# The Interplay of Family Socioeconomic Status, Parental Engagement, and Maternal Employment on Vocabulary Development in Korean Children

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Data Availability Statement: Our data and analyses scripts are available on our OSF repository (https://osf.io/rdz2q/?view_only=7d8d14b82f3d4a51823d474eb7d4cdf7)**.**

**Research Highlights**

- Socio-economic status significantly influences vocabulary size in Korean children under 3, with its impact fully mediated by parental play and book reading.

- Maternal work status has no significant impact on children's vocabulary skills, challenging assumptions, and highlighting the prominence of other factors.

- Despite SES variations, working mothers show no differences in play and book reading frequency, emphasizing the consistent importance of parent-child interactions across socio-economic backgrounds.

**Abstract**

This study aimed to investigate the intricate relationship between socio-economic status (SES) and language development in Korean children under 3 years old. Specifically, it sought to understand how SES influences language development and explored the interconnections among SES, parent-child interactions (specifically through play and book reading), maternal employment, and children's vocabulary scores within the context of Korean parenting culture. Data were collected from 348 mothers of children aged 8–36 months (168 girls; mean age = 20 months 5 days, SD = 7 months and 7 days). Language development was assessed using the Korean version of the MacArthur-Bates Communication Development Index (K-CDI), and parental play frequency, duration, and book-reading frequency were obtained through a questionnaire. We used structural equation modeling to analyze the impact of SES on vocabulary outcomes, examining mediating connections with parental play and book-reading frequency, as well as children's vocabulary skills. Additionally, we compared variables (SES, play and book-related factors, and K-CDI scores) between working mothers and stay-at-home mothers. The findings indicated that SES significantly predicted vocabulary size, but this influence was fully mediated by parental play frequency, play duration, and book-reading frequency. Interestingly, maternal work status showed no significant impact on children's vocabulary skills, and there were no differences in play frequency, play duration, or book reading frequency despite higher SES among working mothers. The mitigated role of maternal work status on children's vocabulary skills, despite the differences in their SES, underscores the importance of parent-child interactions, particularly shared book reading, in vocabulary development when these interactions were considered.

**Introduction**

Family socioeconomic status (SES) serves as a multifaceted metric that encapsulates a family's social standing, financial means, and parental educational background. However, its influence on child language development is not universally consistent and varies depending on specific contextual and cultural factors (e.g., Friends et al., 2022; Hoff & Tian, 2005). Moreover, contemporary trends indicate elevated levels of women's education (Montoya, 2019; United Nations Educational, Scientific, and Cultural Organization, 2022), leading to increased expectations for women to join the workforce post-graduation. However, this trend carries the potential drawback of diminished maternal-child interaction due to work commitments, possibly affecting communication development. Therefore, to comprehend the intricate relationship between SES and child language development, it is crucial to consider diverse factors, including specific contexts within communities and families.

In South Korea, a country marked by a distinctive combination of high maternal education, widespread utilization of childcare services, and a moderate employment rate, there exists a valuable opportunity to investigate these intricate relationships. Despite the fact that a significant majority of young women (approximately 76% of those aged 25-34) possess tertiary education, the female employment ratio within the working population remains below the average of the Organization for Economic Co-operation and Development (OECD Data, 2022; Yoo, 2021). This discrepancy might be influenced by the traditional stereotypes that primarily assign childcare responsibilities to mothers. However, the precise impact of these societal norms on the language development of young children remains ambiguous and warrants further investigation. Investigating if maternal education differs in its effect on language outcomes

compared to employment status and recognizing the role of maternal-child interactions is essential for understanding how socio-cultural factors shape language acquisition in young children.

This study marks the first exploration of the influence of SES on language development in young Korean children under the age of three years. We also explored the quantitative aspects of parent-child interaction, specifically assessing play frequency, duration of play, and frequency of book reading in relation to maternal employment, aiming to gain insight into the underlying mechanisms linking SES and children's language abilities. Finally, we compared SES indices, the quantitative aspects of parent-child interaction, and vocabulary scores among working mothers and stay-at-home mothers. Our findings will shed light on the interplay between SES and the extent of parent-child interactions, providing practical insights for enhancing vocabulary development in young Korean infants.

**The Effect of Socioeconomic Status on Child Development at Young Ages (0-3)**

The influence of socioeconomic status (SES) on children's development is significant (Lee & Kwak, 2008; Romeo, 2019) and encompasses a diverse array of developmental aspects. Family SES is closely linked to children's neurobiology (Hurt & Betancourt, 2016; Merz et al., 2019; Piccolo et al., 2016; Romeo, 2019), executive functioning (Hackman et al., 2015; Lawson & Farah, 2017; Vrantsidis et al., 2020), academic achievement (Sirin, 2005), language processing (Fernald et al., 2013) and language acquisition (Hart & Risley, 1995; Hoff, 2003; Rowe, 2008; Rowe & Goldin-Meadow, 2009). Previous studies have primarily examined parental language input as a mechanism by which SES influences children's language development. High-SES parents often employ enriched language, respond contingently to their

children, and align themselves with their interests (Dollaghan et al., 1999; Hart & Risley, 1995; Hoff & Tian, 2005). These practices support early brain structure, neural function, executive skills, and language development (Brito et al., 2020; Romeo, 2019). Furthermore, the effects of SES on language acquisition emerge before the age of three years (Fernald et al., 2013; Noble et al., 2015; Rowe & Goldin-Meadow, 2009). For instance, Betancourt et al. (2015) found language score disparities across SES levels using the Preschool Language Scale as early as 7 months. This highlights the need to comprehend SES dynamics during the critical period that active parental engagement is essential for optimal linguistic and cognitive growth.

**The Interplay of SES and Parental Engagement (Play and Book-Reading) in Language Development**

It is noteworthy that the impact of parental engagement on children's language development might vary between play and book reading activities. Play in early childhood encompasses various forms, including object play, physical play, outdoor play, social play, and solitary play, each supporting cognitive development (Göncü et al., 2000; Ginsburg et al., 2007; Yogman et al., 2018). The multifaceted nature of play suggests that the quantitative aspects, such as frequency and duration, might have a less pronounced effect on language development compared to the overall impact of play experiences.

In contrast, reading activities require active parental involvement, providing children with a vocabulary-rich environment not typically found in everyday conversations (Mesmer, 2016). Shared book reading offers a concentrated vocabulary approximately eight times more than typical daily interactions, contributing to higher-quality language input (Ko & McDonald, 2020). This combination of abundant and high-quality input through shared book reading has the

potential to widen language proficiency disparities among children, starting from early development (Franks et al., 2022). Projections suggest a substantial gap in vocabulary, exceeding one million words, between children whose parents engage in regular reading and those with infrequent exposure (Logan et al., 2016). Consequently, extensive research has explored how parental book reading impacts children's language development, accounting for variations in their language skills (Bojczyk et al., 2016; Harding et al., 2015; Grolig, 2020).

Understanding the impact of parental engagement on language development requires considering cultural variations, especially in the context of play and book reading. For example, in Western cultures, adults are primary communication partners during social play, whereas in Mayan communities, children assume this role (Rogoff et al., 1993). Cultural differences in play partners and contexts (Göncü et al., 2000) underline the importance of identifying these factors alongside SES to comprehend the impact on language outcomes. The impact of frequent book reading on language outcomes varies across cultures as well. In general, positive associations between parental reading frequency and early vocabulary skills have been observed across diverse cultural contexts (Raikes et al., 2006; Shahaeian et al., 2018; Singh et al., 2023). For example, a study by Singh et al. (2023) with Singapore children aged 12–30 months revealed positive links between parental reading frequency, self-reading, parental encouragement, child's age, and maternal education. In contrast, Raikes et al. (2006) explored the effect of book reading frequency on vocabulary in low-income US families from various backgrounds, observing strong associations, particularly in English-speaking families compared to Spanish-speaking families. Interestingly, vocabulary proficiency remained similar between Spanish-speaking and English-speaking children, indicating the influence of storytelling traditions in Hispanic families. These

studies underscore the interplay of SES, cultural contexts, and parental engagement in shaping language development.

**The Interplay of SES and Maternal Work Status in Language Development**

Maternal employment elevates household income, subsequently enhancing SES and affording access to resources for children's cognitive and linguistic growth, such as books, toys, and educational materials. However, despite financial benefits, guaranteed language development progress is uncertain (Huerta et al., 2011; Laing & Bergelson, 2019; Waldfogel, 2002), because language development is more likely to be influenced by children's active engagement in communicative exchanges in their everyday lives (Romeo et al., 2018; Topping et al., 2013). During regular daily routines, parents can provide enriched language input, thus facilitating the cultivation of a broad range of socio-developmental abilities. This occurs through interactive activities, such as playtime and shared reading (Ginsburg et al., 2007; Milteer et al., 2012; Yogman et al., 2018).

However, research findings indicate that employed mothers might encounter limitations in the amount of time available for interacting with their children. For example, Brocklebank et al. (2013) conducted a study that examined the weekly frequency of maternal play with their 5-year-old children within families in the United Kingdom. This study examined the influence of SES (e.g., occupation and educational attainment), family type (e.g., whether both parents lived with the child), number of children, and ethnic group (e.g., white vs. non-white) on the frequency of play. Notably, the study revealed that mothers who were engaged in full-time employment exhibited a lower frequency of play interactions than those who were not. Similarly, Booth et al. (2002) explored how maternal work status impacts time allocation for 7-month-old infants. Their

study examined care quality and interaction, finding that working mothers spent less time on care and interaction on weekdays than stay-at-home mothers (SAHM); however, interestingly, during weekends, working mothers spent more time interacting with their children than SAHMs. Importantly, there were no significant differences in vocabulary ability between the two groups at 15 months of age. This underscores that, while employment-related time constraints might impact interaction frequency, early vocabulary development seems unaffected.

Taken together, the relationship between maternal employment and children's language development is complex. While maternal work could enhance family SES, it may not consistently align with improved language outcomes, considering its close association with the quantity of parent-child interactions. Working mothers may counterbalance this by engaging in more concentrated social interactions. Therefore, understanding these dynamics is crucial to recognize their impact on children's language development.

**The Impact of SES and Parenting Practices on Children's Language Development in Korean Cultural Contexts**

Previous research on the influence of SES on language outcomes in young Korean children has primarily centered on preschool-aged and older children (Lee & Kim, 2012; Lee & Kwak, 2008; Shin & McCoy, 2022; Yim et al., 2022). For instance, Lee and Kim (2012) examined the impact of SES on Korean children's vocabulary at age five, finding a direct prediction of scores a year later. Notably, six-year-old language scores correlated with concurrent vocabulary scores but not with SES. Similarly, Lee and Kwak (2008) investigated SES effects (maternal education and household income) on language scores in 3- and 4-year-olds, revealing correlations (between 0.21 and 0.32) lower than those observed in English-

speaking family studies (e.g., $r = 0.63$; Hart and Risley, 1995; $r = 0.55$ Rowe Goldin-Meadow, 2008; $r = 0.65$ in Romeo et al., 2018). Despite evidence suggesting SES impacts young Korean children's vocabulary and predicts later language skills, the influence of SES appears limited, especially in early development.

The limited impact of SES on children's language development in Korea may stem from the community's emphasis on higher education and improved educational standards (Anderson et al., 2012). Despite high proportions of tertiary education among women, post-marriage employment rates, especially among those responsible for child-rearing, remain below the OECD average, reflecting traditional stereotypes (Yoo, 2021). Interestingly, a significant percentage of Korean infants attend childcare facilities. Pre-Covid-19, 81.1% of one-year-olds and 91.3% of two-year-olds were in childcare facilities, and during the pandemic, the ratios only slightly decreased (79.3% for one year, 88.4% for two years). This suggests, irrespective of maternal work status, that work commitments might not drastically affect mother-child interactions due to widespread childcare use (Korea Institute of Child Care and Education, 2020, 2021).

To the best of our knowledge, no prior study has explored the relationship between play frequency, duration, and language development in young Korean children while considering variables like SES and maternal employment. Choi and Kim's (2011) study on 3 to 5-year-olds revealed a link between parental interactions, self-regulation, and language skills, suggesting a potential connection between play and language development. However, this study did not examine young toddlers or explore the impact of quantitative play variables (e.g., frequency and duration) on language outcomes and SES factors in the Korean context. Further research is

essential to understand how play influences language development, considering the children's developmental stages, SES, and maternal work status.

Research on how maternal work status influences parental reading practices in Korean families, especially among younger children, remains limited. Nonetheless, reading books to children is a widespread practice in Korean families, starting as early as 0-6 months (Lim & Kim, 2013). Even in low-income households, parental book reading was observed for around ten months, with a positive correlation between book-reading frequency and children's vocabulary skills at 4–5 years (Shin & Kim, 2008). However, research on how maternal work status influences parental reading practices in Korean families, especially among younger children, remains limited. Despite the potential access to more resources, the impact of working mothers on reading frequency among children is unclear. Understanding these dynamics can provide valuable insights into the role of parental engagement and its effects on early childhood language development.

**The Present Study**

The present study examined the influence of SES on language outcomes in Korean families, focusing on the interplay among SES, parental engagement (through play and shared book reading), and maternal work status. This study aimed to expand beyond prior age-related insights and findings by addressing the following research questions:

First, does SES impact language development in Korean children younger than 3 years? While evidence exists on the influence of SES on language in 7-month-old infants from English-speaking families (Betancourt et al., 2015), research on SES effects in Korean families has mainly examined preschool-aged and older children (Shin & McCoy, 2022). We hypothesized

that, while SES would play a role in language outcomes, the effect would be small, consistent with prior studies on Korean children's SES. This exploration will offer insights into how SES shapes language development in young Korean children in their family contexts.

Second, what relationships and dynamics exist among SES, parent-child interaction (including play variables and parental book reading), and children's vocabulary within Korean parenting culture? Analyzing these connections can help identify strategies for Korean mothers to enhance their children's vocabulary. To navigate the intricate interplay of these variables, we adopted structural equation modeling (SEM). As a pioneering study exploring maternal work status, SES, play, parental book reading, and vocabulary among young Korean children, we anticipate that our findings will guide evidence-based guidelines for bolstering language skills.

Finally, does maternal work status affect children's vocabulary? About half of the Korean mothers are unemployed, potentially due to child-rearing pressures, without clarity on the impact of maternal employment on language development. While we assumed that the Working-Mother (WM) group might excel in K-CDI scores due to higher income, Korea's high maternal education and childcare enrollment rates may neutralize group differences. Conversely, stay-at-home mothers (SAHM) might outperform WMs because of more frequent interactions with their children. These findings can help Korean families make informed maternal work decisions by considering their children's language abilities.

## Method

### Participants

Our dataset comprised 348 children aged 8–36 months (168 girls and 180 boys; mean age = 20 months and 5 days, SD = 7 months and 7 days) collected from 2018 to 2023. Participants were recruited via in-person engagement at local baby fairs, social network service ads, and referrals. The majority of the families concurrently participated in a distinct study that focused on the children's language and cognition. For the current analyses, we included only the data of full-term children whose parents provided vocabulary checklists, family SES information, and play/book-reading questionnaires. Participating mother-child pairs received gift coupons valued at about 10 to 50 US dollars depending on their involvement in other experiments. All recruitment procedures were approved by a Large Korean University's Institutional Review Board. Of the total, 136 children's mothers were stay-at-home (SAHM), and 212 reported employment. No age differences in children's mothers emerged between the SAHM and WM groups ($W = 15325$, $p = 0.285$). Neither the father's age ($W = 14574$, $p = 0.855$) nor the children's age differed between the groups ($W = 14018$, $p = 0.664$).

**Measures**

We administered three distinct questionnaires to parents: a standardized vocabulary assessment; an inquiry regarding family SES; and a questionnaire pertaining to play frequency, play duration, and shared book-reading frequency.

***Korean Version of the MacArthur-Bates Communicative Development Index***

The Korean version of the MacArthur-Bates Communicative Development Index (K-CDI; Pae & Kwak, 2011) is a standardized checklist completed by parents to assess their children's vocabulary development. Two versions of the K-CDI were used in our study: Words

and Gestures (WG) for infants aged 8-17 months, and Words and Sentences (WS) for toddlers aged 18-36 months. Of our participants, 137 submitted the WG version and 211 submitted the WS version. Assessing vocabulary skills in young infants can be challenging due to their limited spoken words. To address this, mothers of infants under 18 months completed the receptive vocabulary checklist, while mothers of toddlers completed the expressive vocabulary checklist, as the toddler version lacks a receptive vocabulary section. The original K-CDI manual provides scores of only five percentile ranks (i.e., 10, 25, 50, 75, and 90 percentiles) for each age month and child's sex. However, this approach limits our understanding of fine-grained individual variability in vocabulary development. In light of this constraint, we computed distinct percentile scores for each participant based on the 1,993 K-CDI data accessible through Wordbank (http://wordbank.stanford.edu), an open repository of CDI measures across multiple languages. Our analysis indicated that controlling for the age effect, girls had a greater vocabulary size than boys ($b$ = -51.664, $SE$ = 14.194, $p$<.001, 95% CI = [-79.118, -24.123]), but percentile scores did not significantly differ between the sexes in our data.


*Socioeconomic Status Information*

We collected demographic and SES data from participating families, including parents' age, occupation, income, and education. The income scale initially had six options, ranging from <1.5 million Korean Won to > 6 million Korean Won. However, for stay-at-home mothers without income, we adjusted their income level to zero if <1.5 million Won ($n$ = 127). The income levels of nine stay-at-home mothers earning > 1.5 million Won were maintained. Table 1 summarizes the parents' age and SES after adjustment.

Table1. Parental age, Occupation, Income, and Education Levels for Participating Children

| Category | Options | Father (*n*) | Mother (*n*) |
|---|---|---|---|
| Age (years) | 1 (below 25) | 0 | 2 |
| | 2 (25-29) | 10 | 26 |
| | 3 (30-34) | 100 | 150 |
| | 4 (35-39) | 139 | 134 |
| | 5 (40+) | 99 | 36 |
| Occupation | A (unemployed/stay-at-home) | 1 | 136 |
| | B (physical labor) | 14 | 0 |
| | C (agriculture, forestry, and fisheries) | 5 | 1 |
| | D (Retail) | 14 | 1 |
| | E (Service) | 17 | 18 |
| | F (office job) | 91 | 61 |
| | G (Professionals) | 119 | 92 |

| | | | |
|---|---|---|---|
| | H (Manager) | 13 | 2 |
| | I (Others) | 74 | 37 |
| Income (In million Won) | 0 (none) | 1 | 127 |
| | 1 (below 1.5) | 5 | 29 |
| | 2 (1.5-2.5) | 26 | 53 |
| | 3 (2.5-3.5) | 118 | 81 |
| | 4 (3.5-4.5) | 87 | 34 |
| | 5 (4.5-6.0) | 75 | 14 |
| | 6 (6.0+) | 36 | 10 |
| Education | 1 (middle school) | 0 | 1 |
| | 2 (high school) | 43 | 28 |
| | 3 (Associate's degree) | 71 | 54 |
| | 4 (Bachelor's degree) | 169 | 195 |

| | | | |
|---|---|---|---|
| | 5 (Master's degree) | 48 | 66 |
| | 6 (Doctoral degree) | 17 | 4 |

***Parental Play and Book-reading Behavior Questionnaire***

All participating mothers responded to three questions regarding their parenting practices of playing and reading books with their children: 42.24% of the responses were collected before the K-CDI assessment (range = 2-25 months), while 201 participants provided their answers concurrently ($\pm$ 1 month) with the submission of the vocabulary checklist (age range at questionnaire collection = 5–36 months). The questions pertained to weekly book reading frequency, days spent playing with children, and daily play duration. Table 2 presents the questions and parents' answers.

Table 2. Three Questions About Parental Book Reading and Play, and Responses for Participating Children

| Question | Answer | Response |
|---|---|---|
| How often do you read books to your child each week? | never | 16 |
| | 1-2 | 72 |
| | 3-6 | 84 |
| | 7-13 | 65 |

| | | |
|---|---|---|
| | 14 or more | 111 |
| How many days per week do you or your spouse engage in playtime with your child? | Zero-day | 1 |
| | One or two days | 14 |
| | Three or four days | 27 |
| | Five days or more | 306 |
| How much time do you or your spouse spend playing with the child each day? | Less than 10 minutes | 8 |
| | 10 to 30 minutes | 30 |
| | 30 minutes to an hour | 39 |
| | 1 to 2 hours | 77 |
| | Greater than 2 hours | 194 |

**Statistical Analyses**

Three primary analyses were conducted to comprehend the influence of SES on Korean children's vocabulary development and its underlying mechanisms. We employed structural equation modeling (SEM) to comprehensively assess the relationship between SES and children's vocabulary scores. A latent variable for SES was constructed by integrating indicators such as maternal and paternal education, and household income. Using mediation analysis, we

extended our analysis to investigate the interplay between parental play and book-reading

behaviors (PBR), SES, and children's vocabulary scores.

SEM typically requires a substantial dataset (e.g., >100 or 5-10 per parameter; Boomsma,

1982, 1985; Bentler & Chou, 1987). Our data ($n = 348$) met these conventional requirements for

running the testing models, because our second model, which was the most complex, contained

16 parameters. Nonetheless, because these traditional approaches have faced criticism owing to

their unclear statistical validity, we additionally conducted a power analysis using WebPower

(http://psychstat.org/semchisq), an interactive tool based on the analysis of Satorra and Saris

(1985). The results indicated that a power of .80 with an effect size of 0.05 was achieved with

the current sample size to conduct our second model ($df = 12$).

Model fit was evaluated using multiple indices; Comparative fit index (CFI), Root mean

square error of approximation (RMSEA), and Standardized root mean square residual (SRMR)

(Fan et al., 2016). While some recent studies advocate for the model to adhere to the standards

set by Hu and Bentler (1999), such as CFI >.95 or RMSEA <.05, it is worth noting that strict

adherence to these thresholds might lead to an increase in the rejection of an otherwise

satisfactory model (Type I error) (see Marsh et al., 2004 for a detailed discussion). We adopted a

more comprehensive approach, considering a range of indices with relatively flexible acceptable

levels (e.g., CFI >.90, RMSEA <.08, SRMR <.08; Bentler, 1990; Browne & Cudeck, 1993), in

line with earlier suggestions predating those of Hu and Bentler (1999). We also presented the

chi-square test and Tucker-Lewis Index (TLI; Fan et al., 2016) in the result section, but were

aware that both tests are often affected by sample size (Cheung & Rensvold, 2009; Shi et al.,

2019).

Additionally, a comparative analysis was conducted between the SAHM and WM groups. While the WM group was expected to show higher K-CDI scores due to potential income advantages, the SAHM group might offer more quality time. However, considering the limited SES impact in prior research, significant score differences between the groups might not emerge. Parental engagement in play and book reading was also compared between the two groups to understand the effect of maternal employment on parent-child interaction.

Our data and analyses scripts are available on our OSF repository (https://osf.io/rdz2q/?view_only=7d8d14b82f3d4a51823d474eb7d4cdf7).

## Results

### The Relationship Between the SES and Children's Language Outcomes

In the SEM analysis, we explored the relationship between SES and children's language outcomes using the Lavaan package (Rosseel, 2012) in R (R Core Team, 2020). Because Shapiro-Wilk's W test indicated deviations from normal distribution in both exogenous and endogenous variables, we used maximum likelihood estimation with robust standard errors and the Satorra-Bentler scaled test statistic (Satorra & Bentler, 2001) to address non-normality. We did not have any missing data for this study. Using maternal and paternal education along with household income, we operationalized the latent SES variable to explore whether it predicted children's K-CDI percentile scores. Model fit was assessed using scaled and robust indices, considering non-normality. The chi-square test suggested a satisfactory model-data fit ($\chi^2_{scaled} = 4.395$, $df_{scaled} = 2$, $p_{scaled} = .111$). Moreover, both the comparative fit index (CFI$_{robust}$ = .979) and the Tucker–Lewis index (TLI$_{robust}$ = .936) indicated coherence within the model. In addition, the

root mean square error of approximation (RMSEA$_{robust}$ = 0.059) and standardized root mean square residual (SRMR$_{robust}$ = 0.031) demonstrated a well-aligned model fit (Fan et al., 2016).

SEM analysis confirmed the significance of the factor loadings for the SES indicators. Maternal education had the highest loading (0.787), followed by paternal education and household income (0.369), as shown in Figure 1. Regression analysis revealed that SES significantly predicted the K-CDI scores ($\beta$ = 0.241, $z$ = 3.354, $p$ = .001). An alternative model with maternal work status as a covariate did not meet the criteria for model evaluation (CFI$_{robust}$ = 0.444, RMSEA$_{robust}$ = 0.281, SRMR$_{robust}$ = 0.166). Thus, we proceeded with our planned approach and separately examined the effects of maternal work status on children's language outcomes.
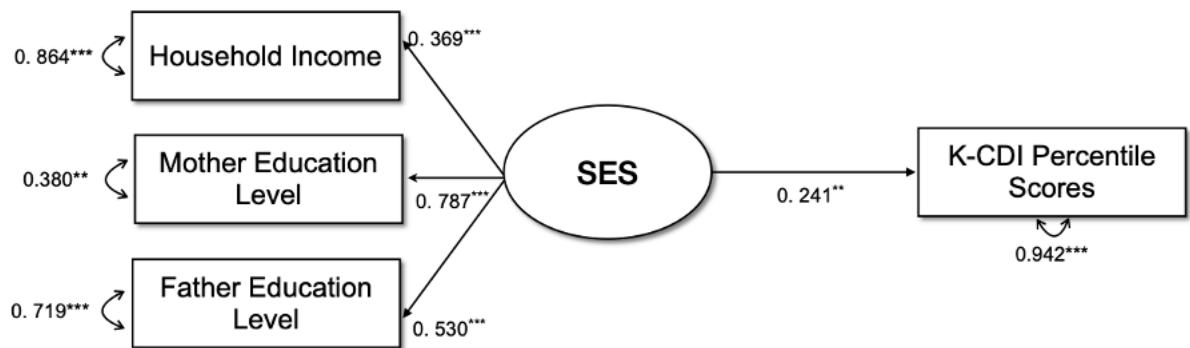


Figure 1. Relationship between family SES and children's K-CDI scores. SES = Socioeconomic Status, K-CDI = Korean Version of the MacArthur-Bates Communicative Development Index. Note: $^{*} p <.05$, $^{**} p <.01$, $^{***} p <.001$. All the presented coefficients are standardized values.


**The Mediating Effect of Parental Engagement (Play and Book-Reading) on the Relationship between SES and Children's Vocabulary Scores**

In this section, our focus was to explore whether there exists a mediated link between SES and children's K-CDI scores through parental play (frequency and duration) and book reading behaviors (PBR). Before proceeding to this analysis, we examined the potential impact of the disparities in age between the collection of PBR data and the K-CDI scores. Approximately 42% of the questionnaires were obtained before K-CDI data collection (with a time gap range of 2–25 months), while 58% were collected concurrently. Notably, no significant correlation emerged between K-CDI scores and the age differences in the data collection, indicating that the time gap was not associated with an increase or decline in scores.

Regarding parental play and book-reading behaviors, we scrutinized the relationship of each variable with a child's age. The play-related variables (play frequency and duration) showed no significant correlation with age. However, we observed a significant positive correlation between age and book-reading frequency ($rho = 0.18$, $p < .001$), indicating an increase in parental reading frequency to their children as they aged within the 5-36 month age range. To isolate the age effect on book-reading frequency, we derived residuals by regressing out the impact of age on book-reading frequency. Henceforth, the frequency of book reading refers to the residuals. Bivariate correlations among the main variables in the analysis are presented in Table 3.

Tables 3. Bivariate Correlation Matrix for Variables Included in the Mediation Analysis

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1.Maternal Education | 1 | **.449***** | **.283***** | **.255***** | **.179**** | **.139+** | **.208**** |
| 2.Paternal Education | .449*** | 1 | **.247***** | **.219**** | **.134+** | **.075** | **.089** |
| 3. Household Income | .283*** | .247*** | 1 | **.138+** | **.003** | **-.047** | **.154*** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4. Book Reading Frequency | .255*** | .219*** | .138* | 1 | **.317***** | **.339***** | **.310***** |
| 5. Play Frequency | .179*** | .134* | .003 | .317*** | 1 | **.378***** | **.104** |
| 6. Play Hours | .139** | .075 | -.047 | .339*** | .378*** | 1 | **.069** |
| 7. K-CDI scores | .208*** | .089 | .154** | .310*** | .104+ | .069 | 1 |

Note: + $p$ <.1, * $p$ <.05, ** $p$ <.01, *** $p$ <.001.

K-CDI = Korean Version of MacArthur-Bates Communicative Development Inventory

Note: The notations for p-values above the diagonal represent the adjusted p-values from the multiple correlation analyses, addressed using the Holm method.
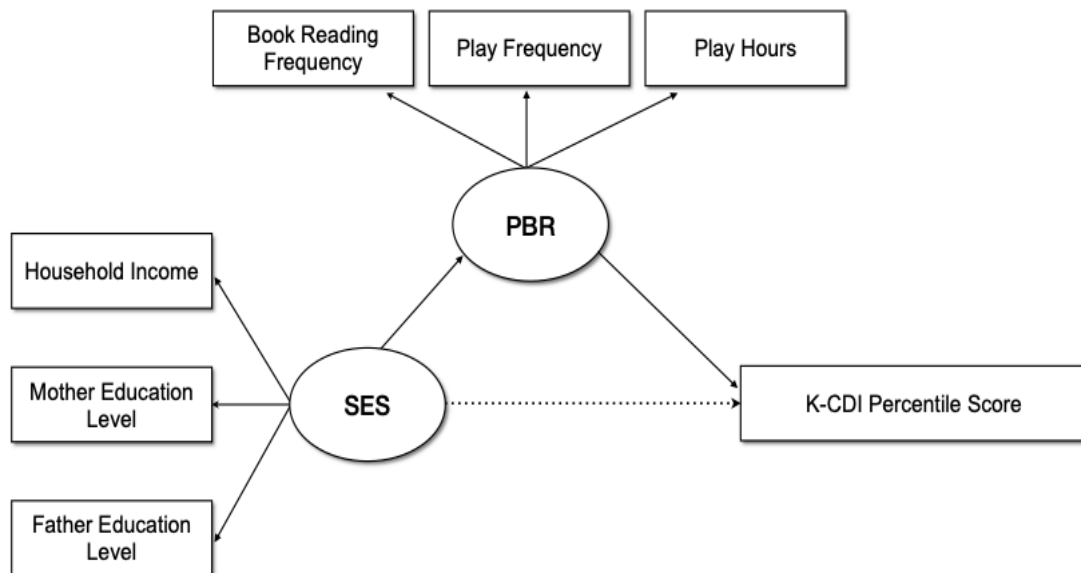


Figure 2. Proposed mediation model for the relationship between family socioeconomic status (SES), parental play and book reading behaviors (PBR), and Korean Version of MacArthur-Bates Communicative Development Inventory (K-CDI) percentile scores.

Note: The dashed line represents a non-significant path.

To explore the interconnected relationships between SES, PBR, and K-CDI scores, we employed the mediation model illustrated in Figure 2. This model encapsulates the dynamic interplay among parental play frequency, play duration, book reading frequency (PBR), SES, and K-CDI scores. Given the non-normal distribution of variables, we adopted maximum likelihood estimation with robust standard errors and the Satorra-Bentler scaled test statistic (Satorra & Bentler, 2001). Table 4 presents the results of the model evaluation.

Table 4. Model Fit Indices of the Mediation Analyses Model

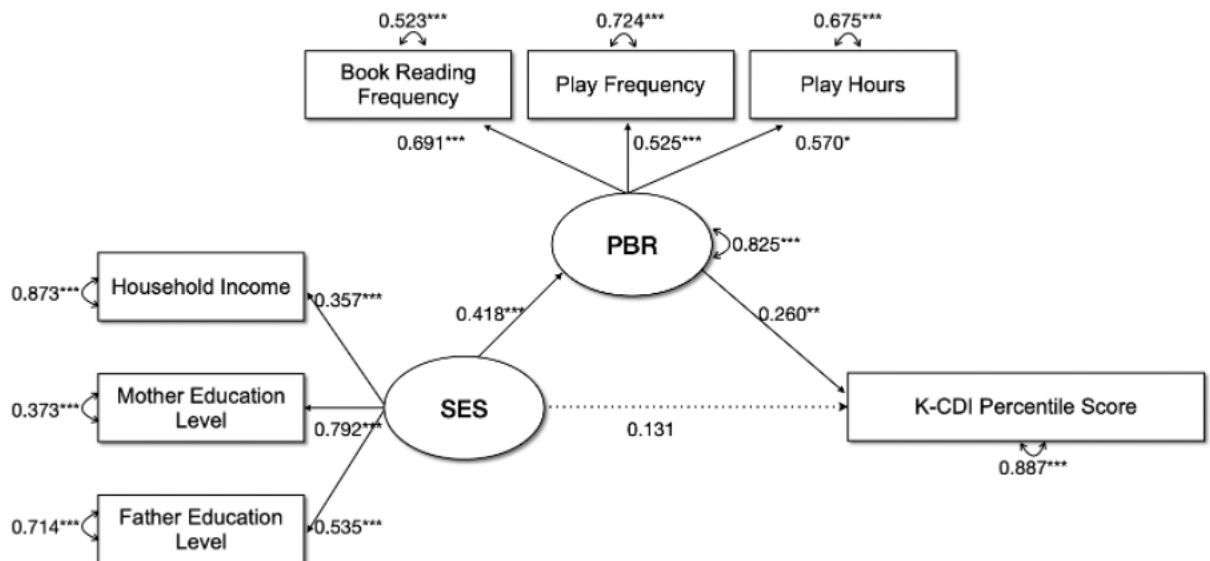| Index | $\chi^2_{scaled}$ $(df)$ | CFI$robust$ | TLI$robust$ | RMSEA$robust$ | SRMR$robust$ |
|---|---|---|---|---|---|
| Values | $\chi^2_{scaled}$ (12) = 33.488* (12) | .919 | .859 | .075 | .051 |

Note: *$p<.05$

Figure 3. Results of the mediation model for the relationship between family socioeconomic status (SES), parental play and book reading behaviors (PBR), and Korean Version of MacArthur-Bates Communicative Development Inventory (K-CDI) percentile scores. Note: $^{*}p$ <.05, $^{**}p$ <.01, $^{***}p$ <.001. All presented coefficients are standardized values. The dashed line represents a non-significant path. The book-reading frequency employed the residual values that regressed out the age effect.

The results of the mediation model are shown in Figure 3. Parental play frequency, play duration, and book-reading frequency exhibited substantial and statistically significant loadings on the composite construct of Parental Play and Book-Reading (PBR). Furthermore, the regression paths revealed a significant predictive relationship between SES and PBR ($b = .530$, $SE = .125$, $p < .001$, $\beta = .418$). Additionally, the PBR significantly predicted K-CDI scores ($b = 8.756$, $SE = 2.969$, $p = .003$, $\beta = 0.260$). In contrast, whereas SES showed a significant indirect effect ($b = 4.640$, $SE = 2.941$, $p = .009$, $\beta = .109$), the direct impact of SES on the K-CDI was not significant ($b = 5.590$, $SE = 3.237$, $p = .084$, $\beta = .131$). Thus, we conclude that the effect of SES on K-CDI scores was fully mediated by parental play and book-reading behaviors (PBR).

**Interplay of Maternal Work Status, SES, and Parental Engagement (Play and Book Reading) in Language Development**

To assess the potential disparities in vocabulary acquisition between children with working mothers and those with stay-at-home mothers, we compared their vocabulary scores (K-CDI). The median K-CDI percentile scores were 50 for the group of working mothers (WM) ($IQR = 50.5$) and 48 for the group of stay-at-home mothers (SAHM) ($IQR = 49.0$). Using the

Wilcoxon signed-rank test, we found no significant group differences in the K-CDI scores ($p$ = .194).

We then explored the differences between the SAHM and WM groups in terms of SES and PBR. To mitigate potential type-I errors due to multiple comparisons, we adjusted the significance level using the Holm method. The median educational level scores for both parents were the same across the groups, as more than 50% of the participants in each group were categorized as level 4 (college graduates). For example, 52.20% of the mothers in the SAHM group had a bachelor's degree (71 of 136), with an additional 17 (12.41%) attaining a higher degree. In the WM group, 58.49% of mothers had a bachelor's degree (124 of 212), with 25% holding a higher degree. However, it is worth noting that the interquartile range displayed greater variability within the SAHM group (i.e., 1) for maternal education levels than in the WM group (i.e., .25), suggesting a more diverse range of educational backgrounds within the SAHM cohort. This variability also extended to fathers' educational achievement. Moreover, a distinct contrast emerged in the household income between the WM and SAHM groups. The Wilcoxon signed-rank test highlighted statistically significant disparities across all three variables (maternal and paternal education and household income) when comparing the two groups (Table 5). In short, the WM group displayed a noticeable socioeconomic advantage over its SAHM counterparts. Despite these variations in socioeconomic factors, no substantial differences were found in vocabulary scores between children with working and stay-at-home mothers.

Table 5. Group Comparisons of SES Variables

| Variables | Median (IQR) | W | $p^*$ |
|---|---|---|---|
| | | | |

| | WM | SAHM | | |
|---|---|---|---|---|
| Maternal Education | 4 (.25) | 4 (1) | 10846 | <.001 |
| Paternal Education | 4 (0) | 4 (1) | 11189 | <.001 |
| Household Income | 6 (3) | 4 (2) | 3657 | <.001 |

Note. WM = Working Mothers, SAHM = Stay-at-Home Mothers, * adjusted *p*-values are all smaller than .001.

In our analysis of parental engagement variables based on maternal work status, we explored potential disparities considering children's sex. Employing regression analyses to test the interaction effect of children's sex and maternal work status, we found no significant main effect of maternal work status or interaction effect for play frequency, duration, or book reading frequency after accounting for age effects. However, a significant difference emerged in book-reading frequency by sex ($b_{original}$ = -1.208, $SE_{original}$ = 0.451, $b_{bootstrapped}$ = -1.211, $SE_{bootstrapped}$ = 0.460, 95% CI = [-2.098, -0.282]). Parents read books to girls more frequently than to boys (median for girls = 0.319 (IQR = 2.038) vs. boys = -0.289 (IQR = 2.234)). Importantly, both groups demonstrated similar levels of engagement in quantitative measures of parental interactive activities, regardless of maternal work status.

**Discussion**

This study investigated the impact of SES on the vocabulary development of young Korean children, addressing a significant research gap for children under 36 months of age. Specifically, we examined the interplay between family SES, parent-child interactions, and

vocabulary scores, focusing on the unique context of Korea. Utilizing structural equation modeling, our research unveiled the substantial influence of SES on the vocabulary skills of young Korean children. Our exploration of underlying mechanisms highlighted the crucial role of parental engagement, encompassing play and book-reading activities. Surprisingly, maternal work status did not emerge as a significant factor influencing vocabulary development in this context. These findings underscore the intricate relationship between SES and parental engagement in shaping the language abilities of young children in Korea.

**The Interplay of SES, Parental Engagement (Play and Book-reading), and Maternal Work Status in Children's Vocabulary Development**

In our examination of the impact of family SES, parental engagement (play and book-reading frequency; PBR), and maternal work status on Korean children's vocabulary scores (K-CDI) through SEM, we found that family SES predicted vocabulary scores. Children from high SES families exhibited better scores than those from low SES families, a pattern consistent with findings from Western countries (Hart & Risely, 1995; Romeo et al., 2018; Rowe & Goldin-Meadow, 2009) and older Korean children (Lee & Kim, 2012; Lee & Kwak, 2008; Shin & McCoy, 2022). However, when we inspected the mediation effect of parent-child play and book reading, the direct effect of SES ($\beta$= 0.131) on K-CDI scores was not statistically significant. In addition, it is worth noting that we also observed relatively small coefficients between SES variables and K-CDI scores in the correlation analysis (ranging from *rhos* = .089–.208; see Table 3). This observation suggests the influence of cultural factors, such as higher parental education and childcare enrollment, in mitigating the impact of SES on early language development in Korean families.

It is noteworthy that a recent previous study showed a significant direct influence of SES on language outcomes when multiple factors were entered as possible mediators. Shin and McCoy conducted path analyses using SEM to examine the association between familial SES and expressive vocabulary in Korean children aged 3 years (2022). They found a significant direct effect of SES ($\beta = 0.12$) on expressive vocabulary. This disparity between the current study and Shin and McCoy's may stem from two key factors: first, Shin and McCoy's study encompassed a substantially larger sample size (1,894 families) than the current study; and second, Shin and McCoy's research focused on vocabulary outcomes in 3-year-olds, whereas the current study analyzed children younger than 3 years. As children age, Korean parents might invest in additional educational activities, potentially influenced by their SES, leading to variations in language development. Consequently, further investigation is warranted to understand the impact of age on the relationship between SES and children's language development in Korea.

Our study highlighted the significant mediating role of quantitative factors in parent-child interactions, specifically parental play frequency, duration, and book reading frequency, in bridging the gap between SES and K-CDI scores. An increase in the frequency and extent of parental play and book reading, along with heightened engagement in play, seems to mitigate the impact of socioeconomic disparities on language development. This underscores the pivotal role of enriched parent-child interactions in nurturing the linguistic growth of children (Topping et al., 2013). Surprisingly, despite socioeconomic disadvantages, the SAHM group exhibited similar K-CDI scores to the WM group, emphasizing the importance of consistent and positive parent-child interactions. These findings are consistent with previous research, such as the study conducted by Booth et al. (2002), which examined mother-child interactions among 326

children, taking into account maternal employment and SES. In their research, US working

mothers compensated for weekday time limitations by extensively engaging in interactive

activities with their children on the weekends. In contrast, even though our investigation of

Korean parent-child interaction attributes did not specifically distinguish between weekdays and

weekends, it is plausible that Korean mothers exhibit minimal disparity in interactions between

the SAHM and WM groups, even during weekdays, owing to the widespread childcare

attendance among children during daytime hours. Booth et al. (2002) also reported vocabulary

score parity across groups, echoing our findings. Overall, these outcomes emphasize the

importance of enriched parent-child interactions for enhanced language experiences, promoting

distinct and positive language outcomes in children.


**The Role of Play and Book Reading Frequency in Children's Vocabulary Development**

Among the parental engagement variables (play frequency, play duration, and book-

reading frequency), only book-reading frequency showed a significant correlation with K-CDI

scores. It is worth noting that while play takes on various complex and dynamic forms, all forms

contribute significantly to children's learning, going beyond the mere provision of enriched

language input (Ginsburg et al., 2007; Yogman et al., 2018). In contrast, parental book reading is

known to notably enhance children's language input compared with routine activities (Ko &

McDonald, 2020; Mesmer, 2016). The findings underscore the consistent potency of book

reading, which is significantly associated with children's language outcomes, consistent with

prior research (Huerta et al., 2011; Raikes et al., 2006; Shahaeian et al., 2018; Singh et al., 2023).

Although this study lacked intricate information on reading activities, such as defining a reading

episode, counting books, or specifying reading strategies (e.g., reading aloud vs. dialogic

reading), the remarkably positive impact of book reading remains noteworthy, despite these

recognized limitations (see Bojczyk et al., 2016 for discussion on reading quality's effect).

The significance of play in diverse aspects of foundational child development, spanning the

neurobiological, cognitive, and language realms, is widely acknowledged (Yogman et al., 2018).

While the direct effect of play on vocabulary development might not be immediately evident,

SEM analyses revealed that both play variables had significant loadings on the PBR factor,

suggesting a shared underlying construct for play and book reading. Together, play and book

reading contribute substantially to young children's language development. That is, while play's

influence extends to broader developmental domains, book reading may play a focused and

efficient role in nurturing children's language skills. Therefore, although encouraging both

parental play and book reading is crucial for fostering the cognitive development of young

children, it appears that book reading has a greater potential to efficiently enhance young

children's language development.


**Maternal Work Status and Parental Book Reading Frequency: Examining Disparities and Cultural Factors**

Regarding the impact of maternal work status on parental book reading frequency, our

analysis revealed no differences between the groups. It is plausible that working mothers, who,

on average, hold higher education levels than stay-at-home mothers, might prioritize book

reading despite time constraints. Conversely, SAHM could engage in frequent book reading to

address socioeconomic gaps and foster children's success, aligned with education-focused

cultural values (Anderson et al., 2013). Alternatively, Korea's high childcare enrollment and

incorporation of book-related activities could mitigate the book exposure disparities among

children. The present findings are also consistent with the active involvement of Korean parents in their children's reading activities at a young age (Lee, 2004). According to our data, parents even read books to infants as young as 5 months old. The results indicated that these activities significantly contributed to the vocabulary development of young Korean children, irrespective of their maternal work status.

We acknowledge that these findings might evolve with variations in participants' ages. Children under three years of age might be the least affected by maternal work status in Korea, while as they grow, increased household income when mothers work may serve as an avenue for increased social interaction and cognitive stimulation through various private educational programs. Nevertheless, parents should recognize that interacting with their children through joyful playtime and book-reading times will strengthen the foundation of their children's language development before they move forward to the upper age. Furthermore, this enriched interaction, emphasizing language exchange during early childhood, can empower parents to feel confident in facilitating their children's language development. This empowerment may potentially result in a lasting impact, extending even when children enter private educational programs later

**Study Limitations and Future Directions**

While this study has provided valuable insights into the relationship between SES, parental engagement, and children's vocabulary development, it is important to acknowledge the limitations of our research. We recognize the following aspects as areas for future exploration and refinement. First, the assessment of PBR variables relied only on a simple questionnaire, offering only an approximate measure without thoroughly exploring specific details, such as the

duration of reading sessions or the strategies employed by parents. A more in-depth exploration of these aspects could significantly enhance our understanding of the impact of parental reading behaviors on young children's vocabulary development. Similarly, our data collection for play variables was limited to play frequency and duration. This approach overlooked potential insights into the diverse forms of play engagement influenced by factors like the child's sex and age. For instance, interactions between fathers and boys might primarily involve physical play rather than activities such as book reading or social pretend play. Variations in play formats could conceivably affect the connection between parent-child interactions and children's language outcomes. To address this complexity, future investigations should gather detailed information about play and book-reading activities within the family context, providing a more comprehensive perspective on the mechanisms guiding children's language development.

Secondly, a notable challenge in our study was the irregular time gap between K-CDI administration and questionnaire distribution for over 50% of the children. This variation in data collection timing could introduce uncertainties in the relationship between parental engagement (PBR) and children's vocabulary outcomes. While we controlled for the impact of age on book-reading frequency, implementing additional controls for data collection timing in future studies could offer valuable insights, providing a clearer understanding of the direction and strength of the connection between these variables.

Finally, in considering the study's scope, it is worth noting the potential benefits of an extended, age-balanced sample. The current data included a diverse group of children ranging from 8 to 36 months old. While previous research has indicated SES's impact on children's language development up to the age of three, our study encompassed this age range without specific controls. Some model-fit indices were sensitive to the number of subjects, and our

mediation model displayed a relatively low TLI value. Although other indices met the acceptable levels of a good fit, a larger participant pool might have further strengthened this particular index. Given the suspected variation in SES impact based on children's age, future studies with a broader and more balanced sample could offer valuable insights into this relationship.

## Conclusions

This study investigated the intricate relationships among SES, parental engagement, and vocabulary outcomes in young Korean children aged 8-36 months. Building upon prior research highlighting the influence of environmental factors, especially SES and parenting practices, on vocabulary development in early childhood, our investigation aimed to unravel the complexity of these interactions. Our findings illuminated the multifaceted nature of language development during the formative years. While SES exhibited a moderate impact on vocabulary outcomes, parental engagement, encompassing play frequency, duration, and book-reading habits, emerged as a pivotal determinant of children's linguistic skills. Through mediation analysis, we gained valuable insights into how the quantity of parent-child interactions mediate the relationship between SES and K-CDI scores. An intriguing revelation was the absence of significant differences in interaction dynamics and vocabulary scores between working and stay-at-home mother groups. Importantly, our study demonstrated that parental involvement in vocabulary development transcends the confines of socioeconomic backgrounds and maternal work statuses. In essence, our research underscores the vital role of parents in nurturing language proficiency through meaningful engagements with their children.

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