as reading and interactive play, conducive to language development (McKean et al., 2015). Excessive television viewing negatively affects early language development, highlighting the importance of balanced and high-quality media interactions (McKean et al., 2015). Further research suggests that children who watch many media on screen but do not have sufficient interactive engagement may develop language skills and comprehension more slowly (Hansen & Broekhuizen, 2020; Anderson & Subrahmanyam, 2017). Another aspect of this discussion is parental responsiveness during digital media use. Research has shown that discussing and co-viewing with children during media viewing can enhance their learning experiences and reduce the adverse effects of screen time (Joseph et al., 2022). If parents create a language-rich environment and interact with their children while watching media, they can help support their children's language skills and achieve more effective learning outcomes (Joseph et al., 2022).

Although digital media provides a valuable resource for enhancing early language acquisition, it should be used cautiously. A balanced strategy that includes high-quality content and parental involvement will help maximize the benefits of digital media and minimize potential risks. Future research must explore the relationship between digital media exposure and language development so parents and teachers can effectively navigate this changing educational landscape.

2.7. The Role of Technology in Children's Language Learning

The role of technology in language learning has become increasingly important, especially as digital media has become pervasive in various parts of early childhood development. Parents, educators, and policymakers must understand how digital tools, such as mobile applications, interactive games, and video content, affect language acquisition.

Research has shown that mobile technology, especially educational applications, can be helpful in children's language learning. For example, Gamlo (2019) noted that mobile game-based language learning applications increase interest and motivation in young learners, which significantly aids vocabulary acquisition. Similarly, Tsuji et al. (2021) found that interactive screen media can help teach words only when children are engaged with the content in the presence of a human, which can be helpful in language development if the technology is used correctly. These findings are consistent with the view that modern digital tools can be particularly effective when they promote interactivity. However, there are important concerns about the effects of passive screen time. Kucker et al. (2024) noted that excessive media use, particularly video viewing, in children under 30 months of age was negatively associated with developmental outcomes, including language skills. This finding highlights the importance of parental involvement and the need to assess the quality of media content. It suggests that while interactive and educational media can be helpful for language development, passive consumption may detract from the quality of language input children receive (Clemente-Suárez et al., 2024). In addition, the quality and context of digital interactions play an important role in shaping language outcomes. For example, Webb et al. (2024) found that how children respond to prompts during attentional tasks is influenced by their exposure to mobile media, suggesting that structured and guided media interactions may foster positive developmental responses. Similarly, Sandberg & Gillen (2021) argue that parents' daily struggles with integrating digital media into their children's lives often impact how effectively technology can be used in language learning. Parental guidance and cooperation are essential to overcoming challenges associated with media use and maximizing learning potential.

In addition, the role of traditional language learning environments should not be overlooked. Many studies have shown that real-life interactive experiences are crucial for language development, especially those that involve rich verbal exchanges between parents and children (Burgoyne et al., 2017; Carranza-Pinedo & Diprossimo, 2025). Socio-emotional

support and parental encouragement are crucial, as these relationships are crucial in children's linguistic, cognitive, and emotional development (Byeon & Hong, 2015).

Digital media can provide valuable tools in teaching children language, but it is important to take a balanced approach that prioritizes high-quality content and active participation. Digital media, if thoughtfully integrated into a child's daily routine, can be helpful in vocabulary acquisition and language skill development. In the future, further research should be conducted to investigate the complexities related to the impact of digital media on language development so that proper guidelines can be provided for practical use in early learning environments.

2.8. Digital Media and the Role of Children in Language Development

The role of digital media in children's language development, especially platforms like YouTube, has received significant attention from researchers, representing a complex relationship between technology use and linguistic growth in early childhood development. Studies have shown that platforms like YouTube can positively impact early language acquisition. For example, effective use of YouTube media is helpful in children's second language learning, especially among preschool children around the age of four, as reported by Misbahuddin & Setiyawan (2024). This finding is consistent with evidence indicating that engaging content designed for educational purposes can significantly aid language development, primarily through diverse vocabulary and correct pronunciation (Richert et al., 2010). In addition, digital media have helped to enrich language practice in bilingual environments, providing exposure to different languages and cultures (Hafizha et al., 2023). These data support that appropriately crafted digital content can serve as a valuable educational resource, helping to increase vocabulary growth and enhance interactive language learning experiences.

However, there are opposing views regarding the risks of excessive screen time. Studies conducted by Kanwal et al. (2023) and Simonović & Hinić (2024) have shown that excessive screen exposure may be associated with language delays and developmental challenges, especially in early childhood. They emphasize that the nature of the content—especially if it is not interactive or age-appropriate—can exacerbate these problems. Similarly, the role of parents is crucial in mitigating these adverse effects; when parents co-view or interactively discuss media with their children, positive outcomes in language skills can be seen (Mahesh

et al., 2024). This highlights the importance of monitoring screen time and ensuring the quality of the content, which can be helpful in language development.

In addition, the social environment plays an important role in this context. Engaging with parents while children use media—such as discussing the content being viewed—can help to enhance the benefits they derive from digital media (Sun & Chao, 2024). This interaction creates opportunities for verbal exchange, which is important for teaching and reinforcing language use (Diprossimo et al., 2024). Furthermore, this shift to digital media has changed the environment for young children's language input, with evidence suggesting that traditional verbal communication may be reduced by media use (Monteiro et al., 2022). While technology holds promise in enhancing language skills, passive media use alone may be less effective for language development and may reduce opportunities for interactive learning (Sun et al., 2017).

2.9. Identifying the Research Gap

The rapid advancement of digital technology and its growth, especially among children, has created a global trend in screen time use related to the advancement of the Fourth Industrial Revolution. This trend is not limited to developed countries; screen time use among children is also increasing in developing countries such as Bangladesh. Children are increasingly exposed to screen media through smartphones, televisions, computers, and gaming consoles, providing entertainment, education, and social interaction opportunities. However, with these potential benefits, there are concerns about screen time's impact on children's mental well-being and language and speaking skills.

There has been much discussion about the effects of digital media use, but its impact on language and speaking skills has not yet been reviewed in depth, especially in Bangladesh. This can be identified as an important research opportunity. According to UNICEF's report "Investigating Risks and Opportunities for Children in a Digital World," while digital technology plays an important role in children's lives, there is not enough research on how different types and amounts of screen time can affect language development (Stoilova et al., 2021). This gap is even more evident in Bangladesh, where cultural, economic, and social environments play an important role. There is a need for intensive research on the relationship between children's screen time habits and their language development.

Chapter Three

Theoretical Perspective

This chapter overviews the cognitive, environmental, technological, and content-based factors influencing children's language development.

3.1. Cognitive and Environmental Influences on Early Language Acquisition

Children's language acquisition is a complex process that is shaped by a combination of genetic predispositions and environmental influences. This combination is reflected in studies that show differences in early childhood language development. Nasrin (2016) said that after a child is born, his language foundation is built around the environment around him. She supports the question of what language is. He says that language is a set of symbols used in a particular linguistic community that are understandable only to that linguistic community.

Hayiou-Thomas et al. (2012) reported that genetic factors account for $a^2 = 0.24$ in early childhood language proficiency, increasing to $a^2 = 0.57–0.63$ in middle childhood. Stromswold (2008) reported that genetic influences have a fivefold effect on language scores in twins of high gestational age. Edhere & Ejie (2024) showed that genetic factors like heredity and personality work together with environmental inputs.

Environmental influences have consistently been shown to be important in early language development. Carvalho et al. (2016) noted that high-quality family environments and effective parental education accelerate vocabulary development. Hoff (2003) demonstrated that features of the mother tongue—such as word variety and sentence structure—facilitate vocabulary growth, fully mediating the effects of economic status.

Some studies have identified critical periods or developmental windows for language acquisition. Gilkerson et al. (2018) identified the importance of conversation between 18 and 24 months. Roulstone et al. (2011) noted the influence of the early communication environment between 0 and 24 months. These papers demonstrate that direct communication during this early period of childhood plays an essential role in shaping a child's brain and building long-term linguistic foundations.

3.3.1 Environmental influences

The language environment at home

The language environment at home significantly impacts language acquisition. Key environmental factors include parental education, parental language exposure, availability of books, family relationships, television viewing, and financial status. The language environment at home refers to the full range of linguistic interactions, opportunities, and stimuli a child is exposed to in their living space. This environment is a primary driver of language development and significantly influences a child's vocabulary, grammar, and communication skills. It's not just about the number of words a child hears but also the quality of the interactions. A rich language environment is characterized by frequent, responsive conversations. This includes talking directly to the child, asking open-ended questions, and narrating daily activities (e.g., "Now we're putting on your shoes"). Reading books aloud is a crucial component, as it exposes children to a wider variety of vocabulary and complex sentence structures than everyday speech. In contrast, a less stimulating language environment may be characterized by limited conversation, with communication often being one-sided or directive (e.g., "Time for bed!"). Excessive passive screen time can also contribute to a less interactive environment, as it often replaces direct communication. The presence of multiple languages at home can also create a bilingual or multilingual environment, which has been shown to offer cognitive benefits, such as enhanced problem-solving skills.

Socioeconomic influences

Socioeconomic status (SES) influences language development, but its effects are complex and mediated by other factors (Schwab & Lew-Williams, 2016). Socioeconomic status (SES) profoundly influences language development, creating a "word gap" between children from low-income families and their more affluent peers. Research shows that by age four, children from low-SES backgrounds may have heard tens of millions fewer words than children from high-SES backgrounds. This disparity isn't just about quantity, but also the quality of linguistic input. Children in higher-SES families often experience more conversational turns and are exposed to a richer vocabulary and more complex sentence structures. Parents in these environments may have more time and resources to engage in activities that foster language, like reading books, telling stories, and visiting museums. Conversely, parents in

low-SES households may be under greater financial stress and have less time for such interactions, which can lead to less frequent and less supportive communication. Furthermore, limited access to quality healthcare can result in undiagnosed hearing issues or speech disorders. These combined factors can lead to slower vocabulary growth, less developed grammar, and poorer academic outcomes, a gap that often persists into adulthood. Early intervention and parent education programs are crucial for mitigating these effects and promoting language equity.

Early education exposure

Early education exposure, particularly preschool attendance, plays a significant role in language development (Klein & Becker, 2017). Early education exposure, particularly through high-quality preschool and daycare, significantly impacts a child's language development. These structured environments provide children with opportunities for rich social interactions with peers and educators, exposing them to a wider range of vocabulary and communication styles than they might encounter at home. Educators use various strategies, such as reading aloud, group discussions, and guided play, to foster language skills. This exposure helps children develop phonological awareness, grammar, and narrative skills. For children from low-socioeconomic backgrounds, high-quality early education can be especially crucial, helping to bridge the "word gap" that often emerges before kindergarten. The benefits of early education on language development are long-lasting, positively influencing reading readiness and academic performance in later years.

Interaction and cumulative effects of factors

Language acquisition is developed through the cumulative effects of biological, environmental, and social factors, and research has shown that these factors interact (Gayraud et al., 2024). Language development isn't shaped by a single factor but by the complex interaction and cumulative effects of various influences. A child's genetic predisposition for language, their home environment, socioeconomic status, and early education all work together. For instance, a child with a strong innate ability for language will still struggle if they're in a less stimulating home environment. Similarly, a rich home environment can help compensate for a less-than-ideal genetic predisposition. The effects of these factors are cumulative: positive influences build on one another over time, leading to accelerated development, while negative influences can compound, creating significant delays. This

highlights the importance of addressing multiple areas simultaneously—such as providing high-quality early education and parental support—to foster optimal language outcomes.

Effects of screen content on language development

The screen content that children are exposed to has different effects on their language development. Educational content can improve children's language skills, while entertainment content can cause difficulties (Karani et al., 2022). The effects of screen content on language development are not uniform and depend heavily on the type of content. Passive viewing, such as watching random videos without interaction, has a negative correlation with language skills, especially in infants and toddlers. This is because it replaces valuable, two-way communication with a one-way flow of information, denying children the opportunity for conversational turns and social cues that are critical for language acquisition. On the other hand, certain screen content can be beneficial. Interactive apps that encourage a child to respond, repeat words, or solve puzzles can positively support learning. Ultimately, the impact is less about the screen itself and more about whether the content facilitates or hinders the interactive, responsive language a child needs to learn.

Effects of educational content

The effects of language on educational content have varied across studies, but some studies have shown positive effects (Pires et al., 2024). Educational content, such as well-designed apps and TV shows, can have a positive impact on language development, particularly when used appropriately. Programs like Sesame Street and Daniel Tiger's Neighborhood are specifically created with an educational curriculum to teach vocabulary, social skills, and early literacy. These shows often use songs, repetition, and clear dialogue to help children learn new words and concepts. Interactive educational apps, which prompt children to speak or perform tasks, are even more effective. They turn passive viewing into an active learning experience, giving children a chance to practice new skills. The benefits of educational content are maximized when a parent or caregiver watches with the child, co-viewing and discussing the content to reinforce the lessons and make them personally relevant. Using quality digital content enriches children's vocabulary and creates new opportunities for creative exchange, which strengthens the foundation of their formal education. When properly supervised, it serves as a powerful educational medium.

Effects of entertainment content

The effects of entertainment content are generally adverse. Studies have shown decreased language skills, decreased conversation, and adverse effects on reading skills (Eric, 2021). Entertainment content, such as cartoons and movies intended solely for amusement, generally has a limited or even negative effect on language development, particularly for very young children. While it may expose them to new words, this type of content is typically fast-paced and lacks the reciprocal interaction crucial for language acquisition. Unlike a conversation with a parent, a child can't ask questions or respond to a character on a screen. This passive consumption can displace more beneficial activities, like pretend play, drawing, or reading books. The potential for harm is highest with background TV, which can be a constant distraction, reducing the quality of parent-child interactions and conversational opportunities. It's the difference between hearing language and actively engaging with it.

Role of parenting

Content viewed by parents positively affects language development, especially interactive content (Safwat & Sheikhany, 2014). Parenting plays the most critical role in a child's language development. The quality of parent-child interactions, often called "serve and return," is a powerful predictor of language outcomes. This involves parents responding to a child's babbles and gestures, engaging in frequent conversations, and using a rich and varied vocabulary. Parents who read to their children daily, ask them questions, and narrate their activities (e.g., "Let's put on your blue shoes") create a highly stimulating language environment. Conversely, parents who are less responsive or provide limited linguistic input may unknowingly hinder their child's progress. The consistent, loving, and verbally rich interactions provided by parents lay the foundation for all future communication and learning.

Effects of screen time

Excessive screen time generally hurts language development (Rayce et al., 2024). The overall effects of screen time on language development are complex and depend on several factors, including the amount, type, and context of usage. For children under 18 months, any screen time is generally discouraged by experts because it is not beneficial and can replace essential face-to-face interaction. For older toddlers, excessive screen time, especially passive viewing,

has been linked to language delays and a smaller vocabulary. This is because it reduces the time spent on activities that foster language, like interactive play and conversation with caregivers. The context matters greatly; co-viewing with a parent who actively discusses the content can be beneficial, while a child left alone with a device for extended periods will likely experience negative effects. The displacement of real-world interaction is the primary concern.

Age-based differences

The effects of screen time may vary by age, with adverse effects found in children aged 2-3 years (Swider-Cios et al., 2023). The effects of screen content on language development vary significantly by age. For infants and toddlers (0-02 years), the impact of screens is almost entirely negative. Their brains are wired for live, human interaction, and they cannot learn language effectively from a two-dimensional screen. Passive screen time at this age is associated with language delays. For preschoolers (3-5 years), the effects are mixed. While excessive passive screen time can still be detrimental, they can begin to benefit from high-quality, interactive educational content, especially with parental guidance. For school-aged children, the risks are generally lower, and screens can be a valuable tool for learning. At this age, the focus shifts to ensuring screen time doesn't replace time for homework, physical activity, and social interaction with peers.

Relationship between daily screen time and language development

Long-term daily screen time can lead to a decline in language production, comprehension, and communication skills. Several studies have shown a negative impact of screen time of more than 1 hour on language skills (Ponti, 2022). The relationship between daily screen time and language development is generally inversely proportional, especially for young children. As the amount of time spent on screens increases, the quality and quantity of a child’s language skills tend to decrease. This is primarily due to the displacement effect, where screen time takes the place of more language-rich activities like reading, conversational play, and face-to-face interaction. For example, a toddler watching a tablet for two hours is not engaging in the back-and-forth "serve and return" conversations that are critical for their brain's development. While limited, high-quality, and interactive screen use can be an exception, the overwhelming evidence suggests that for optimal language development, a low-screen-time approach is best for young children.

Impact of technology on language development: The impact of technology is complex. Excessive screen time and background TV can hinder language development, but educational content and co-viewing experiences can be beneficial (Daly, 2019). The impact of YouTube on language development is highly debated and depends entirely on the type of content and how it's used. Much of the content for young children on YouTube consists of short, fast-paced videos with repetitive songs or unboxing videos. This passive consumption offers very little linguistic input beyond basic vocabulary and lacks the conversational context needed for true language acquisition. It can also lead to a shorter attention span, making it harder for children to focus on longer-form, language-rich activities like reading a book. However, some educational channels provide high-quality content with clear, instructive language. The key difference lies in whether a parent co-views with their child, using the video as a starting point for discussion and interactive learning.

Impact of YouTube on language development

Educational YouTube content can help improve language, vocabulary, and speaking skills, especially with parental support.

Content type and language acquisition

Educational content on YouTube enhances language skills, but parental involvement is important (Duraiappah et al., 2023). When it comes to screens, the type of content is far more important than the device itself. Language acquisition relies on interaction, repetition, and meaningful context. Therefore, content that promotes these elements is more likely to be beneficial. This includes: Interactive Apps: Applications that prompt a child to speak, repeat words, or solve verbal puzzles. Educational TV Shows: Programs designed with a specific curriculum to teach vocabulary and concepts in a clear, deliberate way. Co-viewed Content: When a parent or caregiver watches with a child and talks about what they're seeing, asking questions and explaining concepts. In contrast, passive, fast-paced, and non-interactive entertainment content has a limited or negative effect because it lacks the crucial element of reciprocal conversation that a child needs to truly learn a language.

Parental support and learning outcomes

Active parental involvement positively impacts language development. Parental support is a cornerstone of successful language development and learning outcomes. It's not just about

providing a rich language environment but also about actively guiding a child's learning journey. This includes co-viewing educational content, discussing what's seen, and turning every experience into a learning opportunity. Parents who are engaged and supportive are better able to identify potential language delays and seek intervention early. They can also provide emotional support, which is linked to better cognitive outcomes. This parental involvement creates a positive feedback loop: as children become more confident in their language skills, they are more likely to seek out learning opportunities, which in turn leads to greater parental support and even better outcomes.

Studies show that various online technology tools in Bangladesh impact language and listening skills (Bangla Institute, 2024). Parental supervision and high smartphone access have influenced children. The results of several studies have detailed the impact of various factors on language development in childhood. These studies show the importance of parental support, educational content, and appropriate screen time for increasing language skills in childhood.

3.2. Language Development Theories

Language learning is a unique feature of humans only. It is an important part of brain development and social development. Researchers are interested in the stages of language learning, from a child's first speech to the acquisition of complex language skills in adulthood and the language learning journey (Karadöller et al., 2024). Over the past few decades, many theories have developed that provide different perspectives on language learning and its effects. These theories come together to show the complex nature of language development. For example:

Behaviorism

The primary important idea of behaviorism comes from B.F. Skinner (McLeod, 2025a). He said that children learn language by imitating adults. Children's correct speech is reinforced by praise or meeting their needs. However, this theory has limitations (Samkange, 2015). Children learn language not only by imitating but also by creating new words and making "smart mistakes," such as saying "drank" instead of "drunk." This means that children learn language not only through imitation but also by creating rules.

Nativist theory

The founder of the nativist theory was Noam Chomsky. He viewed the process of language learning as innate (Lemetyinen, 2023). Chomsky said that children are innately prepared to learn the language and the complex language rules, even with little input. He developed a concept called the Language Acquisition Device (LAD), through which children learn the rules of their native language with the help of Universal Grammar (UG). According to him, the child's language environment activates this LAD, which helps them learn the basic structure of language (Flevaris, n.d.).

Noam Chomsky proposed several ideas in his nativist or innateness theory. According to him, children are born with a biologically determined capacity to acquire language. Chomsky discusses the poverty of the stimulus, arguing that the linguistic input children receive is often incomplete and grammatically incorrect. However, they develop a complex and advanced concept of the rules of language that is much greater than this input. He introduces the concept of the Language Acquisition Device (LAD), a hypothetical mental organ. This device contains an underlying concept of the basic principles of all human languages, known as Universal Grammar (UG). According to Chomsky, exposure to language activates the child's LAD, and it helps the child discover the specific rules of the language they are learning and follow them to the underlying universal principles. Chomsky's theory, especially the concept of Universal Grammar, has developed significantly over time (Barman, 2014). Chomsky first introduced syntax as a central element in linguistics in his book Syntactic Structures (1957) and proposed the concept of generative grammar. This system of rules can produce all and only grammatical sentences of a language. This work further established the concept of underlying meaning and surface structure. It also helped to understand the role of their transformation. Later, in his book "Aspects of the Theory of Syntax" (1965), he clarified these concepts further. There, he emphasized linguistic competence and distinguished it from performance. Chomsky's LAD theory attempts to explain the logical problem of language acquisition (Christensen, 2019). It discusses how children acquire such complex knowledge with limited input. Chomsky's theory was later developed further. In the 1980s, the "Principles and Parameters" (P & P) method and the "Government and Binding" (GB) theory were added. It redefines Universal Grammar as the focus of linguistic inquiry. It is seen as a modular system where several principles and parameters are assumed to be familiar to all human languages and govern language acquisition.

In contrast to Chomsky, cognitive theory is seen. Jean Piaget's theory emphasizes the relationship between language acquisition and brain development. Piaget said children's understanding of the world forms a foundation for language development (Thompson, 2017). For example, the ability to understand the existence of an object even if it is not in one place (object permanence) is essential for children to learn language. However, this theory has some problems when learning the complex syntax of language.

Lev Vygotsky's Social Development Theory further emphasizes the importance of social interaction in cultural and linguistic development (McLeod, 2025). Vygotsky claimed that development occurs through social learning, where cognitive functions first appear at the social level (between people) and then are internalized at the individual level (within the child). He introduced the concept of the "Zone of Proximal Development" (ZPD). It describes the gap between what a child can do alone and what he can do with the help of another knowledgeable person (such as a teacher, guardian, or more capable classmate). According to Vygotsky, language is an important tool for communication and intellectual development, progressing from social speech to private speech (talking to oneself) and finally to silent inner speech (attention). Vygotsky also emphasized the influence of culture. He said the cultural environment influences children's thinking and development of cognitive tools.

Various theories show that language learning is a complex process. Understanding it from different perspectives is necessary. Chomsky's innate theory, Piaget's cognitive perspective, and other theories help us better understand the process of language learning and its social and cultural influences.

3.3. Exploring Theoretical Perspectives on Screen Time

The proliferation of digital devices has made screen time an essential part of modern life. Screen time is now a new reality, especially for children and adolescents. From smartphones and tablets to television and computer screens, they provide a wealth of content and opportunities for various forms of communication. Much debate exists about how this new behavior impacts personal development and social well-being. To understand this complex impact, it is important to analyze the contrasting assumptions of social learning theory and online communication regarding transfer versus stimulation (Valkenburg & Peter, 2007).

Social Learning Theory

The proponent of social learning theory is Canadian-American psychologist Albert Bandura (Akers & Jensen, 2007). Social learning theory provides a valuable perspective on how individuals acquire behaviors, attitudes, and cognitive skills by observing others. Screens often hinder this skill. Social learning theory (SLT) states that learning is a process that occurs in a social context. It involves observational learning, reinforcement (both direct and indirect), and cognitive processes (Bandura, 1971).

SLT offers a new perspective on the effects of screen time. According to SLT, children and adolescents learn by observing characters and people presented in various media. If they model these behaviors, especially if the behavior is demonstrated by a popular or influential person or model, the child will imitate it as a positive outcome. A key concept of SLT is vicarious reinforcement (Salkind, 2008), which states that a person is more likely to perform a behavior if they see someone being rewarded for it. On the other hand, seeing punishment reduces the likelihood of performing that behavior. Therefore, the results displayed on the screen can significantly influence the viewer's likelihood of adopting a specific behavior (Bandura, 1971).

In addition, screen technology and opportunities can affect a person's self-efficacy, which is the belief in one's ability to perform a given task or situation. By seeing others perform successfully on the screen, the viewer increases his or her confidence in his or her abilities.

3.4. Screen Time and Social Well-Being

Displacement vs. Stimulation

Two opposing perspectives on the effects of screen time and online communication on social well-being can be seen (Valkenburg & Peter, 2007). These are displacement theory and simulation theory.

3.4.1. Displacement Hypothesis

According to this theory, online communication, which accounts for a large part of many adolescents' screen time, reduces the likelihood of this communication being good because the screen establishes face-to-face relationships. Those who support this perspective argue

that spending time on screens can weaken "strong relationships" and increase "weak relationships" (such as relationships with online friends). As a result, it can lead to loneliness and a lack of social skills in adolescents (Valkenburg & Peter, 2007; Hall & Lui, 2022).

3.4.2. The Stimulation Hypothesis

On the other hand, according to the stimulation hypothesis, online communication can benefit social well-being. Technology provides opportunities to spend time with existing friends and strengthen their relationships(Morris, 2020). Modern online communication technologies, such as instant messaging (IM), facilitate communication with existing friends and can help strengthen relationships. They do not replace face-to-face interaction but rather act as an additional channel through which communication and support can be shared with friends (Valkenburg & Peter, 2007).

3.5. Empirical evidence and analysis

Valkenburg and Peter (2007) directly tested this counterfactual among Dutch adolescents. Their results support the incentive theory. They found that time spent with friends via instant messaging was positively associated with the quality of friendships and beneficial to social well-being. Social learning theory, transference, and incentive theory provide two important perspectives for understanding the relationship between screen time and individual development. The incentive theory suggests that some online communication, especially instant messaging that maintains contact with existing friends, can positively affect relationship quality and social well-being (Bandura, 2001). However, the effects of screen time are complex and multidimensional (K. Kaye et al., 2020). When using theoretical frameworks, we must remember that excessive screen dependence often creates a 'displacement effect', which reduces the time spent talking to people directly. Especially in the case of children, where direct communication is the main basis for language learning, eye contact and body language are much more important than mechanical messages. Finally, in the light of modern research, it is clear that screen time is not just a matter of time, but also its quality and the context of use that determine whether it helps or hinders children's development. Therefore, future research needs to analyze its different effects in different socio-economic contexts more closely.

Chapter Four

Research Methodology

Research is an academic activity. This term is best used in a technical sense, according to Daniel and Sam (2011). Research is formulating a hypothesis or a proposed solution by defining and redefining a problem. Here, data is collected, organized, evaluated, inferred, and concluded; finally, it is carefully concluded to determine whether it fits the hypothesis(Taylor et al., 2015). Any research method involves various methods and techniques for analyzing and searching for data. Snyder (2019) said this task has become increasingly complex. Quantitative, qualitative, and mixed methods are three standard research methods. Each has unique methods, techniques, and data collection methods (Williams, 2007). Quantitative research involves collecting and analyzing numerical data, whereas qualitative research focuses on non-numerical data and interpretive analysis (Williams, 2007). The research process typically includes formulating research questions, sampling, measurement, research design, data analysis, and writing (Trochim, 2015). Various methods may be used, such as surveys, experiments, ethnography, and case studies (Picard, 2007). Case studies are an explicit method of "structured, focused comparison" (Levy, 2008). Data collection techniques include interviews, questionnaires, observations, and focus groups (Picard, 2007; Adams & Cox, 2008). Researchers may also adopt specific philosophical frameworks, such as constructivism, to guide their inquiry (Baker, 2006).

Research and **longitudinal**[3] designs use additional methods to evaluate something or study changes over time (Baker, 2006). Ethical considerations and validity for research are important aspects of the research process (Trochim & Donnelly, 2001).

Qualitative research methods provide deep insights into complex phenomena by exploring people's experiences and perspectives (Freeman & Given, 2011). This method is widely used in sociology, health sciences, and the humanities (Freeman & Given, 2011; Liamputtong & Ezzy, 1999; Given, 2008). In-depth interviews, focus groups, ethnography, and participatory action research are the main methods used (Liamputong, 2005). Data collection also often involves interviews and observations (Patton, 2002). Analysis usually follows an inductive approach, where conclusions are drawn directly from the data (Gamboa, 2003). Researchers

[3] Longitudinal research is a scientific method that involves observing and analyzing the same individuals or groups over a long period. This research collects data at regular intervals, which helps to understand changes over time (Rainer, 2011).

must ensure rigor through credibility, transferability, reliability, and conformability (Ahmed, 2024). Qualitative research helps explore new phenomena, capture individual thoughts and feelings, and understand complex social processes (Lim, 2024). It differs from quantitative research in its purpose and the type of information it provides, which often produces unstructured, literal data that requires careful analysis and interpretation (Patton, 2002).

Research methods are fundamentally important because they provide the systematic frameworks and procedures needed to generate reliable and valid knowledge about the world. Without a well-defined research methodology, no observations or conclusions can be reached. A systematic approach allows for in-depth exploration of subjective and complex phenomena. The impact of screen time on children's speech and language development is one area where qualitative research methods can provide insight into various issues.

4.1. Research Method of This Study

This study followed an explanatory mixed research methodology, where it first collected and analyzed numerical data to identify trends, followed by collecting and analyzing qualitative data to explain the initial findings. It provided an opportunity to understand better children's screen time use, the content they observed, their behavior, and their responses. Observation was conducted in a structure from which detailed notes were taken for expected and unexpected behaviors.

4.1.1 Participants

A total of 50 children and 50 parents and care givers were selected as participants for the study.

a) *Children*

The importance of ensuring diversity in age, gender, socioeconomic status, and geographical location (city/rural) of children from different cities and villages, including Dhaka, Chittagong, and Tangail, was emphasized. Children aged 3-8 years were observed for this study. This age is an important developmental period for language learning, skill acquisition, and communication skills. As part of the study, children's access to digital devices and content was included. An attempt was made to ensure diversity in screen technology-related behaviors.

b) *Parents and caregivers*

The caregiver's perspective is crucial, as they control children's screen time exposure. They can monitor children's development and provide valuable insights into the potential effects of screen use.

The inclusion criteria for children in this study were:

a) Aged between 3 and 8 years.
b) Living in Bangladesh.
c) Had some screen time exposure (reported by the caregiver).

The inclusion criteria for caregivers were:

a) Primary caregiver (parent or legal guardian) of the child.
b) Ability to answer interview questions.
c) Consent to participate in the study.

4.1.2 Screen time observation period

Each child was observed for 30 minutes of screen time. During this time, they were engaged with their favorite content. Everyone was given a mobile phone and tablet. The phone's settings were changed to use child-friendly applications and content. Real-life situations were simulated through the use of mobile phones.

4.1.3 Observation details

The following information was collected during the 30-minute screen time observation period:

Content-Type

Children selected from a variety of content types, such as:

a. Educational apps (e.g., language learning apps, math games)
b. Entertainment apps (e.g., cartoons, video games)
c. Social media (if safe to observe)

Time of use

Level of engagement: Active or passive engagement with the screen (e.g., interacting, staring blankly).

Emotional Response: Expressions of happiness, frustration, excitement, or annoyance during use.

Attention span: Whether the child paid attention to the content or repeatedly wanders off.

After use

Immediate response: Children's physical and emotional state after screen use (e.g., excitement, annoyance).

Social interaction: Whether the child interacted with others (e.g., parents, classmates) after screen use or whether they wanted to be left alone.

Behavioral changes: Any activity or mood changes after screen use (e.g., increased energy, restlessness, fatigue).

a) Physical responses: Physical responses such as eye strain, restlessness, or fatigue was noted.

b) Language responses: Did the child talk about what they saw or played with, and has their language skills been affected (e.g., new words, integrated sentences, or jargon)?

4.2. Data collection

Detailed demographic data were collected from each child and their parents/guardians before the observation process began. This data helped in fulfilling the objectives of the study and analyzing the effects of various variables. The data was mainly divided into two sections:

1. Data Related to Children

The following data was collected to understand the development and screen usage patterns of children:

Age: To observe how the trend of screen usage and its effects change at different developmental stages.

Gender: To examine whether there was any gender differences in screen usage habits or preferences between boys and girls.

Location (City/Rural): To conduct a comparative analysis between the screen usage rate, content preferences and responses of children growing up in urban and rural contexts.

Accessibility of technology: To ascertain whether children had regular access to mobile phones, tablets or other digital devices and what type of devices they usually use most.

Safety and usefulness: To ascertain what types of applications children used and how appropriate or child-friendly they were for their age.

2. Data Related to Parents and Caregivers

The following data were collected from parents to understand the environment and family influences on children's screen usage:

Socio-economic status: To study whether the family's source of income and standard of living had any impact on children's screen usage behavior or device accessibility.

Occupation and engagement: To identify the type of employment of parents and how much quality time they spent with their children daily.

Awareness and attitudes: To assess parents' personal awareness of the potential harmful effects of screen time and their mindset or reasons behind handing over devices to their children.

Control of device use: To collect whether parents set or supervised the time their children spend on digital devices and how much time they themselves spent on digital devices in front of their children (modeling behavior).

4.3. Research Area

The research area is the impact of screen time on children's language and speech development in Bangladesh. The Fourth Industrial Revolution (4IR) has led to an increase in the use of digital devices worldwide, and with it, children's screen time has also increased significantly. This trend is particularly noticeable in South Asia, especially Bangladesh, where smartphones, televisions, computers, and gaming consoles are increasing. This premature and excessive screen time affects various aspects of children's development, especially language and speech acquisition, which serve as an important foundation for later physical and social development. The first 1000 days of a child's life (approximately the first three years) are critical for brain development and maturation. Language and speech acquisition are most intense during this period, and interactions such as bonding with parents, talking, reading,

and playing are significant. However, screen time affects the nature and frequency of these important interactions, which may alter the trajectory of language development.

This study is critical in the Bangladeshi context for several reasons. The rapid development of digital technology and the ease of access to digital devices, even in rural areas, have led to children's increasing use of screens. It is, therefore, essential to understand how screen time affects language development in Bangladesh. Family structure, parental education level, alternative stimuli within the home (such as books or toys), and the type of content viewed can all mediate this relationship. In addition, the lack of early encouragement and language-related resources in Bangladesh further increases the need for such research.

4.4. Sampling Method

Due to the nature of the study, this study primarily used purposive sampling to explore experiences and perceptions related to screen time and language development. This method enabled the researcher to select participants based on specific characteristics or experiences relevant to the research question.

Specifically, the purposive sampling technique was used for the following reasons.

a) Maximum diversity sampling: This helped to select participants with diverse backgrounds and experiences related to screen time and language development.

b) General case sampling: This helped to select participants who represented the 'average' or typical experiences of screen time use and language development in Bangladesh.

4.5. Data analysis and interpretation

Qualitative data collected from the semi-structured interviews were analyzed through thematic content analysis. This method identifies, organizes, and interprets patterns (themes) within the dataset.

4.6. Ethical Considerations

Ethical considerations are critical to protecting participants' rights and well-being at all research stages. All parents provided informed consent, and confidentiality and protection were ensured. The ethical aspect of this study has been considered very seriously. Informed consent was obtained from the parents of each of the 50 children participating in the study. This means that the parents were informed in detail about the purpose, methods and potential effects of the study and the data of the children were collected based on their voluntary consent.

According to the research policy, the confidentiality of the personal information of the participating children has been strictly protected. The information collected has been used only for research purposes and has been stored in such a way that the identity of the children is not revealed in any way. The issue of psychological and social protection of children has been given the highest priority here. No methods have been adopted during the survey or observation that could be harmful to them. In particular, the opinions of experts such as child psychologists and linguists have been taken in analyzing the effects of digital media use, so that the research process is scientific and safe. These ethical precautions have increased the reliability and acceptability of the study many times over in understanding the effects of increasing screen time in the context of Bangladesh. One of the main goals of this study is to ensure a bright future for children by maintaining the trust of parents and teachers.

Chapter Five

Data Presentation and Analysis

Proper interpretation and analysis of the data collected and obtained at the field level play a vital role in achieving the intended goal of any research work. Since this research was conducted using a mixed method, an attempt has been made to present the data collected from two perspectives: linguistic analysis and some simple statistical presentation.

This study included 50 children and 50 parents and caregivers from different backgrounds. Demographic information was collected to understand the differences in screen time usage in different groups.

5.1. Demographic Information of the Participants

Table 1: Children's demographic information

The age group of children	**Particulars**	**Number**	**Percentage**
	3-5 years	25	50%
	6-8 years	25	50%
Gender	Female	25	50%
	Male	25	50%
Location	Urban	30	60%
	Rural	20	40%

Table 2: General information of parents and caregivers

Role	**Frequency (n=50)**	**Percentage (%)**
Parents	30	60%
Other caregivers (Teachers and family members)	11	22%
Member of civil society	9	18%

Participant Profile: The majority of participants were parents (60%), followed by other caregivers (22%), and civil society members (18%). This analysis reflected the perspectives of those directly involved in children's development and screen use.

Table 3: Socio-economic status

Status	Number
Low Socio-economic status	10 children
Middle Socio-economic status	20 children
Upper Socio-economic status	20 children

Table 4: Tech Access

Device type	Number
Regular use of digital devices	30
Occasional use of digital devices	20

The analysis of demographic and technology use data of the 50 children participating in the study revealed a balanced and diverse picture. In terms of socio-economic background, most of the participants were from middle-class (20) and upper-class (20) families, while only 10 were from low-class families. Geographically, the presence of children from urban areas (30) was higher than that from rural or local areas (20) (Figure 2).

Demographic Distribution

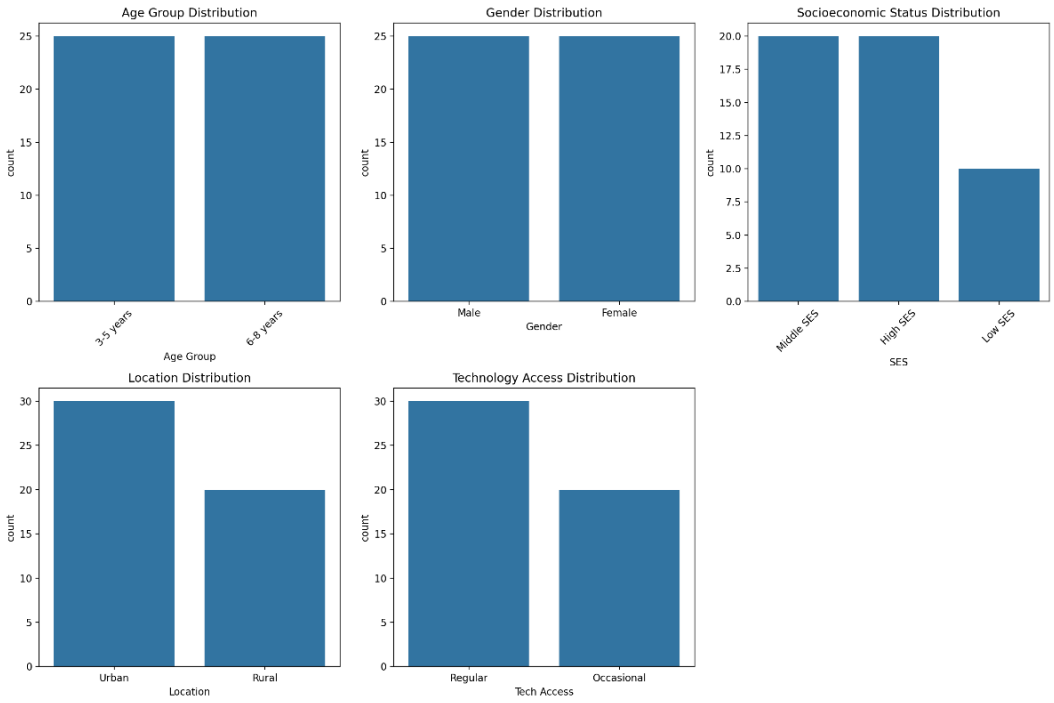


Figure 2: Demographic distribution

Demographic Relationships

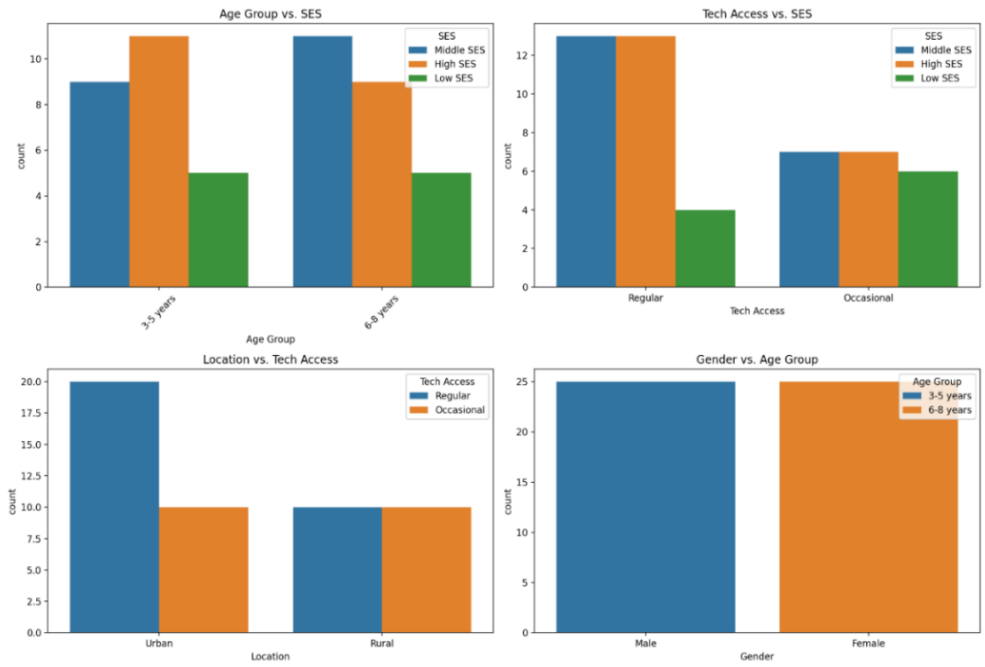


Figure 3: Demographic relation

In terms of technology accessibility, 60% of the total sample (30) used digital devices regularly, and the remaining 40% used them occasionally. A close relationship between socio-economic status and technology use was observed in the cross-tabular analysis (Figure 3). The rate of regular device use among children from upper- and middle-class families (13 each) is significantly higher than that of children from lower-class families (4). Similarly, the rate of regular use among urban children (20) is twice that of rural children (10).

Table 5: Perception of Parents and Caregivers on Children Screen Time Use and Exposure

Questions	Answer	Frequency (n=50)	Percentage (%)
5. How many hours per day do the children spend on screens?	Less than 1 hour	5	10%
	1-2 hours	15	30%
	3-4 hours	20	40%
	More than 4 hours	10	20%
6. What types of screens do the children use the most?	Television	35	70%
	Mobile phone	45	90%
	Tablet	25	50%
	Computer/laptop	15	30%
	Video games	20	40%
7. What types of content do children engage with?	Educational videos and apps	35	70%
	Cartoons/entertainment programs	40	80%
	Interactive games or apps	30	60%
	Video games	20	40%
	Social media (e.g., YouTube)	10	20%
8. How often do children engage in interactive screen activities?	Rarely	10	20%
	Occasionally	15	30%
	Frequently	15	30%
	Always	10	20%
9. How often do children engage in passive screen activities?	Rarely	5	10%
	Occasionally	15	30%
	Frequently	20	40%
	Always	10	20%

Analyzing the presented data, it is seen that according the parents and caregivers' view most children (40%) spend an average of 3-4 hours of screen time daily. Among the devices, mobile phones are the most used (90%), followed by television (70%). In terms of content,

80% of children prefer to cartoons and entertainment shows, and 70% educational videos or apps. The study shows that children are more involved in passive or inactive screen activities (60% often or always) than in interactive or active tasks. Overall, extensive use of smartphones and prolonged viewing of entertainment content have been observed as the main features of children's daily habits.

5.2. Parents and Caregivers' Perspectives: Screen Time Use by Participants

The following data was generated based on responses from 50 parents' participants. This data provided an overview of the patterns of screen time, content use, and potential impacts on children's language development in Bangladesh.

Results getting from Qualitative Study

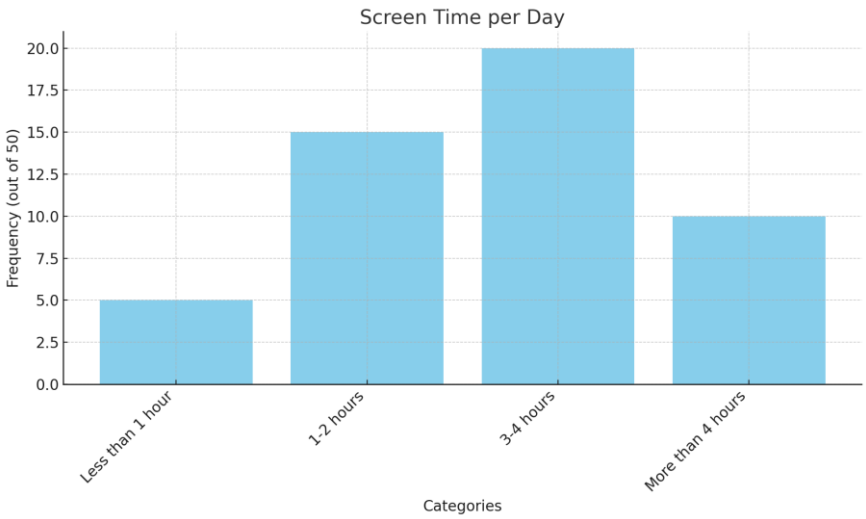


Figure 4: Screen Time per Day

A significant portion (40%) of children use screens for 3-4 hours and 30% for 1-2 hours daily. This shows that screen time is very prevalent. When children spend at least 1 to 4 hours a day on screens, it reduces their physical activity and direct social interaction time (Figure 4). In the long term, this habit can increase the risk of children developing attention deficits and language delays.

Table 6: Parents and Caregivers' opinion on Impact on Language Development

Questions	Answers	Frequency (n=50)	Percentage (%)
10. How does screen time impact children's speech and language development?	Positive impact	10	20%
	Negative impact	25	50%
	No significant impact	10	20%
	Not sure	5	10%
11. What specific language skills do you believe are affected by excessive screen time?	Vocabulary size	30	60%
	Sentence structure and complexity	25	50%
	Pronunciation and articulation	15	30%
	Listening and comprehension skills	20	40%
	Social communication skills	25	50%
12. Do you notice changes in children's language development based on content type?	Educational content promotes better language skills	35	70%
	Entertainment content hampers language development	15	30%
	No, the type of content does not seem to matter	5	10%
	Not sure	5	10%
13. Do you believe screen time can be beneficial for language development if used appropriately?	Yes	30	60%
	Not sure	15	30%
	Better communication skills	5	10%
14. Children who spend more time with screens tend to have better or worse communication skills?	Worse communication skills	10	20%
	No significant difference	25	50%
	Not sure	10	20%
	Answers	5	10%

The tabular data shows that parents have mixed but conscious views on the impact of screen time on children's speech and language development (Table 6). Half of the respondents (50%) believe that excessive screen time has a negative impact on children's language development. On the contrary, only 20% see it as positive. When asked which skills are affected by excessive screen use, 60% of respondents reported a decrease in vocabulary. In addition, screen time has also been blamed for the creation of social communication skills (50%) and sentence complexity (50%). Its negative impact on listening and comprehension skills has also been highlighted.

However, the study also revealed a potential side of screen time. 70% of respondents believed that educational content could be helpful in improving children's language skills. In addition, 60% of participants agreed that screen time might be beneficial for children if used in the right and controlled way. Finally, although 50% of respondents did not see any significant difference in the communication skills of children with prolonged screen time compared to normal children, 20% of respondents confirmed a clear decrease in communication skills. Overall, these data suggested that while uncontrolled screen time can be a barrier to language development, quality content and moderate use can bring about positive changes that reduce this risk.

Table 7: Parental and Social Influence

Questions	**Answers**	**Frequency (n=50)**	**Percentage (%)**
15. How involved are parents in regulating their children's screen time?	Highly involved, set clear limits	15	30%
	Moderately involved, sometimes set limits	20	40%
	Not very involved, no clear guidelines	10	20%
	Not sure	5	10%
16. Do parents actively engage with children while they are using	Yes, always	10	20%
	Sometimes	15	30%

screens?	Rarely	15	30%
	Never	10	20%
17. What role do you believe teachers, schools, or caregivers play in mitigating the adverse effects of screen time?	Very important role	20	40%
	Moderately important role	15	30%
	Little to no role	10	20%
	Not sure	5	10%
18. How much responsibility do you think the media (TV channels, social media, game developers) has in influencing children's language development?	High responsibility	25	50%
	Moderate responsibility	15	30%
	Little responsibility	5	10%
	No responsibility	5	10%

The data provided an important picture of the role of parents, educational institutions and the media in managing children's screen time. The survey found that 40% of parents are moderately involved in controlling their children's screen time, and 30% of parents are very active in setting limits (Table 7). However, it was worrying that only 20% of parents were always actively involved with their children when they use screens. In contrast, 30% of parents spent 'sometimes' and another 30% 'very little' time with them. In other words, most children were using screens without any parental accompaniment, which was a major risk to language development.

Regarding the role of educational institutions and teachers, 40% of respondents believed that they had a very important responsibility in reducing the negative effects of screen time. In addition, the issue of the responsibility of media and game developers also came up strongly. 50% of participants believe that TV channels, social media and app developers have a 'high level' responsibility in children's language development, and 30% see it as a 'medium' responsibility.

Overall, these data suggest that individual control alone is not enough to address the negative impact of screen time on children's language development. Rather, active participation by

parents, proper guidance from teachers, and a concerted effort by media platforms to create responsible content are essential.

Type of Screen Most Used

Most Used Screen Device: Mobile phones are the most used device, followed by televisions and tablets. This indicates that portable devices such as mobile phones are children's primary source of screen exposure.

In the current digital era, various electronic devices or screens have become an integral part of the daily lives of children in Bangladesh. Analyzing the screen usage data of 50 children who participated in the study, it is seen that the availability of modern technology has radically changed the childhood of children. According to the results of the study, the use of various types of devices among children and their impact was very significant.

1. Exclusive dominance of mobile phones: According to the study data, 90% of children (45) used mobile phones, which was the highest among all devices. This statistic proved that mobile phones are currently the main source of screen exposure for children. There are several basic reasons for this:

a. Availability and portability: Since mobile phones are small and portable, children can use them anywhere. Children can easily reach the phone while eating, traveling, and even before sleeping.

b. Personal Use: In many cases, it is seen that the elders of the family hand over their personal phones to their children to keep them calm, which gradually turns into an addiction.

c. Variety of applications: The availability of YouTube Kids, games and various learning apps attracts children the most to mobile phones.

2. Using screen

The study found that 70% of children (35 people) watch television. Despite the increasing popularity of mobile phones, television still remains a major source of entertainment for children. Generally, children watch channels like cartoon channels or Discovery Kids more with family members. However, the limitation of television compared to mobile phones is

that it has to be watched sitting in a specific place, due to which its usage rate is slightly lower than mobile phones (20%).

3. Use and growing popularity of tablets

50% (25 people) of the children participating in the study use tablets. Tablets are generally attractive to children due to their large screen experience and touch-sensitive interface. Many conscious parents prefer tablets as a large screen for children's studies, which is believed to put less strain on the eyes than mobile phones. The use of tablets for playing educational games is especially significant among children of this age.

4. Limited but influential role of video games and computers

The study found that 40% of children (20) play games through video game consoles or devices and only 30% of children (15) use computers or laptops. The main reason for the low rate of computer use is its complex interface. It may be a bit difficult for children aged 3 to 8 to operate a computer using a mouse or keyboard. However, children aged 6 to 8 were more likely to watch YouTube or play games on laptops or computers.

5. The link between the impact of portable devices and language development

This result of the study indicates a matter of deep concern. Since portable devices such as mobile phones and tablets are the main screen medium for children, it is becoming difficult for parents to control their screen time. Children generally prefer to watch "short-form" content or fast-paced videos on mobile phones. According to the main summary of the study, when children only watch entertainment or passive content on such devices, their language skills and social communication abilities are hampered. On the other hand, if these same devices are used for interactive or educational purposes, it can be helpful in increasing children's vocabulary.

6. Socio-economic and environmental context

The results are highly relevant in the context of Bangladesh. Due to the lack of playgrounds for children due to urbanization and the busyness of parents in single families, mobile phones have emerged as children's "digital companions". The 90% usage rate of mobile phones indicates that it is no longer a luxury but has become a common object within the reach of children in every home.

Impact on language skills

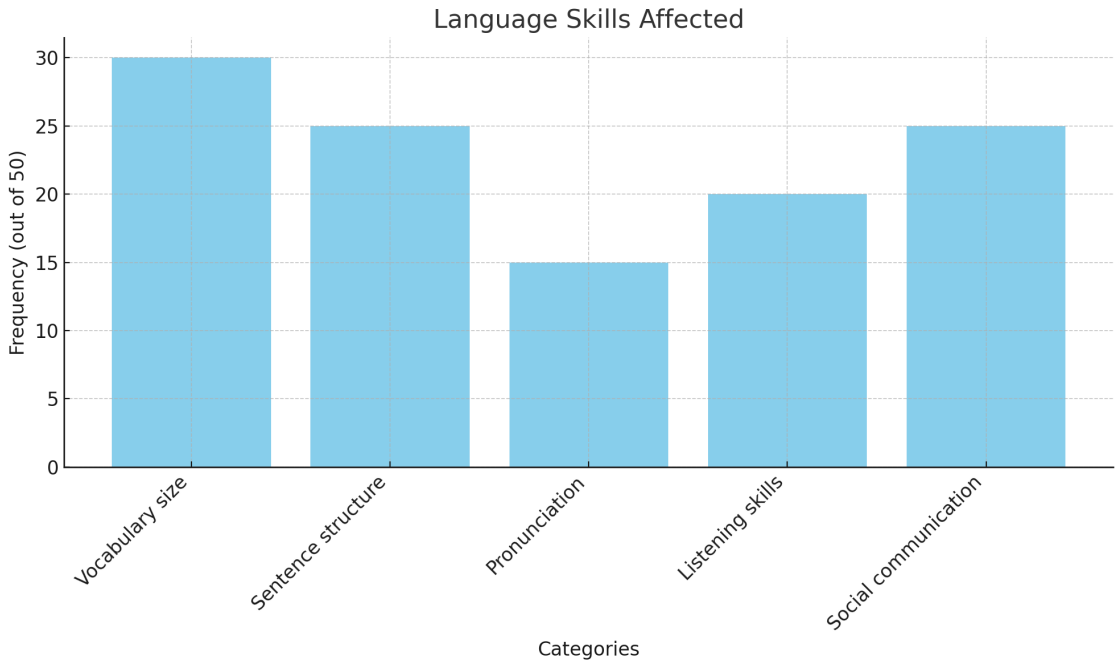


Figure 5: Impact on language skills

The majority of participants (50%) believe that screen time negatively impacts children's language development, which is consistent with concerns that excessive screen use can hurt communication skills (Table 5).

There’s lack of two-way communication. The main condition for learning language is talking to people and getting feedback. When children watch videos on the screen, it is only a 'one-way' process. Even though the child hears, s/he does not get the opportunity to speak himself, which reduces his ability to use new words. Second, vocabulary limitations. In entertaining cartoons or games, meaningless words or excessive word abbreviations are often used. As a result, children cannot learn to form sentences correctly. Research has shown that even if children aged 6-8 talk about the content, their sentence structure is weak. Here’s social isolation is an issue. Children addicted to screens lose interest in talking to people around them or asking questions. Language is not just words, but also a combination of eye gestures and gestures. Excessive screen use causes children to lose these 'non-verbal' communication skills, which severely impairs their social communication abilities or social skills. Basically, lack of active participation is the main cause of linguistic inertia.

Impact of Content Type on Language Development

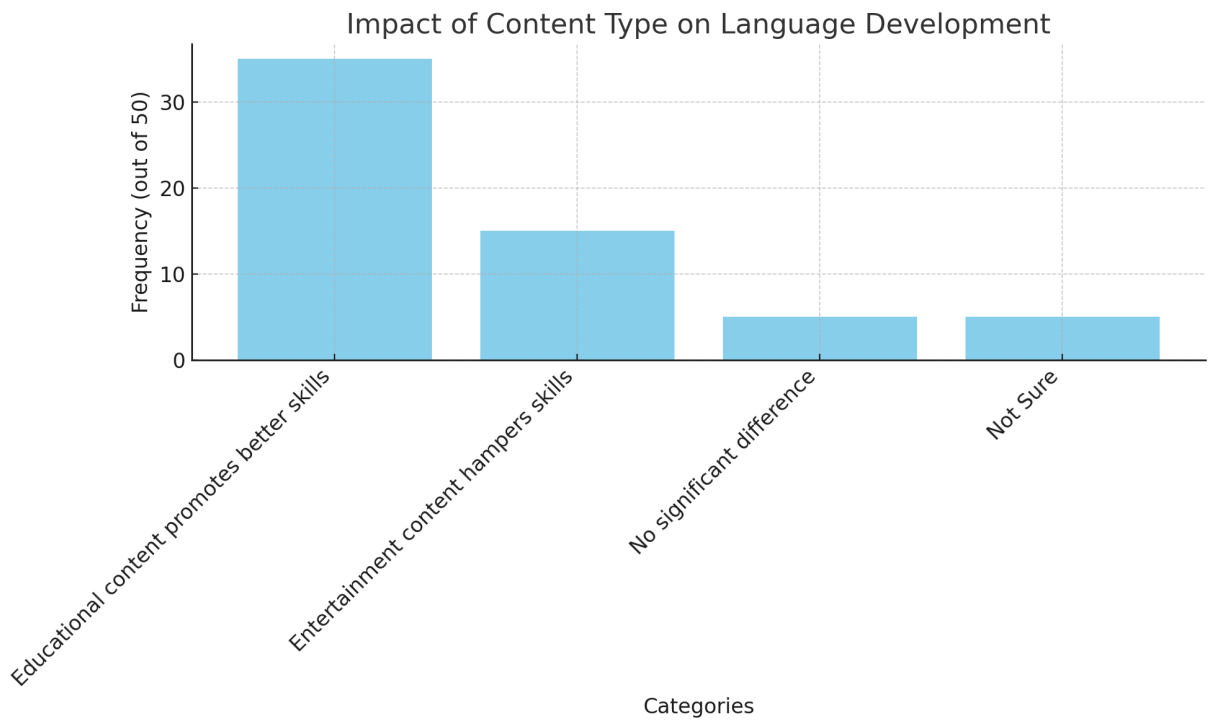


Figure 6: Impact of Content Type on Language Development

Excess screen time most affects vocabulary and social communication skills, with many participants noticing changes in sentence structure and listening skills. Quality educational content plays a helpful role in enriching children's vocabulary and eliminating the complexity of sentence formation. Compared to general entertainment, such content encourages children's active participation, which has a positive impact on their listening skills and correct pronunciation (Figure 6). With proper guidance, age-appropriate educational media significantly increases children's social communication skills. This effect is particularly clear for children aged 03-08. When children are passively exposed to entertainment content, they miss out on opportunities to use language. In contrast, quality educational programs encourage them to use new words, which increases their confidence in real-life conversations and helps overcome long-term language inertia.

Screen Time Can Be Beneficial if Used Appropriately

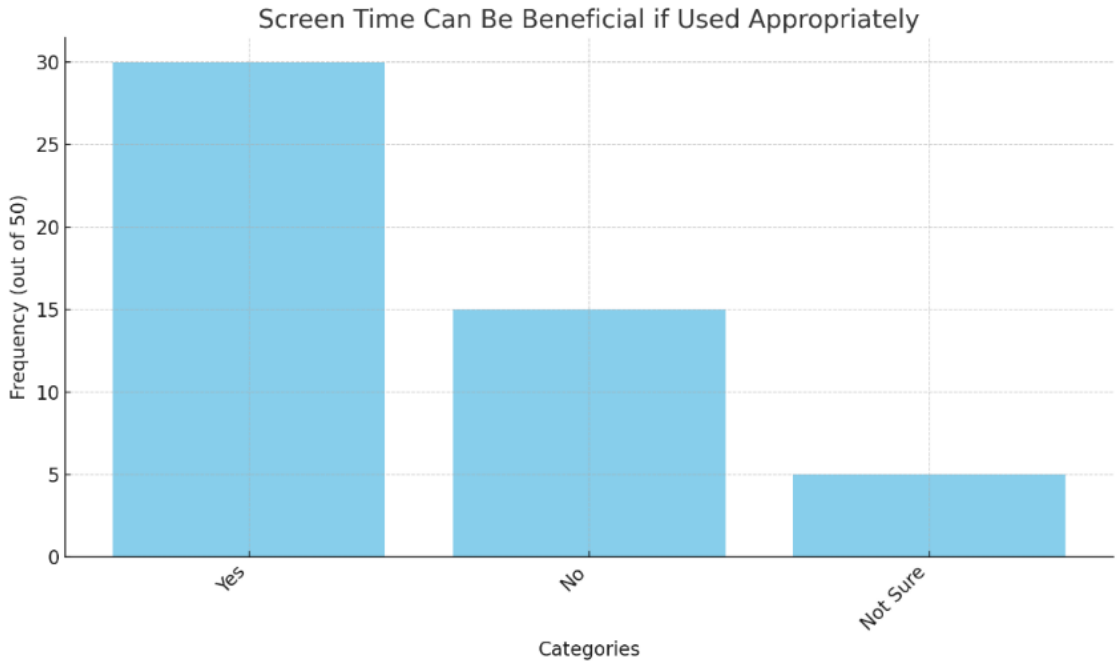


Figure 7: Screen Time Can Be Beneficial if Used Appropriately

Out of the 50 respondents who participated in study, 30 (60%) believe that screen time or the use of digital devices can be positive for children, if it is used in the right way and in a controlled manner (Figure 7). This view highlights the indispensability of technology in the modern education system and the importance of its constructive use. According to participants, the main condition for proper use is the quality of the content. If educational apps, word learning videos or content that enhances language skills are watched instead of ordinary entertaining cartoons or games, children's vocabulary increases significantly. Especially for children aged 3-5, interactive or active content helps them learn new words and form sentences.

A large part of these 30 respondents believe that the usefulness of screen time largely depends on the involvement of parents. When a child watches a screen alone, it is in the passive or inactive learning stage, which can hinder language development. But if the parent sits with the child and watches the content (co-viewing) and discusses and asks questions on various topics, it increases the child's social communication skills and comprehension.

Communication Skills with Screen Time

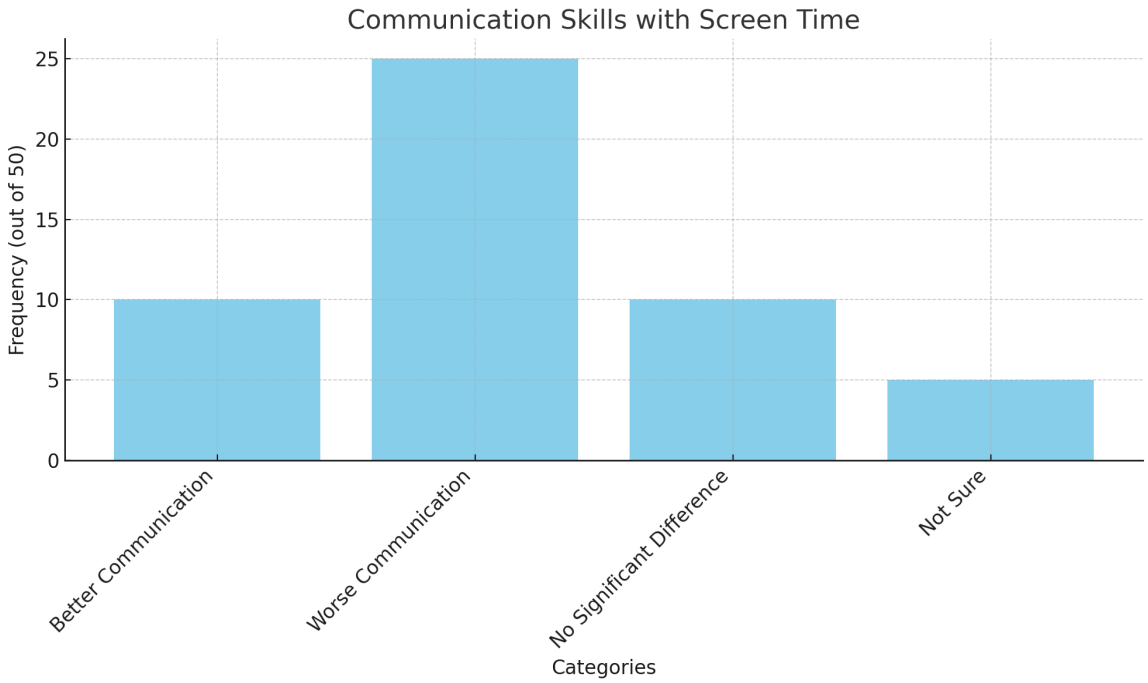


Figure 8: Communication Skills with Screen Time

Most participants, around 50% of the participants felt that more screen time worsened communication skills, negatively impacting social interaction and language use (Figure 8). Excessive screen time reduces children's real-life communication skills because it deprives them of the opportunity for face-to-face or direct conversation. When children are immersed in screens for a long time, they do not learn to understand the eye contact and body language of the people around them. This makes them feel awkward when talking to others in a social environment. When it comes to using language, they only parrot the words they hear on the screen, but cannot express their feelings in a coherent manner. As a result, their social interaction and natural language use ability are hindered. This reduction in real-life interaction stunts the development of emotional intelligence in children. When a child spends too much time in front of a screen, they fail to understand the subtle changes in the emotions or feelings of others. This digital dependency limits their ability to think spontaneously and communicate creatively. As a result, they become mere passive consumers of information, which significantly impairs their social adaptation and long-term language skills.

Parental Involvement in Regulating Screen Time

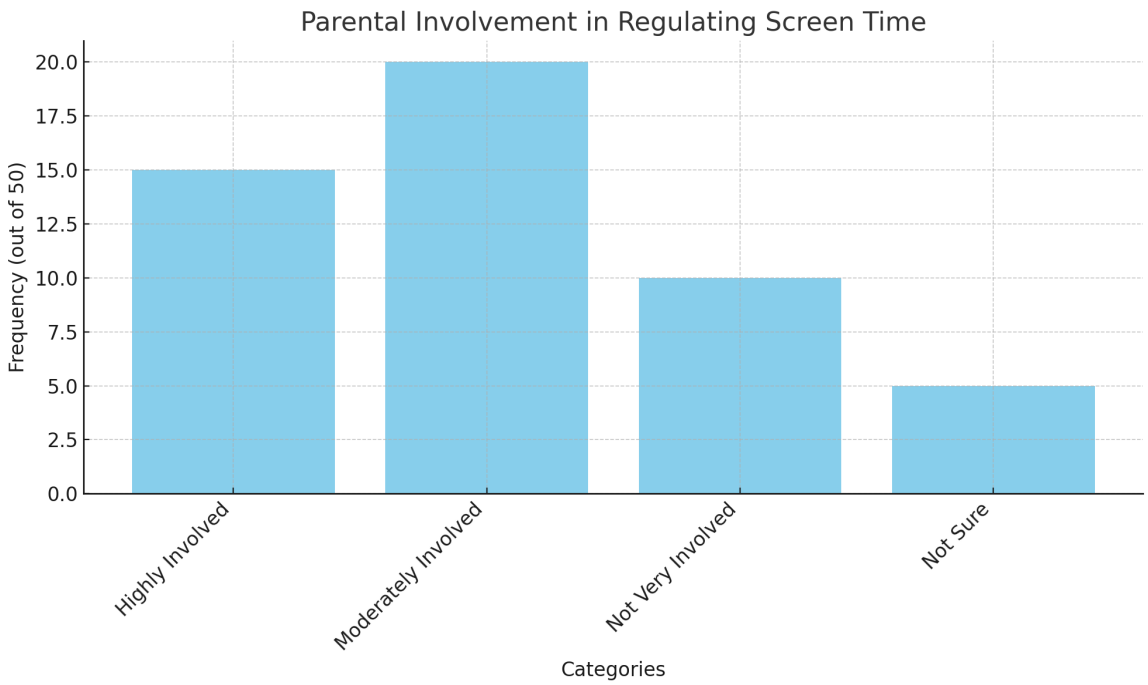


Figure 9: Parental Involvement in Regulating Screen Time

This study found that only 15 (30%) of the participating parents were 'highly involved' in controlling their children's screen time and set specific limits (Figure 9), which is highly inadequate in the current context. On the other hand, 20 (40%) parents were 'moderately involved' and 10 (20%) parents said they were 'not very involved' in their children's screen time. The remaining 5 (10%) were not sure about this. Children are basically imitators; therefore, if parents are not aware of their mobile usage and do not set time limits for their children, then children easily fall prey to digital addiction. Lack of control basically allows children to view low-quality content. Parents should not only reduce the time, but also regularly monitor what their children are watching. Only through proper supervision and setting time limits can children be protected from the long-term risks of digital addiction, which can otherwise seriously disrupt their normal socialization. This indifference of parents gives rise to an uncontrolled digital habit in children, which later becomes a cause of stubbornness and irritability. When children see low-quality content, the foundation of their moral and linguistic development is weakened. Therefore, it is possible to overcome this crisis not only by mechanical discipline, but also by strengthening family ties.

Parental Engagement While Using Screens

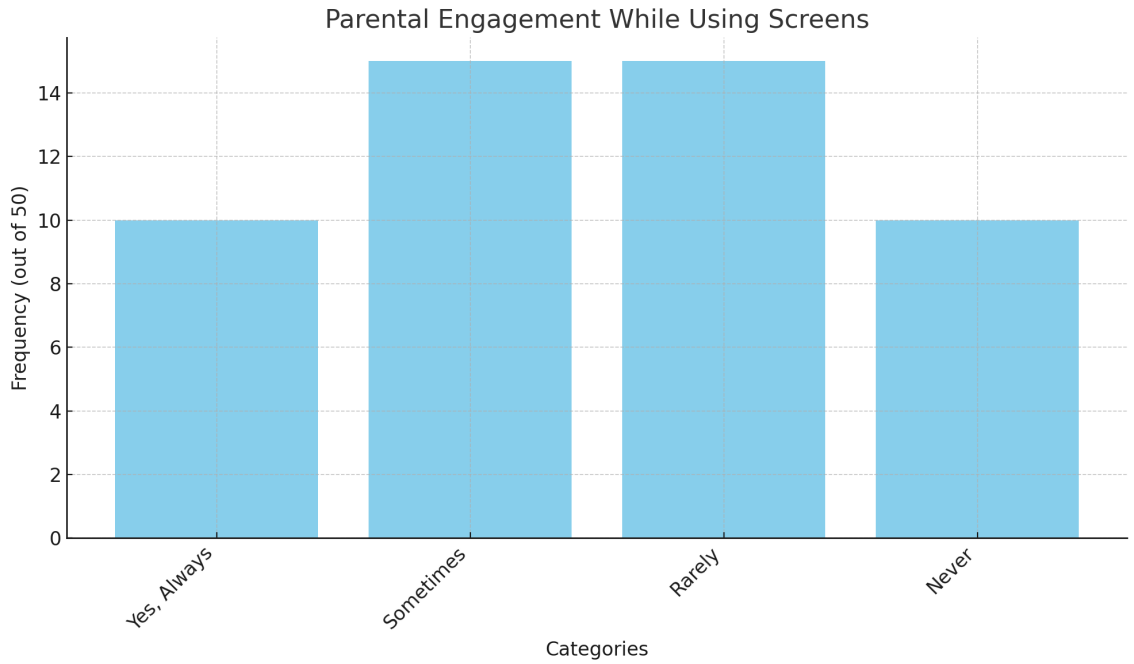


Figure 10: Parental Engagement While Using Screens

According to data, only 20% of parents are always present when their children are using screens. This active participation or 'co-viewing' of the parent is very important, because when the child asks or discusses what s/he is seeing on the screen, his/her language develops (Figure 10). In most cases (about 80%) parents are busy with their own work by giving the device to the child. This makes the child lonely and inactive. If the parents sit nearby and talk about the content, it is no longer just screen time, but rather turns into a learning process. In the absence of the parent, the child only receives information from the screen, but does not get the opportunity to apply it. As a result, they become accustomed to only imitating words or gestures rather than using language constructively. This indifference of parents gives rise to an uncontrolled digital habit in children, which later becomes a cause of stubbornness and irritability. When children see low-quality content, the foundation of their moral and linguistic development is weakened. Therefore, it is possible to overcome this crisis not only by mechanical discipline, but also by strengthening family ties.

Teachers Role in Mitigating Negative Effects

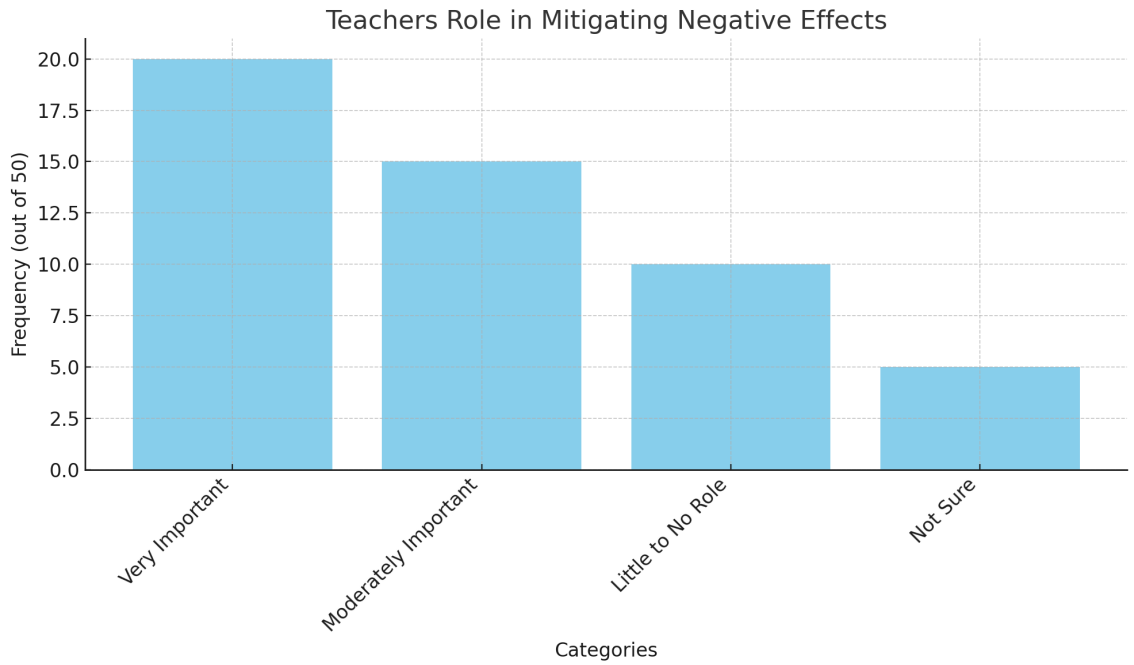


Figure 11: Teachers Role in Mitigating Negative Effects

Around 40% of the participants believe that teachers can play a very important role in reducing the harm of screen time (Figure 11). Teachers can create awareness about the proper use of digital content in the classroom and its harmful effects. They can give children creative tasks or group activities that will encourage them to interact with people more than using mobile phones. In addition, according to the teachers' suggestions, parents can create a constructive routine for children at home. The joint efforts of teachers and parents can play the most effective role in the healthy language development of children. Teachers are not only the ones who work in the classroom, but also the ones who are the key influencers in changing the mental structure of children. When a teacher uses a specific app or content as part of the teaching process, students can learn the constructive use of technology. Ultimately, this coordinated and close supervision of teachers and parents can ensure a rich linguistic and social environment by freeing children from digital addiction. This is essential for the proper development of children's confidence and talent in the long run.

5.3. Results from Children Participated in this Study

5.3.1. Contents Used by Children

Content analysis aims to analyze the types of content children engage with during screen time and how these choices affect their language development, social behavior, and emotional engagement. This analysis is based on observations of 50 children (aged 3-8 years), and the content they access is divided into educational, entertainment, and interactive content. This content analysis helps examine the patterns of screen time usage and its impact on children's development.

5.3.2. Content Categories

First, the types of content children engage with during their screen time are categorized. The following categories were used:

Educational Content

This content is designed to teach children new skills or information, such as vocabulary, numbers, colors, shapes, or concepts related to science and the environment. Examples:

- Language learning apps (e.g., Duolingo Kids)
- Math apps (e.g., Mathway for Kids)
- Educational cartoons (e.g., Sesame Street, Dora the Explorer)
- Puzzle solving games (e.g. Toca Boca)

Entertainment Content

Content designed for passive enjoyment, such as cartoons, animated shows, and children's movies. Examples:

- Cartoons (e.g., Peppa Pig, Paw Patrol, Bangla Cartoons)
- Movies (e.g. Frozen, Toy Story)
- Short YouTube videos (e.g., Nursery rhymes, toy unboxing)

Interactive Content

Games and apps that encourage active engagement, decision-making, and sometimes collaboration with others. These may include role-playing, problem-solving, or storytelling. Examples:

- Interactive games (e.g., Minecraft, Animal Crossing)
- Educational games that involve physical or mental engagement (e.g., puzzle apps, logic games)
- Storytelling apps or platforms (e.g. Storybird, Epic!)

Analysis Variables

The following variables will be assessed for each content category:

Engagement Level

High Engagement

The child actively interacts with the screen, responds to prompts, makes decisions, and engages in a conversation or play.

Low Engagement

The child is mainly passive, viewing content without making decisions or engaging in social activities.

Cognitive and Language Development Impact

Positive Impact: Content improves language skills (e.g., new vocabulary, sentence structure, improved comprehension) and mental abilities (e.g., problem-solving, memory). Quality and age-appropriate digital content works like magic to enrich children's vocabulary. It is especially helpful in learning the correct pronunciation of new words, mastering complex sentence formation techniques, and understanding the depth of the subject through stories. According to research data, children who are engaged with educational content increase their memory and attention span. This also indirectly helps them achieve academic success.

Neutral Impact: No visible changes in language development or mental skills. In many cases, it is seen that some content of ordinary quality does not bring any visible change in children's language or mental skills. This mainly happens when the content is much easier than the child's intellectual level or does not contain any new learning material. Although it does not cause any immediate harm, it wastes the child's valuable time that could be used for other creative purposes.

Negative Impact: The content may result in decreased mental skills, such as limited language use, difficulty with sentence formation, or attention problems. Excessive and unstandardized screen time can seriously deteriorate children's mental skills. As a result, children become accustomed to using limited vocabulary and face problems in forming long sentences. Digital addiction creates attention deficit in children, due to which they cannot concentrate for long on studies or any other task. This hinders their intellectual development in the long run.

Emotional and Behavioral Impact

Positive: Content may elicit positive emotions, such as excitement, joy, or peace. The child may show interest or curiosity. The right content can create joy, curiosity, and peace of mind in children. Watching videos about science or nature makes children eager to learn something new. Such positive emotions make children interested in learning and give them a kind of healthy emotional satisfaction.

Neutral: The child has no significant emotional response. In some cases, there is no particular emotional reaction in children during or after watching screen time. This usually happens when children watch something out of habit or mechanically.

Negative: The child shows signs of depression, irritability, or withdrawal after screen time. Behavioral problems such as restlessness, aggression, or mood swings may occur. This is the most worrying. Many children experience depression, extreme irritability, and a tendency to social isolation or withdrawal after excessive screen use. Watching fast-paced or fast-paced media causes behavioral problems in children such as restlessness, aggressiveness, and unreasonable mood swings. Especially the strong reaction or mood swings seen in them when asked to turn off the device are a manifestation of digital addiction.

5.3.3 Analysis of Content That Children Observed During the Study

1. Age Distribution of Children

To find the content impact, a total of 50 children aged 03 to 08 years were included in this study (Figure 12). Looking at the data structure, it can be seen that the number of 03-year-old children is relatively low, while the presence of children aged 4 to 7 years is the highest. In particular, a large proportion of children aged 5 and 6 years are represented in this study.

This age diversity makes the results of the study more acceptable, as it highlights the screen usage habits of both early childhood (3-5 years) and early primary school (6-8 years). In the case of 3-year-old children, the screen usage pattern is mainly limited to nursery rhymes or simple cartoons, whereas children aged 7-8 years tend to play more complex games or use learning apps. This age difference plays a very important role in understanding the impact of screen time.

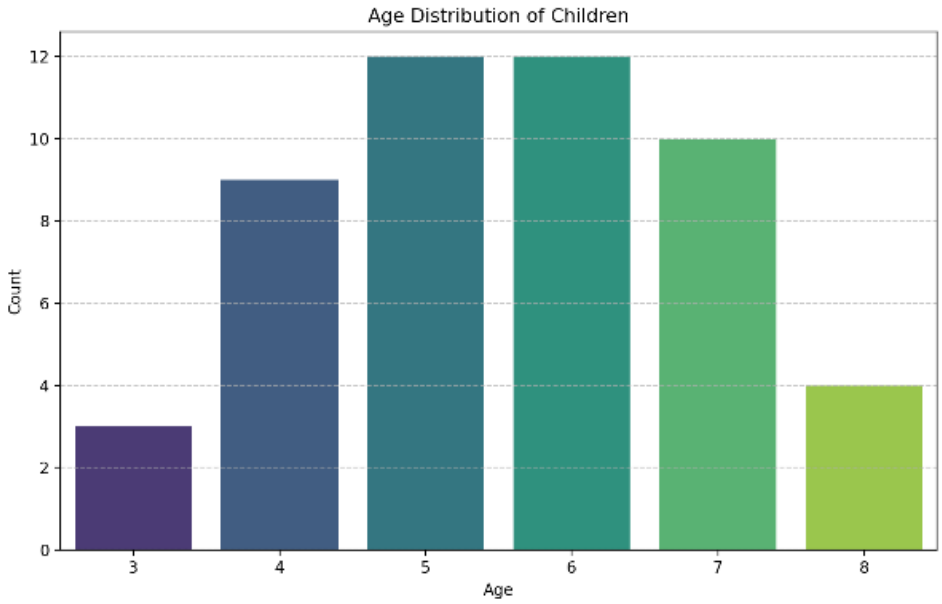


Figure 12: Age of participating children

2. Distribution of Content Categories

The study found that the content used by children is mainly divided into three main categories: Educational, Entertainment, and Interactive (Annex 3). Although there is a balance between all the content, parents have shown a slightly higher inclination towards educational content. Many children are directly using language learning or math apps. Among the entertainment content, YouTube rhymes and popular cartoons such as Pippa Pig or Paw Patrol are among them. On the other hand, interactive games such as 'Toca Boca' or 'Minecraft' are being used to develop children's creativity and problem-solving skills. However, it is noteworthy that whenever the prominence of entertainment content has increased, the rate of active participation of children has decreased slightly.

3. Distribution of Engagement Level

When children use screens, their level of engagement can be of two types: High and Low. According to the research data, children's level of engagement was very high in educational and interactive content (Figure 13). They did not just watch, but acted according to the instructions on the screen, answered questions, or created something new. In contrast, most children's engagement was very low or passive when watching entertaining cartoons or unboxing videos. This low level of engagement makes children's thinking lazy. Among the 50 children who were highly engaged, their interest in learning and ability to pay attention were much higher.

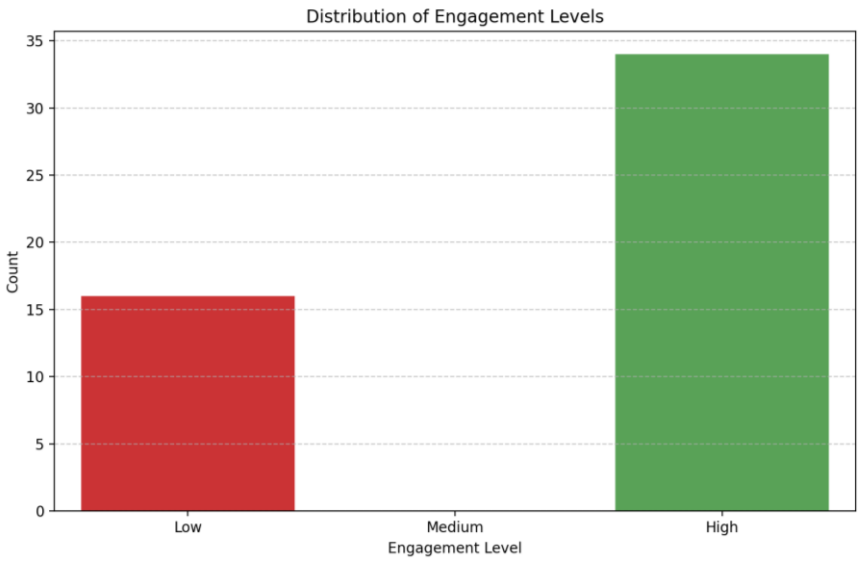


Figure 13: Distribution of engagement levels

4. Content Category Preference by Age

A significant change has been observed in the type of content preference of children with age (Figure 14). Children aged 03 to 04 years mainly prefer bright pictures and rhythmic sounds, which makes them more attracted to nursery rhymes or simple games. Children aged 5 to 6 years start to prefer interactive content such as story-based cartoons and puzzles. Children aged 7 to 8 years are more interested in video games and educational apps (such as science or reading apps). While younger children are just spectators, older children prefer to actively control the content. This evolution proves that as children grow in mental maturity, their digital needs also change.

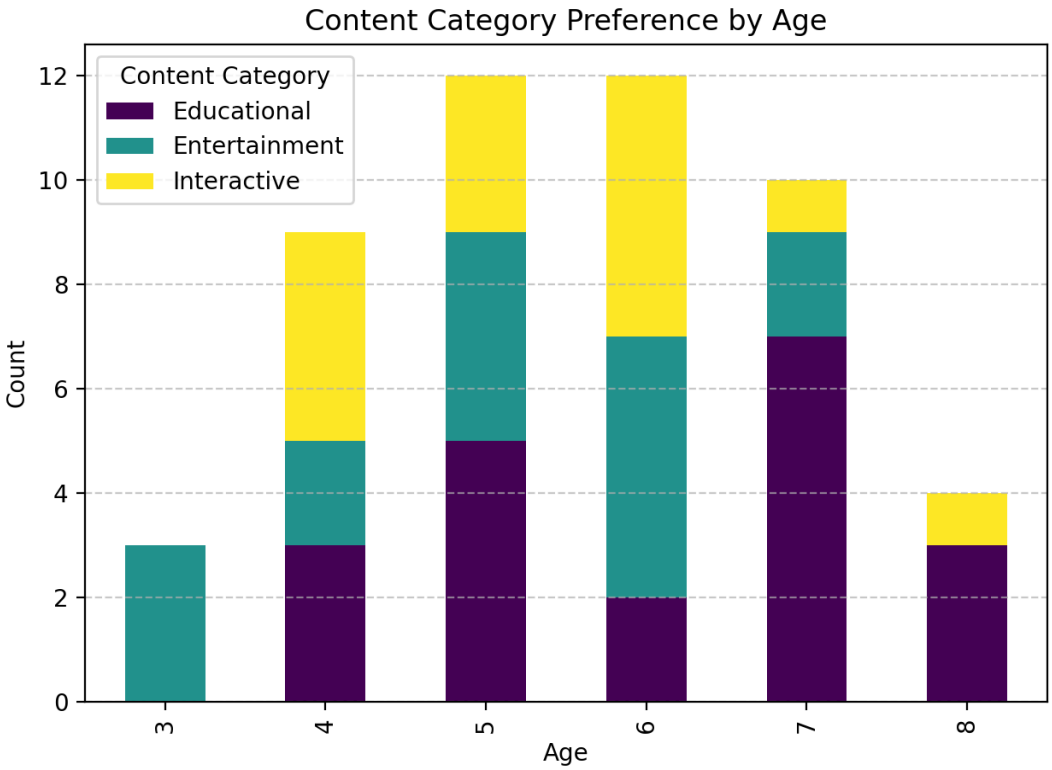


Figure 14: Content usage trends by age

5. Engagement Level by Content Category

The type of content directly determines how active the child will be. Studies have shown that the engagement rate is almost 100% in the case of interactive and educational content (Figure 15). When a child uses a drawing app or puzzle game, their brain is actively working. But in the case of entertainment content, the opposite picture has been seen. While watching cartoons on television or YouTube, children basically sit in one position, which is called 'passive viewing'. In this situation, there is little verbal response or physical movement among children. Therefore, it can be said that if the content is not participatory, then screen time is nothing more than a waste of time for children. This observation shows that there is a deep and direct relationship between the type of content and the stimulation of the child's brain. When the content is participatory, the child's 'cognitive load' or cognitive performance increases, which forces him to process new information and make immediate decisions. Such active participation is very helpful in the child's neurological development. On the other hand, in the case of purely entertaining videos, the child tends to accept information without any thought or question, which reduces his creative imagination in the long run.

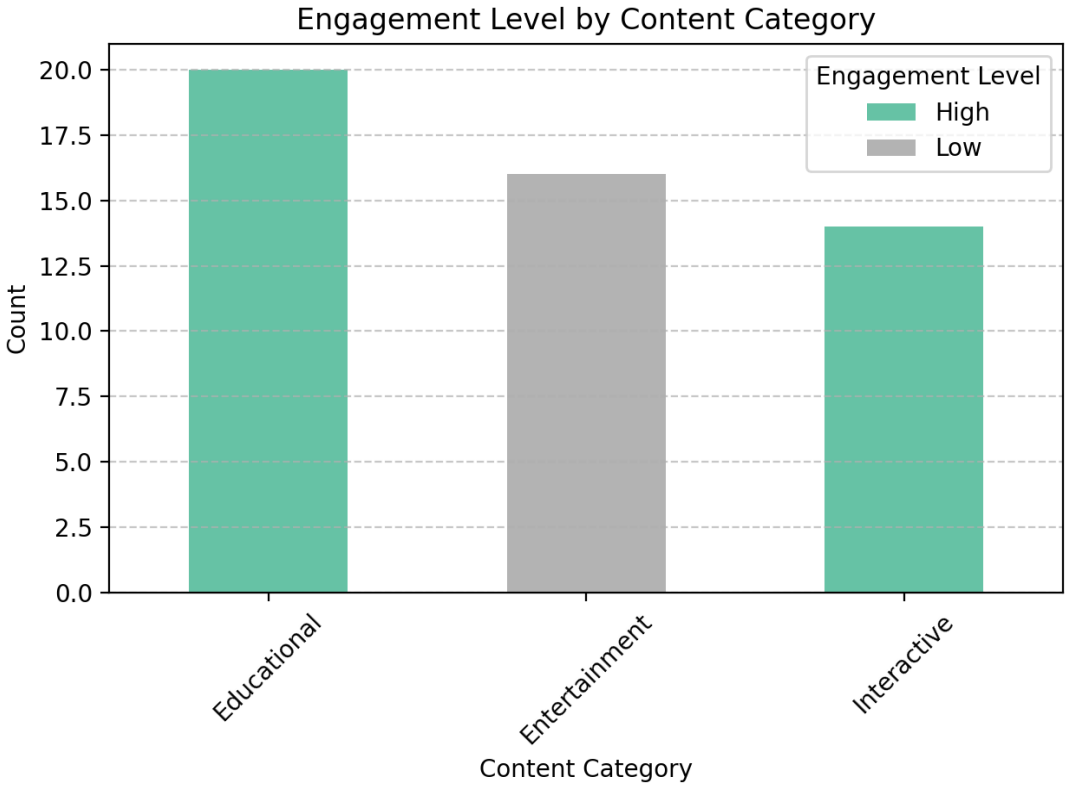


Figure 15: Engagement level

6. Cognitive and linguistic impact by content category

Educational content has had a very positive impact on linguistic development. Children who use apps like ABC Mouse or Duolingo have improved in learning new words, sentence formation, and reading skills. Interactive games have helped children increase their problem-solving and quick decision-making abilities (Figure 16). However, the impact of entertainment content was mostly neutral or negative. Those who only watched cartoons did not improve their linguistic skills, but rather, speech inertia was observed in many cases. Therefore, if screen time is through the right content, it can act as a helpful digital tool in the development of children's intelligence. This data analysis shows that the quality of the content determines the trajectory of a child's intellectual development. When educational apps teach children new words in the guise of play, the active recall process works in their brain, which helps in long-term learning. This not only teaches language, but also strengthens the foundation of the child's grammatical structure.

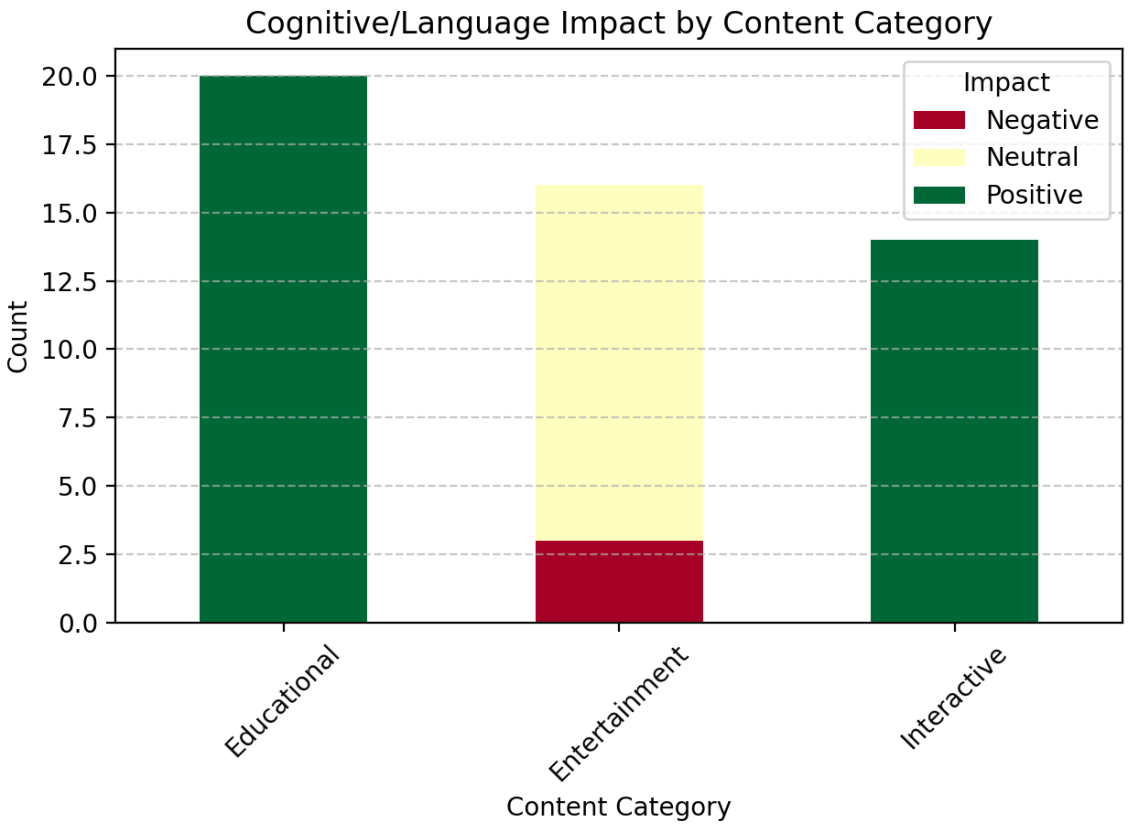


Figure 16: Cognitive/Language impact

7. Emotional/Behavioral Impact by Content Category

From an emotional perspective, it has been seen that children engaged in educational and interactive activities are much more cheerful, curious, and confident. They feel proud when they learn something. On the other hand, after watching entertainment content or YouTube videos for a long time, children have been found to become irritable or annoyed. Especially when the video or cartoon is stopped, many children become stubborn or cry. Passive entertainment reduces patience in children and creates a need for instant gratification. In contrast, creative apps help children develop patience and attention, which provides them with behavioral stability.

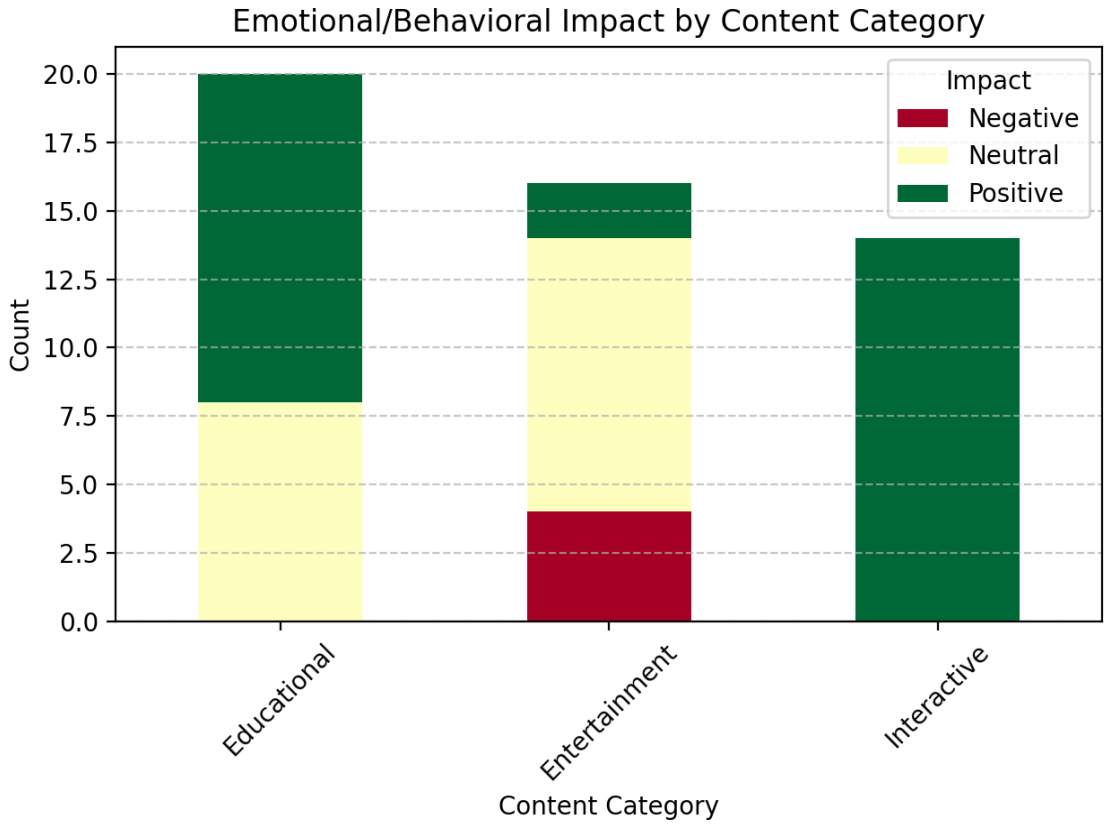


Figure 17: Emotional/Behavioral impact

Chapter Six

Discussion

This chapter presented a detailed analysis of the various data collected for the study and the findings obtained through it. This study, conducted on 50 children aged 3 to 8 years, mainly focused on their screen usage patterns and its multifaceted impact. For the convenience of analysis, the data collected was organized based on important variables such as age, gender, socio-economic status (SES), geographical location, and accessibility of technology. How these variables affect children's access to digital devices and their screen usage habits is the main topic of discussion in this chapter.

The study found that children's age and family socio-economic background act as major determinants of their digital habits. In particular, clear differences were observed in content preferences between children aged 3-5 and 6-8 years. Children from upper and middle class families and children living in urban areas have access to screens for long periods of time due to the availability of advanced infrastructure and devices, which has a profound impact on their language and behavioral development. In contrast, children from rural or lower class families have relatively low screen usage rates due to limited opportunities.

The chapter analyzes not only statistical data, but also indicators of children's post-screen behavior, physical reactions, and language acquisition through close observation. The results obtained indicate that while educational content plays a positive role in children's vocabulary and sentence formation, uncontrolled entertainment content often causes inactivity, restlessness, and mood swings in them.

6.1 Screen Time Review: Children's Screen Time Use and Impact

This study collected data on 50 children aged 3-8 to analyze screen time use and its various impacts. The review was mainly based on various aspects of children's screen time, such as age, gender, socioeconomic status (SES), location, and access to technology. The aim was to analyze how these factors influence children's screen time habits and access to digital devices.

Age distribution

The data collected showed parity between the two age groups: 3-5 years: 25 children, and 6-8 years: 25 children. This age distribution represents children's different levels of thinking and language development. Younger children (3-5 years) generally spend more time with educational and interactive play content, while older children (6-8 years) are more interested in video games, social media, and YouTube content, which increases their screen time use.

Socioeconomic Status (SES) Analysis

Children were divided into three SES categories:

a) Low SES: 10 children
b) Middle SES: 20 children
c) High SES: 20 children

The data shows that middle—and high-SES children are more likely to be affected by technology access and screen time use. High-SES children are more likely to have access to digital devices and fast internet, which may lead to more screen time. On the other hand, low-SES children may have less screen time due to limited access. This difference is important in terms of children's exposure to digital content.

Distribution by location

Children were located in:

a) Urban: 30 children
b) Rural: 20 children

Urban children generally have more access to digital devices, fast internet, and diverse content, which affects their screen time use. Rural children may have limited resources, leading to less screen content. This urban-rural divide is important in screen time usage, as cities have better infrastructure and higher digital device penetration.

Technology access

Children were divided into two categories based on technology access:

a) Regular access: 30 children
b) Occasional access: 20 children

This shows that most children have regular access. Regular access is generally associated with more screen time, mainly when children use mobile phones, tablets, or computers for entertainment, educational content, or social interaction. Children with occasional access will likely have more structured screen time, which may help control their screen exposure.

Cross-tabulation observations

Age group vs. SES

Among children aged 3-5, children with higher SES had more digital device access (11) than children with lower SES (5). The divide across SES was reasonably even among children aged 6-8, with a higher proportion of children in the middle SES (11). This data suggests that children, particularly from high SES families, gain more access to technology with age.

Tech access vs. SES

Regular access was highest among middle and high SES children, with 13 coming from middle SES. There were also 13 high SES children, indicating that children from these families are most likely to be involved with technology. Occasional access was also seen in low SES (6) and high SES (7) families, suggesting that some families may have limited resources but still allow some access to screen time.

Location vs. Technology access

Regular access is higher among children in urban areas (20), indicating the city's advanced infrastructure and rapid digital device growth. Regular and occasional access is almost equal among children in rural areas, reflecting the limited technological growth and availability of quantitative content in rural areas.

Analysis of this data suggests a strong relationship between SES, location, and technology access, which influences children's screen time and their relationship with digital content. Children from higher SES and urban areas are likelier to have more screen time and content exposure. These data suggest that differences in access to technology and SES affect the amount and type of digital content children consume. In the future, more research is needed to understand how these different factors impact children's language and psychological development.

6.2. Content Analysis on Children's Screen Time Patterns

After completing 30 minutes of observation for each child, the following general trends were observed:

Content Preference

a) Children aged 3-5 years preferred interactive, educational games and cartoons with animation.

b) Children aged 6-8 were interested in video games or YouTube videos, and their interest in social media and video content creation increased.

Response during Screen Time

a) Children who participated in educational content showed greater attention and language skills by repeating words, asking questions, or engaging in language-related tasks.

b) Children shown entertainment content (cartoons or games) showed less talkativeness and more passive behavior. However, they were likelier to display excitement or strong emotional reactions (e.g., laughter, frustration).

Post-Screen Time Behavior

a) Children of higher socioeconomic status (SES) showed less harmful behavior (e.g., less irritability or restlessness) after screen use, possibly due to greater parental involvement and supervision.

b) Those with limited access to digital devices are more likely to be excited about screen time but may exhibit mood swings (e.g., frustration or irritability) after screen use, especially when asked to turn off the device.

Language Development Indicators

a) Younger children (3-5 years) who interact with educational content show improvements in their vocabulary and sentence structure.

b) Older children (6-8 years) display more jargon or content-based dialogue (e.g., referring to characters, games, or trends they see), but their conversations lack coherence or structure.

c) Physical and Emotional Effects:

d) Signs of eye strain and fatigue (eye rubbing, blinking) have been observed after prolonged screen use, especially in children who engage in passive viewing (e.g., cartoons).

e) Children exposed to stimulating content (e.g., games or fast-paced media) for extended periods may develop restlessness or hyperactivity.

6.3. Analysis of Results

As part of the research findings on children's screen time and language development, an opportunity has been created to analyze the impact of different content types and their behavioral and physical responses on children. The main topics discussed here are content preferences, screen time responses, post-screen time behavior, language development indicators, and physical and emotional effects. We will analyze these results in light of various theories and previous research.

a) Content preferences: The study found that children aged 3-5 years prefer interactive and educational games or cartoons with animation, while children aged 6-8 years are becoming more interested in video games, YouTube videos, and social media content. Such content preferences are related to the age of the children. According to social learning theory (SLT), children learn behaviors and preferences from their environment, and their preferred content types change over time as they learn new social behaviors and media usage patterns (Bandura, 1963).

b) Screen Time Response: Children who engage in educational content have been shown to improve language skills through word repetition and participation in language-related tasks. This is consistent with the cognitive load theory (Sweller, 1988), which states that active and interactive content benefits children in learning as they are actively engaged in the task and learn new concepts. On the other hand, children who engage in entertainment content tend to behave passively, which is consistent with the passive learning theory. When children do not just learn by watching but through active participation, the learning process is more productive.

c) Post-Screen Time Behavior: While children from higher socioeconomic levels (SES) have been shown to have less harmful behavior after screen time, children from lower SES groups have been shown to have more mood swings and depression after screen time. This is consistent with the *ecological systems theory* (Bronfenbrenner, 1979), which states that a child's environment plays a crucial role in their learning and behavior. Family monitoring and involvement

can strongly impact children's behavior and language development. For children of lower SES, parents may be less involved in controlling screen time, which can negatively affect their behavior and emotions.

d) Language Development Indicators: Children aged 3-5 years have improved vocabulary and sentence structure through educational content, which can be seen as a powerful way to learn language based on social learning theory, also known as Vygotsky's Sociocultural theory ((McLeod, 2025a)). Language formation and vocabulary growth occur through socially dynamic interactions and internal thought processes, which increase children's language skills. On the other hand, children aged 6-8 years use more jargon and content-based dialogue, but their conversation is not structured and well-organized. This means that children at this age may learn some specific words, but their language use does not fully develop a flow and structure.

e) Physical and Emotional Effects: Children may experience eye strain, fatigue after screen time, restlessness, or hyperactivity after fast-paced content. This is related to the Stimulation Hypothesis (Anderson & Dill, 2000), which states that prolonged exposure to stimulating content can affect children's physical and emotional states. High levels of stimulation during screen time can cause restlessness and irritability in children, which can be detrimental to their physical and mental health. The results clearly show a strong relationship between the type of content and children's behavior. Educational content is positive for children's language skills, while entertainment content can impact passive behavior and sensitivity. As a result, parents, teachers, and policymakers should play a more active role in managing and monitoring children's screen time so that children's language, physical, and emotional development are appropriately managed. The observations obtained are consistent with social learning theory and show how children's preferences, behavior, and language skills are learned through screen time. Differences based on content type, age, and social status reveal the complexity of the effects of screen time. This could provide more detailed guidance on how different forms and contexts of screen use can impact different aspects of children's development and well-being.

Chapter Seven

Conclusion

This chapter presents a comprehensive analysis and discussion of the findings from a study on the relationship between children's screen time and their language development. The research, which utilized data from a content analysis, a survey, and statistical tests, highlights the complex interplay of various factors, including age, socioeconomic status (SES), location, and content type, in shaping a child's interaction with digital media. The findings are contextualized within established psychological and educational theories, providing a robust framework for understanding the observed effects. The discussion is structured around four key areas: a review of the demographic data, an analysis of content and behavioral patterns, an examination of parents' and other stakeholders' perspectives, and a summary of the statistical hypothesis testing.

7.1 Summary of the findings

Demographics and Screen Time Usage

The study's initial analysis of demographic data from 50 children aged 3-8 revealed a balanced distribution across age groups, with 25 children in the 3-5 age bracket and 25 in the 6-8 bracket. This parity was crucial for comparing developmental stages. The research found a significant link between screen time habits and a child's socioeconomic status, geographic location, and access to technology. Children from middle- and high-SES families were more likely to have greater access to digital devices and faster internet, leading to increased screen time. Specifically, the data showed that middle-SES and high-SES children were most likely to have regular access to technology, with 13 children from each group reporting this level of access. This suggests that financial and social capital are major determinants of digital exposure.

Similarly, the study identified a stark urban-rural divide. The majority of children in the study resided in urban areas (30 children), where advanced infrastructure and a high penetration of digital devices led to more frequent and regular technology access. In contrast, rural children (20 children) showed more balanced rates of regular and occasional access, likely due to limited technological resources. The cross-tabulation of age and SES further highlighted these disparities, indicating that younger children from high-SES families gained more frequent access to digital devices with age. These demographic findings collectively suggest

that a child's environment—including their family's economic standing and geographic location—plays a foundational role in their screen time habits, influencing both the quantity and type of digital content they consume.

Content Analysis and Behavioral Patterns

Through 30-minute observational sessions with each child, the study identified clear patterns in content preference and their associated behavioral, linguistic, physical, and emotional effects. A key finding was the age-related shift in content preference. Younger children (3-5 years) were drawn to educational and interactive content such as animated cartoons and games. In contrast, older children (6-8 years) showed a growing interest in video games, social media, and YouTube videos. This shift is consistent with social learning theory (Bandura, 1963), which posits that children's preferences evolve as they are exposed to new social behaviors and media usage patterns. The study found that engagement with educational content positively influenced language skills, with children actively repeating words and participating in language-related tasks. This finding aligns with the cognitive load theory (Sweller, 1988), which suggests that active engagement enhances learning.

Conversely, children who consumed passive entertainment, such as cartoons or games, exhibited less talkativeness and more passive behavior. While they showed strong emotional reactions like laughter or frustration, their engagement did not lead to the same level of language development. The study also observed distinct post-screen time behaviors. Children from high-SES backgrounds showed less irritability after screen use, possibly due to greater parental supervision. Conversely, children with limited access to digital devices were more likely to show mood swings and frustration when asked to turn off the device, a finding that supports the ecological systems theory (Bronfenbrenner, 1979), which emphasizes the significant role of the child's environment and parental involvement in shaping behavior.

In terms of language development, younger children engaging with educational content showed notable improvements in vocabulary and sentence structure, which corroborates Vygotsky's Sociocultural Theory, where language acquisition is a social process. In contrast, older children, while using content-specific jargon, often lacked coherent or structured conversations, suggesting that passive consumption of entertainment content may not fully support the development of complex language skills. The study also noted physical and emotional effects, such as eye strain and fatigue, particularly in children engaged in passive

viewing. Children exposed to fast-paced, stimulating content showed signs of restlessness and hyperactivity, supporting the Stimulation Hypothesis (Anderson & Dill, 2000). These findings collectively underscore the critical importance of content type and parental guidance in mitigating the potential negative impacts of screen time.

Parental and Stakeholder Perspectives

The research also incorporated a survey of 50 participants, including parents, teachers, journalists, and civil society members, to gather a broader perspective on the issue. Parents constituted the largest group of respondents (60%), providing direct insight into family-level screen time management. The survey revealed that a significant portion of children (40%) spend 3-4 hours on screens daily, with mobile phones being the most common device. A majority of the children were found to be consuming passive entertainment content like cartoons, rather than educational material.

A notable finding was that 50% of the participants believed excessive screen time negatively impacts language development, specifically affecting vocabulary and social communication skills. This aligns with modern research on the topic (Hutchinson et al., 2020; Radesky et al., 2020), which suggests that excessive screen time can impair social and language skills. However, 60% of respondents also believed that with appropriate use, screen time could benefit language development, highlighting the potential of educational content. This finding underscores the duality of technology's impact on children.

The survey also brought to light the issue of parental involvement. Only 40% of parents reported being moderately involved in controlling their children's screen time, indicating a significant gap in supervision. This lack of involvement is a critical factor, as parental guidance can significantly influence a child's experience with technology. The survey also highlighted the collective responsibility of society, with 40% of participants believing teachers play a crucial role and 60% advocating for government and societal promotion of educational content and clear screen time guidelines. This feedback emphasizes that a multi-faceted approach involving parents, educators, and policymakers is essential to manage the effects of screen time effectively and foster positive language development in the digital age.

In conclusion, the hypothesis analysis statistically validates the study's primary qualitative observations. While the sheer amount of screen time is not the main predictor of language development, the type of content consumed and the level of engagement it fosters are crucial

factors. These findings provide a strong empirical basis for advocating the promotion of educational, high-quality digital content and underscore the need for active monitoring by parents and educators to ensure that screen time contributes positively to a child's language and cognitive development.

7.2 Limitation of the study

Sample Size and Generalizability

The study's sample size of 50 children is a significant limitation. While the data provides valuable insights into the specific population studied, it may not be large enough to generalize the findings to a broader population of children in Bangladesh or elsewhere. The small sample size also makes it difficult to draw statistically powerful conclusions and may not capture the full diversity of experiences with screen time across different regions and socioeconomic backgrounds. Future research should aim for a larger and more geographically diverse sample to enhance the generalizability of the results.

Lack of Longitudinal Data

The study relies on a cross-sectional design, which captures data at a single point in time. This approach, by its nature, cannot establish a cause-and-effect relationship between screen time and language development. For example, while the study notes that children consuming passive content have lower language skills, it cannot definitively prove that the passive content caused this outcome. A child may have had lower language skills to begin with and, therefore, preferred passive content. A longitudinal study, which follows the same children over an extended period, would be necessary to track developmental changes and better understand the long-term impact of screen time.

Self-Reported and Observational Bias

The data collection methods, which included a survey for parents and a brief 30-minute observational period for children, introduce potential for bias. Parental reports on screen time can be subject to recall bias, social desirability bias (where they might under-report screen time to appear more responsible), and general inaccuracy. Furthermore, the limited 30-minute observation window may not be representative of a child's typical behavior. Children may

behave differently when they know they are being observed, and their content choices and engagement levels might vary significantly throughout a normal day.

Limited Scope of Language Development Assessment

The study's assessment of language development seems to be based on general observations and parental perceptions, such as changes in vocabulary and sentence structure. It does not appear to use standardized, clinical assessments or validated linguistic metrics to measure language skills. This lack of a formal, quantitative measure for language development makes it difficult to compare the results with other studies and may lead to subjective interpretation of the findings. Future research would benefit from incorporating well-established language assessments to provide more objective and reliable data.

Simplified Categorization of Screen Time

The study simplifies the complex nature of screen time by categorizing it into broad groups like "educational," "entertainment," and "interactive." In reality, digital content is often a mix of these elements. A "game" may be interactive but also highly entertaining and have some educational components. The study also does not fully account for the context of screen time, such as whether a parent is co-viewing with the child or the time of day. These nuances are critical, as a co-viewing experience with an entertaining show can be highly beneficial for language development, a factor not fully explored in this study's framework.

7.3 Recommendations

1. Children should not be given digital devices all the time. Screen time can harm children's physical and mental health, so they should be allowed to use screens within a specific time and have enough time for sports, social activities, and spending time with family. The well-being of children can be ensured according to the World Health Organization's Guidelines on physical activity, sedentary behavior, and sleep for children under 5 years of age (WHO, 2019).

2. Parents, guardians, and teachers should take more responsibility as learning mediums. Parents and teachers should be more aware of the use of screen-based digital technology and should be actively involved in developing children's language. Parents should be aware of the need to control screen time

for children and should explain the importance of body language and nonverbal communication when talking to them.

3. Poor content should be controlled for children's language and learning (Perkins et al., 2013): Excessive screen time using non-educational and entertaining content can harm children's language development. The government and relevant institutions should take measures to control content that helps enhance children's language and thinking skills.

4. Focus on creating and promoting good content: Content should be created for children to help develop language skills, essential thinking, and social awareness. It is important to promote interactive and educational content through digital platforms.

5. Parents and teachers should be more aware: Parents and teachers should play an important role in children's linguistic and social development ((United Nations International School of Hanoi, 2024). They should understand that it is much more important for children to develop human communication habits outside of digital screens.

6. Setting the correct time limit for screen time: Children should be given a specific time limit to participate in many other activities that help them learn and grow.

7. Create alternative learning media: Alternative learning media should be created for children to continue learning without digital screens, such as reading books, quiz games, discussions, and activity-based learning (Liu, Reynolds et al., 2024). These alternative media engage children's five senses in a way that digital screens cannot. Hands-on activities or reading picture books help children develop long-term attention and deep understanding.

8. Screen time should include social activities: Children should be encouraged to engage in discussions, storytelling, and virtual social activities with their families while using screens.

9. Regular monitoring and evaluation: Regular monitoring and evaluation systems should be introduced for children. Learning and screen time should be

monitored regularly to develop children's language skills and thinking. Regular monitoring is not just a means of time management, but it is a continuous process of evaluating the child's mental and linguistic progress. When parents regularly monitor, they understand what kind of content is stimulating the child's thinking and what is stalling it. Through this assessment, changes in the child's word choice, sentence structure and reasoning are detected, which is helpful in creating subsequent learning plans.

10. Government campaigns and training programs should be launched: Various government campaigns and training programs should be launched to raise awareness about children's screen time so that parents are more aware of its effects and can manage it properly. Newspaper, TV and other electronic and social media could play strong role. Through government initiatives and campaigns, it is possible to reach out to marginalized parents about the scientific aspects of screen time. Especially if the public health and education departments jointly organize workshops or seminars, a national awareness will be created to prevent digital addiction in children. If mainstream media such as newspapers and television regularly broadcast expert opinions and awareness documentaries, parents will be more aware of the negative effects of screen time. In addition, effective parenting tips and short videos on digital literacy can be disseminated using social media platforms. If special training programs are arranged for teachers, they will be able to provide proper guidance in schools and parent-teacher meetings. Such coordinated government and private campaigns can build an aware society where children take advantage of technology but do not fall victim to its misuse. Finally, if government policies set standards for safe digital content for children, it will play a very fruitful role in national talent development in the long run.

If these recommendations are implemented, screen time's impact on children's language and speech development can be reduced, and their physical, mental, and social development can be supported.

References

Ab, A., Fazal, M., & Sheikh, M. A. (2024). Digital learning of children through youtube: perception of young parents in Lahore. *Online Media and Society*, *5*(1), 25–35. https://hnpublisher.com/ojs/index.php/OMS/article/view/410

Achol, A. I., & Akter, S. (2022). Influence of popular online games on english language skills development of children in Dhaka city. *International Journal of English Literature and Social Sciences*, *7*(6), 271–281. https://doi.org/10.22161/ijels.76.40

Adams, A., & Cox, A. L. (2008). *Questionnaires, in-depth interviews and focus groups* (P. Cairns & A. L. Cox, Eds.). Oro.open.ac.uk; Cambridge University Press. https://oro.open.ac.uk/11909/

Ahmed, S. K. (2024). The pillars of trustworthiness in qualitative research. *Journal of Medicine, Surgery, and Public Health*, *2*(1), 1–4. Science Direct. https://doi.org/10.1016/j.glmedi.2024.100051

Akers, R. L., & Jensen, G. F. (2007a). *Social learning theory and the explanation of crime*. Transaction Publishers.

Alroqi, H., Serratrice, L., & Cameron-Faulkner, T. (2022). The association between screen media quantity, content, and context and language development. *Journal of Child Language*, *50*(5), 1–29. https://doi.org/10.1017/s0305000922000265

American Academy of Pediatrics. (2013). Children, adolescents, and the media. *PEDIATRICS*, *132*(5), 958–961. https://doi.org/10.1542/peds.2013-2656

American Academy of Pediatrics. (2016). Media and young minds. *Pediatrics*, *138*(5). https://doi.org/10.1542/peds.2016-2591

Anderson, D. R., & Subrahmanyam, K. (2017). Digital screen media and cognitive development. *Pediatrics*, *140*(Supplement 2), S57–S61. https://doi.org/10.1542/peds.2016-1758c

Anderson, & Dill. (2000). *APA PsycNet*. Psycnet.apa.org. https://psycnet.apa.org/record/2000-08135-012

Axelsson, E. L., Purcell, K., Asis, A., Paech, G., Metse, A., Murphy, D., & Robson, A. (2022). Preschoolers' engagement with screen content and associations with sleep and cognitive development. *Acta Psychologica*, *230*, 103762. https://doi.org/10.1016/j.actpsy.2022.103762

Baker, J. A. (2006). Contributions of teacher–child relationships to positive school adjustment during elementary school. *Journal of School Psychology*, *44*(3), 211–229. https://doi.org/10.1016/j.jsp.2006.02.002

Bal, M., Aydemir, K., Gülüzar Şule Tepetaş Cengiz, & Ahmet Altındağ. (2024). Examining the relationship between language development, executive function, and screen time: A systematic review. *PLoS ONE*, *19*(12), e0314540–e0314540. https://doi.org/10.1371/journal.pone.0314540

Bandura, A. (1971). *Social Learning Theory*. General Learning Press. https://ia801807.us.archive.org/14/items/BanduraSocialLearningTheory/Bandura_SocialLearningTheory_text.pdf

Bandura, A. (2001). Social cognitive theory of mass communication. *Media Psychology*, *3*(3), 265–299. https://doi.org/10.1207/s1532785xmep0303_03

Bangla Institute. (2024, December 3). *The Role of Technology in Bangla Language Learning: Tools and Resources*. Bangla Institute. https://banglainstitute.com/2024/12/03/the-role-of-technology-in-bangla-language-learning-tools-and-resources/

Bangladesh Bureau of Statistics (BBS). (2023). *Bangladesh Bureau of Statistics*. Bbs.gov.bd. http://nsds.bbs.gov.bd/en/posts/200/Survey%20on%20ICT%20Use%20and%20Aceess%20by%20Individuals%20ans%20Households%202023

Barman, B. (2014). the linguistic philosophy of Noam Chomsky. *Philosophy and Progress*, *51*(1-2), 103–122. https://doi.org/10.3329/pp.v51i1-2.17681

Barnett, S. (2019). Application of Vygotsky's social development theory. *Core.ac.uk*, *10*(35), 1–4. https://core.ac.uk/reader/276531380

Belton, S., Issartel, J., Behan, S., Goss, H., & Peers, C. (2021). The differential impact of screen time on children's wellbeing. *International Journal of Environmental Research and Public Health*, *18*(17), 9143. https://doi.org/10.3390/ijerph18179143

Bergmann, C., Dimitrova, N., Khadeejah Alaslani, Alaa Almohammadi, Haifa Alroqi, Aussems, S., Mihaela Barokova, Davies, C., Nayeli Gonzalez-Gomez, Gibson, S. P., Havron, N., Tzipi Horowitz-Kraus, Kanero, J., Kartushina, N., Keller, C., Mayor, J., Mundry, R., Shinskey, J., & Mani, N. (2022). Young children's screen time during the first COVID-19 lockdown in 12 countries. *Scientific Reports*, *12*(1). https://doi.org/10.1038/s41598-022-05840-5

Berwick, R. C., & Noam Chomsky. (2016). *Why only us : language and evolution*. The Mit Press.

Bhutani, P., Gupta, M., Bajaj, G., Ramesh Chandra Deka, Siddhartha Sankar Satapathy, & Suvendra Kumar Ray. (2024). Is the screen time duration affecting children's language development? - A scoping review. *Clinical Epidemiology and Global Health*, *25*(25), 101457–101457. https://doi.org/10.1016/j.cegh.2023.101457

Bronfenbrenner, U. (1979). The ecology of human development: experiments by nature and design. *JSTOR Daily*. https://www.jstor.org/stable/j.ctv26071r6

Brown, M. (2019). *Too much screen time hurts toddlers' social skills, new study shows*. Ualberta.ca. https://www.ualberta.ca/en/folio/2019/06/too-much-screen-time-hurts-toddlers-social-skills-new-study-shows.html

BTRC. (2023). *BTRC Report 2022-2023*. BTRC. https://btrc.gov.bd/sites/default/files/files/btrc.portal.gov.bd/annual_reports/00f6bad3_7a73_42b6_8088_aad11cc76aa4/2023-12-11-09-06-451cc046dd6fbde25b69bcd9cf8cdd57.pdf

Bull, F. C., Al-Ansari, S. S., Biddle, S., Borodulin, K., Buman, M. P., Cardon, G., Carty, C., Chaput, J.-P., Chastin, S., Chou, R., Dempsey, P. C., DiPietro, L., Ekelund, U., Firth, J., Friedenreich, C. M., Garcia, L., Gichu, M., Jago, R., Katzmarzyk, P. T., & Lambert, E. (2020). World health organization 2020 guidelines on physical activity and sedentary behaviour. *British Journal of Sports Medicine*, *54*(24), 1451–1462.

Burgoyne, K., Gardner, R., Whiteley, H., Snowling, M. J., & Hulme, C. (2017). Evaluation of a parent-delivered early language enrichment programme: evidence from a randomised controlled trial. *Journal of Child Psychology and Psychiatry*, *59*(5), 545–555. https://doi.org/10.1111/jcpp.12819

Bustamante, J. C., Fernández-Castilla, B., & Alcaraz-Iborra, M. (2023). Relation between executive functions and screen time exposure in under 6 year-olds: A meta-analysis. *Computers in Human Behavior*, *145*, 107739. https://doi.org/10.1016/j.chb.2023.107739

Byeon, H., & Hong, S. (2015). Relationship between television viewing and language delay in toddlers: evidence from a Korea national cross-sectional survey. *PLOS ONE*, *10*(3), e0120663. https://doi.org/10.1371/journal.pone.0120663

Byrne, R., Terranova, C. O., & Trost, S. G. (2021). Measurement of screen time among young children aged 0–6 years: A systematic review. *Obesity Reviews*, *22*(8). https://doi.org/10.1111/obr.13260

Cain, N., & Gradisar, M. (2010). Electronic media use and sleep in school-aged children and adolescents: A review. *Sleep Medicine*, *11*(8), 735–742. https://doi.org/10.1016/j.sleep.2010.02.006

Cao, H., Qian, Q., Weng, T., Yuan, C., Sun, Y., Wang, H., & Tao, F. (2011). Screen time, physical activity and mental health among urban adolescents in China. *Preventive Medicine*, *53*(4-5), 316–320. https://doi.org/10.1016/j.ypmed.2011.09.002

Carvalho, A. de J. A., Lemos, S. M. A., & Goulart, L. M. H. de F. (2016). Language development and its relation to social behavior and family and school environments: A systematic review. *CoDAS*, *28*(4), 470–479. https://doi.org/10.1590/2317-1782/20162015193

Cazden, C. B. (2011). Dell Hymes's Construct of "Communicative Competence." *Anthropology & Education Quarterly*, *42*(4), 364–369. https://www.jstor.org/stable/41410139

Choi, E. J., Seguin, D., Hmidan, A., & Duerden, E. G. (2024). Associations among screen time, sleep, mental health and cognitive functioning in school-aged children during the COVID-19 pandemic, November 2020 through to August 2022. *Heliyon*, *10*(17), e36889. https://doi.org/10.1016/j.heliyon.2024.e36889

Christakis, D. A., Zimmerman, F. J., DiGiuseppe, D. L., & McCarty, C. A. (2004). Early television exposure and subsequent attentional problems in children. *Pediatrics*, *113*(4), 708–713. https://doi.org/10.1542/peds.113.4.708

Christensen, C. H. (2019). Arguments for and against the Idea of Universal Grammar. *Leviathan: Interdisciplinary Journal in English*, *4*(4), 12–28. https://doi.org/10.7146/lev.v0i4.112677

Christian , S., Masur, P. K., Geiß, S., Müller, P., & Schäfer, S. (2020). The impact of internet and social media use on well-being: A longitudinal analysis of adolescents across nine years. *Journal of Computer-Mediated Communication*, *26*(1), 1–21. https://doi.org/10.1093/jcmc/zmaa014

Clemente-Suárez, V. J., Beltrán-Velasco, A. I., Herrero-Roldán, S., Rodriguez-Besteiro, S., Martínez-Guardado, I., Martín-Rodríguez, A., & Tornero-Aguilera, J. F. (2024). Digital device usage and childhood cognitive development: Exploring effects on cognitive abilities. *Children*, *11*(11), 1299. https://doi.org/10.3390/children11111299

Coulanges, L., Bachman, H. J., Libertus, M., & Votruba-Drzal, E. (2024). Examining profiles of U.S. children's screen time and associations with academic skills. *Journal of Children and Media*, *18*(2), 235–253. https://doi.org/10.1080/17482798.2024.2327021

Course-Choi, J., & Hammond, L. (2020). Social media use and adolescent well-being: a narrative review of longitudinal studies. *Cyberpsychology, Behavior, and Social Networking*, *24*(4). https://doi.org/10.1089/cyber.2020.0020

Daly, C. (2019). *Impact of Television on the Language Development of Young Impact of Television on the Language Development of Young Children Children*. https://digitalcommons.library.umaine.edu/cgi/viewcontent.cgi?article=1564&context=honors

Daniel, P. S., & Sam, A. G. (2011). Research Methodology. In *Google Books*. Gyan Publishing House. https://books.google.com/books/about/Research_Methodology.html?id=IHz7lsdpDBgC

Daud, E. A. (2019). Research on second language: Offering new alternative to introduce second language to children in early age through youtube channel. *ELT Worldwide: Journal of English Language Teaching*, *6*(1), 60. https://doi.org/10.26858/eltww.v6i1.6000

Deshpande, S., Sachdev, A., Anwesha Maharana, Siddhesh Zadey, Dharmadhikari, S. P., Swati Ghate, Pawankumar Godatwar, Nisha Kumari Ojha, & Sharma, S. (2024). Screen use time and its association with mental health issues in young adults in India: A cross-sectional study of crowd sourced online sample (Preprint). *JMIR Research Protocols*, *13*, e39707–e39707. https://doi.org/10.2196/39707

Diprossimo, L., Tüchler, A. F., & Giulia Zantonello. (2024, May 13). *Evidence Briefing: How Can We Promote Child Language and Literacy Development in an Increasingly Digital World?* https://doi.org/10.31219/osf.io/x3spe

Dong, H.-Y., Feng, J.-Y., Wang, B., Shan, L., & Jia, F.-Y. (2021). Screen Time and Autism: Current Situation and Risk Factors for Screen Time Among Pre-school Children With ASD. *Frontiers in Psychiatry*, *12*. https://doi.org/10.3389/fpsyt.2021.675902

Draper, C. E., Yousafzai, A. K., McCoy, D. C., Cuartas, J., Obradović, J., Bhopal, S., Fisher, J., Jeong, J., Klingberg, S., Milner, K., Pisani, L., Roy, A., Seiden, J., Sudfeld, C. R., Wrottesley, S. V., Fink, G., Nores, M., Tremblay, M. S., & Okely, A. D. (2024). The next 1000 days: Building on early investments for the health and development of young children. *The Lancet*, *404*(10467), 2094–2116. https://doi.org/10.1016/S0140-6736(24)01389-8

Duch, H., Fisher, E. M., Ensari, I., Font, M., Harrington, A., Taromino, C., Yip, J., & Rodriguez, C. (2013). Association of screen time use and language development in hispanic toddlers. *Clinical Pediatrics*, *52*(9), 857–865. https://doi.org/10.1177/0009922813492881

Dunckley, V. L. (2015). *Reset Your Child's Brain*. New World Library.

Duraiappah, A. K., Mochizuki, Y., & Sharma, R. (2023). *Screen Time and Learner Well-being: The Debate, the Evidence and Directions for Future Research and Policy*. Unesco.org. https://unesdoc.unesco.org/ark:/48223/pf0000377895

Edhere, U. J., & Ejie, M. I. (2024). A psycholinguistic study of the language of under-five users of english. *African Journal of Humanities and Contemporary Education Research*, *13*(1), 300–316. https://doi.org/10.62154/bcmzk584

Ennemoser, M., & Schneider, W. (2007). Relations of television viewing and reading: Findings from a 4-year longitudinal study. *Journal of Educational Psychology*, *99*(2), 349–368. https://doi.org/10.1037/0022-0663.99.2.349

Eric, O. (2021). The negative effects of new screens on the cognitive functions of young children require new recommendations. *Italian Journal of Pediatrics*, *47*(1). https://doi.org/10.1186/s13052-021-01174-6

Eslit, E. (2023). Unlocking the power of music: a novel approach to language teaching and learning. *Social Science Research Network*. https://doi.org/10.2139/ssrn.4490747

Estrin, G. L., & Bhavnani, S. (2020). *Synaptogenesis - an overview*. Www.sciencedirect.com. https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/synaptogenesis

Ewin, C. A., Reupert, A. E., McLean, L. A., & Ewin, C. J. (2020). The impact of joint media engagement on parent–child interactions: A systematic review. *Human Behavior and Emerging Technologies*, *3*(2), 230–254. https://doi.org/10.1002/hbe2.203

Fakhriyah, F. N. (2020). Media Youtube Sebagai Sarana Pemerolehan Bahasa B2 Anak Usia 3-5 Tahun (Studi Kasus Dua Orang Anak). *KaderaBahasa*, *12*(1), 48–57. https://doi.org/10.47541/kaba.v12i1.111

Farahsani, Y., Rini, I. P., & Jaya, P. H. (2020). Youtube as a medium for indonesian toddlers' second language acquisition (An analysis through children songs). *HUMANIKA*, *27*(2), 147–154. https://doi.org/10.14710/humanika.v27i2.33793

Fernández, E., Smith, H., Lytle, S., & Kuhl, P. (2018). *The Handbook of Psycholinguistics, First Edition. Social Interaction and Language Acquisition: Toward a Neurobiological View*. https://ilabs.uw.edu/sites/default/files/2018_lytle_kuhl_socialinteractionandlanguage_neurobiologicalview_.pdf

Fitzpatrick, C., Florit, E., Lemieux, A., Garon-Carrier, G., & Mason, L. (2024). Associations between preschooler screen time trajectories and executive function. *Academic Pediatrics*, 102603–102603. https://doi.org/10.1016/j.acap.2024.102603

Flevaris, T. (n.d.). *Nativism in Linguistics: Empirical and Theoretical Issues*. https://linguistics.northwestern.edu/documents/award-winners/linguistics-undergraduate-award-past-winner-flevaris.pdf

Gamlo, N. (2019). The impact of mobile game-based language learning apps on efl learners' motivation. *English Language Teaching*, *12*(4), 49–56. https://eric.ed.gov/?id=EJ1208441

Gao, J., & Gao, L. (2024). A meta-analysis of prospective cohort studies on screen time and the risk of depression in adolescents. *Acta Psychologica*, *251*, 104530. https://doi.org/10.1016/j.actpsy.2024.104530

Gath, M., Horwood, L. J., Gillon, G., McNeill, B., & Woodward, L. J. (2025). Longitudinal associations between screen time and children's language, early educational skills, and peer social functioning. *Developmental Psychology*. https://doi.org/10.1037/dev0001907

Gath, M., McNeill, B., & Gillon, G. (2023). Preschoolers' screen time and reduced opportunities for quality interaction: Associations with language development and parent-child closeness. *Current Research in Behavioral Sciences*, *5*, 100140. https://doi.org/10.1016/j.crbeha.2023.100140

Gayraud, F., Lanoë, J.-L., & De Agostini, M. (2024). Factors influencing language performance in boys and girls at age 2 in the French ELFE birth cohort. *Brain Research*, *1847*, 149305. https://doi.org/10.1016/j.brainres.2024.149305

Gilkerson, J., Richards, J. A., Warren, S. F., Oller, D. K., Russo, R., & Vohr, B. (2018). Language experience in the second year of life and language outcomes in late childhood. *Pediatrics*, *142*(4). https://doi.org/10.1542/peds.2017-4276

Gilkerson, J., Richards, J. A., Zimmerman, F. J., Garrison, M. M., Xu, D., Gray, S., & Yapanel, U. (2009). Audible television and decreased adult words, infant vocalizations, and conversational turns. *Archives of Pediatrics & Adolescent Medicine*, *163*(6), 554. https://doi.org/10.1001/archpediatrics.2009.61

Given, L. (2008). The SAGE encyclopedia of qualitative research methods. *The SAGE Encyclopedia of Qualitative Research Methods*, *2*(1). https://doi.org/10.4135/9781412963909

Hafiz, S., Rashid, T., Hossain, M. S., Haque, D. R., & Fahmida Tofail. (2024). Supervised and unsupervised screen time and its association with physical, mental and social health of school-going children in Dhaka, Bangladesh: Cross-sectional study (Preprint). *JMIR Pediatrics and Parenting*. https://doi.org/10.2196/62943

Hafizha, A., Fauziah, H. A., & Lubis, Y. (2023). Difficulties faced by english language students in phonology courses. *SinarDunia: JurnalRisetSosialHumaniora Dan Ilmu Pendidikan*, *2*(3), 37–46. https://doi.org/10.58192/sidu.v2i3.1110

Hakim, A. (2022). *Autistic ShishurBhasha O Jogajog Therapy* [Language and communication therapy for autistic children]. Onnesha Publication. https://www.rokomari.com/book/233301/autistic-shishur-bhasha-o-jogajog-therapy

Hale, L., & Guan, S. (2015). Screen time and sleep among school-aged children and adolescents: A systematic literature review. *Sleep Medicine Reviews*, *21*(21), 50–58. https://doi.org/10.1016/j.smrv.2014.07.007

Hall, J. A., & Liu, D. (2022). Social media use, social displacement, and well-being. *Current Opinion in Psychology*, *46*, 101339. https://doi.org/10.1016/j.copsyc.2022.101339

Hansen, J. E., & Broekhuizen, M. L. (2020). Quality of the Language-Learning Environment and Vocabulary Development in Early Childhood. *Scandinavian Journal of Educational Research*, *65*(2), 1–16. https://doi.org/10.1080/00313831.2019.1705894

Haque, T., Hossain, K. M., Bhuiyan, Md. M. R., Ananna, S. A., Hussain, Md. A., Islam, M. R., Ahmed, A., & Rahman, M. M. (2020). *Knowledge, attitude and practices (KAP) towards COVID-19 and assessment of risks of infection by SARS-CoV-2 among the Bangladeshi population: An online cross sectional survey*. https://doi.org/10.21203/rs.3.rs-24562/v2

Hayiou-Thomas, M. E., Dale, P. S., & Plomin, R. (2012). The etiology of variation in language skills changes with development: a longitudinal twin study of language from 2 to 12 years. *Developmental Science*, *15*(2), 233–249. https://doi.org/10.1111/j.1467-7687.2011.01119.x

Heimann, M., Bus, A., & Barr, R. (2021). *Growing up in a Digital World - Social and Cognitive Implications*. Frontiers Media SA.

Hen, M., Deri, N., & Dolev, N. (2025). Face-to-face vs. screen-based dialogic reading: a comparative study on language skills in preschool children. *Early Child Development and Care*, 1–16. https://doi.org/10.1080/03004430.2025.2465636

Henward, A. (2015, December 9). *Does screen time help children learn?* World Economic Forum. https://www.weforum.org/stories/2015/12/does-screen-time-help-children-learn/

Hmidan, A., Seguin, D., & Duerden, E. G. (2023). Media screen time use and mental health in school aged children during the pandemic. *BMC Psychology*, *11*(1). https://doi.org/10.1186/s40359-023-01240-0

Hoff, E. (2003). The specificity of environmental influence: Socioeconomic status affects early vocabulary development via maternal speech. *Child Development*, *74*(5), 1368–1378. https://doi.org/10.1111/1467-8624.00612

Hosani, A., Ebtihal Ahmed Darwish, Ayanikalath, S., Ruqaya Saeed Al Mazroei, Radwha Saeed Al Maashari, & Amer Tareq Wedyan. (2023). Screen time and speech and language delay in children aged 12–48 months in UAE: a case–control study. *Middle East Current Psychiatry*, *30*(1). https://doi.org/10.1186/s43045-023-00318-0

Howard, K., Roberts, G., Lim, J., Lee, K. J., Barre, N., Treyvaud, K., Cheong, J., Hunt, R. W., Inder, T. E., Doyle, L. W., & Anderson, P. J. (2011). Biological and environmental factors as predictors of language skills in very preterm children at 5 years of age. *Journal of Developmental & Behavioral Pediatrics*, *32*(3), 239–249. https://doi.org/10.1097/dbp.0b013e31820b7882

Hutchinson, B., Prabhakaran, V., Denton, E., Webster, K., Zhong, Y., & Denuyl, S. (2020, July 1). *Social biases in nlp models as barriers for persons with disabilities*. ACLWeb; Association for Computational Linguistics. https://doi.org/10.18653/v1/2020.acl-main.487

Hutton, J. S., Dudley, J., Horowitz-Kraus, T., DeWitt, T., & Holland, S. K. (2020). Associations between screen-based media use and brain white matter integrity in preschool-aged children. *JAMA Pediatrics*, *174*(1), e193869. https://doi.org/10.1001/jamapediatrics.2019.3869

Jasiah, J., Khasanah, U., Asry, W., Latifah, N., & Zulham. (2023). Improving early childhood language development through “kiki miu-miu” youtube videos. *Journal of Childhood Development*, *3*(2), 24–35. https://doi.org/10.25217/jcd.v3i2.3780

Jesmine, J., Sultana, A., Jui, F., Sonia, U., Thakur, M., Shaon, M., & Ahmed, S. (2024). Effects of prolonged screen time on children aged 1-5 years – A cross-sectional study. *American Journal of Pediatrics*, *10*(4), 193–199. https://doi.org/10.11648/j.ajp.20241004.16

Joseph, E. D., Kracht, C. L., St. Romain, J., Allen, A. T., Barbaree, C., Martin, C. K., & Staiano, A. E. (2019). Young children’s screen time and physical activity: perspectives of parents and early care and education center providers. *Global Pediatric Health*, *6*, 2333794X1986585. https://doi.org/10.1177/2333794x19865856

Joseph, H. B., Sandhiya, K., & Shetty, A. P. (2022). Touch screen device usage and its effect on sleep among young children: do parents delude younger generation deliberately? Time to ruminate and impede this technological harm. *Indian Journal of Community Medicine*, *47*(3), 360–363. https://doi.org/10.4103/ijcm.ijcm_1065_21

K. Kaye, L., Orben, A., A. Ellis, D., C. Hunter, S., & Houghton, S. (2020). The conceptual and methodological mayhem of “screen time.” *International Journal of Environmental Research and Public Health*, *17*(10), 3661. https://doi.org/10.3390/ijerph17103661

Kanwal, N., Khan, A., & Gulzar, M. A. (2023, September 30). *Kanwal et al. Linguistic and Socio-Semiotic Study of the Political Humor in Comic Strips*. https://www.researchgate.net/publication/375518805_Kanwal_et_al_Linguistic_and_Socio-Semiotic_Study_of_the_Political_Humor_in_Comic_Strips

Karadöller, D. Z., Beyza Sümer, & Aslı Özyürek. (2024). First-language acquisition in a multimodal language framework: Insights from speech, gesture, and sign. *First Language*. https://doi.org/10.1177/01427237241290678

Karani, N. F., Sher, J., & Mophosho, M. (2022). The influence of screen time on children’s language development: A scoping review. *South African Journal of Communication Disorders*, *69*(1), 7. https://sajcd.org.za/index.php/sajcd/article/view/825

Kerai, S., Almas, A., Guhn, M., Forer, B., &Oberle, E. (2022). Screen time and developmental health: results from an early childhood study in Canada. *BMC Public Health*, *22*(1). https://doi.org/10.1186/s12889-022-12701-3

Khan, M. Z. H. (2025). *Translation of Nirer Shikkha-The education of the nest by Rabindranath Tagore*. Medium. https://medium.com/@zhkaashaa/translation-of-nirer-shikkha-the-education-of-the-nest-by-rabindranath-tagore-cc02a8a81b6c

Klein, O., & Becker, B. (2017). Preschools as language learning environments for children of immigrants. Differential effects by familial language use across different preschool contexts. *Research in Social Stratification and Mobility*, *48*, 20–31. https://doi.org/10.1016/j.rssm.2017.01.001

Kracht, C. L., Redman, L. M., Bellando, J., Krukowski, R. A., & Andres, A. (2023). Association between maternal and infant screen time with child growth and development: A longitudinal study. *Pediatric Obesity*, *18*(7). https://doi.org/10.1111/ijpo.13033

Krapf-Bar, D., Davidovitch, M., Rozenblatt-Perkal, Y., & Gueron-Sela, N. (2022). Maternal mobile phone use during mother–child interactions interferes with the process of establishing joint attention. *Developmental Psychology*, *58*(9), 1639–1651. https://doi.org/10.1037/dev0001388

Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukophadhyay, T., & Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist*, *53*(9), 1017–1031. https://doi.org/10.1037//0003-066x.53.9.1017

Kucker, S. C., Perry, L. K., & Barr, R. (2024). Variability and patterns in children's media use and links with language development. *ActaPaediatrica*. https://doi.org/10.1111/apa.17100

Kushlev, K., & Leitao, M. R. (2020). The effects of smartphones on well-being: theoretical integration and research agenda. *Current Opinion in Psychology*, *36*, 77–82. https://doi.org/10.1016/j.copsyc.2020.05.001

Lemetyinen, H. (2023, September 7). *Language acquisition theory*. Simply Psychology. https://www.simplypsychology.org/language.html

Lerner, C., & Barr, R. (2015). Screen sense: setting the record straight--research-based guidelines for screen use for children under 3 years old. *ZERO to THREE*, *35*(4), 1–10. https://eric.ed.gov/?id=EJ1125470

Levy, J. S. (2008). Case Studies: Types, Designs, and Logics of Inference. *Conflict Management and Peace Science*, *25*(1), 1–18.

Li, C., Cheng, G., He, S., Xie, X., Tian, G., Jiang, N., Min, X., Shi, Y., Li, R., Zhou, T., & Yan, Y. (2022). Prevalence, correlates, and trajectory of screen viewing among Chinese children in Changsha: a birth cohort study. *BMC Public Health*, *22*(1). https://doi.org/10.1186/s12889-022-13268-9

Liamputtong, P., & Ezzy, D. (1999). *Qualitative Research Methods*. Oxford University Press, USA.

Lim, W. M. (2024). What is qualitative research? An overview and guidelines. *Australasian Marketing Journal (AMJ)*, *0*(0). https://doi.org/10.1177/14413582241264619

Lin, F. Y. (2017). A refutation of universal grammar. *Lingua*, *193*, 1–22. https://doi.org/10.1016/j.lingua.2017.04.003

Linebarger, D. L., & Walker, D. (2005). Infants' and Toddlers' Television Viewing and Language Outcomes. *American Behavioral Scientist*, *48*(5), 624–645. https://doi.org/10.1177/0002764204271505

Liu, D., Baumeister, R. F., & Yang, C.-C. (2024). A meta-analysis on the relationship between the use of electronic media and psychological well-being. *Emerging Trends in Drugs Addictions and Health*, *4*, 100162–100162. https://doi.org/10.1016/j.etdah.2024.100162

Liu, M., Ming, Q., Yi, J., Wang, X., & Yao, S. (2016). Screen time on school days and risks for psychiatric symptoms and self-harm in mainland chinese adolescents. *Frontiers in Psychology*, *7*. https://doi.org/10.3389/fpsyg.2016.00574

Liu, S., Reynolds, B. L., Thomas, N., & Soyoof, A. (2024). The use of digital technologies to develop young children's language and literacy skills: A systematic review. *SAGE Open*, *14*(1). https://doi.org/10.1177/21582440241230850

Madigan, S., Browne, D., Racine, N., Mori, C., & Tough, S. (2019). Association between screen time and children's performance on a developmental screening test. *JAMA Pediatrics*, *173*(3), 244. https://doi.org/10.1001/jamapediatrics.2018.5056

Madigan, S., McArthur, B. A., Anhorn, C., Eirich, R., & Christakis, D. A. (2020). Associations between screen use and child language skills. *JAMA Pediatrics*, *174*(7). https://doi.org/10.1001/jamapediatrics.2020.0327

Mahesh, U., Reddy, K., None Haarika V, & Sekhar, C. (2024). Evaluating the role of digital media in language development among pre-schoolers: An observational study. *Asian Journal of Medical Sciences*, *15*(2), 58–63. https://doi.org/10.3126/ajms.v15i2.59871

Martinot, P., Bernard, J. Y., Peyre, H., De Agostini, M., Forhan, A., Charles, M.-A., Plancoulaine, S., & Heude, B. (2021). Exposure to screens and children's language development in the EDEN mother–child cohort. *Scientific Reports*, *11*(1). https://doi.org/10.1038/s41598-021-90867-3

Massaroni, V., Delle Donne, V., Marra, C., Arcangeli, V., & Chieffo, D. P. R. (2024). The relationship between language and technology: how screen time affects language development in early life—A systematic review. *Brain Sciences*, *14*(1), 27. https://doi.org/10.3390/brainsci14010027

May, N. (2024, March 4). Screen time robs average toddler of hearing 1,000 words spoken by adult a day, study finds. *The Guardian*. https://www.theguardian.com/australia-news/2024/mar/04/does-children-toddlers-kids-watching-tv-impact-development-learning

McCarthy, D. (1946). Language development in children. *Manual of Child Psychology.*, 476–581. https://doi.org/10.1037/10756-010

McKean, C., Mensah, F. K., Eadie, P., Bavin, E. L., Bretherton, L., Cini, E., & Reilly, S. (2015). Levers for language growth: characteristics and predictors of language trajectories between 4 and 7 years. *PLOS ONE*, *10*(8), e0134251. https://doi.org/10.1371/journal.pone.0134251

McLeod, S. (2025). *Vygotsky's Sociocultural Theory of Cognitive Development*. Simply Psychology. https://www.simplypsychology.org/vygotsky.html

Medawar, J., Tabullo, Á. J., & Gago-Galvagno, L. G. (2022). Early language outcomes in Argentinean toddlers: Associations with home literacy, screen exposure and joint media engagement. *British Journal of Developmental Psychology*. https://doi.org/10.1111/bjdp.12429

Mendelsohn, A. L., Brockmeyer, C. A., Dreyer, B. P., Fierman, A. H., Berkule-Silberman, S. B., & Tomopoulos, S. (2010). Do verbal interactions with infants during electronic media exposure mitigate adverse impacts on their language development as toddlers? *Infant and Child Development, 19*(6), 577–593. https://doi.org/10.1002/icd.711

Misbahuddin, & Setiyawan, A. (2023). *YouTube Media on Arabic Language Acquisition Early Childhood 4 Years Old*. doi: 10.30762/asalibuna.v7i02.2393

Monteiro, R., Fernandes, S., Hutton, J. S., Huang, G., Ittenbach, R. F., & Rocha, N. B. (2022). Psychometric properties of the ScreenQ for measuring digital media use in Portuguese young children. *ActaPaediatrica, 111*(10), 1950–1955. https://doi.org/10.1111/apa.16439

Montsaye Academy. (2019). *Theories of Language Acquisition*. https://www.montsaye.northants.sch.uk/assets/Uploads/English-Language-Summer-Work-2.pdf

Morris, M. (2020). Enhancing Relationships through technology: Directions in parenting, caregiving, Romantic partnerships, and Clinical Practice. *Dialogues in Clinical Neuroscience*, *22*(2), 151–160. https://doi.org/10.31887/dcns.2020.22.2/mmorris

Muhammad Darwis, Intan Zuhra, & Nurjannah Nurjannah. (2024). Pengaruh Media Youtube "Omar & Hana" Terhadap Keterampilan Berbicara Anak Usia 2 Tahun. *JurnalSosialHumanioraSigli*, *7*(1), 566–575. https://doi.org/10.47647/jsh.v7i1.2373

Muhammad, N., Meem Umme Sabana, & Talukder, A. A. (2024). Bangladeshi parents' awareness of young children's smartphone use. *Bangladesh Journal of Integrated Thoughts, 19*(1), 93–116. https://doi.org/10.52805/bjit.v19i1.303

Muppalla, S. K. (2023). *Effects of excessive screen time on child development: an updated review and strategies for management*. National Library of Medicine; Cureus. https://pmc.ncbi.nlm.nih.gov/articles/PMC10353947/

Mustonen, R., Torppa, R., & Stolt, S. (2022). Screen time of preschool-aged children and their mothers, and children's language development. *Children*, *9*(10), 1577. https://doi.org/10.3390/children9101577

Nasrin, S. (2016). Noun acquisition in Bengali-speaking autistic children (Original: বাংলাভাষী অটিস্টিক শিশুর বিশেষ্য আয়ত্তীকরণ). *The Dhaka University Journal of Linguistics*, *7 & 8*, 13–16. https://linguisticsdu.org/wp-content/uploads/2024/06/Salma-Nasrin-Vol.-7-8-No.-13-16-February-2016.pdf

Neuman, S. B., & Celano, D. (2025). Giving our children a fighting chance: poverty, literacy, and the development of information capital. In *NYU Scholars*. Teachers College Press. https://nyuscholars.nyu.edu/en/publications/giving-our-children-a-fighting-chance-poverty-literacy-and-the-de

Nga, S., Yu, M.-L., & Brown, T. (2024). The relationship between children's screen time and the time they spend engaging in play: An exploratory study. *Journal of Occupational Therapy, Schools & Early Intervention*, *17*(4), 1–20. https://doi.org/10.1080/19411243.2024.2333276

Nikooharf Salehi, E., Brakenridge, C., Jaydarifard, S., & Mielke, G. I. (2024). Longitudinal analysis of the bidirectional relationship between screen time and sleep: Exploring the role of physical activity. *Sleep Medicine*, *126*, 319–326. https://doi.org/10.1016/j.sleep.2024.12.028

Noam Chomsky. (2002). *On nature and language*. Cambridge Cambridge University Press.

None Nailul Fadhillah, Ratih Kusumawardani, & Laily Rosidah. (2023). Pengaruh Penggunaan Youtubeuntuk Kemampuan Berbicarapada Anak Usia 4-5 Tahun. [The influence of youtube usage on speaking ability in children aged 4-5 years.] *GenerasiEmas/GenerasiEmas*, *6*(1), 15–20. https://doi.org/10.25299/ge.2023.vol6(1).11210

Noor, S. E., & Islam, H. (2021, September). *How Much Screen Time Is Too Much?* Daily Star. https://www.thedailystar.net/shout/cover-story/news/how-much-screen-time-too-much-2171546

Panjeti-Madan, V. N., & Ranganathan, P. (2023). Impact of screen time on children's development: cognitive, language, physical, and social and emotional domains. *Multimodal Technologies and Interaction*, *7*(5), 52. https://doi.org/10.3390/mti7050052

Patton, M. Q. (2002). Two decades of developments in qualitative inquiry. *Qualitative Social Work: Research and Practice*, *1*(3), 261–283. https://doi.org/10.1177/1473325002001003636

Paulich, K. N., Ross, J. M., Lessem, J. M., & Hewitt, J. K. (2021). Screen time and early adolescent mental health, academic, and social outcomes in 9- and 10- year old children: Utilizing the Adolescent Brain Cognitive Development [SM] (ABCD) Study. *PLOS ONE*, *16*(9), e0256591. https://doi.org/10.1371/journal.pone.0256591

Pearson, N., Biddle, S. J. H., Griffiths, P., Sherar, L. B., McGeorge, S., & Haycraft, E. (2020). Reducing screen-time and unhealthy snacking in 9–11 year old children: the Kids FIRST pilot randomised controlled trial. *BMC Public Health*, *20*(1). https://doi.org/10.1186/s12889-020-8232-9

Perkins, S. C., Finegood, E. D., & Swain, J. E. (2013). Poverty and language development: roles of parenting and stress. *Innovations in Clinical Neuroscience*, *10*(4), 10. https://pmc.ncbi.nlm.nih.gov/articles/PMC3659033/

Picard, C. A., & Melchin, K. R. (2007). Insight mediation: a learning-centered mediation model. *Negotiation Journal*, *23*(1), 35–53. https://doi.org/10.1111/j.1571-9979.2007.00126.x

Pires, L., María-JesúsMancebón, Mediavilla, M., & José-María Gómez-Sancho. (2024). New evidence on the impact of learning in a foreign language on educational outcomes. *Studies in Educational Evaluation*, *83*, 101386–101386. https://doi.org/10.1016/j.stueduc.2024.101386

Ponti, M. (2017). Screen time and young children: Promoting health and development in a digital world. *Paediatrics & Child Health*, *22*(8), 461–468. https://doi.org/10.1093/pch/pxx123

Ponti, M. (2022). *Screen time and preschool children: Promoting health and development in a digital world: Canadian Paediatric Society*. Cps.ca; Canadian Paediatric Society. https://cps.ca/en/documents/position/screen-time-and-preschool-children

Priftis, N., & Panagiotakos, D. B. (2023). Screen time and its health consequences in children and adolescents. *Children (Basel)*, *10*(10), 1665–1665. https://doi.org/10.3390/children10101665

ProthomAlo. (2020, June 19). *Mobile subscribers decrease by 3.2 million (Bangla)*. Prothom Alo. https://www.prothomalo.com/business/%E0%A6%AE%E0%A7%8B%E0%A6%AC%E0%A6%BE%E0%A6%87%E0%A6%B2-%E0%A6%97%E0%A7%8D%E0%A6%B0%E0%A6%BE%E0%A6%B9%E0%A6%95-%E0%A6%95%E0%A6%AE%E0%A7%87%E0%A6%9B%E0%A7%87-%E0%A7%A9%E0%A7%A8-%E0%A6%B2%E0%A6%BE%E0%A6%96

Qi, J., Yan, Y., & Yin, H. (2023). Screen time among school-aged children of aged 6–14: a systematic review. *Global Health Research and Policy*, *8*(1). https://doi.org/10.1186/s41256-023-00297-z

Rabindran, & Madanagopal, D. (2020). Piaget's theory and stages of cognitive development-an overview. *Scholars Journal of Applied Medical Sciences*, *8*(9), 2152–2157. https://doi.org/10.36347/sjams.2020.v08i09.034

Radesky, J. S., Schumacher, J., & Zuckerman, B. (2014). Mobile and interactive media use by young children: The good, the bad, and the unknown. *PEDIATRICS*, *135*(1), 1–3. https://doi.org/10.1542/peds.2014-2251

Radesky, J. S., Weeks, H. M., Ball, R., Schaller, A., Yeo, S., Durnez, J., Tamayo-Rios, M., Epstein, M., Kirkorian, H., Coyne, S., & Barr, R. (2020). Young children's use of smartphones and tablets. *Pediatrics*, *146*(1). https://doi.org/10.1542/peds.2019-3518

Rainer, A. (2011). The longitudinal, chronological case study research strategy: A definition, and an example from IBM Hursley Park. *Information and Software Technology*, *53*(7), 730–746. https://doi.org/10.1016/j.infsof.2011.01.003

Rakiyah, S. (2021). Strategi Peningkatan Kemampuan Bicara Anak Usia 3 Tahun Melalui Youtube [Strategies for Improving Speaking Skills in 3-Year-Old Children Through YouTube.]. *Komunikologi: Jurnal Pengembangan Ilmu Komunikasi Dan Sosial*, *5*(1), 56. https://doi.org/10.30829/komunikologi.v5i1.9467

Ramadhan, E. T., Madjri, A., & Farahdilla, M. (2023). Hubungan Intensitas Menonton Youtubedengan Kemampuan Bicaradan Personal Sosial Anak Balita Usia (2–5 Tahun) di PAUDIT Insan Permata [The relationship between youtube viewing intensity and speaking

ability and personal-social skills of toddlers (aged 2–5 years) at PAUD IT Insan Permata.]. *Journal of Isues in Midwifery*, *7*(3), 125–134. https://doi.org/10.21776/ub.joim.2023.007.03.4

Raney, J. H., Al-shoaibi, A. A., Ganson, K. T., Testa, A., Jackson, D. B., Singh, G., Sajjad, O. M., & Nagata, J. M. (2023). Associations between adverse childhood experiences and early adolescent problematic screen use in the United States. *BMC Public Health*, *23*(1). https://doi.org/10.1186/s12889-023-16111-x

Rayce, S. B., Gunhild Tidemann Okholm, & Trine Flensborg-Madsen. (2024). Mobile device screen time is associated with poorer language development among toddlers: results from a large-scale survey. *BMC Public Health*, *24*(1). https://doi.org/10.1186/s12889-024-18447-4

Richert, R. A., Robb, M. B., Fender, J. G., & Wartella, E. (2010). Word learning from baby videos. *Archives of Pediatrics & Adolescent Medicine*, *164*(5). https://doi.org/10.1001/archpediatrics.2010.24

Roseberry, S., Hirsh-Pasek, K., & Golinkoff, R. M. (2013). Skype me! socially contingent interactions help toddlers learn language. *Child Development*, *85*(3), 956–970. https://doi.org/10.1111/cdev.12166

Roulstone, S., Law, J., Rush, R., & Peters, T. (2011). *Investigating the role of language in children's early educational outcomes*. Research Gate; unknown. https://www.researchgate.net/publication/265099078_Investigating_the_Role_of_Language_in_Children

Roussel-Ouellet, J., Beaulieu, D., Vézina-Im, L.-A., Turcotte, S., Labbé, V., & Bouchard, D. (2022). Psychosocial correlates of recreational screen time among adolescents. *International Journal of Environmental Research and Public Health*, *19*(24), 16719. https://doi.org/10.3390/ijerph192416719

Safwat, R. F., & Sheikhany, A. R. (2014). Effect of parent interaction on language development in children. *The Egyptian Journal of Otolaryngology*, *30*(3), 255. https://doi.org/10.4103/1012-5574.138488

Salehi-pourmehr, H., Niroomand, S., Shakouri, S. K., Asgarlou, Z., & Farshbaf-Khalili, A. (2018). Association between antenatal and postpartum depression and anxiety with weight

retention 1 year after childbirth: A longitudinal study. *Community Mental Health Journal*, *54*(8), 1284–1294. https://doi.org/10.1007/s10597-018-0324-y

Salkind, N. J. (Ed.). (2008). Vicarious Reinforcement. *Encyclopedia of Educational Psychology*. https://doi.org/10.4135/9781412963848.n276

Samkange, W. (2015). Examining skinner's and bandura's ideas on language acquisition: implications for the teacher. *examining skinner's and bandura's ideas on language acquisition: implications for the teacher.*, *2*(11), 1858–1863. https://www.gjar.org/publishpaper/vol2issue12/d379r76.pdf

Sandberg, H., & Gillen, J. (2021). Investigating the digital media engagements of very young children at home: Reflecting on methodology and ethics. *Communications*, *0*(0). https://doi.org/10.1515/commun-2021-0046

Sara Jane Webb, Howard, W., Garrison, M., Corrigan, S., Quinata, S., Taylor, L., & Christakis, D. A. (2024). Mobile media content exposure and toddlers' responses to attention prompts and behavioral requests. *JAMA Network Open*, *7*(7), e2418492–e2418492. https://doi.org/10.1001/jamanetworkopen.2024.18492

Schwab, J. F., & Lew-Williams, C. (2016). Language learning, socioeconomic status, and child-directed speech. *Wiley Interdisciplinary Reviews: Cognitive Science*, *7*(4), 264–275. https://doi.org/10.1002/wcs.1393

Simonović, S., & Hinić, D. (2021). Excessive screen media exposure and language delay in the development of infants and toddlers – Three case reports. *Serbian Journal of Experimental and Clinical Research*, *0*(0). https://doi.org/10.2478/sjecr-2021-0028

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, *104*(1), 333–339. ScienceDirect. https://doi.org/10.1016/j.jbusres.2019.07.039

Stiglic, N., & Viner, R. M. (2019). Effects of screentime on the health and well-being of children and adolescents: a systematic review of reviews. *BMJ Open*, *9*(1). https://doi.org/10.1136/bmjopen-2018-023191

Stoilova, M., Livingstone, S., & Khazbak, R. (2021). *Investigating risks and opportunities for children in a digital world: A rapid review of the evidence on children's internet use and outcomes Media and Communications*. https://www.unicef.org/innocenti/media/5621/file/UNICEF-Investigating-Risks-Opportunities-Children-Digital-World-2021.pdf

Stromswold, K. (2006). Why aren't identical twins linguistically identical? Genetic, prenatal and postnatal factors. *Cognition*, *101*(2), 333–384. https://doi.org/10.1016/j.cognition.2006.04.007

Stromswold, K. (2008). The genetics of speech and language impairments. *New England Journal of Medicine*, *359*(22), 2381–2383. https://doi.org/10.1056/nejme0807813

Suhada Afrin. (2025, January 8). *Tax burden on mobile phone and internet services, thoughts of increasing again (Original: ইন্টারনেট সেবায় করের বোঝা, আবার বাড়ানোর চিন্তা)*. Prothomalo. https://www.prothomalo.com/bangladesh/o0nfricf24

Sun, Q., YannAbdourazakou, & Norman, T. J. (2017). Perceived value of an online interactive learning tool and its critical antecedents. *Academy of Marketing Science Annual Conference*. https://www.researchgate.net/publication/317569925_Perceived_Value_of_An_Online_Interactive_Learning_Tool_and_Its_Critical_Antecedents

Sun, W., & Chao, M. (2024). Exploring the influence of excessive social media use on academic performance through media multitasking and attention problems: a three-dimension usage perspective. *Education and Information Technologies*. https://doi.org/10.1007/s10639-024-12811-y

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, *12*(2), 257–285. https://doi.org/10.1207/s15516709cog1202_4

Swider-Cios, E., Vermeij, A., & Sitskoorn, M. M. (2023). Young children and screen-based media: The impact on cognitive and socioemotional development and the importance of parental mediation. *Cognitive Development*, *66*(66), 101319. https://doi.org/10.1016/j.cogdev.2023.101319

Tagore, R. (1916). *Nirer Shiksha (Original: নীড়ের শিক্ষা)*. Tagoreweb.in. https://tagoreweb.in/Essays/shantiniketan-86/nirer-shikkha-188

Tamana, S. K., Ezeugwu, V., Chikuma, J., Lefebvre, D. L., Azad, M. B., Moraes, T. J., Subbarao, P., Becker, A. B., Turvey, S. E., Sears, M. R., Dick, B. D., Carson, V., Rasmussen, C., Pei, J., & Mandhane, P. J. (2019). Screen-time is associated with inattention problems in preschoolers: Results from the CHILD birth cohort study. *PLOS ONE*, *14*(4), e0213995. https://doi.org/10.1371/journal.pone.0213995

Taylor, S. J., Bogdan, R., & Devault, M. L. (2015). *Introduction to Qualitative Research methods: a Guidebook and Resource*. John Wiley & Sons, Cop.

Thompson, P. (2017). *Cognitive Development: The Theory of Jean Piaget*. Oklahoma State University Libraries. https://open.library.okstate.edu/foundationsofeducationaltechnology/chapter/2-cognitive-development-the-theory-of-jean-piaget/

Timotheou, S., Miliou, O., Dimitriadis, Y., Sobrino, S. V., Giannoutsou, N., Cachia, R., Monés, A. M., & Ioannou, A. (2022). Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. *Education and Information Technologies*, *28*(28), 6695–6726. https://doi.org/10.1007/s10639-022-11431-8

Tomopoulos, S., Dreyer, B. P., Berkule, S., Fierman, A. H., Brockmeyer, C., & Mendelsohn, A. L. (2010). Infant media exposure and toddler development. *Archives of Pediatrics & Adolescent Medicine*, *164*(12). https://doi.org/10.1001/archpediatrics.2010.235

Trochim, W. (2015). *The Research Methods Knowledge Base*. https://www.researchgate.net/profile/William-Trochim/publication/243783609_The_Research_Methods_Knowledge_Base/links/55db837008aed6a199ac6246/The-Research-Methods-Knowledge-Base.pdf

Tsuji, S., Fiévét, A.-C., & Cristia, A. (2021). Toddler word learning from contingent screens with and without human presence. *Infant Behavior and Development*, *63*, 101553. https://doi.org/10.1016/j.infbeh.2021.101553

Tsuji, S., Jincho, N., Mazuka, R., & Cristia, A. (2020). Communicative cues in the absence of a human interaction partner enhance 12-month-old infants' word learning. *Journal of Experimental Child Psychology*, *191*, 104740. https://doi.org/10.1016/j.jecp.2019.104740

United Nations International School of Hanoi. (2024). *Social development in early childhood and how it can affect your kids*. Www.unishanoi.org. https://www.unishanoi.org/about/calendar-news-and-publications/post-default/~board/news/post/social-development-in-early-childhood

Unseth, P. (n.d.). *A False Claim of Translation Quality: Deliberately Omitting Polite Morphology*. Retrieved April 9, 2025, from https://www.diu.edu/documents/gialens/Vol5-2/Unseth_politeness.pdf

Vacchiano, M., & Valente, R. (2021). Did the screens win? An autoregressive model linking leisure, relatedness and mental health. *Computers in Human Behavior*, *120*, 106755. https://doi.org/10.1016/j.chb.2021.106755

Valkenburg, P. M., & Peter, J. (2007). Online communication and adolescent well-being: testing the stimulation versus the displacement hypothesis. *Journal of Computer-Mediated Communication*, *12*(4), 1169–1182. https://doi.org/10.1111/j.1083-6101.2007.00368.x

Veldman, S. L. C., Altenburg, T. M., Chinapaw, M. J. M., & Gubbels, J. S. (2023). Correlates of screen time in the early years (0–5 years): A systematic review. *Preventive Medicine Reports*, *33*, 102214. https://doi.org/10.1016/j.pmedr.2023.102214

Víctor Carranza-Pinedo, & Diprossimo, L. (2025). Scaffolding and individuality in early childhood development. *Topoi*. https://doi.org/10.1007/s11245-024-10155-3

Vizcaino, M., Buman, M., DesRoches, C. T., & Wharton, C. (2019). Reliability of a new measure to assess modern screen time in adults. *BMC Public Health*, *19*(1), 1–8. https://doi.org/10.1186/s12889-019-7745-6

Vulchanova, M., Baggio, G., Cangelosi, A., & Smith, L. (2017). *Language Development in the Digital Age*. Frontiers Media SA.

Wang, G., Zhang, Y., Zhao, J., Zhang, J., & Jiang, F. (2020). Mitigate the effects of home confinement on children during the COVID-19 outbreak. *The Lancet*, *395*(10228), 945–947. https://doi.org/10.1016/S0140-6736(20)30547-X

WHO. (2019, April 2). *Guidelines on physical activity, sedentary behaviour and sleep for children under 5 years of age*. Www.who.int. https://www.who.int/publications/i/item/9789241550536

Williams, C. (2007). Research Methods. *Journal of Business & Economics Research (JBER)*, *5*(3). https://doi.org/10.19030/jber.v5i3.2532

World Bank. (2024, October 17). *The World Bank In Bangladesh*. World Bank. https://www.worldbank.org/en/country/bangladesh/overview

Xiang, H., Lin, L., Chen, W., Li, C., Liu, X., Li, J., Ren, Y., & Guo, V. Y. (2022). Associations of excessive screen time and early screen exposure with health-related quality of life and behavioral problems among children attending preschools. *BMC Public Health*, *22*(1). https://doi.org/10.1186/s12889-022-14910-2

Xu, J., Farooq, B., Crick, D. C. P., Zhou, X., & Howe, L. D. (2024). Adverse childhood experiences and excessive recreational screen time among adolescents in the united kingdom: A national longitudinal study. *Journal of Adolescent Health*, *75*(3), 451–460. https://doi.org/10.1016/j.jadohealth.2024.05.016

Xu, Q., Wang, J., Zhou, B., H. Jin, C., & Zhang, L. (2023). [Effects of Screen Exposure on Language Skills in Children]. *Chinese Journal of Pediatric*, *61*(04), 328–332. https://doi.org/10.3760/cma.j.cn112140-20221219-01056

Yamamoto, M., Mezawa, H., Sakurai, K., Mori, C., & Japan Environment and Children's Study Group. (2023). Screen time and developmental performance among children at 1-3 years of age in the japan environment and children's study. *JAMA Pediatrics*, *177*(11). https://doi.org/10.1001/jamapediatrics.2023.3643

Yan, S., & Yang, Y. (2020). Education informatization 2.0 in china: motivation, framework, and vision. *ECNU Review of Education*, *4*(2), 209653112094492. https://doi.org/10.1177/2096531120944929

Yang, X., Chen, Z., Wang, Z., & Zhu, L. (2017). The relations between television exposure and executive function in chinese preschoolers: the moderated role of parental mediation behaviors. *Frontiers in Psychology*, *8*. https://doi.org/10.3389/fpsyg.2017.01833

Zhao, L. (n.d.). *Study on Child Language Acquisition-Behaviorism, Nativism, and Sociolingustic Approach*. https://www.atlantis-press.com/article/125975957.pdf

Zimmerman, F. J., Christakis, D. A., & Meltzoff, A. N. (2007). Associations between media viewing and language development in children under age 2 years. *The Journal of Pediatrics*, *151*(4), 364–368. https://doi.org/10.1016/j.jpeds.2007.04.071

Zong, B., Li, L., Cui, Y., & Shi, W. (2024). Effects of outdoor activity time, screen time, and family socioeconomic status on physical health of preschool children. *Frontiers in Public Health*, *12*. https://doi.org/10.3389/fpubh.2024.1434936

Annex

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Annex A

Consent Form

I hereby present the data collection process during the interview in the following manner.

This research is being conducted as part of my M. Phil dissertation at the University of Dhaka. To ensure that research work follows proper research ethics, I will adhere to the following principles:

The purpose of the research will be communicated to the interviewees participating in the study.

The interviewees are free to decide to participate and can withdraw from participation even after the interview.

The data collected will be handled confidentially and stored so that no unauthorized person can obtain or access it.

This interview will be recorded, making it easier for me to document the information shared and assist in the research's ongoing work. This analysis may alter some data so that no interviewee can be identified. The data will be deleted after the work is completed. The data I collect will be used only for this research. You can refuse to answer any question or end the interview without giving any reason.

Please contact me (email below) if you have any questions.

Md. Zahid Hossain Kshan
Department of Communication Disabilities, University of Dhaka
Email: unzahid@gmail.com

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Annex B

Questionnaire for Parents and Teachers

Research Title:

Effect of using screen time in developing children's speech and language: Bangladesh context

Background: This questionnaire is part of a STUDY that is working to determine the impact of screen time on children aged 3-8 years in Bangladesh and their language development. The STUDY is a collaborative effort that includes parents, teachers, child psychologists, and linguists working together to understand the various parameters affecting children's screen exposure and language development.

Answer the following questions based on your experience and knowledge. Please be assured that your answers will remain confidential and used only for the STUDY.

Section A: General Information

1. Your role:

□ Parent

□ Teacher

□ Child psychologist

□ Linguist

2. Age group of children you work with or have observed:

□ 3-5 years

□ 6-8 years

□ Other: _____

3. Gender:

□ Male

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□ Female

□ Other: _____

4. Location:

□ Urban

□ Rural

Section B: Screen time use and exposure

5. How many hours of screen time do you (or your child) spend daily on screens (e.g., TV, mobile phone, tablet, computer) in your observation?

□ Less than 1 hour

□ 1-2 hours

□ 3-4 hours

□ More than 4 hours

6. What types of screens do children use the most? (all that apply)

□ Television

□ Mobile phone

□ Tablet

□ Computer/laptop

□ Video games

□ Other: _____

7. What types of content are children typically engaged with on screens? (all that apply)

□ Educational videos and apps

□ Cartoons/entertainment programs

□ Interactive games or apps

□ Movies

□Social media (e.g. YouTube, TikTok, etc.)

□ Other: _____

8. How many interactive screen activities do children engage in (e.g., educational apps, puzzles, word games)?

□ Very little

□ Sometimes

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□ Often

□ Always

9. How many passive screen activities do children engage in (e.g., watching TV, playing games without conversation)?

□ Very little

□ Sometimes

□ Often

□ Always

Section C: Effects on language development

10. In your opinion, how does screen time affect children's language development? (Select one)

□ Positive effects

□ Negative effects

□ No significant effects

□ Not sure

11. On which language skills can you see the effects of excessive screen time? (all that apply)

□ Vocabulary

□ Sentence structure and complexity

□ Pronunciation and Speech

□ Listening and comprehension skills

□ Social communication skills

□ Other: _____

12. Have you found that the type of content (e.g., educational vs. entertainment) makes any difference in children's language development?

□ Yes, educational content improves language skills

□ Yes, entertainment content hinders language development

□ No, content type has no effect

□ Not sure

13. Do you think that, if used correctly, screen time can be beneficial for language development?

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□ Yes

□ No

□ Not sure

14. Have you noticed that children with more screen time have better or worse communication skills (e.g., social interaction)?

□ Better communication skills

□ Poor communication skills

□ No significant difference

□ Not sure

Section D: Parents and Social Influences

15. How involved are parents in controlling their children's screen time?

□ Very involved, sets clear limits and guidelines

□ Moderately involved, sometimes sets limits

□ Very little involved, no clear guidelines

□ Not sure

16. Are parents actively involved in their children's screen time (e.g., watching shows, discussing content)?

□ Yes, always

□ Sometimes

□ Very little

□ Never

17. Do you think teachers, schools, or caregivers play an important role in reducing the adverse effects of screen time?

□ Vital role (educating about screen time and language development)

□ Moderately important role (occasionally solving screen time problems)

□ Minimal role

□ Not sure

18. Do you think the media (TV channels, social media, game developers) are responsible for influencing language development?

□ High responsibility

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□ Medium responsibility

□ Very little responsibility

□ No responsibility

E Section: General Observations and Feedback

19. Would you recommend strategies to help balance screen time and improve children's language development?

……..

20. how can the government or society help improve children's language development in the digital age?

……..

21. Do you have any further comments or observations regarding the effects of screen time? Thank you!

……..

Your participation and time will help us with our STUDY, which is important for understanding how screen time affects children's language and conversational development.

(Signature)

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Annex C

Content Analysis Related Data

Child ID	Age	Content Category	Content Types	Level of involvement	Mental/ Linguistic Effects	Emotional/Behavioral Impact	Notes
Child 1	4	Educational	Language learning app	High	Positive (new vocabulary)	Positive (excited, engaged)	Increased vocabulary
Child 2	6	Entertainment	Cartoon (Peppa Pig)	Low	Neutral	Neutral (watching passively)	Passive viewing, low interaction
Child 3	5	Interactive	Puzzle game (Toca Boca)	High	Positive (problem-solving)	Positive (curious, focused)	Active problem-solving and creativity
Child 4	7	Educational	Educational video (Math)	High	Positive (understands concepts)	Neutral (focused but calm)	Improved math skills
Child 5	3	Entertainment	Nursery rhymes on YouTube	Low	Negative (little verbal response)	Negative (irritated when stopped)	Low engagement, distracted
Child 6	6	Interactive	Role-playing game (Minecraft)	High	Positive (decision-making, social interactions)	Positive (engaged, happy)	Social interaction while playing with friends
Child 7	8	Educational	Educational game (ABCmouse)	High	Positive (improved reading skills)	Positive (enthusiastic, proud)	Strong language development
Child 8	5	Entertainment	Toy unboxing YouTube video	Low	Neutral	Negative (frustration when the video ends)	Lack of interactive content

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Child ID	Age	Content Category	Content Types	Level of involvement	Mental/ Linguistic Effects	Emotional/Behavioral Impact	Notes
Child 9	7	Educational	Science app - Exploration	High	Positive (knowledge gain)	Neutral (calm, focused)	Gaining new scientific knowledge
Child 10	4	Interactive	Drawing app - Toca Boca	High	Positive (creativity, language use)	Positive (excited, proud)	Creative expression and language development
Child 11	4	Educational	Educational app - Math	High	Positive (learning numbers)	Positive (focused, happy)	Improved number recognition
Child 12	6	Entertainment	Cartoon (Paw Patrol)	Low	Neutral	Neutral (watching passively)	Passive viewing, no verbal interaction
Child 13	5	Interactive	Puzzle game - Toca Boca	High	Positive (problem-solving)	Positive (curious, engaged) - Positive (curious, engaged)	Participation in creative problem-solving
Child 14	7	Educational	Science app - Exploration	High	Positive (concept understanding)	Neutral (calm, focused) - Neutral (calm, focused)	Gaining knowledge on scientific topics
Child 15	3	Entertainment	Nursery rhymes (YouTube)	Low	Negative (limited verbal output) Negative (limited verbal response)	Negative (irritated, restless) - Negative (irritated, restless)	Distracted, minimal interaction

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Child ID	Age	Content Category	Content Types	Level of involvement	Mental/ Linguistic Effects	Emotional/Behavioral Impact	Notes
Child 16	6	Interactive	Role-playing game – Minecraft, Bangla Cartoon Video	High	Positive (decision-making, social interaction)	Positive (engaged, happy) - Positive (engaged, happy)	Increased social interaction
Child 17	8	Educational	Language learning app (Duolingo)	High	Positive (new words learned)	Positive (enthusiastic) - Positive (frustration when the video ends) - Negative (frustration when the video ends)	Strong vocabulary development
Child 18	5	Entertainment	Toy unboxing (YouTube)	Low	Neutral	Neutral (calm, focused) - Neutral (calm, focused)	Low engagement, passive consumption
Child 19	7	Interactive	Math game (ABCmouse)	High	Positive (math skills development)	Positive (excited, proud) - Positive (excited, proud)	Improved basic math skills
Child 20	4	Educational	Drawing app (Toca Boca)	High	Positive (creativity, language use)	Positive (engaged, happy) - Positive (engaged, happy)	Increased creative expression and language use

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Child ID	Age	Content Category	Content Types	Level of involvement	Mental/ Linguistic Effects	Emotional/Behavioral Impact	Notes
Child 21	5	Entertainment	Interactive story app (Interactive story app)	High	Positive (narrative skills)	Neutral (passive watching) - Neutral (passive watching)	Developing new storytelling skills
Child 22	6	Interactive	Animated series (Frozen)	Low	Neutral	Positive (focused, happy) - Positive (focused, happy)	Minimal verbal interaction, confined to screen
Child 23	7	Educational	Educational game (ABCmouse)	High	Positive (language skills)	Positive (engaged) - Positive (engaged)	Increased language skills
Child 24	5	Entertainment Educational	Puzzle game (Memory app)	High	Positive (memory improvement)	Neutral (calm, passive) - Neutral (calm, passive)	Improved neurocognitive skills
Child 25	3	Interactive	Cartoon (Peppa Pig)	Low	Negative (no verbal interaction)	Positive (engaged, thoughtful) - Positive (excited, happy) - Positive (excited, happy)	No improvement in language skills
Child 26	6	Educational	Storytelling app (Storybird)	High	Positive (story creation)	Neutral (focused) - Neutral (focused)	Improved storytelling skills

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Child ID	Age	Content Category	Content Types	Level of involvement	Mental/ Linguistic Effects	Emotional/Behavioral Impact	Notes
Child 27	4	Entertaining	Learning game (ABC)	High	Positive (letter recognition)	Positive (interested, calm) - Positive (interested, calm)	Improved letter recognition
Child 28	5	Interactive	Science learning app (Science learning app)	High	Positive (concept understanding)	Positive (enthusiastic, joyful) - Positive (enthusiastic, joyful)	Learning new scientific information
Child 29	6	Educational	Children's movie (Toy Story)	Low	Neutral	Positive (focused, excited) - Positive (focused, excited)	Enjoyment, minimal impact on language
Child 30	7	Entertaining	Music app (Rhythm game)	High	Positive (musical rhythm, language) Positive (musical rhythm, language)	Neutral (relaxed, calm) - Neutral (relaxed, calm)	Improved rhythm and vocabulary skills
Child 31	5	Educational	Language app (Lingokids)	High	Positive (language development)	Neutral (focused, quiet) - Neutral (focused, quiet)	Sentence structure and vocabulary

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Child ID	Age	Content Category	Content Types	Level of involvement	Mental/ Linguistic Effects	Emotional/Behavioral Impact	Notes
Child 32	3	Interactive	Nursery rhymes (YouTube) (Nursery rhymes - YouTube)	Low	Neutral	Positive (engaged) - Positive (connected)	Lack of interaction, language improvement No
Child 33	6	Entertaining	Educational video (Math, numbers)	High	Positive (learning numbers)	Neutral (passive, detached) - Neutral (passive, detached)	Improved math skills
Child 34	4	Educational	Puzzle game (Tangram)	High	Positive (problem-solving)	Positive (engaged, proud) - Positive (connected, proud)	Improved neurocognitive abilities
Child 35	5	Interactive	Cartoon (Mickey Mouse)	Low	Neutral	Positive (happy, engaged) - Positive (connected, happy)	No effect on language development
Child 36	6	Entertaining	Learning game (SpellWords)	High	Positive (spelling, vocabulary)	Neutral (calm, observant) - Neutral (calm, observant)	Improved spelling skills
Child 37	8	Educational	Drawing/Art app (Artie 3000)	High	Positive (creativity, language use)	Positive (engaged, thoughtful) - Positive (calm, entertained)	Improved creative expression and language

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Child ID	Age	Content Category	Content Types	Level of involvement	Mental/ Linguistic Effects	Emotional/Behavioral Impact	Notes
Child 38	5	Interactive	Animated movie (Finding Nemo)	Low	Neutral	Positive (excited, curious)	Passive viewing, minimal interaction
Child 39	7	Entertaining	Storytelling app (Epic!)	High	Positive (storytelling skills)	Neutral (focused)	Strong storytelling skills developed
Child 40	6	Educational	Kids' TV series (Pocoyo)	Low	Neutral	Neutral (passive viewing)	Less verbal interaction, limited language use
Child 41	4	Interactive	Game (Animal Sounds)	High	Positive (language learning)	Positive (excited, proud)	Improved language through word recognition
Child 42	5	Entertaining	Reading app (Epic! Reading) (Reading app - Epic! Reading)	High	Positive (improved reading skills)	Positive (focused, excited)	Big improvement in reading development
Child 43	6	Educational	Children's cartoon (Tom & Jerry) (Children's cartoon - Tom & Jerry)	Low	Neutral	Neutral (calm, passive)	Minimal interaction or language use
Child 44	7	Content Category	Digital drawing (Drawing Pad) (Digital drawing - Drawing Pad)	High	Positive (creative language use)	Positive (focused, engaged)	Creativity through language and drawing

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Child ID	Age	Content Category	Content Types	Level of involvement	Mental/ Linguistic Effects	Emotional/Behavioral Impact	Notes
Child 45	5	Educational	Math learning game (Prodigy) (Math learning game - Prodigy)	High	Positive (math skills)	Neutral (focused)	Improved math comprehension
Child 46	6	Entertainment	Animated TV show (Clifford) (Animated TV show - Clifford)	Low	Neutral	Neutral (focused)	Distracted, limited verbal communication
Child 47	4	Interactive	Puzzle app (Sudoku for Kids) (Puzzle app - Sudoku for Kids)	High	Positive (problem-solving)	Neutral (relaxed, passive)	Improved problem-solving skills
Child 48	5	Educational	Science and Nature app (Science and Nature app)	High	Positive (problem-solving) Solution)	Positive (engaged, excited)	Increased interest in nature and scientific subjects
Child 49	6	Entertainment	Children's TV show (Barney & Friends) (Kids' TV show - Barney & Friends)	Low	Positive (scientific knowledge)	Positive (engaged, excited)	Low involvement, minimal language use
Child 50	7	Interactive	Language learning video (YouTube) (Language learning video - YouTube)	High	Neutral	Emotional/Behavioral Impact	Improved language skills and vocabulary