E-ISSN: 2502-3519 P-ISSN: 2798-3234
JGA, Vol. 10(2), June 2025 (331-342)
DOI: https://doi.org/10.14421/jga.2025.102.09

Golden Age
Jurnal Ilmiah Tumbuh Kembang Anak Usia Dini

OPEN ACCESS

Early Reading Difficulties among Young Twins: A Survey Study on Phonological Challenges and Cryptophasia in East Kalimantan

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Keywords:
Early reading skills, Twin language development, Cryptophasia, Phonological awareness

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Received 28 12 2024
Revised 20 05 2025
Accepted 20 06 2025
Published Online First 28 06 2025

Abstract
One of the receptive language abilities that must be developed in early childhood before progressing to more advanced stages is the capacity for early reading. Language development in twins tends to be slower compared to that of children in general. Difficulties commonly observed include challenges in word pronunciation and verbal reading. Cryptophasia is a unique phenomenon in the language development of twins; crypto" means secret, and phasia" refers to a speech disorder. The purpose of this research is to collect data from a representative sample to draw broader conclusions about early reading abilities in twins. This survey-based study employs a quantitative methodology, focusing on 66 twins in Samarinda. Data were collected using a research instrument checklist comprising nine basic items. Each item is scored on a scale from zero to five. Survey results, with a maximum score of one, reveal the following average abilities: recognizing vowel letters (3.64); recognizing consonant letters (2.71); spelling consonant-vowel patterns (1.68); spelling open syllables V-C-V (1.70); spelling identical open syllables C-V-C-V (1.68); spelling varied open syllables C-V-C-V (1.67); spelling closed syllables C-V-C-V-C (1.59); spelling syllables with diphthongs (1.59); and spelling syllables with double consonants (1.47). The overall average early reading ability score among young twins is 1.85. The findings indicate that the reading ability of twins is lower than that of children in general. Strong vowel recognition and moderate consonant recognition serve as the foundation for reading development. However, the low ability to spell syllables highlights the need for targeted intervention, particularly due to the influence of cryptophasia. Although this study was conducted in Kalimantan Timur, it offers valuable insights into early reading abilities in twins. Future research is recommended to further explore twin language development in diverse contexts.

To cite: Pertiwi, A. D., Kartika, W. I., Maghfirah, F., Kamila, K. C., Fortuna, S. B. C., Setianingsih, H. P., & Ferdiyanti, T. (2025). Early reading difficulties among young twins: A survey study on phonological challenges and cryptophasia in East Kalimantan. *Golden Age: Jurnal Ilmiah Tumbuh Kembang Anak Usia Dini, 10*(2), 331-342. *https://doi.org/10.14421/jga.2025.102-09*

Introduction

Language development is one of the key aspects in a child's growth and development process. Language acquisition begins between 8–14 months of age through listening, speaking, reading, and writing (M. Syahran Jailani, 2018). Initially, a child can comprehend what has been heard, and later progresses to produce language sounds that form words. According to Asrori (Adhwa Maris Al-Rasyid & Siagian, 2023), language development is the process in which a child learns to recognize, use, and master increasingly advanced aspects of language. In early childhood, language acquisition occurs naturally and rapidly.

This comprehension process involves language structure, vocabulary development, and the ability to use words and phrases in appropriate contexts (Adhwa Maris Al-Rasyid & Siagian, 2023). For children, language is a means of conveying intent through spoken words and simple constructions, serving as a communication tool to interact with their environment through listening, observing, imitating, attending, and storytelling (Paradis, 2019). Gardner (Suyadi, 2017) notes that because language is essential for communication both with others and oneself,

it is among the most important forms of human intelligence. A sign of verbal-linguistic intelligence is the ease with which individuals speak, debate, present reports, interpret information, and handle writing and oral tasks. They can also influence others through their words.

Through language skills, children can develop social skills with those around them (Aksoy & Baran, 2020). Children without language struggle to interact with others. They use language to express their thoughts so that others can understand them. Language is considered an indicator of a child's success because it facilitates effective peer communication. Rikeriwayanti (Heny Friantary, 2020) states that language comprises both verbal and nonverbal communication and can be learned systematically, depending on one's maturity and learning opportunities. Language also supports learning in other areas. Children must learn language in order to understand well before they can learn other subjects. Children with strong language skills eventually develop the ability to socialize and adapt to their social environment (Hashmi et al., 2022; Lynch et al., 2019; van den Bedem et al., 2019).

Reading is another crucial aspect of language development in children. Basic reading skills include recognizing letter symbols, understanding letter sounds, identifying initial sounds, distinguishing letters, recognizing the sounds of animals and objects around them, assembling syllables into words, and linking words with images (Ajeng Anggit Ganarsih, 2022). Adams (Tia Purwati, 2021) states that the ability to quickly and accurately identify letters is a strong predictive factor for a child's future reading success, aligning with findings from an extensive literature review. According to the Indonesian Minister of Education and Culture Regulation No. 137 of 2014, language development standards for children aged 4–5 years include receptive language understanding, expressive language abilities, and literacy aspects. Regarding early reading skills, children aged 4–5 are expected to recognize symbols, understand sounds made by animals or objects in their environment, and recite letters A through Z.

Rislina (Ajeng Anggit Ganarsih, 2022) explains that letter recognition is a foundational step for children to learn to read. Although this skill seems simple, it must be mastered by kindergarten children, as it is essential for developing reading skills (Traverso et al., 2022). Before children can read sentences fluently, they must first understand the letters (Kamphorst et al., 2021). Without a strong letter foundation, sentence comprehension or overall reading ability will be limited (Jurkic et al., 2023). Phonological awareness in understanding language sound structure is crucial in the reading process (Babayiğit & Stainthorp, 2010). Phonological awareness involves recognizing and manipulating sounds in words to support phoneme blending—an essential aspect of combining sounds into words (Metsala & Kalindi, 2022). Early reading skills, including spoken language ability, listening comprehension, and phonological awareness, form an important foundation for future academic success (Cooper et al., 2014).

At ages 4 to 6 in kindergarten, children begin to understand language in both verbal communication and instruction. Between 5 and 6 years old, more mature development occurs in understanding spoken language and nonverbal instructions, known as syntactic and pragmatic development (Sari, 2021). Language development in twins tends to differ from that of singletons. Twins typically acquire language more slowly, with an average speaking onset at around 25 months. They often have difficulty articulating words clearly. Nonetheless, twins can interpret various nonverbal cues that express feelings, thoughts, and desires—from both their twin and others. They can convey such cues through actions, facial expressions, eye contact, hugs, touch, and more (Ikrar & Wahyu, 2019).

Since the 1990s, idioglossia has attracted considerable research interest. Many believe twins develop their own private language that only they understand, incomprehensible to others. Their speech may sound unintelligible. According to Bautista (Ikrar & Wahyu, 2019), recent studies indicate that the language used between twins is often incomplete and disorganized, with irregular grammar and pronunciation. This results from imitating each other's unstructured language (Meng et al., 2024). About 38% of twins experience language delay (Bakker, 1987). Roughly 34.6% of parents report that one or both of their twins experience

speech and language delay (Horsnall, 2023). Factors such as gestational age, birth weight, and number of siblings can influence language development in twins.

Although many theories exist on why twins experience language delay, identifying the primary cause of cryptophasia remains challenging. The impact of twins on each other's language development is rarely studied. It is evident that they do influence each other's language, with 30–50% of twins developing a private language understood only by themselves (Madison Grimm, 2022). Studies on identical and fraternal twins aim to assess the role of genetics in language development. These compare fraternal twins, who share roughly half of their genetic makeup, with identical twins, who share nearly all genes. Similar language development among both types suggests genetics may play a significant role (Bal et al., 2024; Rice & Earnest, 2024).

Various learning media can be used to enhance reading skills. In today's globalized era, especially among Generation Alpha children who have increasingly sophisticated technological understanding, digital habits are integral to their lives. These can be leveraged as supportive media for early childhood development aspects (Pertiwi et al., 2023). According to Setiawan et al. (Nur Safitri Harahap et al., 2023), digital educational games not only boost specific skills but also improve comprehension, language abilities, cognition, and sensory development. Educational games are engaging learning media due to their visual appeal—including sound, images, and animation—that capture children's attention (Ermiyati et al., 2023). Moreover, children learn vowels, consonants, and the alphabet through these media, helping them grasp learning concepts.

Using the Marbel application in experimental classes has been shown to enhance children's reading skills. It helps them recognize alphabet letters, name nearby objects, and learn about various fruits, animals, and their characteristics. However, children tend to lack enthusiasm and become quickly bored when learning with traditional boards and books. Digital media like this app better capture children's attention, and offer multiple games to support learning (Nur Safitri Harahap et al., 2023). In this study, the media used to analyze early reading ability is a specially designed e-card. The novelty of this research lies in analyzing the early reading ability of twins. The uniqueness of identical twins with cryptophasia will be demonstrated using a questionnaire instrument assessing initial reading ability. The study's results will reveal how the early reading abilities of twins and singletons compare.

Methods

This study employed a quantitative research approach with a survey method to analyze the early reading abilities of young twin children. The survey was conducted through tests and direct observations by visiting the twins either at their homes or schools (Rahmi et al., 2024). The research instrument framework used in this study is a continuation of the researcher's previous work, using the same control variables. It consists of nine detailed components of basic early reading skills assessed from respondents. The survey targeted twins aged 5–7 years located across various regions in East Kalimantan. A purposive sampling technique was used, specifically targeting early childhood twins. The sample comprised 66 twin children distributed across East Kalimantan.

Table 1. Research Instrument for Early Reading Ability (Pertiwi, 2016)

Variable	Indicator	Sub-Indicator
Early Reading Ability	Recognizing Vowels and Consonants	Vowels
		Consonants
	Spelling Syllables	Consonant-Vowel (CV)
		Vowel-Consonant-Vowel (VCV)
		Consonant-Vowel-Consonant-Same Vowel (CVCV-same)
		Consonant-Vowel-Consonant-Different Vowel (CVCV-diff)

doi: *https://doi.org/10.14421/jga.2025.102-09*

Variable	Indicator		Sub-Indicator
			Consonant-Vowel-Consonant-Vowel-Consonant (CVCVC)
	Spelling Containing	Syllables	Double Consonants
			Diphthongs

Each sub-indicator contains five assessment items, and a child receives a score of five if they can correctly identify the e-card shown by the panelist. A total of 66 twin children aged between 5 and 7 years participated in this study across different areas in East Kalimantan. Prior to conducting the study, researchers obtained consent from parents or guardians and arranged a suitable time and location for data collection. As a result, the times and locations varied depending on parental or guardian approval.

The collected data were coded and analyzed using Microsoft Excel. Descriptive analysis was conducted using a Likert scale, where scores were interpreted based on average-based criteria (Pertiwi et al., 2022): (5) very good, (4) good, (3) fair, (2) poor, and (1) very poor. This analysis aimed to assess the early reading abilities of young twin children. The survey instrument underwent expert review and a pilot test to ensure its reliability and validity. Ethical principles, including respondent privacy and confidentiality, were strictly observed. Participation was voluntary, with clear information provided about the study's objectives and procedures. All data were securely stored and used solely for research purposes.

Result

This study presents data on early reading abilities in children, specifically focusing on the ability to recognize vowels and consonants, spell syllables, and spell syllables containing diphthongs and double consonants using e-card media. The research findings provide a comprehensive understanding of early reading abilities in twins. The study employed a survey method using a questionnaire as the data collection tool. The survey was conducted with 66 young twin children across East Kalimantan. Data analysis involved descriptive statistics and interpretation of the early reading abilities of twins using the e-card medium. The following table summarizes the study's findings based on nine assessment instruments.

Table 2. Research Findings on Early Reading Ability in Twin Children

Sub-Indicator	Percentage	Average	Criteria
Vowels	72.73%	3.64	Good
Consonants	51.52%	2.71	Fair
Spelling Consonant-Vowel	33.64%	1.68	Poor
Spelling Vowel-Consonant-Vowel	33.94%	1.70	Poor
Spelling Consonant-Vowel-Consonant-Same Vowel	33.64%	1.68	Poor
Spelling Consonant-Vowel-Consonant-Different Vowel	33.33%	1.67	Poor
Spelling Consonant-Vowel-Consonant-Vowel-Consonant	31.82%	1.59	Poor
Spelling Double Consonants	31.82%	1.59	Poor
Spelling Diphthongs	29.39%	1.47	Very Poor

The results above represent the initial data collected from a sample of 66 twin children. Nine sub-indicators were assessed using a specially designed e-card developed by the research team. The findings show that each stage influences the subsequent one; each level of ability is interrelated with the next. Children who struggle in the early stages tend to have difficulty progressing to more advanced stages of early reading. The early reading instrument, validated by subject matter experts, uses familiar words from the children's everyday environments.

The results reveal a "good" criterion for the first sub-indicator, a "fair" rating for the second, "poor" for sub-indicators three through eight, and "very poor" for the ninth sub-indicator. These findings will be discussed in greater detail in the following section.

Recognition of Vowel and Consonant Letters

The data for this study were collected from 66 early-age twin children. The data distribution is presented based on each item under the sub-indicator of recognizing vowels and consonants, according to the children's abilities.

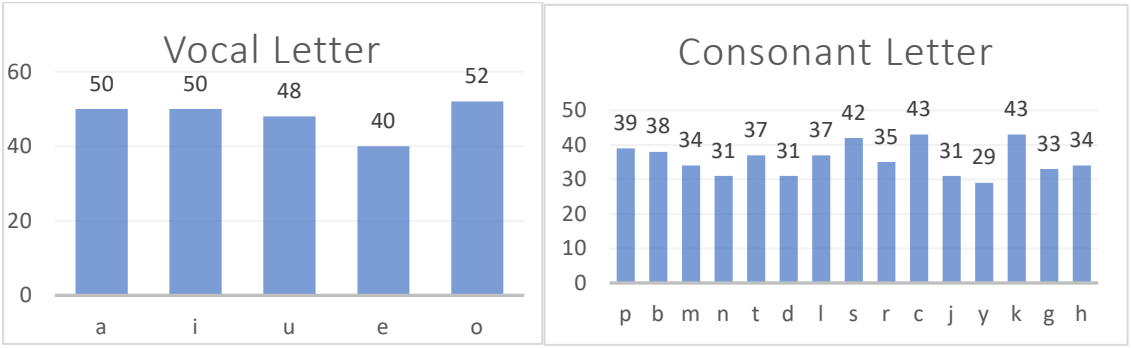

Figure 1. Twin Children's Ability to Recognize Vowels and Consonants

The results, based on a sample of 66 twin children, indicate that they are generally able to recognize vowel and consonant letters at an early age. Fifty-two children showed strong recognition of the letter "o", while 40 had difficulties recognizing the letter "e". Fifty children showed equal recognition levels for the letters "a" and "i". The percentage of twin children's ability to recognize vowel letters was 72.73%, with an average score of 3.64, classified as good.

The consonant letters used in this study included 15 consonants as referenced by relevant theories. The highest scores in consonant recognition were for the letters "c" and "k", each recognized by 43 children. Following closely, 42 children could recognize the letter "s". The lowest score was for the letter "y", recognized by only 29 children. The average percentage of twin children's ability to recognize consonant letters was 51.52%, with an average score of 2.71, categorized as fair.

Ability to Spell Syllables

This sub-indicator includes five skills: the ability to spell consonant-vowel (CV), vowel-consonant-vowel (VCV), consonant-vowel-consonant-vowel (CVCV) with the same ending, CVCV with different endings, and closed syllables (CVCVC). Data were collected from 66 twin children aged 5–7 years.

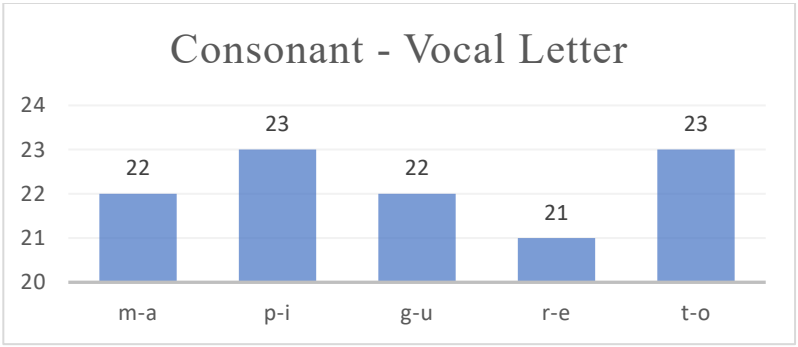

Figure 2. Twin Children's Ability to Spell Consonant-Vowel Syllables

Results show that the highest performance in spelling CV syllables was on "t-o" and "p-i", with 23 children able to spell them correctly. The lowest was for "r-e", with only 21 children succeeding—this aligned with the previously noted difficulty in recognizing the vowel "e". The percentage for this skill was 33.64%, with an average score of 1.68, categorized as poor.

doi: *https://doi.org/10.14421/jga.2025.102-09*

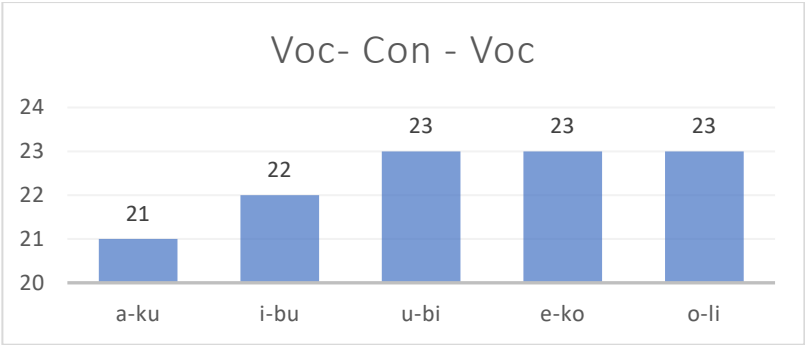

Figure 3. Twin Children's Ability to Spell Vowel-Consonant-Vowel Syllables

For VCV syllables, the highest correct spellings were found with the words *o-li*, *e-ko*, and *u-bi*, each successfully spelled by 23 children. The word *i-bu* was correctly spelled by 22 children, while *a-ku* had the lowest at 21 children. The spelling ability in this pattern showed a percentage of 33.94%, with an average score of 1.70—also falling under the poor category. Performance in this stage showed a slight improvement compared to the CV stage.

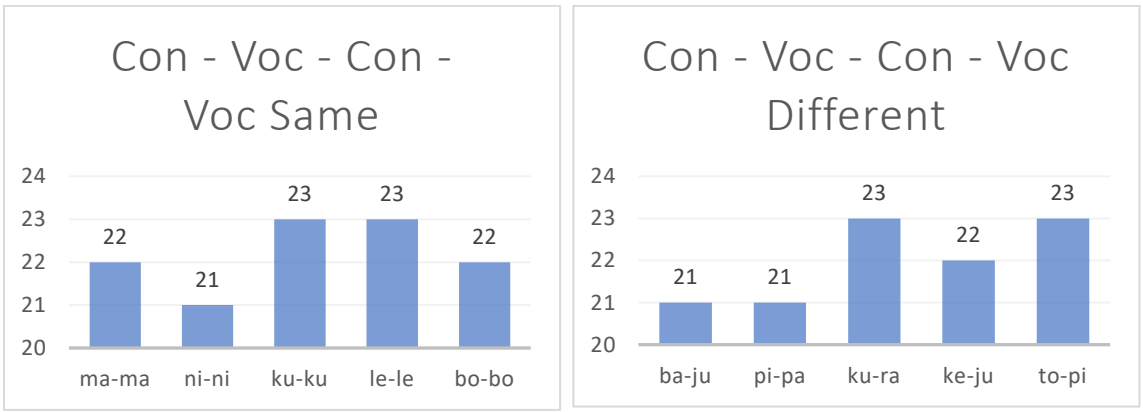

Figure 4. Twin Children's Ability to Spell Open Syllables (CVCV)

This stage differentiates between spelling repeated syllables (same CVCV) and different syllables within the same structure. For identical syllables, the best results were seen in the words *ku-ku* and *le-le*, each spelled correctly by 23 children. The lowest result was with *ni-ni*, spelled correctly by 21 children. The percentage of performance in identical CVCV syllables was 33.64%, with an average score of 1.68, categorized as poor.

For differing syllables (CVCV with different endings), the highest correct spelling was for *ku-ra* and *to-pi*, each by 23 children. The lowest scores were seen with *ba-ju* and *pi-pa*, with 21 children succeeding. The percentage of ability in this sub-indicator was 33.33%, with an average score of 1.67—again falling in the poor category.

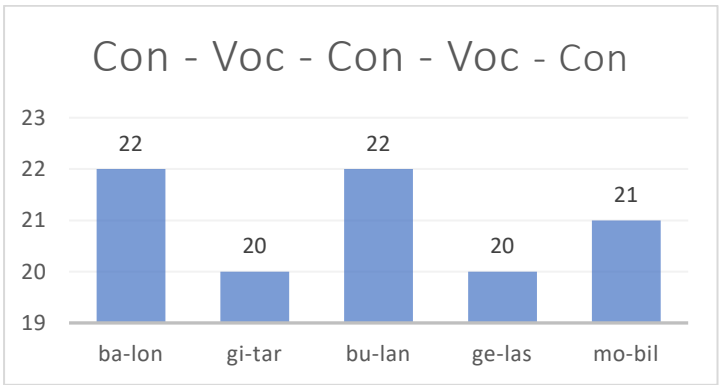

Figure 5. Twin Children's Ability to Spell Closed Syllables (CVCVC)

In spelling closed syllables, the words *ba-lon* and *bu-lan* were most successfully spelled, with 22 children achieving correct results. *Gi-tar* and *ge-las* were correctly spelled by 20 children, while 21 children correctly spelled *mo-bil*. The overall percentage for closed syllable spelling was 31.82%, lower than that of open syllables. The average score for this stage was 1.59, categorized as poor.

Ability to Spell Syllables Containing Specific Sounds

Syllables containing double consonants and diphthongs represent two sub-indicators under the broader category of syllable spelling abilities. In this study, syllables with double consonants used the sound "ng" at the end of words with varied preceding syllables. Diphthongs included in the assessment were "oi", "au", and "ai". These sub-indicators were tested on 66 twin children aged 5–7 years in East Kalimantan.

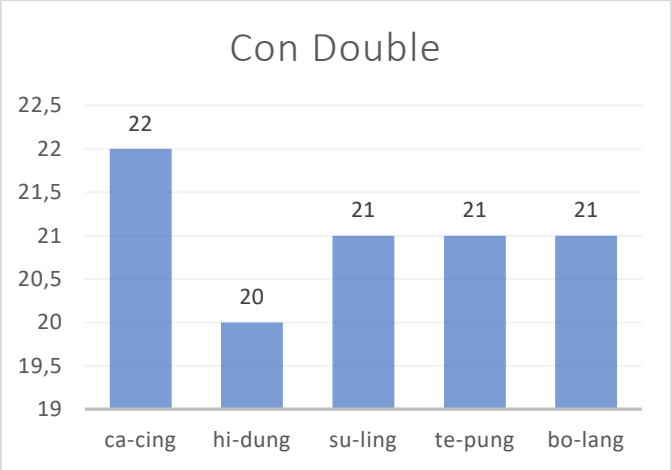

Figure 6. Twin Children's Ability to Spell Double Consonants

Based on the collected data, the word *ca-cing* was correctly spelled by 22 children, making it the most successfully spelled item in this sub-indicator. Following this, 21 children were able to spell the words *su-ling*, *te-pung*, and *bo-lang* correctly. Additionally, 20 children succeeded in spelling *hi-dung*. The percentage of children who correctly spelled syllables with double consonants was 31.82%, equal to the percentage in the closed syllable stage. The average score was 1.59, categorized as poor.

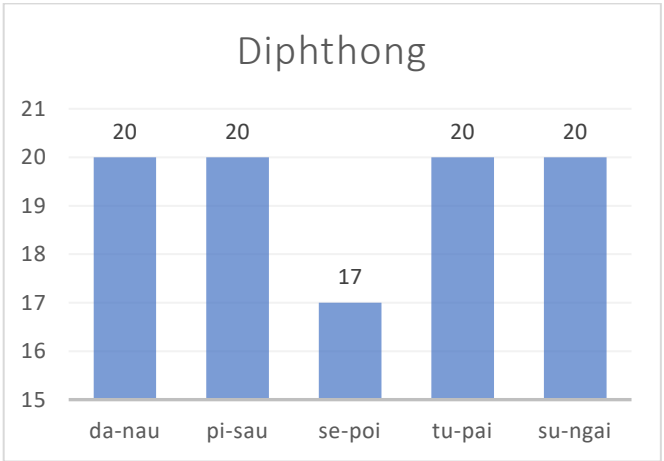

Figure 7. Twin Children's Ability to Spell Diphthongs

As shown in the figure above, 20 children correctly spelled the words *da-nau*, *pi-sau*, *tu-pai*, and *su-ngai*. However, only 17 children managed to spell *se-poi* correctly. The percentage of children able to spell diphthong-containing syllables was 29.39%, lower than that for double consonants. This is consistent with the average score of 1.47, classified as very poor.

doi: *https://doi.org/10.14421/jga.2025.102-09*

Table 3. Comparison of Early Reading Ability Results

Sub-Indicator	Percentage – Twins	Percentage – Singletons
Vowels	72.73%	96.52%
Consonants	51.52%	86.96%
Spelling Consonant-Vowel	33.64%	77.39%
Spelling Vowel-Consonant-Vowel	33.94%	66.67%
Spelling CVCV – Same	33.64%	76.52%
Spelling CVCV – Different	33.33%	69.85%
Spelling CVCVC (Closed Syllables)	31.82%	54.20%
Spelling Double Consonants	31.82%	35.07%
Spelling Diphthongs	29.39%	37.10%

Based on Table 3, it can be concluded that there is a notable difference in early reading ability between twin and singleton children. Each child undergoes a stepwise reading development process, where performance in each stage affects the subsequent one. Challenges become more pronounced in stages involving closed syllables, as well as syllables containing double consonants and diphthongs. In contrast, open syllables—ending in vowels—appear to facilitate easier pronunciation and spelling for children.

Discussion

This study aimed to examine early reading abilities in twin children aged 5–7 years in East Kalimantan. Language plays a central role as a cultural tool that mediates cognitive and learning processes, especially through peer interaction involving conversation, discussion, and role-play (Futterer et al., 2022; Villardón-Gallego et al., 2018). Foundational reading skills, such as oral language comprehension and phonological awareness, are essential predictors of later academic achievement in primary school (Cooper et al., 2014). Phonological awareness helps children recognize that words are made up of smaller units, including letters and syllables, and understand how these units can be combined and separated (Daries et al., 2022). Early reading programs are typically designed to assess development in reading accuracy and word recognition skills (Tyler et al., 2015).

The development of early reading skills acts as a bridge between narrative abilities and broader reading competence. These skills encompass syntactic awareness, letter knowledge, and phonological sensitivity (Piasta et al., 2018; Siegelman et al., 2020). In this study, familiar vocabulary was used to enhance engagement and effectiveness in reading instruction, based on evidence that familiar words are easier for young children to process (Sampa et al., 2018). Assessing twins' reading development offers insights into how such skills emerge under specific developmental conditions. The use of e-cards as a learning tool provided an interactive way to measure foundational literacy in a controlled environment.

The findings suggest a sequential relationship among reading stages, where earlier skills directly impact subsequent learning. The twin children demonstrated a 72.73% success rate in recognizing vowel letters and a 51.52% rate for consonants, with the vowel “e” being the most difficult to identify (Pertiwi, 2016). These results suggest that letter recognition forms a critical foundation before progressing to more complex phonological tasks. As children transition from recognition to spelling, the ability to accurately combine sounds becomes increasingly important. Difficulties at this stage can hinder advancement through later stages of reading development.

Performance in spelling tasks, including open and closed syllables as well as double consonants, was generally poor, with average scores below the midpoint on the Likert scale. The lowest performance was observed in spelling diphthongs, with an average score of 1.47, indicating a significant challenge for twin children in processing adjacent vowel combinations. This trend is consistent with prior research indicating that diphthongs pose particular difficulties in early phonological development (Daries et al., 2022). Overall, the only skills that reached acceptable performance levels were vowel and consonant recognition. In contrast, all other assessed areas fell into the “poor” or “very poor” categories.

When compared with singletons under the same research design (see Table 3), twins consistently underperformed across all sub-indicators. Singleton children demonstrated higher percentages in all areas, particularly in spelling consonant-vowel and diphthong syllables. These differences may be attributed to variations in individual cognitive development, language exposure, or environmental factors. The data further reinforce the importance of tailored instructional strategies for twin children, who may require different pacing or support. The comparative results highlight the need to understand how shared developmental environments among twins influence early literacy outcomes.

The observed delay in early reading among twins aligns with prior findings suggesting that twin children are at greater risk of language delay (Thorpe, 2006). Cryptophasia, a phenomenon where twins create their own private language, may contribute to lower performance in standard language assessments (Bakker, 1987). Additionally, twins have been found to score lower in receptive language skills compared to their singleton peers (D'Haeseleer et al., 2016). These language delays may be mild and transient but nonetheless impact early academic performance if not addressed. Early identification and differentiated intervention are essential to address these challenges effectively.

Finally, the study emphasizes the importance of early intervention for twin children with suspected language or reading difficulties. Genetic and environmental factors interact uniquely in twin development, necessitating specific support strategies (Rice et al., 2018). Although delays in twins often decrease over time, the early years are critical for establishing reading competence (Thorpe, 2006). A strong bond between twins may provide some compensatory benefits, such as mutual support in social or communicative development (Hayashi et al., 2014). However, the prevalence of language delay in twin populations highlights the need for proactive screening and support, especially in cases involving cryptophasia (Horsnall, 2023).

Conclusion

This study aimed to analyze early reading abilities in young twin children in East Kalimantan. A key limitation of this research lies in its focus solely on early reading skills in twins, comparing the results with those from previous studies involving singletons. Early reading skills are stimulated in early childhood to support academic success in later stages. The words and syllables used in this study employed familiar vocabulary, as such language has been shown to be more effective in supporting literacy development. Each stage of early reading proficiency contributes progressively to the next, forming a foundational pathway.

The findings indicate that twin children demonstrated lower early reading performance compared to their singleton peers. Among all the assessed areas, only vowel recognition among twins was categorized as "good," while consonant recognition fell into the "fair" category. In contrast, their performance in spelling open and closed syllables, as well as syllables containing double consonants, was categorized as "poor." Spelling diphthongs was the most challenging, with scores falling into the "very poor" category. The relatively low percentages across these areas suggest a potential language delay among twin children.

One contributing factor to this delay may be the phenomenon of cryptophasia, where twins develop a private language understood only between themselves. This study highlights the importance of targeted stimulation and intervention for developing early reading skills in twins. Engaging media and focused strategies are essential to support their language development effectively. The results provide further evidence of the presence of cryptophasia, as reflected in the lower early reading performance of twin children compared to singletons. The implications of this study emphasize the need for early and structured support in fostering foundational literacy among twins. Future research should seek to broaden the understanding of twin development across various domains, particularly by examining factors associated with cryptophasia. Expanding this research could uncover new developmental patterns or risk factors unique to twins. Such efforts would be valuable in designing tailored interventions and educational strategies for this specific population.

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