

Original Paper

An Analysis of Influencing Factors of Parent-Child Shared Reading of Bilingual Originals in the Era of Digital Intelligence

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Abstract

In the era of digital intelligence, parent-child shared reading of bilingual originals has become an important pathway to foster children's linguistic and cognitive development. However, the understanding of the multifaceted factors influencing this practice remains limited. To explore the influencing factors of parent-child shared reading of bilingual originals in digital intelligence, this study adopts a questionnaire survey method based on theories such as the ecosystem theory and the Input-Process-Output (IPO) model. The study finds that in the process of digital reading, the parent-child shared reading activity is mainly affected by three significant dimensions: parental support, technological media characteristics, and children's commitment. Among them, the variables of parents' emotional communication and cognitive stimulation, digital literacy, and the multimedia features of digital reading carriers are particularly significant in enhancing the effect of digital reading, which can further promote the development of children's linguistic expression and social-emotional functions.

Keywords

digital intelligence era, parent-child reading, bilingual originals, parental support, digital reading effectiveness

1. Introduction

In the digital intelligence era, parent-child reading is a crucial step for children to establish initial interpersonal interactions and develop social skills. In the context of the digital age, children start using electronic devices at a very young age, which leads to a decrease in the duration and quality of traditional parent-child interactions. According to the critical period hypothesis, 3 - 6 years of age is a crucial stage in children's language development (Johnson & Newport, 1989). If children's language skills are not

guided in time during this period, they will be seriously affected. Currently, the factors influencing parent-child co-reading in an electronic device environment are unclear. In addition, previous intervention studies have rarely explored the effects of parent-child shared reading mode on children's language expression ability and socio-emotional functioning from the perspective of digital multimedia environments. The present study was conducted through a questionnaire survey method. Based on relevant theories, its influence on digital reading effectiveness was explored from the dimensions of parental support, digital technology-mediated platforms, and children's input to further enhance children's expressive language ability and socio-emotional functioning. This study provides data support for the interactive mechanism of children's language ability and provides a theoretical basis for constructing a high-quality optimization model for young children's language development in the digital era.

2. Model Construction and Research Hypotheses

2.1 Theoretical Basis

With the deep integration of digital technology in the field of education and family, the environments and forms of parent-child shared reading activities have become increasingly diversified and complex. To systematically explore the influencing factors of parent-child shared reading of bilingual texts in the era of digital intelligence, this study introduces the ecosystem theory (Bronfenbrenner, 1979) at the macro level, and draws on the input-process-output (IPO) model at the micro level to construct a theoretical analysis framework that is both holistic and hierarchical.

Ecosystem theory emphasizes that an individual's development is not only influenced by his or her internal characteristics but also shaped by the external multi-level environment (Jessica & Jonathan, 2025). Specifically, children's development in digital reading environments needs to take into account the potential roles of both microsystems (family interactions, parent-child relationships) and external systems (technological media platforms, community resources, and socio-cultural environments). In the era of digital intelligence, family attitudes toward the use of digital tools, parents' digital literacy, and the media environment at the societal level may have a significant impact on children's reading engagement and development through interactive processes.

The IPO model provides a logical and clear analytical path to explore the mechanisms of multiple influencing factors and children's reading effectiveness. In the context of this study, "Input" includes the dimensions of parental support (emotional communication, positive parenting, frequency, and duration of shared reading, and digital literacy), technological media characteristics (multimodal functions, media forms), and children's engagement (reading interest, language ability) (Nation, 1990). In the parent-child shared reading activities, the "Process" embodies the interactive process between children and parents on the digital reading platform, including the way of shared reading, reading feedback, and the depth of parent-child interaction, etc. The "Output" is the children's digital reading comprehension and mastery, as well as the improvement of language expression and social-emotional functioning.

2.2 Research Hypotheses

This study will investigate the factors affecting the effect of parent-child shared reading of bilingual original digital reading in terms of the dimensions of parental support, the dimensions of technological media characteristics, and the dimensions of children's input.

2.2.1 Parental Support

(1) Emotional Communication and Research Hypotheses

Emotional communication refers to the process in which parents convey care, empathy, and encouragement through verbal or nonverbal means when they interact with their children in reading. According to Social Cognitive Theory (Bandura, 1989), positive emotional communication helps to create a safe learning atmosphere and enhances children's concentration and comprehension in digital reading (Ngorosho, 2001). At the same time, good emotional communication can also fulfill children's emotional needs and enhance their interest and engagement in reading content. The hypotheses of this study:

H1a: Emotional communication positively affects the effect of digital reading.

H1b: Emotional communication positively affects children's verbal expression and social-emotional functioning.

(2) Mindful Parenting Level and Research Hypotheses

Mindful parenting level emphasizes the ability of parents to remain aware and attentive in the present moment while interacting with their children, respecting their children's feelings, and responding to them when appropriate (Duncan et al., 2009). A high level of positive parenting helps parents capture their children's needs promptly in digital reading scenarios, provide personalized guidance and feedback, and promote reading effectiveness. The hypotheses of this study:

H2a: Positive thoughts parenting level positively affects digital reading effectiveness.

H2b: Positive parenting level positively affects children's expressive language ability and social-emotional functioning.

(3) Frequency and Duration and Research Hypotheses

Reading frequency and duration refers to the number of times parents and children carry out parent-child reading in a certain cycle and the duration of each reading. According to the Input-Output Theory (Investment Model), higher reading frequency and more ample reading duration usually imply greater parental investment in their children's learning activities, which enhances the depth and effectiveness of digital reading. The hypotheses of this study are:

H3a: The frequency and duration of parent-child shared reading of bilingual original texts positively affects the effectiveness of digital reading.

H3b: The frequency and duration of parent-child shared reading of bilingual originals positively affects children's expressive language ability and social-emotional functioning.

(4) Digital Literacy and Research Hypotheses

Digital literacy level refers to parents' proficiency in the use of digital tools, information retrieval and evaluation skills, etc. (Eshet-Alkalai, 2004). Parents who have a high level of digital literacy are better able to select and integrate high-quality digital resources to provide their children with richer and more appropriate reading materials, which in turn promotes digital reading effectiveness. The hypotheses of this study:

H4a: The level of digital literacy positively affects the digital reading effect.

H4b: The level of digital literacy positively affects children's language expression ability and social-emotional functioning.

2.2.2 Technological Media Characteristics

(1) Multimodal Function and Research Hypotheses

Multimodal function refers to the integrated presentation of text, images, audio, video, interactive animation, etc., which are possessed by digital reading carriers (Jewitt, 2008). Multimodal functions can stimulate children's multi-sensory participation, improve the fun and immersion of reading, and thus enhance the understanding and memory of reading content. The hypotheses of this study:

H5a: Multimodal functioning positively affects digital reading effectiveness.

H5b: Multimodal functioning positively affects children's expressive language ability and social-emotional functioning.

(2) Media Form and Research Hypotheses

Media forms include specific hardware carriers such as tablet computers, smartphones, e-book readers, etc., and can also involve emerging technologies such as AR/VR. More convenient and interactive media forms can reduce children's operating difficulty and increase the flexibility of reading, thus improving the quality of digital reading. The hypotheses of this study:

H6a: Media forms positively affect the effect of digital reading.

H6b: Media forms positively affect children's expressive language ability and social-emotional functioning.

2.2.3 Children's Input Dimensions

(1) Reading Interest and Research Hypotheses

Reading interest refers to children's curiosity and positive attitudes toward the reading activity itself (Guthrie & Wigfield, 2000). In a digital reading environment, if children have a high interest in the content or form of reading, they are more willing to invest time and attention to obtain better reading results. The hypotheses of this study:

H7a: Reading interest positively influences digital reading effectiveness.

H7b: Reading interest positively affects children's expressive language ability and social-emotional functioning.

(2) Language Ability and Research Hypotheses

Language ability, which includes vocabulary, grammatical comprehension, and reading comprehension, is the basis for children's information absorption and expression in digital reading (Vygotsky, 1978).

Children with higher language abilities are more likely to acquire knowledge from multimodal reading materials and express or transfer it effectively after reading (Richter, Cardoso, & Mervis, 2022). The hypotheses of this study:

H8a: Language proficiency positively affects digital reading effectiveness.

H8b: Language proficiency positively influences children's expressive language skills and social-emotional functioning.

2.2.4. Effects of Digital Reading

In this research model, "Effects of digital reading" are not only reflected in the comprehension and mastery of reading content but also affect children's language expression ability and social-emotional functioning. It also affects children's language expression ability and social-emotional function. In other words, when the digital reading process is facilitated by parental support, technological media features, and children's engagement, children not only improve their language (e.g., vocabulary, fluency) but also develop their social-emotional function (e.g., self-emotional management, empathy) (Sylva et al., 2008). In addition, gender, age, parental education, and economic income were added as control variables to the model. The model is shown in Figure 1.

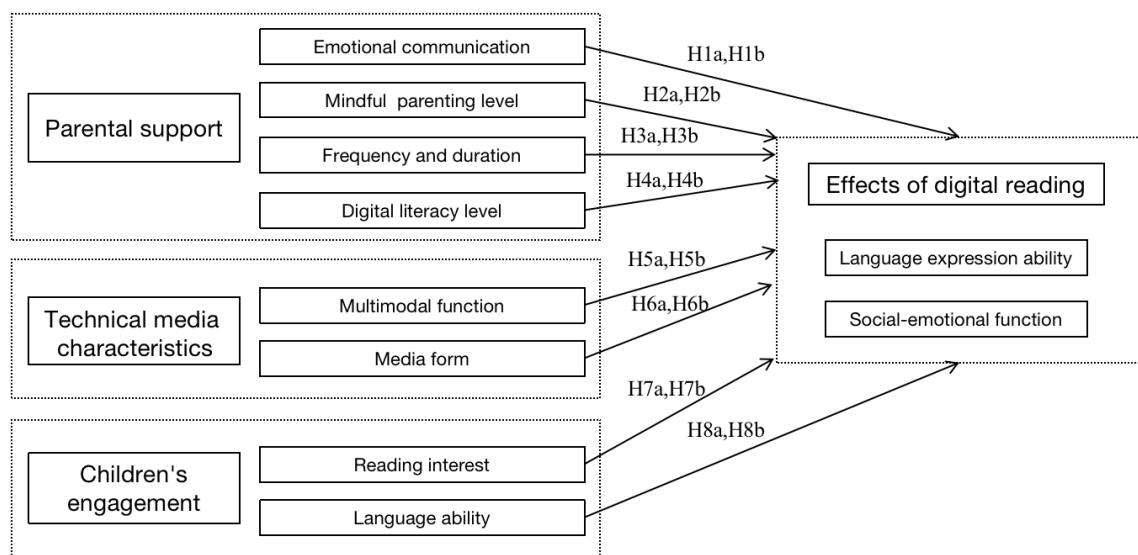


Figure 1. The study model

3. Research Design

3.1 Variable Measurement

Based on the combing of the literature, a total of eight major research variables were distilled in this study, namely, parents' effective communication and cognitive stimulation, the level of positive parenting, the frequency and duration of parent-child reading of bilingual originals, parents' digital literacy (e.g., technological proficiency and trust in digital tools), the multimedia function of the digital reading carriers, media forms, children's interest in reading, and language proficiency. In terms of scale design, we mainly

drew on scales that have been proposed and tested by scholars both at home and abroad, such as the Parenting and Family Adjustment Scale (PAFAS), the Wechsler Programme for Young Children's Psychological Intelligence Scale (WPPSI-IV) for assessing verbal intelligence, the Picture Vocabulary Test (PPVT) for measuring receptive vocabulary ability, and the Children's Behavior Checklist (CBCL) for evaluating emotional affectivity. In addition to the standardized tests, the scale measures were presented in the form of a five-point Likert scale.

3.2 Sample Collection

The target group of this study was set to be children aged 3-6 years old and their parents. According to the theory of critical period hypothesis, the human brain is highly sensitive and efficient in language learning at a specific age, so the group of this study is designated as 3-6 years old. The questionnaire of this study is divided into four main parts: basic information of the sample, assessment of parent-child co-reading frequency and interaction, use of digital tools, and assessment of co-reading effect. The questionnaires were distributed and collected through the Questionnaire Star platform and offline, and 232 questionnaires were finally collected, after screening, the final valid sample was 210. Among the 210 samples, the age distribution of parents covered different age groups from 18 years old to over 50 years old, with parents aged 31-35 and 41 years old and above dominating. The coverage of parents' education level and monthly household income was more comprehensive. In addition, the age of the children was mainly concentrated in the preschool and school-age groups. These samples are diverse in terms of age, educational attainment, and income level, and thus have good representativeness.

4. Data Analysis

4.1 Descriptive Statistical Analysis

The basic situation of this sample is as follows: in terms of parents' age, the sample mainly focuses on the levels of 31-35 years old and 41 years old and above, accounting for 28.57% and 27.62% respectively; in terms of parents' education level, 37.14% of the sample has a college degree, and 30.48% has a bachelor's degree or above; in terms of the monthly family income perspective, 37.14% of the samples are in the range of 5,000 to 10,000 yuan, and 30.95% of the samples are in the range of 10,000 to 20,000 yuan.

4.2 Reliability Analysis

This study used SPSS 27.0 software for data analysis. The reliability analysis was performed through Cronbach's alpha coefficient. Validity analysis was tested through KMO value and Bartlett's sphere test. The reliability of the total scale is 0.83 and the reliability of each variable is above 0.7, which indicates that the reliability of the questionnaire scale is good. The KMO value of the total scale was 0.962 and the KMO value of each variable was above 0.7, which indicates that the validity of the scales is high. Since the questionnaire measurement scales used in this study were adapted from scholars' studies, exploratory factor analysis of the questionnaire scales was required, and a total of three common factors were extracted, which were consistent with the initial question item settings in the questionnaire, and in total

explained 64.7% of the variance, which indicates that the individual scales in this questionnaire have good validity.

4.3 Descriptive Statistical Analysis of Variables

After analyzing the score means of each variable in this study, it was found that except for the two variables of parents' level of positive parenting and children's interest in reading, which had score means lower than 3.8, the rest of the variables had score means higher than 3.8, which indicated that parents' performances in several other aspects were more positive and adequate, but slightly insufficient in terms of their educational concepts and stimulation of children's interest in reading. The mean values of the scores of the variables of parents' emotional communication and cognitive stimulation, and parents' acceptance of digital tools are particularly prominent. This suggests that the interactive communication between parents and children is more adequate during the parent-child reading process, which can positively promote children's thinking development and language expression ability. At the same time, parents' acceptance and use of digital tools also affect the effectiveness of parent-child shared reading to a certain extent, which helps to improve children's vocabulary skills and emotional cognition.

4.4 Influence of Individual Traits on Variables

This study further analyzed the influence of parents' traits (e.g., gender, education, economic income, etc.) on the variables using an independent samples t-test. The results showed that female parents scored significantly higher ($p < 0.05$) than male parents in terms of time commitment to parent-child co-reading, parental emotional communication, and cognitive stimulation. Parents with higher education (master's degree and above) scored significantly higher than parents with bachelor's degree and below on frequency and duration of parent-child reading of bilingual originals, and parenting concepts. And the individual traits of the other samples had no significant effect on the variables.

4.5 Correlation Analysis among Variables

In this study, Pearson's correlation coefficient analysis was used to analyze the correlation among variables. The data showed that there was a significant positive correlation ($p < 0.01$) between the interactive behaviors during shared reading (e.g., adjusting the pace of reading according to the child's response, encouraging the child to express thoughts and feelings) and the children's expressive language and social-emotional functioning, indicating that these interactive behaviors had a positive impact on the development of the children's language and social-emotional functioning. Significant positive correlations ($p < 0.01$) were found between the frequency of shared reading and the effects of vocabulary enhancement, the effects of bilingual switching ability enhancement, the effects of empathy enhancement, and the ability to understand the emotions of others, suggesting that the higher the frequency of shared reading, the more significant was the enhancement of the children's linguistic and socio-emotional functioning. Parents who perceived digital tools as a necessary complement to children's language learning and who were willing to invest time in learning to use new educational apps had more significant ($p < 0.01$) effects on their children's enhancement of each competency. More interactive media forms and multimodal features can stimulate children's multisensory engagement and improve their relevant

abilities. Children's interest in reading positively affected the effect of digital co-reading, but did not significantly affect the enhancement of children's language expression and social-emotional functioning. The correlation between children's language ability and parent-child shared reading effect and ability enhancement was not significant. In addition, parents' level of positive parenting did not have a significant effect on digital reading effects. H1, H3, H4, H5, H6, and H7a were validated through the analysis, whereas the remaining hypotheses were not confirmed.

5. Research Conclusions and Recommendations

5.1 Diversified Leadership to Enhance the Level of Parent-child Shared Reading Guidance

Based on the data and analysis results of this study, parents demonstrated strong emotional communication and digital tool use abilities during the process of parent-child shared reading, but there is still room for improvement in the level of positive parenting and certain interactive guidance strategies. It is suggested that parents should not only rely on their strengths in emotional communication and cognitive stimulation to flexibly adjust the pace and method of reading according to their children's immediate responses but also take the initiative to participate in digital literacy training, and skillfully utilize resources provided by multimodal digital platforms, such as text, images, audio and video, and interactive animation. Through the comprehensive use of these diversified leadership measures, parents can create a richer and more efficient interactive environment for parent-child co-reading at the emotional and technical levels, further enhancing the overall effect of digital reading.

5.2 Diversified Models to Encourage Children's Active Participation in Practice

The research data also show that the degree of children's active participation in digital reading is closely related to the enhancement of their language expression and social-emotional functions. Therefore, to build an interactive reading platform in shared reading activities, we can further stimulate children's multi-sensory participation and enthusiasm for expression by designing a variety of forms such as voice interaction, situational quizzes, and role-playing; at the same time, parents and educational institutions should carry out personalized reading activities, such as role-playing, story continuation, and parent-child co-creative practice, according to children's interests and abilities, to make children experience the joy of creativity in their participation, and obtain instant feedback mechanisms. This will enable children to experience the joy of creation through participation and receive positive incentives with the help of an immediate feedback mechanism. Through this diversified practice mode, children's interest in reading and intrinsic motivation can not only be stimulated, but also effectively promote the transformation from passive acceptance to active exploration, to realize comprehensive development in language, cognition, and social-emotional aspects (Xing, Wei, & Wang, 2022).

5.3 Diversified Platforms to Empower Digital parent-child Reading Ecology

The analysis results show that the multimodal function of digital reading platforms helps to enhance the effect of parent-child reading. Therefore, the platform can further integrate multimodal functions such as text, images, audio and video, and interactive animation to create an intuitive and rich content display

form, and also provide quality resources that meet the needs of parents and children according to their interests and reading habits promptly with the help of intelligent recommendation and personalized customization technology. By building a real-time interaction and feedback mechanism, the platform can effectively stimulate children's enthusiasm for participation and desire for expression, making reading activities more attractive and practical. At the same time, digital media platforms can strengthen collaboration with educational institutions, parents, and content creators to jointly develop educational content that meets children's cognitive characteristics and developmental needs, and build an open, inclusive, and interactive digital reading ecosystem. Such a diversified platform strategy not only provides parents with scientific guidance but also creates an immersive and interactive learning environment for children, thus enhancing the effect and quality of digital reading on the whole.

6. Conclusion

This study has analyzed the main influencing factors of parent-child shared reading of bilingual originals in the era of digital intelligence, but there are still some shortcomings in this study. Future research can further examine the moderating and mediating roles of variables such as parents' positive parenting, children's reading interest, and language proficiency in different contexts, and explore the reasons for their failure to have a significant direct effect. Given that the sample of this study mainly focused on the group of children aged 3 to 6, subsequent studies may consider samples of different ages, family backgrounds, and regions, and adopt longitudinal follow-up and experimental designs to more comprehensively verify the mechanisms of the variables in digital reading.

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