

RESEARCH ARTICLE

An assessment of parent-child reading program and the children's reading literacy skills: Basis for an action plan

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ABSTRACT

This study examines associations between five dimensions of family reading programs and three sub-dimensions of literacy development among lower primary school children in China. A quantitative cross-sectional survey design was adopted. A total of 675 parents of Grade 1–3 students at the Second Experimental Primary School in Zhangzhou, Fujian Province, completed a self-developed five-point Likert scale questionnaire. The instrument assessed five family reading program dimensions: availability of reading materials, frequency of shared reading, print-rich home environment, parental modeling behaviors, and access to technological tools. Children's literacy was measured across three sub-dimensions: reading comprehension, reading skills, and reading motivation. Data were analyzed using descriptive statistics, the Kruskal-Wallis test, the Mann-Whitney U test, and Spearman rank correlation analysis. Results show that parental modeling behaviors demonstrated the strongest association with literacy outcomes overall ($\rho = 0.707$, $p < 0.001$), while the print-rich home environment showed the strongest link to reading motivation specifically ($\rho = 0.669$, $p < 0.001$). Access to technological tools produced the lowest correlation coefficients across all literacy sub-dimensions, and significant age-group differences emerged on this dimension ($p < 0.001$). These findings establish a consistent positive relationship between family reading program quality and multidimensional literacy outcomes in young children, offering practical evidence for the design and improvement of family reading intervention programs.

Keywords: parent-child reading; emotional interaction; reading self-efficacy; social development; literacy; family reading environment; lower primary grades

1. Introduction

Reading ability forms the cognitive foundation on which children's academic achievement and lifelong learning trajectories are built. Early reading development does not unfold in isolation; it is shaped by the interplay of individual characteristics and the environmental conditions that surround the child from birth. Among these conditions, the home literacy environment (HLE) — encompassing the physical resources, behavioral practices, and relational contexts within which families engage with reading — has been consistently identified as one of the most powerful proximal determinants of early literacy outcomes^[1]. Crucially, within the HLE the behavioral and relational practices that parents enact — above all the visible reading models they

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provide — carry developmental weight at least equal to, and in some settings exceeding, that of the physical print resources the home makes available.

The theoretical case for prioritizing the home environment rests on well-established foundations. Bronfenbrenner's ecological systems theory positions the family microsystem as the most direct and influential developmental context for young children, predicting that both the structural features of the home — such as the availability of books and print materials — and the process features — such as the frequency and quality of parent-child interactions around text together with parental modeling of literate behavior — independently shape learning trajectories^[2]. Within this framework, parent-child shared reading constitutes a core microsystem activity: it simultaneously provides rich language input, models literate behavior, and establishes emotional associations between reading and secure relational experience. Sénéchal and LeFevre's Home Literacy Model further specifies that informal shared reading activities predict children's oral language development and reading motivation, while more formal literacy instruction predicts decoding skills, with both pathways contributing independently to early reading achievement^[3].

Empirical research in China and internationally has consistently supported these theoretical predictions. Wang et al^[4]. demonstrated that family socioeconomic status positively predicts children's learning ability, with the home reading environment functioning as a key mediating variable. Shen et al^[5]. surveyed families with children aged zero to three and identified significant deficiencies in shared reading interaction frequency, depth, and parental guidance quality, underscoring the need for targeted family reading training. Guo et al^[6]. analyzed data from 4,088 Jiangsu Province families and found that extending public reading resources into the home setting meaningfully supports young children's early literacy development within national reading promotion contexts.

The quality of parental involvement during shared reading carries particular developmental significance. Consistent with this emphasis, the present study finds that parental modeling behaviors — not structural resources — show the strongest associations with every literacy outcome examined, positioning adult reading example as the single most influential lever in the family reading program. Ming et al^[7]. found that interaction quality during shared reading significantly predicted children's social cognition and interpersonal competencies. Song et al^[8]. demonstrated that parental emotional responsiveness during reading activities promoted emotional recognition, expression, and empathic development in children aged three to six^[9]. Chen identified three systemic barriers to effective parent-child reading interaction — limited parental awareness of interaction strategies, weak interactive engagement, and insufficient communication skills — and proposed practical approaches for improving interaction quality in family reading contexts^[10]. Tian further documented that insufficient parental awareness, limited participation variety, and absence of effective interaction strategies constitute the primary obstacles to meaningful family reading engagement across policy, school, and family domains.

Digital tools have emerged as a growing but empirically contested dimension of family reading practice^[11]. Bruner and Kucirkova conducted a systematic quality assessment of children's reading applications and identified a pronounced imbalance between price and educational quality in the current market, cautioning that digital tool access does not automatically translate into literacy benefit^[12]. Zhou and Zhang applied field theory to parent-child reading service demands and found that parental need for substantive reading guidance substantially exceeds available service resources, a structural gap that digital tools have not yet bridged. In the present sample, technological tools return the weakest associations with literacy of any dimension, reinforcing this cautionary view.

Despite the accumulated evidence, gaps remain in the existing literature, particularly in the Chinese context. Most existing studies examine individual HLE dimensions in isolation rather than comparing the relative associations of multiple dimensions simultaneously. Few studies have systematically investigated how parental demographic characteristics — particularly educational attainment and age — moderate engagement with different reading program dimensions, despite the theoretical expectation from ecological systems theory that these characteristics shape both resource access and interaction quality. Research focusing specifically on lower primary school children (Grades 1–3) in China remains relatively scarce compared with the preschool literature.

This study addresses these gaps by examining associations between five dimensions of family reading programs and three literacy sub-dimensions among 675 lower primary school parents in Zhangzhou. The specific aims are: (1) to describe the current implementation level of family reading program dimensions as reported by parents; (2) to examine whether significant differences exist across demographic groups on these dimensions; and (3) to identify the strength and direction of associations between family reading program dimensions and children's literacy outcomes. The findings are intended to provide evidence-based guidance for optimizing family reading intervention programs in the Chinese primary education context.

2. Literature review

Two complementary theoretical frameworks inform this study's conceptualization of family reading environments and their developmental consequences.

Bronfenbrenner's ecological systems theory provides the overarching framework for understanding how home-based conditions shape children's literacy. The microsystem of the family constitutes the most immediate developmental context, within which the bidirectional interactions between children and caregivers — mediated by the physical and symbolic resources present in the home — directly influence cognitive and motivational development. Applied to family reading, this framework distinguishes between structural conditions (e.g., availability of books, environmental print richness) and process conditions (e.g., frequency of shared reading, quality of parent-child interaction during reading, and parental modeling of literate behavior), predicting that both contribute independently to literacy outcomes. It also anticipates that parental characteristics — including age, educational background, and digital literacy — function as person-level factors that moderate the relationship between environmental conditions and child outcomes.

Sénéchal and LeFevre's Home Literacy Model provides a more focused framework for the literacy domain. The model distinguishes informal literacy activities — including shared storybook reading and book-related conversations — from formal literacy activities such as explicit letter and word teaching. Informal activities are predicted to promote oral language and reading motivation primarily, while formal instruction targets decoding skills more directly. Both pathways independently predict children's early reading achievement, and the model has been validated across multiple cultural contexts. This study operationalizes the informal-formal distinction through its five-dimensional assessment of family reading program features, anticipating that dimensions more closely aligned with informal engagement — shared reading frequency, print-rich environment, parental modeling — produce their strongest associations with literacy outcomes broadly, with parental modeling emerging as the most influential process dimension across comprehension, skill, and motivation alike, while material availability produces comparatively more modest associations across comprehension and skill dimensions.

Together, these frameworks generate testable predictions about the differentiated associations of specific HLE dimensions with distinct literacy outcomes — predictions that the correlation analysis in this study directly addresses.

2.1. Home literacy environment and literacy development

A robust body of evidence documents the associations between specific HLE dimensions and literacy outcomes across diverse populations and age groups.

The physical richness of the home print environment — characterized by the visible and accessible presence of books, magazines, and literacy-related objects — is among the most consistently identified ecological predictors of early reading achievement. Sustained ambient exposure to print creates implicit learning opportunities that accumulate into significant vocabulary and comprehension advantages, operating independently of deliberate parental instruction^[13]. Material availability and book diversity further extend this effect by broadening the range of text genres and vocabulary domains to which children are exposed^[14]. Yet ambient print operates as an enabling condition rather than an active driver; its influence tends to be surpassed by the behavioral practices parents enact within that environment.

Shared reading frequency is a well-established predictor of reading motivation and oral language development. The mechanism operates through both linguistic and relational pathways: repeated exposure to narrative structure and complex vocabulary builds comprehension-relevant knowledge, while the warm relational context of joint reading associates books with positive emotional experience, strengthening intrinsic motivation^[15]. Liang et al. examined public library parent-child reading services under China's "double reduction" education policy and found that configurational combinations of reading service features — not frequency alone — predicted outcomes, indicating that the quality and structure of reading activities mediate the effect of frequency on child literacy^[16]. Ye et al. analyzed online consumer reviews of shared reading materials and identified parental preference for content that is interactive, engaging, and culturally appropriate, indicating that material quality shapes the motivational effectiveness of reading frequency.

Parental modeling behaviors occupy a distinctive position in the HLE literature^[17]. Bandura's social cognitive theory predicts that children develop beliefs about reading's value and personal relevance partly through observing significant others engage in literate behaviors. When parents read visibly for leisure, children internalize the normative belief that reading is a meaningful adult activity, which strengthens reading self-concept and intrinsic motivation. Ming et al. extended this finding by demonstrating that interaction quality during shared reading predicts children's social cognition and interpersonal skills, suggesting that parental modeling operates across both literacy and social developmental domains. The present study advances this line of evidence: modeling behaviors show the strongest associations with all three literacy sub-dimensions, indicating that observational learning functions as a general literacy-support mechanism rather than a motivation-specific one.

2.2. Digital tools in family reading

The role of digital tools in family reading environments remains contested in the empirical literature. Bruner and Kucirkova found a systematic misalignment between the price and educational quality of children's reading applications, establishing that market access does not ensure pedagogical value. Their findings indicate that parents require both media literacy and pedagogical awareness to select and use digital tools effectively in reading contexts. Zhou and Zhang demonstrated that parental demand for substantive reading guidance substantially exceeds available digital resources, identifying a structural service gap that current digital markets have not resolved. These findings collectively suggest that while digital tools carry potential as supplementary engagement devices, their contribution to deep literacy skill development depends critically on how they are integrated into broader family reading practices rather than on their mere availability. The present findings echo this: technological tools yield the weakest literacy associations of any dimension and vary significantly only across parental age cohorts.

2.3. Research gap

The reviewed literature establishes a rich empirical foundation but leaves several gaps unaddressed. Most Chinese studies on family reading have concentrated on the preschool years, leaving the lower primary school period (Grades 1–3) comparatively underexamined. Existing research has predominantly investigated single HLE dimensions rather than comparing the relative associations of multiple dimensions simultaneously within a unified analytical framework. Moreover, the moderating role of parental demographic characteristics — particularly educational level and age — on family reading program implementation has received insufficient systematic attention. This study addresses these three gaps through a multi-dimensional survey design with a demographically diverse sample of 675 lower primary school parents, providing a comparative account of how five distinct reading program dimensions associate with three literacy outcomes in a Chinese urban primary school context.

3. Research methodology

3.1. Research design

This study adopted a quantitative cross-sectional survey design to examine associations between family reading program dimensions and children's literacy outcomes. Quantitative methods are well suited to this objective because standardized instruments applied to large samples enable systematic description, reliable between-group comparisons, and statistical inference about associations among variables^[18]. A cross-sectional design was selected as appropriate for the exploratory and descriptive aims of this investigation. Cross-sectional designs capture distributions and associations at a single point in time and are well suited to establishing baseline patterns and generating hypotheses for longitudinal follow-up, though they do not support causal inference^[19]. All associations reported in this study are therefore interpreted as correlational rather than causal in nature.

Data were collected in October 2025. The research instrument was a researcher-made five-point Likert scale questionnaire comprising 39 items across three modules. Prior to formal administration, the questionnaire underwent content validity review by three domain experts with substantial experience in family reading research, followed by a pilot test with 40 non-sample parents. Cronbach's alpha coefficients were calculated for each dimension to verify internal consistency. Data analysis employed descriptive statistics, the Kruskal-Wallis test, the Mann-Whitney U test, and Spearman rank correlation analysis. Non-parametric methods were selected because ordinal Likert data cannot be assumed to satisfy the normality requirements of parametric tests^[20]. A significance threshold of $p < 0.05$ was applied throughout.

3.2. Research site

The study was conducted at the Second Experimental Primary School in Zhangzhou, Fujian Province, China. Zhangzhou is a mid-sized city in southern Fujian with established primary education infrastructure and active community reading initiatives. The school is a representative public institution serving a sociodemographically diverse student body that includes urban residents, rural migrants, and households across varying socioeconomic levels, making it suitable for capturing variation in family reading practices. The school's sustained commitment to home-school collaboration and its established family reading programs ensured that participating parents possessed baseline familiarity with shared reading practices, supporting the validity of parent-reported data^[21]. Findings are site-specific; generalization to other regions or school types requires careful consideration of contextual differences.

3.3. Participants and sampling

Participants were parents or primary guardians of children enrolled in Grades 1 through 3. Stratified random sampling was employed to ensure representativeness across key demographic characteristics including parental age, gender, and educational attainment. The target sample size of 675 was determined on the basis of statistical power requirements for the planned correlation analyses. A total of 675 valid questionnaires were obtained, meeting the target^[22].

By age, the 31–40 group was the largest ($n = 472$, 69.93%), followed by those aged 41–50 ($n = 161$, 23.85%), those aged 25–30 ($n = 28$, 4.15%), and those over 50 ($n = 14$, 2.07%). By gender, female respondents comprised 585 participants (86.67%) and males 90 (13.33%). This pronounced imbalance reflects broader sociocultural patterns in which mothers assume primary responsibility for children's educational activities and constitutes a sampling limitation discussed in Section 5.2. By educational attainment, 421 respondents (62.37%) held non-degree qualifications; 232 (34.37%) held bachelor's degrees; 21 (3.11%) held master's degrees; and one (0.15%) held a doctoral degree.

3.4. Research instrument

A researcher-made structured questionnaire served as the primary data collection instrument. The questionnaire comprised 39 items rated on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). Module 1 collected demographic information: parental age, gender, and educational attainment. Module 2, the family reading program assessment scale, comprised 24 items across five dimensions: availability of reading materials, frequency of shared reading, print-rich home environment, parental modeling behaviors (PM1–PM5), and access to technological tools (TT1–TT5), with five items per dimension except the print-rich home environment dimension (PE1–PE4), which comprised four items. Module 3, the children's literacy assessment scale, comprised 15 items across three sub-dimensions — reading comprehension, reading skills, and reading motivation — with parents rating children's observable daily reading performance based on direct observation^[23].

Content validity of the researcher-made instrument was established through expert review, with item wording revised for accuracy and appropriateness based on feedback from three scholars with extensive experience in parent-child reading research. A subsequent pilot test with 40 non-sample parents produced Cronbach's alpha coefficients confirming satisfactory internal consistency across all dimensions. The researcher-made instrument met standard requirements for content validity and reliability^[24].

3.5. Data collection procedure

Data collection proceeded through three stages. During preparation, formal school administration approval was obtained and parents received informed consent forms detailing the research purpose, data use scope, and voluntary participation conditions. Written informed consent was obtained from all participants before any data collection began. Research assistants were trained in standardized distribution and collection procedures^[25].

During implementation, questionnaires were distributed through school meetings and class communication channels. Parents completed surveys independently under on-site guidance, with trained assistants available to clarify instructions. An electronic version of the questionnaire accommodated parents unable to attend in person.

During retrieval, each returned questionnaire was individually examined. Those with excessive missing responses or systematic response patterns indicating disengagement were excluded. A total of 675 valid questionnaires were confirmed, establishing a reliable data foundation for statistical analysis^[26].

3.6. Data analysis methods

Descriptive statistics — frequency counts, percentages, means, and standard deviations — characterized participant demographics and dimension-level scores. The Kruskal-Wallis test examined differences across age and educational attainment groups, with post hoc comparisons identifying specific inter-group differences. The Mann-Whitney U test compared male and female respondents. Spearman rank correlation coefficients assessed associations between reading program dimensions and literacy sub-dimensions^[27].

The present study's analytical approach is primarily bivariate. While this is appropriate for the exploratory aims of the investigation and consistent with the ordinal nature of the data, it does not control for the potential confounding effects of parental education, age, or socioeconomic background on the observed associations. Future research should employ hierarchical multiple regression or structural equation modeling to isolate the independent contributions of each reading program dimension while accounting for sociodemographic covariates.

3.7. Ethical considerations

Formal ethical approval was obtained with (ethics review code: 2025-1st-CASE-Huang-v2, approved September 25, 2025). All participants were fully informed of the research purpose, data use scope, and voluntary nature of participation prior to enrollment. Anonymity and confidentiality were maintained throughout: identifying information was stored separately from questionnaire responses, and all raw data were securely managed and properly disposed of upon study completion in accordance with established research ethics protocols^[28].

4. Results

4.1. Demographic characteristics of respondents

A total of 675 valid questionnaires were collected. Descriptive analysis across three demographic variables — age, gender, and educational attainment — revealed the following patterns (**Table 1**).

The age distribution was concentrated among middle-aged respondents. Parents aged 31–40 formed the largest group ($n = 472$, 69.93%), followed by those aged 41–50 ($n = 161$, 23.85%), those aged 25–30 ($n = 28$, 4.15%), and those over 50 ($n = 14$, 2.07%). This concentration reflects the typical demographic profile of parents with lower primary school-aged children in urban China and confirms that the sample captures a population at an active stage of child-rearing involvement. The predominance of parents in the 31–40 bracket also indicates a group for whom digital literacy and reading culture intersect with intensive parenting demands, a combination that shapes both the capacity and the motivation for family reading engagement^[29].

Gender distribution showed a pronounced imbalance: 585 respondents were female (86.67%) and 90 were male (13.33%). This pattern is consistent with the established sociocultural division of child-rearing labor in China, where mothers are substantially more likely to attend school events and complete educational surveys. While the distribution is consistent with findings from comparable domestic and international studies on parental involvement in literacy activities, it constitutes a sampling limitation that restricts the findings' representativeness of balanced parental perspectives. Fathers' reading behaviors and attitudes differ from those of mothers in patterned ways, and their systematic underrepresentation introduces potential bias in the description of family reading dynamics^[30].

Regarding educational attainment, respondents without a bachelor's degree formed the largest group ($n = 421$, 62.37%), followed by bachelor's degree holders ($n = 232$, 34.37%), master's degree holders ($n = 21$,

3.11%), and one doctoral degree holder (0.15%). This moderate overall educational profile is relevant to interpreting family reading practices: parental educational level shapes awareness of literacy development strategies, confidence in guiding children's reading, and the cognitive resources available for interactive reading engagement^[31]. The predominance of non-degree holders provides important context for the moderate mean scores observed across several reading program dimensions in subsequent analyses.

Table 1. Summary of respondent demographic characteristics (N = 675).

Demographic Variable	Category	Frequency	Percentage (%)
Age	25–30 years	28	4.13
	31–40 years	472	69.93
	41–50 years	161	23.85
	Over 50 years	14	2.06
	Total	675	100
Gender	Female	585	86.67
	Male	90	13.27
	Total	675	100
Highest Educational Attainment	Other qualifications	421	62.37
	Bachelor's degree	232	34.37
	Master's degree	21	3.11
	Doctoral degree	1	0.15
	Total	675	100

Note: "Other qualifications " refers to non-degree backgrounds including junior college and secondary education.

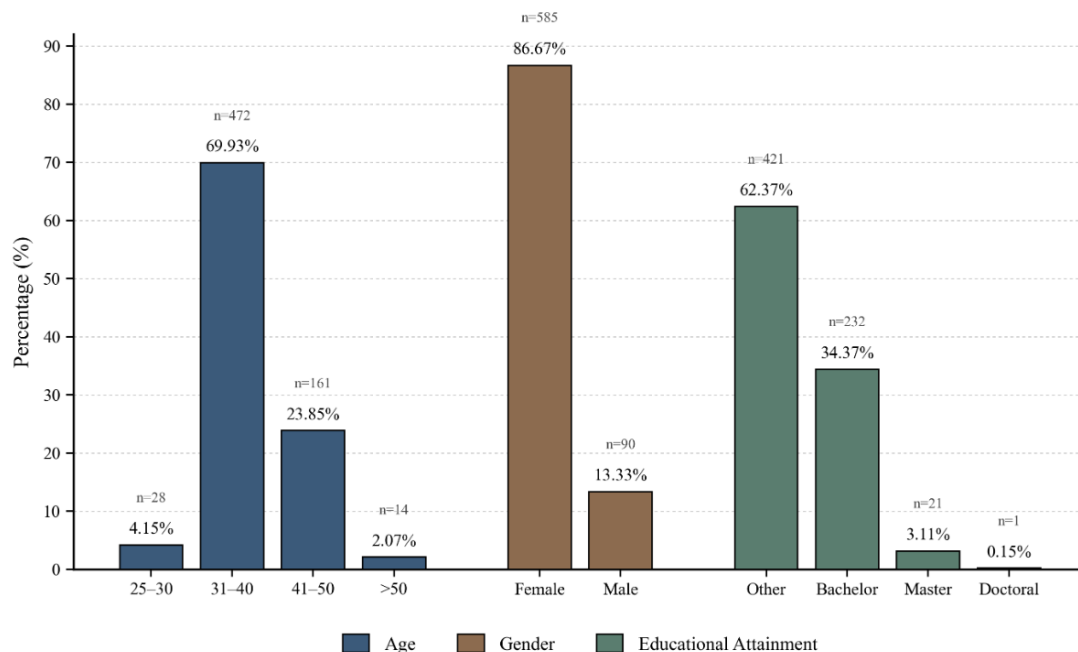


Figure 1. Demographic characteristics of respondents (N = 675).

4.2. Parents' assessment of the parent-child reading program

4.2.1. Parental modeling behaviors

The parental modeling dimension assesses five observable everyday behaviors through which parents function as reading role models: reading in front of children (PM1), displaying a positive attitude toward reading (PM2), enjoying discussing books and stories with children (PM3), being seen treating reading as a personal leisure activity (PM4), and actively participating in children's literacy-related activities (PM5). Results are presented in **Table 2**.

The overall dimension mean was 4.00 (SD = 0.80), falling within the "agree" range and indicating that respondents generally practice these modeling behaviors as part of their daily routines. PM5 ("actively participating in children's literacy-related activities") received the highest item mean ($M = 4.15$, $SD = 0.82$), reflecting strong parental engagement in structured interactive literacy tasks. PM3 ("enjoying discussing books and stories with children") scored 4.10 ($SD = 0.85$), confirming that book-related dialogue is an established practice among most respondents. PM2 ("displaying a positive attitude toward reading") achieved a mean of 4.08 ($SD = 0.87$), indicating that parents actively convey the value of reading to their children.

PM1 ("reading in front of children") and PM4 ("being seen treating reading as a personal leisure activity") jointly received the lowest item means (both $M = 3.83$, $SD = 0.92$ and 0.95 respectively), noticeably below the other three items. This finding reveals that spontaneous leisure reading — in which children observe parents reading for personal enjoyment — is practiced less consistently than structured or guidance-directed reading behaviors. The gap carries important theoretical implications: Bandura's social cognitive theory establishes that children develop motivational orientations toward reading partly through vicarious observation of significant adults engaging in literate behavior. When children routinely see parents reading for pleasure, they form the normative belief that reading is a personally meaningful activity, which in turn strengthens reading self-concept and intrinsic motivation. The convergence of the two lowest-scoring items on parents' own visible reading identifies leisure reading visibility as a specific and addressable gap in how parental modeling currently functions in these households, and points to a concrete behavioral target for family reading intervention programs.

Table 2. Descriptive statistics for parental modeling dimension items ($N = 675$).

Item Code	Item Content	Mean (M)	SD	Descriptive Interpretation
PM1	Actively participating in children's literacy-related activities	4.14	0.71	Agree
PM2	Regularly discussing books or stories with children	4.05	0.74	Agree
PM3	Taking children to libraries or bookstores	3.97	0.78	Agree
PM4	Encouraging children to read independently	3.92	0.76	Agree
PM5	Reading for leisure in front of children	3.82	0.83	Agree
Overall Dimension Mean		3.98	0.76	Agree

Note: Interpretive benchmarks: 4.50–5.00 = Strongly Agree; 3.50–4.49 = Agree; 2.50–3.49 = Neutral; 1.50–2.49 = Disagree; 1.00–1.49 = Strongly Disagree.

4.2.2. Access to technological tools

The technological tools dimension assesses five practices related to digital reading support: using devices to read e-books (TT1), using educational applications to improve reading skills (TT2), accessing

online reading resources at home (TT3), encouraging children to use e-readers or tablets (TT4), and drawing on apps to enrich the reading experience (TT5). Results are presented in **Table 3**.

The overall dimension mean was 3.57 (SD = 0.94), the lowest among the five reading program dimensions, placing it at the lower boundary of the "agree" range. This result indicates that integration of digital tools into family reading routines is the weakest area of implementation in this sample, and that consistent, purposeful digital reading practices have not yet become normative in most participating households.

TT2 ("using educational applications to improve reading skills") received the highest item mean (M = 3.83, SD = 0.98), reflecting moderately positive attitudes toward educational apps as learning tools, consistent with the expanding availability of quality reading applications in China and growing parental familiarity with app-based learning. TT3 ("accessing online reading resources at home") scored 3.74 (SD = 1.01), indicating that many households provide network access for children to locate reading content. TT5 ("drawing on apps to enrich the reading experience") recorded a mean of 3.51 (SD = 1.07), suggesting that app-supported reading enrichment is present but inconsistent across families.

TT1 ("using devices to read e-books") scored 3.44 (SD = 1.09), entering the "neutral" range and indicating that device-based reading of digital books presents genuine practical difficulty for a substantial proportion of families. TT4 ("encouraging children to use e-readers or tablets for reading") received the lowest item mean of 3.32 (SD = 1.11), also within the "neutral" range. This cautious stance is consistent with documented parental concerns about the effects of prolonged screen exposure on children's visual health and sustained attention capacity, concerns that are prevalent in Chinese public health discourse and echoed in international comparative literature on parental digital reading attitudes^[32].

Significant differences across parent age groups were identified on this dimension (Kruskal-Wallis test: $\chi^2 = 16.868$, $df = 3$, $p < 0.001$). Post hoc analysis confirmed that younger parents aged 25–30 (M = 3.98) reported higher levels of technology integration than the 31–40 (M = 3.59) and 41–50 (M = 3.40) groups, reflecting a generational digital literacy gap that directly bears on family reading program design. This finding extends Bruner and Kucirkova's observations about uneven digital reading quality to the question of uneven parental capacity for digital reading engagement across age cohorts.

Table 3. Descriptive statistics for access to technological tools dimension items (N = 675).

Item Code	Item Content	Mean (M)	SD	Descriptive Interpretation
TT1	Using devices to read e-books	3.44	1.09	Neutral
TT2	Using educational applications to improve children's reading skills	3.83	0.98	Agree
TT3	Accessing online reading resources at home	3.74	1.01	Agree
TT4	Encouraging children to use e-readers or tablets for reading	3.32	1.11	Neutral
TT5	Drawing on apps to enrich children's reading experience	3.51	1.07	Agree
	Overall Dimension Mean	3.57	0.94	Agree

Note: Interpretive benchmarks: 4.50–5.00 = Strongly Agree; 3.50–4.49 = Agree; 2.50–3.49 = Neutral; 1.50–2.49 = Disagree; 1.00–1.49 = Strongly Disagree.

4.3. Correlation analysis between reading program dimensions and children's literacy

Spearman rank correlation coefficients were calculated to examine associations between the five reading program dimensions and the three literacy sub-dimensions. Results are presented in **Table 4**.

All 15 correlation coefficients reached statistical significance at $p < 0.001$, leading to rejection of the null hypothesis H_{02} . The observed ρ values ranged from 0.445 to 0.707, indicating consistent moderate-to-strong positive associations across all dimension-outcome pairs. These results establish that higher implementation levels across all five reading program dimensions are associated with better outcomes across all three literacy sub-dimensions.

The parental modeling dimension produced the strongest associations with all three literacy sub-dimensions: reading comprehension ($\rho = 0.707$), reading motivation ($\rho = 0.687$), and reading skills ($\rho = 0.640$). This pattern identifies parents' own visible reading behavior as the most consistently predictive process feature of children's literacy outcomes in this sample, consistent with Bandura's account of observational learning as a driver of reading self-concept. The modeling of literate behavior across daily family life creates a sustained literacy ecology that supports comprehension, skill development, and motivational engagement simultaneously.

Shared reading frequency ranked second in overall association strength, with correlations of $\rho = 0.661$ for reading comprehension, $\rho = 0.649$ for reading motivation, and $\rho = 0.582$ for reading skills. The strong showing on both comprehension and motivation reflects the dual linguistic and relational pathways through which joint reading operates.

The print-rich home environment dimension produced its strongest association with reading motivation ($\rho = 0.669$), exceeding its correlations with reading comprehension ($\rho = 0.632$) and reading skills ($\rho = 0.617$). This differentiated pattern is theoretically coherent within the Home Literacy Model: an environment saturated with accessible print builds intrinsic interest in books over time, as ambient exposure associates the home with positive reading experience. The finding that environmental print richness associates particularly strongly with motivation aligns with Song et al.'s evidence on the role of parental emotional responsiveness in promoting children's reading interest and engagement.

Availability of reading materials produced stable moderate associations across all three sub-dimensions ($\rho = 0.567\text{--}0.613$), confirming that material provision operates as a generalized literacy-support mechanism rather than targeting any single outcome dimension. This pattern supports Ming et al.'s finding that interaction quality during shared reading predicts broad developmental competencies, and is consistent with Bandura's prediction that observational learning from significant others shapes domain-general motivational and self-efficacy beliefs.

The technological tools dimension produced the lowest associations overall, with ρ values ranging from 0.445 to 0.507, and its highest correlation with reading comprehension ($\rho = 0.507$) rather than motivation or skills. This finding indicates that digital tools function primarily as engagement-stimulating devices rather than as vehicles for deep literacy skill development at the lower primary level, consistent with Bruner and Kucirkova's critique of the limited educational quality of children's reading applications. The result cautions against treating digital tool access as a substitute for the relational and environmental dimensions of family reading.

The differentiated correlation pattern across dimensions and outcomes provides direct empirical support for the theoretical frameworks outlined in Section 2. Process dimensions (parental modeling, shared reading frequency) demonstrate the strongest and most generalized associations with literacy outcomes; structural

environmental dimensions (print richness, material availability) show robust associations, with print richness linking most strongly to motivation specifically; and the technological dimension, while positively associated with all outcomes, contributes less to literacy development than the other four dimensions. These patterns offer a clear empirical basis for prioritizing specific program components in family reading intervention design.

Table 4. Spearman correlation coefficient matrix: Reading program dimensions and children's literacy sub-dimensions (N = 675).

Reading Program Dimension	Reading Comprehension (ρ)	Reading Skills (ρ)	Reading Motivation (ρ)
Availability of reading materials	0.613***	0.567***	0.585***
Frequency of shared reading	0.661***	0.582***	0.649***
Print-rich home environment	0.632***	0.617***	0.669***
Parental modeling behaviors	0.707***	0.640***	0.687***
Access to technological tools	0.507***	0.445***	0.458***

Note: *** $p < 0.001$ (two-tailed). Bold values indicate the highest correlation coefficient in each column. P = Spearman rank correlation coefficient.

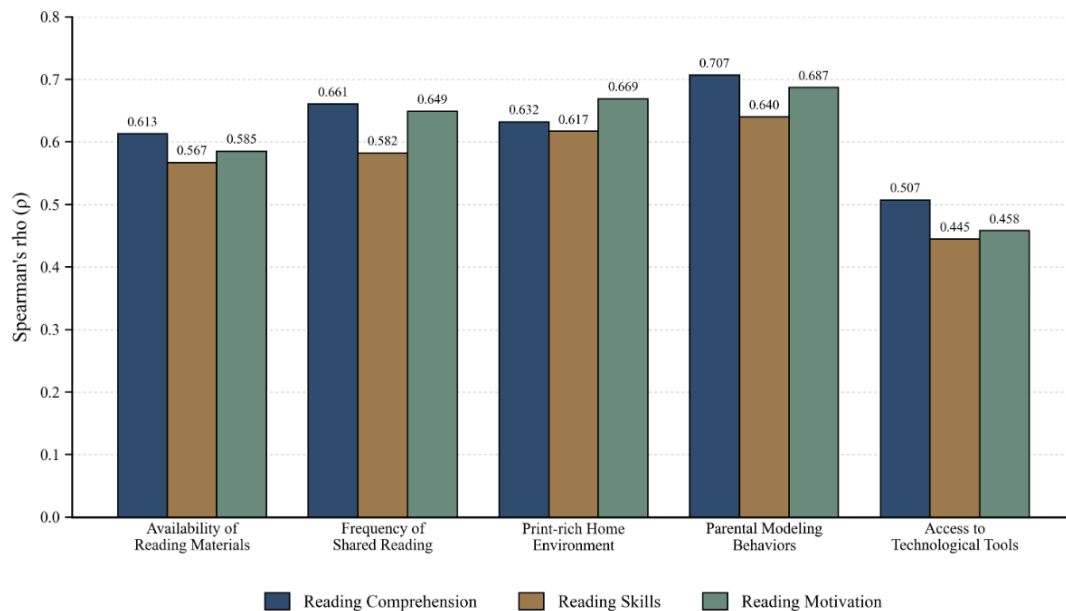


Figure 2. Spearman's rho between reading program dimensions and children's literacy sub-dimensions (N = 675, all $p < .001$).

5. Discussion and conclusion

5.1. Discussion of main findings

This study examined associations between five family reading program dimensions and three children's literacy sub-dimensions among 675 lower primary school parents in Zhangzhou, China. Five principal findings are discussed below in relation to theoretical frameworks and prior empirical evidence.

Finding 1: Demographic profile and its implications for reading program implementation.

The sample was predominantly composed of mothers aged 31–40 with non-degree qualifications. From an ecological systems perspective, parental characteristics — including educational background, age, and gender — constitute person-level factors that moderate the relationship between environmental reading conditions and child literacy outcomes. The concentration of non-degree holders in the sample aligns with

the moderate rather than high mean scores observed across several reading program dimensions, particularly parental modeling and technology use. Consistent with this, educational attainment produced significant group differences on the home environment, parental modeling, reading comprehension, and reading skills dimensions, indicating that parents with lower formal educational attainment tend to rely on intuitive rather than strategy-based interaction approaches during shared reading, which constrains both the frequency and the interactional quality of shared reading activities. The near-exclusive representation of mothers, meanwhile, reflects the sociocultural division of child-rearing labor in China but introduces a systematic limitation: the data capture a maternal model of family reading rather than the full spectrum of parental engagement.

Finding 2: Parental modeling as the strongest literacy predictor.

The parental modeling dimension demonstrated the highest associations with literacy outcomes across all three sub-dimensions, particularly reading comprehension ($p = 0.707$). This finding is fully consistent with Bandura's social cognitive theory, under which children acquire reading self-concept and intrinsic motivation by observing significant adults engage in literate behavior. A household in which parents visibly and consistently model reading generates sustained reading-relevant stimulation that accumulates over time into measurable comprehension and skill advantages. Ming et al. similarly found that interaction quality during shared reading predicts broad developmental competencies, underscoring the practical leverage that behavioral modeling provides even in contexts of limited parental educational resources.

The second-ranked performance of shared reading frequency ($p = 0.582\text{--}0.661$) and the strong showing of the print-rich home environment ($p = 0.617\text{--}0.669$) further confirm that process and structural dimensions jointly produce broad benefits across literacy sub-dimensions. These relationally and environmentally oriented dimensions collectively suggest that interventions targeting both parental reading behavior and the physical home reading environment — through modeling-focused parent training, book provision programs, library access initiatives, and home literacy resource distribution — carry strong empirical justification.

Finding 3: Print-rich environment and its particular association with reading motivation.

The print-rich home environment dimension produced its strongest association with reading motivation ($p = 0.669$) rather than comprehension or skills. This differentiated pattern directly replicates the Home Literacy Model's distinction between informal ambient exposure — which primarily promotes motivational engagement — and formal literacy instruction — which more directly targets decoding. Song et al. demonstrated that parental emotional responsiveness during reading activities promotes children's intrinsic interest and empathic development, suggesting that the motivational effects of environmental print richness are amplified when the relational quality of shared reading is warm and responsive. The finding that print richness associates most strongly with motivation has direct implications for intervention design: programs that enrich the home print environment without attending to interaction quality risk missing a critical pathway through which reading habit formation translates into durable literacy motivation.

Finding 4: Parental modeling and the underactivation of leisure reading visibility.

Although parental modeling emerged as the strongest overall predictor ($p = 0.640\text{--}0.707$), item-level analysis revealed that PM1 and PM4 — the two items capturing parents' own visible personal reading — were consistently the lowest-scoring items (both $M = 3.83$). This gap between guidance-directed modeling behaviors (PM2, PM3, PM5, $M = 4.08\text{--}4.15$) and spontaneous leisure reading (PM1, PM4) points to an underactivated mechanism of motivational transmission. Bandura's social cognitive theory predicts that children's reading self-concept develops partly through observational learning: seeing parents read for pleasure communicates that reading is a personally valuable adult activity, internalizing a motivational

model that structured guidance alone cannot fully replicate. The finding extends Chen's identification of limited parental awareness as a barrier to interaction quality: parents who are active reading coaches but invisible as personal readers may be inadvertently limiting the vicarious motivational modeling that leisure reading visibility provides.

Finding 5: The constrained role of digital tools.

The technological tools dimension produced the weakest associations with literacy outcomes overall ($p = 0.445\text{--}0.507$), despite all correlations remaining significant. Its strongest link was with reading comprehension ($p = 0.507$), indicating that digital tools function primarily as engagement-stimulating rather than skill-building devices at this developmental level. This pattern is consistent with Bruner and Kucirkova's finding that the educational quality of most children's reading applications is limited and misaligned with their cost, and with Zhou and Zhang's observation that digital resources have not yet filled the substantive reading guidance gap that parents identify. The significant age-group differences on this dimension ($p < 0.001$) further indicate that generational digital literacy gaps produce uneven family reading technology use, a finding that requires differentiated policy responses targeting parents of different age cohorts.

5.2. Limitations

First, the sample is geographically restricted to a single school in Zhangzhou, Fujian Province. Generalizing findings to rural areas, regions with different educational infrastructure, or schools serving distinct socioeconomic populations requires caution^[33]. Future research should expand sampling across multiple provinces and diverse school types to improve external validity.

Second, the pronounced gender imbalance (86.67% female) constitutes a structural sampling limitation. The findings reflect primarily maternal reading perspectives and behaviors. Fathers' reading involvement patterns and modeling behaviors differ systematically from those of mothers, and their underrepresentation introduces potential bias into the characterization of family reading dynamics^[34]. Future research should incorporate targeted recruitment strategies for paternal participants and dedicated survey modules assessing father-specific reading involvement.

Third, the cross-sectional design prevents causal inference. All associations reported are correlational, and the temporal direction of the relationships cannot be established from the present data. Children with stronger literacy skills may elicit more engaged parental reading behaviors, producing reversed or reciprocal causation. Longitudinal tracking designs or quasi-experimental intervention studies are required to establish the direction and stability of the observed associations^[35].

Fourth, all core variables relied on parental self-report, introducing social desirability bias. Parents likely overestimate both their own reading behaviors and their children's literacy performance. Future studies should triangulate self-report data with teacher assessments, standardized literacy measures, and behavioral observation to strengthen measurement validity.

Fifth, the educational attainment variable used a broadly defined "other qualifications" category grouping junior college, vocational secondary, and other non-degree backgrounds. This coarse classification limits analytical precision and reduces the capacity to detect meaningful differences in reading practices across distinct educational backgrounds. Future instrument design should disaggregate this category.

Sixth, and critically, this study did not directly measure emotional interaction quality during shared reading. The five dimensions assessed reflect structural and behavioral features of the HLE — material availability, reading frequency, environmental print richness, behavioral modeling, and technology access —

rather than affective process variables such as parental warmth, emotional responsiveness, empathic attunement, or dyadic emotional expression during reading activities. Consequently, the study cannot draw conclusions about how emotional interaction patterns specifically influence literacy outcomes. Future research should incorporate validated instruments measuring emotional interaction quality — such as structured observational coding schemes for parent-child reading interaction — alongside structural HLE assessments, to directly address the relational process dimensions that the present study was unable to capture.

5.3. Recommendations

For schools and teachers, family reading program support should be systematically embedded within home-school partnership work. Regular training for parents of lower primary students should focus on evidence-based shared reading strategies — including open-ended questioning, dialogic reading techniques, collaborative story prediction, and turn-taking during reading — that transform passive text delivery into genuine interactive exchange. Teachers should explicitly communicate to parents that leisure reading visibility is a concrete behavioral objective, not merely a byproduct of adult habit, and provide practical guidance on integrating naturalistic reading into daily family routines to directly address the PM1 and PM4 gap identified in this study.

For parents, modeling visible reading behavior produces the strongest measurable associations with children's literacy outcomes and should be the first priority in family reading practice. This does not require substantial financial investment: letting children routinely see a parent read for pleasure, alongside consistent provision of diverse, accessible reading materials — age-appropriate books, story collections, magazines, and environmental print — sustains a literacy-supportive ecology that benefits comprehension, skill, and motivation simultaneously. Shared reading frequency should be treated as a daily routine rather than an occasional activity, given its strong association with both comprehension and reading motivation. For digital tool use, intentionality and balance are key: selecting educationally sound applications, co-participating in digital reading, and maintaining clear boundaries with print-based reading produces better outcomes than unrestricted screen access.

For policymakers, the significant age-group differences in technology use indicate that family reading support policies require differentiated approaches. Younger parents with stronger digital literacy need encouragement to sustain traditional shared reading alongside digital engagement; older parents need accessible training that builds digital reading confidence without displacing established print-based routines. Regional family reading promotion policies should therefore incorporate differentiated guidance tracks calibrated to parental age and digital literacy profiles. Evaluation frameworks should shift from quantitative metrics — such as books distributed or events held — toward quality indicators capturing interaction depth, environmental print richness, and parental responsiveness, consistent with the quality-over-quantity orientation that the correlation data support.

For future researchers, three methodological priorities are warranted. First, longitudinal or quasi-experimental designs should be adopted to establish causal direction and developmental stability of the associations documented here. Second, geographical and socioeconomic sampling scope should be substantially expanded to test the generalizability of findings across diverse Chinese family contexts. Third, future instruments should incorporate validated emotional interaction measures — capturing parental warmth, responsiveness, and empathic attunement during reading — alongside structural HLE assessments. Combining observational data, standardized child literacy assessments, and teacher ratings with parental self-

report would substantially strengthen measurement validity and support more rigorous causal inference about the relational process dimensions of family reading that the present study identified as a critical gap.

Conflict of interest

The author declares no conflict of interest.

References

1. Xu N. Practice and reflections on reading promotion for children and families in public libraries. *Comparative Study of Cultural Innovation*. 2024;8(31):95 - 99.
2. Bronfenbrenner U. *The Ecology of Human Development: Experiments by Nature and Design*. Harvard University Press; 1979.
3. Sénéchal M, LeFevre J. Parental involvement in the development of children's reading skill: A five-year longitudinal study. *ChildDevelopment*. 2002;73(2):445-460.
4. Wang S, Zhang L, Yao MM, et al. The relationship between family socioeconomic status and the development of learning abilities in preschool children: The mediating role of the home reading environment. *Journal of Educational Biology*. 2023;(05):368-372.
5. Shen XM, Zhang XH, Wang XQ. A survey study on parent-child interaction in parent-child reading for children aged 0-3 years. *Education Observation*. 2023;(30):17- 19.
6. Guo FR, Zhou P, Yang JH, Chen W. Development and support strategies for early childhood reading in families under the national reading campaign: Based on a survey of 4088 children's families in Jiangsu Province. *Library Research and Work*. 2023;(12):57-63.
7. Ming JR, Zhu QY, Chen XY, Ma LH. A study on the factors influencing children's social competence from the perspective of family parent-child reading. *Library Construction*. 2023;1-10 .
8. Song S, Zhu Q, Wang XS, Wang SL, Liu YX. The impact of parent-child reading on emotional intelligence of children aged 3 to 6. *Psychology Monthly*. 2023;18(07):10-13.
9. Chen L. Analysis of the reasons for the lack of interactivity in parent-child reading and strategies for improvement. *Journal of Fujian Institute of Education*. 2023;(11) : 108- 110 .
10. Tian Y. A study on the current situation and improvement strategies of parental involvement in parent-child reading under the background of national reading. *Journal of Jiamusi Vocational College*. 2023;(12) : 106 - 108 .
11. Bruner L, Kucirkova IN. The price of learning: Assessing cost versus quality in children's reading apps. *Literacy*. 2025;59(3):360-371.
12. Zhou X, Zhang YY. A field theory-based study on the service needs of parent-child reading. *Information Science*. 2023;(07):115- 124.
13. Cunningham AE, Stanovich KE. Early reading acquisition and its relation to reading experience and ability 10 years later. *Developmental Psychology*. 1997;33(6):934-945.
14. Mol SE, Bus AG. To read or not to read: A meta-analysis of print exposure from infancy to early adulthood. *Psychological Bulletin*. 2011;137(2):267-296.
15. Liang X, Ding Y, Zhou X, Ye YP. Public library's family parent-child reading services under the "double reduction" policy: Influence path analysis based on csQCA method. *Information Science*. 2023;(08):63 - 70 .
16. Ye YP, Ren ZX, Zhou X. Visualization study of parent-child reading preferences based on online consumer reviews. *Information Science*. 2023;(05):144- 152.
17. Bandura A. *Social Foundations of Thought and Action: A Social Cognitive Theory*. Prentice-Hall; 1986.
18. Creswell JW, Creswell JD. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 5th ed. SAGE Publications; 2018 .
19. Levin KA. Study design III: Cross-sectional studies. *Evidence-Based Dentistry*. 2006;7(1):24 -25 .
20. Field A. *Discovering Statistics Using IBM SPSS Statistics*. 5th ed. SAGE Publications; 2018 .
21. Epstein JL. *School, Family, and Community Partnerships: Preparing Educators and Improving Schools*. 2nd ed. Westview Press; 2011.
22. Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. 2nd ed. Lawrence Erlbaum Associates; 1988.
23. Li Y. Problems and countermeasures of picture book parent-child reading in children's reading. *Science & Technology Vision*. 2022;(09):157- 160.
24. DeVellis RF. *Scale Development: Theory and Applications*. 4 th ed. SAGE Publications; 2017.
25. Creswell JW. *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research* 4th ed. Pearson; 2012.
26. Tabachnick BG, Fidell LS. *Using Multivariate Statistics*. 7th ed. Pearson; 2019.
27. Siegel S, Castellan NJ. *Nonparametric Statistics for the Behavioral Sciences*. 2nd ed. McGraw-Hill; 1988.
28. American Psychological Association. *Ethical Principles of Psychologists and Code of Conduct*. APA; 2017.

29. Yang YH. A study on the correlation between parent-child reading and preschool children's self-identity construction. *Education Observation*. 2022;11(06):43 -47.
30. Tamis-LeMonda CS, Luo R, McFadden KE, Bandel ET, Vallotton C. Early home learning environment predicts children's 5th grade academic skills. *Applied Developmental Science*. 2019;23(2):153 - 169.
31. HoffE. The specificity of environmental influence: Socioeconomic status affects early vocabulary development vi a maternal speech. *Child Development*. 2003;74(5):1368- 1378.
32. Nathanson AI, Aladé F, Sharp ML, Rasmussen EE, Christy K. The relation between television exposure and executive function among preschoolers. *Developmental Psychology*. 2014;50(5):1497 - 1506.
33. Palma GN, Calet N, Bello RAM, et al. The role of rhythm in learning to read in children with and without reading difficulties: An intervention study. *Learning and Instruction*. 2026;102:102273.
34. Stocker CM, Stattin H. Research on sibling and peer relationships and their links to development. *Journal of Family Psychology*. 2014;28(4):447-449.
35. Shadish WR, Cook TD, Campbell DT. *Experimental and Quasi-Experimental Designsfor Generalized Causal Inference*. Houghton Mifflin; 2002.