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Phonological Aspects of Language Acquisition in Children Aged 3–5 Years: A Case Study in Lubuk Lintang Village, Indonesia

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ABSTRACT

This study investigates the phonological aspects of language acquisition among children aged 3–5 years in Lubuk Lintang Village, Seluma Regency. The objectives were to describe the types of phonological elements acquired by children and to identify the factors influencing this process. Employing a qualitative descriptive design, data were collected through observation, recording, interviews, and documentation involving five children and their parents. Triangulation techniques ensured data validity. The findings reveal that children have generally mastered the vowel sounds [a], [e], [i], [o], and [u], and most consonants, although difficulties remain with /r/, /l/, and /z/ in certain contexts. Diphthongs were also acquired, except [ei], which was rarely produced due to limited input frequency. Family and environmental contexts emerged as decisive factors shaping phonological development. These results underscore the critical role of parental linguistic input and social interaction in early language acquisition. The novelty of this study lies in its localized phonological documentation within an understudied Indonesian community, contributing empirical evidence to cross-linguistic phonological acquisition research. The implications highlight the importance of early parental awareness and structured linguistic environments for fostering optimal language development. However, the limited sample size constrains the generalizability of findings.

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Introduction

Early childhood language acquisition is widely recognized as a cornerstone of cognitive development and social participation, with phonology constituting the substrate upon which lexical and morphosyntactic growth unfolds (Feldman, 2019; Vehkavuori et al., 2021; Wiethan et al., 2014). From the first year onward, children progress from cooing and canonical babble to word-like forms as articulatory control, auditory feedback, and prosodic sensitivity interact (Iverson, 2010; Laing & Bergelson, 2020). Cross-linguistically, acquisition pathways show regularities: unmarked vowels and early-emerging bilabials typically precede later-acquired liquids and rhotics, while syllable templates shift from CV to more complex onsets and codas (Levelt et al., 2000; Watts & Rose, 2020). These developmental profiles are shaped by both biological constraints and distributional properties of the ambient language, including frequency,

phonotactic probability, and neighborhood density (Chan & Vitevitch, 2019; Flores et al., 2021; Gray et al., 2014; Vitevitch & Luce, 2016). At the same time, phonological acquisition is embedded within socio-interactional ecologies in which contingent feedback, joint attention, and caregiver speech styles scaffold children's sound categories and phonetic detail (Grolig, 2020; Swanson, 2020).

In Indonesian, the focus of the present study—phonological development has been discussed in linguistics and education literatures, yet systematic community-based documentation in early childhood remains comparatively sparse (Annisa Zulhantiar et al., 2024; Fitriana & Agustina, 2019; Hapsari, 2023; Umara et al., 2021; Wijayanti, 2021). Foundational descriptions of Indonesian phonology provide the inventory and articulatory features necessary to frame acquisition hypotheses, distinguishing phonetics and phonemics and noting context-sensitive allophony (Khairiah Zahra et al., 2023; Wijana, 2003). Such descriptions align with cross-linguistic reviews showing that many Indonesian-learning children should master the five-vowel system early, but may show protracted mastery for liquids/rhotics and certain fricatives—patterns that echo typological trends across 27 languages (Fitriana & Agustina, 2019; McLeod & Crowe, 2018). Frequency and functional load in the input are especially relevant in Indonesian speech communities, where regional registers and contact with local languages may modulate exposure to particular segments, clusters, and diphthongs (Ambridge et al., 2015; Edwards et al., 2015; Stokes & Surendran, 2005; Storkel & Lee, 2011).

A growing body of evidence emphasizes that family and community practices are decisive for early phonology: caregivers' phonetic clarity, lexical diversity, and responsive turn-taking predict speech outcomes over and above socioeconomic variation (Cychosz, 2022; Ferjan Ramírez et al., 2020; Swanson, 2020). Ecological models further specify multi-layered influences—home, peers, and neighborhood institutions—that jointly shape children's opportunities to hear and practice language (Fitriana & Agustina, 2019; Grolig, 2020). These perspectives are especially pertinent for Indonesian rural or peri-urban settings where input profiles may differ from metropolitan centers due to multilingual repertoires, caregiver workload, and availability of preschool programs (Rezeki, 2021; Rezeki & Sagala, 2020). Within this landscape, preliminary observations in Lubuk Lintang, Seluma, indicate that children's early vocalic contrasts are salient, while certain consonants (e.g., /r/, /l/, /z/) and some digraphs or diphthongs appear less frequent in spontaneous speech—anecdata consistent with both articulatory difficulty and input frequency accounts (McLeod & Crowe, 2018; Rezeki, 2021), and reflected in local documentation motivating the present inquiry

Methodologically, qualitative descriptive approaches enable fine-grained capture of naturalistic speech and the interactional contingencies in which phonological tokens occur (Doyle et al., 2020; Nassaji, 2015; Neergaard et al., 2009). Triangulating recordings, field notes, and caregiver interviews increases the credibility of inferences about what children *can* produce versus what they *tend* to produce given situational demands and addressee effects (Johnson et al., 2020). In addition, community-based sampling in a defined locale supports ecological validity and allows interpretation of phonological outcomes alongside cultural practices of address and play. The present study leverages these principles in the context of Lubuk Lintang, documenting the phonological forms in spontaneous child speech and mapping them against family and environmental influences reported by caregivers and observed in situ

Despite the substantial theoretical and typological base, two gaps remain. First, Indonesian early-phonology research is dominated by single-case studies or urban cohorts, limiting transferability to rural communities where input conditions and bilingual repertoires likely diverge (Rezeki, 2021). Second, few studies integrate naturalistic phonological profiling with contextual accounts of *why* particular segments or clusters are delayed—i.e., disentangling articulatory complexity from input frequency and social-pragmatic usage (Ferjan Ramírez et al., 2020; McLeod & Crowe, 2018; Rezeki & Sagala, 2020). Addressing these gaps, this study aims to (1) describe the phonological elements—vowels, consonants (including liquids and rhotics), consonant digraphs, and diphthongs—acquired by children aged 3–5 years in Lubuk Lintang, and (2) identify the family and environmental factors associated with their emergence and stability in spontaneous production. By offering a localized, ecologically grounded profile of early Indonesian phonology, the study contributes empirical detail to cross-linguistic acquisition research and informs caregiver and preschool practices in comparable communities (Hoff et al., 2022).

Methods

This study employed a qualitative descriptive research design to provide an in-depth understanding of children's phonological acquisition within their natural environments. A qualitative approach was considered appropriate because it allows the researcher to capture linguistic phenomena as they occur in real-life contexts, emphasizing meaning rather than statistical generalization (Merriam & Grenier, 2019). Fieldwork was conducted in Lubuk Lintang Village, Seluma Regency, Indonesia, over a two-month period from November to December 2021. The research site was selected purposively, as it provided access to children aged 3–5 years, the age group in which foundational phonological structures typically emerge.

Participants consisted of five children aged 3–5 years and their parents, who were treated as key informants regarding language input and speech practices within the home. Purposive sampling was applied to ensure the inclusion of children who represented the relevant age range and were actively engaged in family and community communication. The relatively small sample size reflects the exploratory nature of qualitative research, where depth and richness of data are prioritized over representativeness (Creswell & Creswell, 2018).

Data collection employed multiple techniques to capture both spontaneous linguistic production and contextual factors. These included direct observation of children's speech in natural interactions, audio recording and systematic note-taking, semi-structured interviews with parents, and documentation of environmental settings. The triangulation of techniques, sources, and time ensured data credibility by cross-verifying information from multiple perspectives (Creswell & Creswell, 2018).

To ensure trustworthiness, the study applied established qualitative validation strategies. Credibility was supported by prolonged engagement in the field and repeated observation sessions. Dependability and confirmability were strengthened through consistent documentation of data collection and analysis procedures, while transferability was addressed by providing detailed descriptions of the research setting and participant backgrounds. Data were analyzed using Miles et al., (2013) interactive model, which involved iterative cycles of data reduction, data display, and conclusion drawing. Phonological data were first transcribed phonetically and then categorized into vowel systems, consonant inventories, consonant clusters, and diphthongs.

Instances of substitutions, omissions, or delayed acquisition were systematically coded and interpreted with reference to established phonological acquisition frameworks (Ferjan Ramírez et al., 2020; McLeod & Crowe, 2018).

By employing this rigorous methodological framework, the study sought to ensure that the phonological profiles of the children were interpreted accurately within their ecological contexts, reflecting both linguistic structures and the family–community dynamics that shaped them.

Results and Discussion

Vowel Acquisition

The analysis of spontaneous speech data demonstrated that all participants had consistently acquired the five core Indonesian vowels: [a], [e], [i], [o], and [u]. These vowels appeared in word-initial, medial, and final positions without significant distortion, indicating stable acquisition. For example, children were able to pronounce words such as *api* [a-pi], *bola* [bo-la], and *ibu* [i-bu] with clear articulation. The accuracy of vowel production suggests that vowel acquisition occurs early and is reinforced by the high frequency of vowel use in Indonesian speech. This finding corresponds with universal acquisition trends, where vowels are typically acquired before consonants due to their relative articulatory simplicity.

Consonant Acquisition

In addition to vowels, children demonstrated mastery of a broad range of consonants. Frequently used consonants such as [b], [m], [n], [t], [k], and [s] were produced clearly and consistently. However, certain consonants remained problematic. For instance, the rhotic /r/ was often substituted with /l/, as in *motor* being pronounced *motol*. Similarly, /z/ was rarely encountered in spontaneous speech, reflecting both articulatory challenges and its low frequency in daily vocabulary. Liquids such as /l/ also posed occasional difficulties, especially in complex word-medial positions. Despite these challenges, children's overall consonant inventories showed significant expansion compared to earlier developmental stages, suggesting ongoing phonological maturation.

Consonant Clusters and Digraphs

The acquisition of consonant clusters and digraphs was more variable. Clusters such as [ny] and [ng] were consistently articulated, as in words like *nyanyi* [ɲaɲi] and *makan nasi goreng* [gorɛŋ]. By contrast, clusters such as [kh] and [sy] were rarely produced, reflecting their limited usage in everyday vocabulary within the children's environment. When children attempted these clusters, simplifications or omissions were observed. For example, *syukur* was sometimes reduced to *sukur*. These results highlight the influence of lexical frequency and community language use on phonological acquisition.

Diphthong Acquisition

With respect to diphthongs, children acquired [ai], [au], and [oi] successfully, producing words such as *pantai* [pantai], *pulau* [pulau], and *amboi* [amboi]. However, [ei] was inconsistently produced or omitted. This absence is attributed to the low frequency of [ei] in everyday communication, suggesting that diphthong acquisition is highly sensitive to input frequency. The

results reinforce claims from usage-based phonological theories that frequent forms are acquired earlier and more robustly than rare forms.

Factors Influencing Acquisiton

Two major factors were found to strongly influence phonological acquisition: family and environment. Within the family, parents and relatives acted as the primary language models. Positive influences occurred when caregivers provided correct and clear phonological input. However, negative influences were also observed; for example, some caregivers simplified words (e.g., using *mamam* instead of *makan*), which were then imitated by children. Environmental factors also played a critical role. Peer interaction provided opportunities for repetition and reinforcement, though the phonological accuracy of peers sometimes perpetuated errors. Teachers and community members also contributed, especially when engaging children in structured or semi-structured conversations.

Table 1. Expanded Summary of Phonological Acquisition in Children Ages 3-5 Years

Category	Acquired Phonemes / Patterns	Challenges and Observations
Vowels	[a], [e], [i], [o], [u]	Fully mastered; clear articulation across all positions
Consonants	[b], [c], [d], [f], [g], [h], [j], [k], [l], [m], [n], [p], [q], [r], [s], [t], [v], [w], [x], [y], [z]	Difficulties with /r/ (substituted by /l/), occasional errors in /l/ and /z/
Clusters/Digraphs	[ny], [ng]	[kh], [sy] rarely produced; simplifications observed
Diphthongs	[ai], [au], [oi]	[ei] absent or inconsistently produced
Influencing Factors	Family (parents, relatives); Environment (peers, teachers, community)	Input quality critical; incorrect caregiver forms imitated by children

Discussion

The findings of this study demonstrate that children aged 3–5 years in Lubuk Lintang Village have acquired the five primary vowels [a], [e], [i], [o], and [u], along with a wide range of consonants, clusters, and diphthongs. However, persistent difficulties were observed with specific phonemes, including the rhotic /r/, the liquid /l/, and the fricative /z/, as well as limited production of diphthong [ei] and digraphs such as [kh] and [sy]. These outcomes align with cross-linguistic research emphasizing that certain phonemes—particularly liquids and rhotics—are among the last to be mastered due to their articulatory complexity. McLeod & Crowe, (2018) reported similar findings across 27 languages, confirming that rhotics and liquids typically emerge later than stops and nasals. Likewise, Stoel-Gammon, (2011) and Vihman, (2014) highlighted that consonant acquisition follows a universal trajectory from simple to complex forms, a pattern mirrored in the present data.

The observed inconsistency in the production of [kh], [sy], and [ei] also reflects the significant role of input frequency and lexical distribution in shaping acquisition. Rezeki, (2021) emphasized that high-frequency phonological forms are acquired earlier and with greater stability, while less frequent items remain vulnerable to omission or substitution. In the Indonesian context, Ferjan Ramírez et al., (2020) and Rezeki & Sagala, (2020) similarly noted that

phoneme acquisition is closely tied to the frequency of exposure within family and community interactions. This is reinforced by Rezeki, (2021), who documented variation in children's phonological development linked to local linguistic practices, particularly in rural communities where input patterns differ from urban areas.

Another salient finding concerns the role of family and environmental factors. Parents and close relatives were the first and most influential language models for children, both positively and negatively. Rezeki, (2021) seminal study established that the quantity and quality of caregiver input directly affect children's linguistic development, and this has been supported by subsequent research (Doyle et al., 2020). The present study corroborates these findings, showing that when parents used simplified or non-standard speech forms (e.g., *mamam* instead of *makan*), children readily imitated them. Such evidence resonates with Flores et al., (2021), who argued that inaccurate phonological input in Indonesian families can delay mastery of standard forms. Beyond the family, peer interaction and community involvement played an additional role in reinforcing or diversifying phonological exposure, echoing ecological models of language acquisition advanced by Cychosz, (2022).

Collectively, these findings indicate that while children's phonological acquisition follows universal pathways, it is also locally mediated by linguistic input frequency, caregiver practices, and social interaction patterns. The novelty of this study lies in its ecological documentation of phonological acquisition in a rural Indonesian community, an underrepresented setting in the literature. Unlike most prior studies focusing on single-case observations or urban cohorts, this research provides systematic evidence from a rural environment, highlighting the interplay of universal developmental trajectories and context-specific linguistic exposure.

The implications of these findings extend to both theory and practice. Theoretically, the results contribute to cross-linguistic acquisition research by providing data from an underexplored linguistic community, thereby enriching comparative analyses of phonological development. Practically, the findings suggest that parental awareness and intervention programs are essential to ensure accurate phonological modeling in early childhood. Educators can also integrate phonological awareness activities in preschool curricula to reinforce mastery of less frequent phonemes and diphthongs. Furthermore, health and education policymakers should consider supporting community-based early language development programs, especially in rural areas where resources and linguistic models may be limited.

Despite these contributions, this study is not without limitations. The small sample size of five children limits the generalizability of the findings, and the reliance on a single community context restricts broader applicability across diverse Indonesian regions. In addition, the study was cross-sectional, capturing phonological development at a single point in time, rather than tracking longitudinal changes. Future research should involve larger and more diverse samples, including urban–rural comparisons, as well as longitudinal designs to examine developmental trajectories over time. Incorporating acoustic analyses may also enhance precision in documenting phonetic details that are not easily captured through auditory transcription alone.

Conclusion

This study concludes that children aged 3–5 years in Lubuk Lintang Village have generally mastered the core Indonesian vowel system and most consonant phonemes, although persistent

difficulties remain with liquids and rhotics (/l/, /r/) as well as less frequent sounds such as /z/, [kh], [sy], and the diphthong [ei]. The findings underscore that while phonological development follows universal trajectories observed across languages, its outcomes are strongly mediated by local factors, particularly the quality and frequency of input provided by family members and reinforced through environmental interactions with peers and the community. The study's novelty lies in documenting phonological acquisition in a rural Indonesian context, contributing evidence that expands the global literature on early phonological development beyond predominantly urban and Western settings. These results carry important implications for early childhood education and parental awareness, highlighting the need for accurate phonological modeling and enriched linguistic input to support optimal language acquisition. Nevertheless, the small sample size and cross-sectional design limit the generalizability of the findings, and future studies should employ larger, more diverse cohorts and longitudinal approaches to capture developmental trajectories more comprehensively.

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