

# A Study on the Effects of Mother's Reading Intervention on Children's Smart Device Usage

Sungyeon Kim

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## Abstract

This study aimed to highlight the critical role of maternal reading interventions in mitigating children's smartphone addiction, provide practical insights for educators, policymakers, and caregivers, and emphasize maternal reading practices as an effective strategy to prevent smartphone addiction and promote balanced media use in children. 88 data points were collected from mothers of preschool children in Yongin, Gyeonggi-do. The study analyzed how reading interventions impact various sub-factors, including children's smartphone addiction. The results showed that mothers' reading interventions significantly influenced both mothers' media literacy and smart media mediation. Notably, reading books to children had a substantial effect on reducing their addiction to smart devices. Conversely, mothers' own reading habits did not affect their children's smartphone addiction or their own device use. This finding emphasizes the importance of direct maternal reading interventions in preventing smartphone addiction in children.

## Introduction

People now live in the information era. Using a smart device to get everything we need is simple; we can easily access our TV, computer, tablet, and smartphone. All of the most recent content, including YouTube videos and headline news, can be accessed with just a few clicks. One of the most distinguishing characteristics of the information era is its ease of communication with others. No matter where they are in the world, as long as the circumstances are correct, you may always connect with them via phone calls, Instagram Direct Messages, KakaoTalk, or other means. Smart devices are among the most essential items people own in the twenty-first century, as we live in the information age. It would be inconvenient to live without it. Everyone communicates with each other dozens of times a day through a small smartphone screen, communicates with people on the phone, and finds information and entertainment through web searches. The National Information Society Agency reports that 85% of South Koreans are smartphone owners<sup>1</sup>. Furthermore, out of 50 countries surveyed by Digital Times regarding smartphone ownership rates, Korea comes in first<sup>2</sup>. Although the widespread usage of cell phones has made life easier, children's excessive use of

these devices has become a social issue. Children who are raised surrounded by screens from an early age are referred to as digital natives<sup>1</sup>. According to a study by Lee(2014), 53.1% of infants and toddlers first used a smartphone at the age of 2.27<sup>2</sup>.

In addition, Ryu(2014) found that the age of first smartphone use among toddlers was 2.86 years old, while the age of first smartphone use among infants was 0.84 years old<sup>3</sup>. We can anticipate seeing even higher rates of smartphone adoption among infants and toddlers in the future, with the average age gradually declining. This shows that the first smartphone use is earlier for infants, at around one year of age than for toddlers, between the ages of two and five.

Parents, especially mothers, are the biggest influence on children and can have a positive or negative impact on their use of smart devices. Albert Bandura's social learning theory states that children learn new behaviors by observing and imitating the behavior of others. This means that children are influenced by their surroundings and learn social norms and behaviors through modeling, especially from their parents and other people around them. In particular, mothers, who spend the most time with their children and are the ones they imitate the most, have the most significant influence on their children's learning and how often they use smart devices. Previous studies have shown that as parents' smartphone use increases, their children's smartphone use increases proportionally, and the age of smartphone use increases as well<sup>2</sup>. Therefore, it is clear that mothers' personal behavior can have a significant impact on children's smartphone use. In particular, if the mother, who is the closest person to the child, has a tendency to become addicted to smart devices and is interfered with by negative media influences, it can be assumed that the child will be adversely affected. Also, since children are

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influenced by the people and environments around them and learn by imitating them, it can be inferred that mothers' misuse of smart devices is closely related to their children's tendency to become addicted to devices.

Children, the place of books, the most traditional tool of education and a medium for parent-child bonding, is rapidly shrinking. In traditional families, children are naturally introduced to books and reading through picture books and nighttime stories read to them by their parents before they enter school or public education. This is a very beneficial activity that not only transfers knowledge, but also fosters emotional connections, communication skills, and imagination. For this reason, reading with parents has long been recognized as a great way to develop children's knowledge and wisdom. In recent years, the need to read has been resurfacing to counteract the downsides of smartphones. The digital addiction caused by the popularization of smartphones has led to a decrease in reading, and the side effects are showing. The quick accessibility of information on smartphones and the ease and accessibility of video-based information has led to a decline in literacy and comprehension. However, the process of reading books to find information and improve reading comprehension and information acquisition has gained a lot of attention in recent years. In particular, children's growth and use of digital devices are greatly influenced by their mothers, so there is a need to conduct research. Specifically, Kim(2015) found that smartphone use and reading time were inversely correlated in a study of 6th graders, suggesting that maternal reading intervention can have a significant impact on children's use of smart devices<sup>4</sup>.

Reading intervention is defined as how much mothers read and how much mothers read to their children, which naturally enhances the interest of reading in their children and, through the interaction of activities, helps them to face their own situation, to recognize the problems within themselves, and to solve their own adaptation process and the problems at hand<sup>5</sup>. Mothers who are more aware of and vigilant about the dangers of smart devices and interest in education through reading are more likely to have higher media literacy to moderate media, assess risks, and use them effectively, as well as higher smart media interventions to control and moderate the amount, duration, and content of their children's smart device use. Overall, we can see that children's tendency to become addicted to smart devices is strongly influenced by their mothers' factors on smart device use. While maternal influences and outcomes for adolescents have been well studied, there is less research on toddlers' smartphone use. The use of smart devices is getting younger and younger, and it is imperative to study how to prevent adverse effects. In particular, there is an urgent need to investigate how reading, which has been recognized as the most basic activity for acquiring knowledge, affects the tendency of smart addiction.

Therefore, the main purpose of this study is to analyze how

mothers' reading intervention affects the degree of addiction in children and how the medium of reading is related to children's addiction tendencies incorporating the variable of maternal reading intervention. This study seeks to contribute to the understanding of how early reading habits, fostered by maternal involvement, may mitigate the increasing trend of digital addiction among young children.

## Theoretical Background

### Toddlers' smart device use and its effects (addiction)

The rate of smartphone use among infants and toddlers in Korea has been increasing year by year. In 2013, the Korea Institute of Child Care and Education published a report titled "Media Exposure Status and Protection Measures for Infants and Infants," which provided objective data on the use and exposure of smartphones by infants and toddlers<sup>6</sup>. According to the report, as of 2024, despite the survey being conducted 11 years ago, the smartphone usage rate among infants and toddlers was 53.1%, and the average age of first smartphone use was 2.27 years old.

Ryu(2014) surveyed mothers of infants under 36 months old and found that 76% of respondents reported that their children were using smartphones<sup>3</sup>. A study by Lee(2014) of 0-5-year-olds found similar results, noting that the age of first smartphone use was 2.86 years for toddlers, compared to 0.84 years for infants<sup>2</sup>. A study looking at the average number of hours per week that infants use smartphones showed that more than 15% of infants use smartphones for 2-4 hours per week, and more than 7% of infants use smartphones for more than 5 hours per week, indicating that some infants use smartphones for long periods<sup>3</sup>. However, a study by Oh et al.(2019) showed that the usage rate and practice among infants and toddlers are increasing<sup>7</sup>. In a survey of 602 parents of children aged 12 months to 6 years old, 59.3% of respondents reported that their children use smart media, and 45.1% of them first used smart media when they were between 12 and 24 months old. Another 7.8% said they started when they were less than 12 months old. These results show an earlier age of first exposure to smart media for children aged 3-5 years than the average age of 2.27 years and earlier than the age of 3 years reported by Kim et al.(2014) in their study of mothers of children aged 1-6 years<sup>6,8</sup>

The problem with smart media is that it provides immediate visual and auditory stimulation, which can easily lead to a state of uncritical immersion<sup>9</sup>. Infants and toddlers are more likely to become addicted to smart devices. In particular, the earlier they are exposed to them and the longer they use them, the more likely they are to become addicted<sup>4</sup>. As a result, the National Information Society Agency (NISA) has reported that children resist parental control over smartphone use and want to spend a significant portion of their daily lives using smartphones,

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resulting in parent-child conflicts, daily play/learning problems, the risk of delaying the development of ICT competencies, and physical health problems<sup>1</sup>

As such, many studies have been conducted to verify the negative effects of smart media use, and significant findings have been found. Kim et al.(2016) found that the earlier the age of first use of smartphones, the higher the levels of depression/anxiety and aggression, and the more frequent the use of smartphones, the higher the aggression<sup>10</sup>. Early childhood is a critical time when neural circuits are still being formed, excessive immersion in smart media can cause adverse effects such as neurodevelopmental imbalances and neurological deficits, cause problems with concentration and thinking, impair the ability to control oneself, and negatively affect emotional development<sup>11</sup>. In addition, because the neural circuitry of a child's brain cannot respond quickly enough to the fast screen switching speeds of smart media, excessively fast stimuli can distract a child's attention, causing attention deficit disorder, impairing cognitive development, inability to control and regulate their own behavior, and potentially leading to devastating social and emotional developmental problems such as autism<sup>12</sup>. Children who are overly immersed in smart media have been shown to lack empathy for others, are immature in how to express their feelings, exhibit aggressive behaviors, and are egocentric, while children who are less immersed in smart media are more likely to be social, interpersonal, and active. In other words, immersion in devices rather than people hinders social development<sup>8</sup>.

In a previous study on toddlers' tendency to immerse themselves in smart media and self-regulation, it was found that toddlers who were highly immersed in smart media had lower self-determination and lower self-control<sup>13</sup>. Kang et al.(2023) found an inverse relationship between higher digital addiction scores and lower self-regulation scores<sup>14</sup>. This finding is supported by previous studies that have shown that children who overuse digital devices have low self-regulation and that low self-regulation increases the impact of digital addiction<sup>15, 16</sup>.

### **The relationship between mothers' parenting attitudes and children's dependence on smart devices**

Parents, who spend the most time with children after they are born in traditional families, are the most important figures in the development of their emotions and intelligence through their interactions with their children<sup>17</sup>. In particular, mothers play a larger role than fathers in raising children in a typical family, and their parenting attitudes are the most important influence on children's development<sup>18</sup>

Parents have also been shown to have a strong influence on their children's smartphone use and its negative effects. In a study by Lee(2014), it was found that the more time parents spend on their smartphones, the more time their children spend on their smartphones and the earlier they start using

them<sup>2</sup>. In addition, Kim et al.(2014) reported that parents are the main determinants of whether or not their children use smartphones, with 93.5% of parents having a significant influence<sup>19</sup>. Therefore, the role of parents is important in preventing children's smartphone use and its adverse effects. Especially, parental addiction to smart devices is a major factor that negatively affects the control of children's smart device use. After all, inadequate parenting attitudes have been found to have a significant impact on increasing children's addiction to smart devices<sup>10</sup>.

Parents play a critical role in helping children grow up to be proactive and controlled users of media. For example, how parents guide and moderate their children's media use will determine their media behavior. Restrictive media moderation involves setting time limits or rules to prevent exposure to certain media or content, while active media moderation involves guiding children's media use through explanations and conversations, active media moderation is effective in reducing children's overall media use time and selecting informative and prosocial content<sup>20</sup>. Positive parenting behaviors in everyday life have also been shown to play a positive role in children's appropriate media use. Even without direct guidance on media use, children are more likely to use media appropriately and correctly when parents express affection and interest and positively treat them. In general, positive parenting attitudes are associated with lower levels of media use addiction in children<sup>21</sup>, and autonomous, accepting, and positive parenting attitudes are inversely associated with internet addiction or gaming addiction in children<sup>9</sup>

### **Reading intervention**

Reading is a well-established method for developing language and social skills in young children. In the parent-child relationship, children gradually develop their language skills by imitating their parents, and reading is an excellent way to develop language skills through refined, formalized, and modeled sentences in books. In particular, the Bookstart movement, which reads books to infants and toddlers, began in the UK in 1992 with the intention that if infants and toddlers become familiar with books, they will like books as they grow up and help their cognitive, social, and emotional development. As a result of a follow-up study of infants and toddlers, they were found to have high concentration, quick language acquisition, and excellent academic achievement and social skills<sup>6</sup>. As a result of these findings, parental reading to infants has been widely practiced around the world, and many parents in Korea are also practicing this method. Parental reading to infants not only helps to develop listening skills and a positive attitude toward reading, but also expands the infant's own knowledge, increases vocabulary, builds social relationships, fosters imagination and expression, and enriches

experiences<sup>22,23</sup>. In addition, when parents read to their infants, they listen to the sounds of their parents reading to them. This develops an attitude toward listening and increases auditory attention<sup>24</sup>. In addition, when parents read to their infants, they engage in meaningful interaction, which promotes intimacy and bonding<sup>25</sup>

This kind of reading interaction is referred to as reading intervention, which involves the systematic practice of facilitating linguistic, emotional, and social development in infants through interactions centered on books. Reading intervention not only enhances children's language abilities, vocabulary acquisition, auditory attention, and imaginative expression but also supports the formation and strengthening of their social relationships. Furthermore, when parents read aloud to their children, it contributes to the establishment of positive learning attitudes and fosters intimacy and bonding between parent and child, serving as a crucial educational tool for the overall development of the child

In an Australian study, reading intervention was found to have a highly beneficial effect on children's vocabulary and literacy development<sup>26</sup>. In the Netherlands, maternal reading to 3-year-olds was also reported to improve literacy skills as well as mutual attachment security<sup>27</sup>.

## Research Hypotheses


This study aims to investigate whether mothers' reading interventions, defined as the practice of regularly reading aloud to children and encouraging a shared interest in books to promote cognitive and emotional development, are related to children's tendency toward smart addiction. Through the theoretical background, it was confirmed that smart device addiction harms children's development and requires proper parenting and intervention by parents, especially mothers. Especially, mothers' reading intervention is an effective way to develop children's language skills, socialization, and attachment, so it can be inferred that reading intervention through reading books to children can be a way to prevent children's smart addiction. In addition, mothers who read a lot to their children are likely to read a lot themselves, as they recognize the importance of books themselves. Furthermore, it can be assumed that mothers who recognize the importance of books will be more media literate, able to recognize the dangers of smart devices and discern the right and wrong of their content and content choices. They will also be able to control the content and time of their children's use of smart devices to keep them out of danger of addiction. As a result, mothers' reading interventions may prevent smart addiction in both themselves and their children.

Therefore, the following hypotheses were developed for this study.

## Mothers' Reading Interventions Influence Media Literacy, Smart Media Mediation, and Smart Media Addiction

1. mothers' reading influences media literacy
2. mothers' reading influences smart media mediation
3. mothers' reading influences mothers' smart addiction
4. mothers' reading influences children's smart addiction
5. mothers' book reading to children affects media literacy
6. mothers' book reading to children affects smart media mediation
7. mothers' book reading to children affects mothers' smart addiction
8. mothers' book reading to children affects children's smart addiction

Table 1. Research Hypotheses

Mothers' Reading Interventions		Smart Addiction
- mothers' reading		media literacy
		smart media mediation
- mothers' book reading to children		mothers' smart addiction
		children's smart addiction

## Method

### Participants

For this study, a survey was conducted among mothers of preschool-aged children living in Yongin, located in Gyeonggi-do, South Korea. The survey was conducted over three weeks from January 15 to February 2, 2024, during which a total of 93 questionnaires were distributed to participants. All 93 questionnaires were returned, and five questionnaires were excluded from the analysis because they were deemed to be insincere. Therefore, 88 questionnaires were ultimately analyzed, and the results of this study are based on these data.

### Measurement

The questionnaire used in this study consists of 36 items, each designed to assess a different aspect. The questionnaire consists of 10 items related to media literacy (the ability to critically understand and utilize media), 11 items assessing smart media mediation (how mothers manage and regulate their children's

smart media use), 10 items related to mothers' smart addiction (assessing the problems caused by excessive smartphone use), and 5 items related to children's smart addiction (assessing the extent to which children are dependent on their smartphones). Responses to each question were on a 5-point Likert scale, with respondents selecting one of five options for each item, ranging from strongly disagree to strongly agree. The questions are shown in Table 2.

### Statistical Analysis

The collected survey data was coded and cleaned before being used for statistical analysis. SPSS 22 program was used for the analysis. SPSS (Statistical Package for the Social Sciences) is a software used for statistical data analysis and has functions such as statistical analysis and data visualization processing (Nwogwugwu & Ovat, 2021)<sup>28</sup>. SPSS is a highly effective program for analyzing data and generating meaningful results, and it is widely used because it is easy to operate. First, the Cronbach's Alpha value was calculated to check the reliability of the survey questions. Next, descriptive statistics and frequency analysis were conducted to analyze the demographic characteristics of the survey participants and the contents of the study. Finally, one-way ANOVA and Scheffe's post hoc test were conducted to test the hypotheses of this study.

### Analysis Results

#### Participant Demographics

The gender distribution of the children in the study is shown in Table 4. Of the 88 children included in the study, 47 were boys, making up 53.4% of the total, while 41 were girls, accounting for 46.6%. The age distribution of the children ranged from 1 to 6 and 8 years old. Specifically, 1-year-olds accounted for 3.4% of the total, with 3 children, while 2-year-olds represented 17%, with 15 children. Three-year-olds comprised 18.2% with 16 children, and both four- and five-year-olds accounted for 21.6%, with 19 children each. Children aged 6 totaled 15, or 17%, and finally, there was 1 child aged 8, representing 1.1% of the total, as shown in Table 4.

The table of mothers' ages is also shown in Table 4. The most common age range for mothers was 35–39 years, with 50 mothers representing 56.8% of the total. This was followed by 7 mothers aged 30–34, making up 8%, and 31 mothers aged over 40, comprising 35.2%.

The amount of time children spent on their smartphones is summarized in Table 4. A total of 21 children spent less than an hour on their phones, accounting for 23.9% of the total. The most common group was children who spent between 1 and 2 hours, with 28 children, or 31.8%. Slightly fewer children, 27

Table 2. questions

<p><b>media literacy</b></p> <p>Q1. I can find the information I need using search engines (Naver, Google, etc.).</p> <p>Q2. It's easy to use different media environments (computers, smartphones, tablet PCs, etc.) to get the information I need.</p> <p>Q3. I have access to the hardware (computer, smartphone, tablet PC) I need to create media content (posts, images, videos, etc.). Q4. I can use basic execution tools (hyperlinks, file transfers, etc.).</p> <p>Q5. I pay attention to violent elements in media content (text, images, videos, etc.).</p> <p>Q6. I can identify the presence of commercial messages (e.g., PPL ads) in media content (text, images, videos, etc.). Q7. I can analyze the positive or negative effects of media content (text, images, videos, etc.) on individuals.</p> <p>Q8. I can evaluate media according to legal and ethical rules (copyright, human rights, etc.).</p> <p>Q9. I can determine whether a media source is credible and provides objective and generally accepted information.</p> <p>Q10. I can protect myself from the risks and consequences of content (text, images, videos, etc.) I encounter in the media.</p>
<p><b>smart media mediation</b></p> <p>Q11. Help my child understand the content (text, images, videos) provided by SmartMedia. Q12. explain why an action taken by a character in the content is bad behavior.</p> <p>Q13. Explain the motivation (reason) for why a character in the content does what they do. Q14. Explain the real-world meaning of content provided by smart media.</p> <p>Q15. monitor your child when they are using smart media.</p> <p>Q16. Set specific times when your child can access media content. Q17. Prohibit your child from viewing certain media content.</p> <p>Q18. Decide what types of media content your child can view and how much they can use (amount, time, etc.).</p> <p>Q19. Praise your child when they use smart media correctly and well. (e.g., when they follow the rules you set with them) Q20. Teach your child how to use smart media (IPTV, SmartMedia, etc.) appropriately.</p> <p>Q21. Help your child understand how to stay safe on the internet (e.g., by explaining the risks of personal information leakage).</p>
<p><b>mothers' smart addiction</b></p> <p>Q22. I've tried to reduce the amount of time I spend on my smartphone, but I'm not succeeding. Q23. Using my smartphone makes me feel good and relieves stress.</p> <p>Q24. I find myself thinking about my smartphone even when I'm not using it.</p> <p>Q25. I feel more comfortable talking to people on my smartphone than I do in person. Q26. I am constantly reminded that I should use my smartphone less.</p> <p>Q27. When I stop using my smartphone, I feel like I want to use it again. Q28. I spend most of my breaks on my smartphone.</p> <p>Q29. I've stayed up all night using my smartphone. Q30. I feel more anxious as the battery level decreases.</p> <p>Q. I use my smartphone while walking down the street or talking to other people.</p>
<p><b>children's smart addiction</b></p> <p>Q32. My child often gets frustrated when he stops playing smart media and wants to play again. Q33. My child gets nervous or restless when he/she can't play smart media.</p> <p>Q34. My child only seems excited or energized when he/she is playing smart media.</p> <p>Q35. My child reacts in a grim way when he or she sees gory scenes in smart media videos, games, or other apps (e.g., injury, red blood splatter).</p> <p>Q36. My child promises to use a certain amount of screen time, but usually doesn't keep their promise.</p>

Table 3. Reliability Analysis

factor	Numbers of questionnaire	Cronbach's $\alpha$
media literacy	10	0.887
smart media mediation	11	0.933
mothers' smart addiction	10	0.893
children's smart addiction	5	0.836

(30.7%), used their phones for 2–3 hours, and 12 children, or 13.6%, used them for more than 3 hours daily.

Similarly, the table shows mothers' smartphone usage. Most mothers, 40 in total (45.5%), spent 2–3 hours on their phones per day. Only 3 mothers (3.4%) spent less than an hour daily, while 18 mothers (20.5%) used their phones for 1–2 hours. Finally, 27 mothers (30.7%) used their phones for more than 3 hours daily.

Table 4 also displays the average amount of time mothers spent talking to their children. A total of 18 mothers (20.5%) talked for less than an hour daily, while 34 mothers (38.6%) spoke for 1–2 hours. Another 26 mothers (29.5%) engaged in 2–3 hours of conversation, and 10 mothers (11.4%) talked for more than 3 hours.

In terms of mothers' reading habits, Table 4 shows that 36 mothers (40.9%) read no books in a month, while 40 mothers (45.5%) read less than one book monthly. Only 12 mothers (13.6%) reported reading more than one book per month.

Finally, the table summarizes the extent to which mothers read to their children. A total of 15 mothers (17%) reported never reading to their children, while 43 mothers (48.9%) read 1–2 books per week. Another 30 mothers (34.1%) read three or more books per week.

**Comparing differences in media literacy, smart media mediation, mother smart addiction, and child smart addiction by the amount of reading mothers do**

A one-way ANOVA was conducted to compare whether mothers' reading had an effect on media literacy, smart media mediation, mother-smart addiction, and child-smart addiction. The Table 5 results showed that mothers' media literacy ( $F=4.648, p=.012$ ) and smart media mediation ( $F=6.721, p=.002$ ) were significantly different according to their reading level, but there was no significant difference between mothers' and children's smart addiction. Post hoc analyses revealed significant differences in mothers' media literacy and smart media mediation between mothers who do not read books and mothers who read more than 1 book per month, with the mean values of media literacy and smart media mediation for mothers who read more than 1 book per month being higher than the mean values for mothers who do not read books.

Table 4. Participant Demographics

Category	Valid	Frequency	Percent
<b>Gender of Child</b>	Male	47	53.4
	Female	41	46.6
	<b>Total</b>	<b>88</b>	<b>100</b>
<b>Child's Age Range</b>	1 year old	3	3.4
	2 year old	15	17
	3 year old	16	18.2
	4 year old	19	21.6
	5 year old	19	21.6
	6 year old	15	17
	8 year old	1	1.1
	<b>Total</b>	<b>88</b>	<b>100</b>
<b>Mother's Age Range</b>	30-34 years old	7	8
	34-39 years old	50	56.8
	Over 40	31	35.2
	<b>Total</b>	<b>88</b>	<b>100</b>
<b>Hours of Smartphone Use by Child (Per Day)</b>	Less than 1 hour	21	23.9
	1-2 hours	28	31.8
	2-3 hours	27	30.7
	Over 3 hours	12	13.6
	<b>Total</b>	<b>88</b>	<b>100</b>
<b>Hours of Smartphone Use by Mothers (Per Day)</b>	Less than 1 hour	3	3.4
	1-2 hours	18	20.5
	2-3 hours	40	45.5
	Over 3 hours	27	30.7
<b>Total</b>	<b>88</b>	<b>100</b>	
<b>Time Spent Talking to Child (Per Day)</b>	Less than 1 hour	18	20.5
	1-2 hours	34	38.6
	2-3 hours	26	29.5
	Over 3 hours	10	11.4
<b>Total</b>	<b>88</b>	<b>100</b>	
<b>Amount of Reading by Mother (Per Month)</b>	None	36	40.9
	Less than 1 book per month	40	45.5
	More than 1 book per month	12	13.6
	<b>Total</b>	<b>88</b>	<b>100</b>
<b>Amount of Reading to Child by Mother (Per Week)</b>	None	15	17.0
	1-2 times per week	43	48.9
	More than 3 times per week	30	34.1
	<b>Total</b>	<b>88</b>	<b>100</b>

Table 5. Amount of reading of mother data results

		N	Mean	SD	F	P	Scheffe
media literacy	Not read (A)	36	3.186	0.6043	4.648	.012*	A<C
	Less than 1 book/month (B)	40	3.45	0.6481			
	More than 1 book / month (C)	12	3.767	0.3551			
smart media mediation	Not read (A)	36	2.953	0.8475	6.721	.002**	A<C
	Less than 1 book/month (B)	40	3.198	0.5997			
	More than 1 book / month (C)	12	3.818	0.573			
mothers' smart addiction	Not read (A)	36	3.069	0.6836	1.617	0.204	-
	Less than 1 book/month (B)	40	2.88	0.6517			
	More than 1 book / month (C)	12	2.692	0.7391			
children's smart addiction	Not read (A)	36	3.044	0.8143	2.223	0.114	-
	Less than 1 book/month (B)	40	2.99	0.634			
	More than 1 book / month (C)	12	2.567	0.4418			

\* $p < .05$ , \*\* $p < .01$

Table 6. amount of times mothers read to their children data results

		N	Mean	SD	F	P	Scheffe
media literacy	Not read (A)	15	3.033	0.5802	7.34	.001**	A<C
	1-2 times/week (B)	43	3.295	0.561			
	Atleast 3 times/ week (C)	30	3.690	0.615			
smart media mediation	Not read (A)	15	2.623	0.7348	10.739	.000***	A,B<C
	1-2 times/week (B)	43	3.093	0.621			
	Atleast 3 times/ week (C)	30	3.589	0.7379			
mothers' smart addiction	Not read (A)	15	3.320	0.7437	3.077	0.051	-
	1-2 times/week (B)	43	2.858	0.584			
	Atleast 3 times/ week (C)	30	2.843	0.7338			
children's smart addiction	Not read (A)	15	3.440	0.5914	7.487	.001*	A<C
	1-2 times/week (B)	43	3.000	0.5855			
	Atleast 3 times/ week (C)	30	2.647	0.7749			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Comparing differences in media literacy, smart media mediation, mother smart addiction, and child smart addiction by the amount of times mothers read to their children**

A one-way ANOVA was conducted to compare whether the extent to which mothers read to their children affects media literacy, smart media mediation, mother-smart addiction, and child-smart addiction. Table 6 results showed that the extent to which mothers read to their children significantly affected mothers' media literacy ( $F=7.340$ ,  $p=.001$ ), smart media mediation ( $F=10.739$ ,  $p=.000$ ), and children's smart addiction ( $F=7.487$ ,  $p=.001$ ), but not mothers' smart addiction. Post hoc analyses revealed significant differences in mothers' media literacy, smart media mediation, and children's smart addiction between mothers who do not read to their children and mothers who read to their children at least three times a week. Maternal media literacy was higher among mothers who read to their children at least three times a week than among mothers who did not read to their children. Smart media interventions were higher among mothers who read to their children 3 or more times per week than among mothers who do not read to their children and among mothers who read to their children 1-2 times per week. Child smart addiction had a higher mean value among mothers who read to their children 3 or more times per week than among mothers who did not read to their children.

**Discussion**

The purpose of this study is to investigate whether maternal reading intervention is associated with children's tendency to develop smart addiction. Reading intervention refers to mothers' own reading behavior and reading to their children. Therefore, this study analyzed whether mothers' reading mediation affects media literacy, smart media mediation, mothers' smart addiction, and children's smart addiction. Based on the results of the study, the following are discussed. When examining the effects of mothers' reading mediation, especially mothers' own reading, on media literacy, smart media mediation, mothers' smart addiction, and children's smart addiction, it was found that there was a significant difference between mothers' media literacy ( $F=4.648$ ,  $p=.012$ ) and smart media mediation ( $F=6.721$ ,  $p=.002$ ), but there was no significant difference between mothers' and children's smart addiction. This suggests that mothers' own reading behavior enhances their ability to judge the rightness or wrongness of media and makes them more effective in mediating smart media use for their children. In addition, for the factor of mothers reading to their children, the extent to which mothers read to their children significantly affected mothers' media literacy ( $F=7.340$ ,  $p=.001$ ), smart media mediation ( $F=10.739$ ,  $p=.000$ ), and children's smart addiction ( $F=7.487$ ,  $p=.001$ ), but not mothers' smart addiction. Mothers who read to their children at least three times a week had higher levels of media literacy, better ability to mediate smart media use, and lower levels of smart addiction in their children than

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those who did not. This suggests that as the amount of time mothers spent reading to their children increased, the amount of time they spent on smart media naturally decreased, which in turn decreased their children's propensity for smart addiction. This suggests that reducing time spent on smart devices is an important factor in reducing smart addiction.

When the effects of the two reading intervention factors on media literacy, smart media mediation, mother's smart addiction, and child's smart addiction were combined, the results were significant for smart literacy and smart media mediation. This result indicates that non-maternal reading intervention has a good effect on the judgment of the right and wrong of smart media, which means that it will be very effective in guiding and teaching children to use smart devices correctly. It also suggests that the intervention behaviors are very effective in directly reducing children's smart media use and may even reduce the actual time spent on smart media<sup>21,9</sup>. However, only maternal reading interventions had a positive effect on children's addiction, which we speculate may be because the more time mothers spend reading to their children, the less time children have for direct smart media use. This supports the previous hypothesis because the reading intervention in which the mother reads to the child is possible without indirect effects on the child.

However, neither of the two reading interventions had any effect on mothers' addiction to smart devices. As to why the mothers' reading interventions did not affect their own smartphone addiction, it is possible that the mothers perceived reading and smartphone use as separate activities. It is also possible that the reading interventions did not affect their smartphone addiction due to the routinization of smartphone use by the mothers' life patterns and habits, and the versatility of smart devices. However, it can be inferred that even if the mothers are in a state of smartphone addiction, if they are diligent in reading to their children, they can block the possibility of their children becoming smartphone-addicted.

## Conclusion

The purpose of this study was to determine the effect of mothers' reading intervention on children's smartphone addiction. To this end, a survey was conducted among mothers of preschool children in Yongin City, Gyeonggi-do, and a total of 88 data were collected, and how reading intervention affects subfactors including smartphone addiction in children was analyzed. The findings of the study were as follows. First, mothers' reading interventions (reading to themselves and reading to their children) were effective for mothers' media literacy and smart media interventions. Second, among the reading interventions, only mothers' reading to their children showed effectiveness on their children's addiction. However, the mother's own reading behavior did not have a significant effect. Third, mothers' reading interventions (both behaviors) did not affect mothers'

smart addiction. The above results show that mothers' reading intervention has a significant effect on media literacy, where mothers judge the rightness or wrongness of smart media, and smart media mediation, where mothers control their children's smart media use, but not on mothers' own smart addiction. In addition, it was found that mothers' reading intervention has a significant effect on children's smart device addiction only through the reading intervention of reading books. This suggests that only reading intervention

through direct reading by mothers has a significant effect on children's addiction to smart devices. In future research, it is necessary to study the effects of mothers' reading intervention at different ages based on a larger sample.

While the findings provide meaningful insights, several limitations should be noted. First, the cross-sectional nature of this study prevents it from addressing causality. Although the results suggest associations between mothers' reading behaviors and children's smartphone addiction, they do not establish whether these behaviors directly cause changes in smartphone addiction or literacy. To explore causality, future studies should adopt a longitudinal design. Second, the study relied on self-reported data for both maternal reading and smartphone use, which raises concerns about reporting bias and social desirability bias. Mothers may have underreported their own smartphone use or overreported their reading habits due to perceived social expectations. As no objective measures were utilized, this limitation should be considered when interpreting the findings. Third, the statistical analysis lacked rigor and appropriate controls. Potentially confounding factors, such as child age, family income, and parental education, were not included as control variables in the ANOVA. Additionally, multiple comparisons were conducted without applying corrections, which could compromise the reliability of the results. Fourth, the study does not provide information on the pilot testing or validation of the questionnaire. This absence raises questions about the reliability and validity of the data collection instrument. Fifth, the measures used to assess smartphone addiction were not clearly differentiated from normal usage patterns. A clearer operational definition of smartphone addiction is necessary to ensure an accurate interpretation of the results. Finally, this study's findings are not generalizable to the entire population of mothers and children, as the sample was limited to those residing in Yongin City, Gyeonggi-do, South Korea. Moreover, the sample size of 88 participants further limits the applicability of the findings to larger populations.

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