

Verb Production in Malay-English Bilingual Preschoolers:
A Processability Theory Framework
(Penghasilan Kata Kerja dalam Kalangan Kanak-Kanak Prasekolah Dwibahasa Melayu-Inggeris:
Kerangka Processability Theory)

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ABSTRACT

Malaysia is a multilingual country where many children are exposed to more than one language from an early age; yet, empirical evidence on how young Malaysian children produce verb structures across typologically different languages remains limited. This study examines verb production among 58 Malay-dominant bilingual preschoolers aged 5 to 6 in Selangor, Malaysia, whose English input was largely confined to school instruction. Using a mixed-methods descriptive cross-sectional design, picture elicitation tasks elicited targeted verbs in both languages; the data were transcribed in ELAN and analysed through Processability Theory (PT). PT was adopted because its implicational hierarchy maps verb output in both languages onto developmental stages rather than describing it through frequency alone, and the study constitutes the first group-level, verb-focused application of PT to Malay. Base forms were the preferred verb type in both languages. In Malay, fifteen (25.9%) children reached the Phrasal Procedure through productive use of the progressive marker tengah, as in tengah tidur, while the rest demonstrated Lemma Access through base forms. In English, most children produced no stageable output; seventeen (29.3%) children reached Lemma Access through bare forms such as sleep and eat, and one child reached the Category Procedure through productive V+ing use. Qualitative analysis also revealed far greater lexical variety in Malay. Given the children's unequal exposure, these patterns are interpreted as reflecting both processing development and differences in input and instruction, rather than processability alone. The findings offer preliminary support for a Malay-based PT framework and baseline evidence for early English vocabulary instruction.

Keywords: Malay-English bilingualism; verb production; preschool children; Processability Theory; language exposure

ABSTRAK

Malaysia adalah sebuah negara dengan kepelbagaian bahasa, yang mana ramai kanak-kanaknya terdedah kepada lebih daripada satu bahasa sejak usia awal. Namun demikian, kajian empirikal tentang cara kanak-kanak Malaysia menghasilkan struktur kata kerja merentas bahasa yang berbeza dari segi tipologi masih terhad. Kajian ini meneliti penghasilan kata kerja dalam kalangan 58 kanak-kanak prasekolah dwibahasa berumur 5 hingga 6 tahun di Selangor, Malaysia, yang menguasai bahasa Melayu sebagai bahasa dominan, dengan pendedahan bahasa Inggeris sebahagian besar dari mereka terhad kepada pengajaran di sekolah. Dengan menggunakan reka bentuk keratan rentas deskriptif berkaedah campuran, tugas elisitasi bergambar digunakan untuk menjana kata kerja sasaran dalam kedua-dua bahasa; data ditranskripsikan menggunakan ELAN dan dianalisis melalui Processability Theory (PT). PT dipilih kerana hierarki implikasinya membolehkan output kata kerja dalam kedua-dua bahasa dipetakan

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kepada tahap perkembangan dan bukan sekadar diuraikan melalui kekerapan. Kajian ini juga merupakan aplikasi PT yang pertama terhadap kata kerja bahasa Melayu pada peringkat kumpulan. Bentuk dasar merupakan bentuk kata kerja yang paling kerap dihasilkan dalam kedua-dua bahasa. Dalam bahasa Melayu, lima belas orang (25.9%) kanak-kanak mencapai Prosedur Frasa melalui penggunaan produktif penanda progresif tengah, seperti dalam tengah tidur, manakala kanak-kanak lain menunjukkan Capaian Lema melalui bentuk dasar. Dalam bahasa Inggeris, kebanyakan kanak-kanak tidak menghasilkan output kata kerja yang boleh dipetakan pada mana-mana tahap; tujuh belas orang (29.3%) kanak-kanak mencapai Capaian Lema melalui bentuk dasar seperti *sleep* dan *eat*, dan hanya seorang mencapai Prosedur Kategori melalui penggunaan *V+ing* yang produktif. Analisis kualitatif turut menunjukkan kepelbagaian leksikal yang jauh lebih luas dalam bahasa Melayu. Oleh kerana tahap pendedahan kanak-kanak kepada kedua-dua bahasa tidak seimbang, pola ini mungkin dipengaruhi bukan sahaja oleh perkembangan keupayaan pemprosesan mereka, tetapi juga oleh perbezaan dalam pendedahan dan pengajaran bahasa. Dapatan kajian memberikan sokongan awal terhadap kerangka PT berasaskan bahasa Melayu dan bukti asas bagi pengajaran awal kosa kata bahasa Inggeris.

Kata Kunci: kedwibahasaan Melayu–Inggeris; penghasilan kata kerja; kanak-kanak prasekolah; Processability Theory; pendedahan bahasa

INTRODUCTION

Malaysia has a rich linguistic environment shaped by its multicultural population of Malay, Chinese, Indian, indigenous, and other communities. As the national language, Bahasa Melayu plays a central role in public life alongside many actively used ethnic languages. Multilingualism is thus a normal part of everyday life in the nation (Hashim, 2024). Alongside this linguistic diversity, English occupies an important position as an institutionalised second language associated with economic and social mobility, particularly in urban areas (Kachru, 1992). Its development in the region reflects a model of *Postcolonial Englishes* undergoing ongoing structural and social stabilisation within the local context (Percillier, 2024).

Within this linguistic landscape, Malay and English serve different functions: Malay is prioritised as the language of national identity, while English remains important for global competitiveness, professional mobility, and access to global knowledge (Hashim et al., 2024). Exposure to English often begins in the preschool years, through parental effort, English-dominant homes, or digital media, and some children acquire English alongside, after, or even before their mother tongue (Lee & Yap, 2025; Lim & Chieng, 2022; Mahmud & Salehuddin, 2023; Raadha Krishnan & Sharmini, 2024).

Depending on the amount of exposure to each language, Malaysian children may develop as simultaneous early bilinguals, as sequential early bilinguals who encounter the second language after partially acquiring the first, or as late bilinguals (Mahmud & Salehuddin, 2023). For a large proportion of Malay families, particularly those served by national preschools in suburban and rural areas, Malay remains the dominant language of the home and community, and sustained exposure to English begins only with formal schooling (Mahmud & Salehuddin, 2023; Mohamed Salleh et al., 2022; Mohamed Salleh, Di Biase, & Kawaguchi, 2023). Children from these families are best described as Malay-dominant sequential early bilinguals. It is this latter profile, which likely represents the majority of children in national preschools, that the present study examines.

Given this context, it is important for linguists, speech therapists, educators, and policymakers to understand the language acquisition trajectories of children learning English in a multilingual environment where English is not the dominant societal language, since measuring Malaysian children against normative benchmarks derived from monolingual English-speaking populations misrepresents the realities of their multilingual development.

This study therefore focuses on Malay-dominant sequential early bilingual preschoolers. While Malay-English bilingual children have received growing research attention (e.g., Lim & Chieng, 2022; Mohamed Salleh et al., 2016, 2019, 2020; Razak et al., 2016; Salehuddin & Winskel, 2012), the verb production of this population at preschool age remains largely undocumented, particularly at group level. The study examines their verb production, one of several understudied grammatical domains in this population but a particularly informative one given the centrality of verbs to sentence structure (Engelhardt et al., 2024). In this study, verb forms refer to the morphological shapes a verb may take: in English, the bare base form (*eat*) and inflected V+ing (*eating*); in Malay, the base form (*makan*), prefixed forms with *meN-* or *beR-* (*memakan*, *berenang*), and progressive *tengah* constructions (*tengah makan*). The research is guided by two questions: First, what verb forms do these preschoolers produce in Malay and English, and what PT stages do these forms reflect in each language? Second, how do the lexical usage patterns of English and Malay action verbs compare at these early stages?

The paper reviews the literature on children's verb acquisition and PT, describes the methodology, maps the findings onto the PT hierarchy in both languages, and concludes with practical implications for educators and curriculum designers in the Malaysian context.

THE COGNITIVE CENTRALITY OF VERB ACQUISITION

Acquiring any language in early childhood places considerable demands on a child's developing cognitive and linguistic system; acquiring two adds a further layer of complexity, as the child must build and keep separate two sets of form-meaning mappings (De Houwer, 2021). This study examines that process through Processability Theory (PT; Pienemann, 1998; Pienemann & Lenzing, 2025), a psycholinguistic framework which holds that learners acquire grammatical structures in a fixed, implicational sequence determined by the processing procedures available to them.

Although nouns generally predominate in early vocabularies and are typically acquired earlier, they involve fewer morphological distinctions relevant to the present study (Gentner, 1982; Marchman & Bates, 1994). Verbs present a greater learning challenge because they express relations rather than refer to objects, and their acquisition is influenced by the typological properties of the language being learned (Bowerman & Levinson, 2001; Slobin, 2001). They also form the structural core of the sentence, functioning as 'organisational hubs' that determine the arguments required and the positions of subjects and objects (Engelhardt et al., 2024).

The contrast between English and Malay is particularly clear in their verbal systems. English marks tense, aspect, and agreement through verb inflection, as in *eats*, *ate*, and *eating*. Malay has no tense or agreement inflection. Instead, prefixes such as *meN-* and *beR-* mark voice and verb type (e.g., *main* 'play' → *bermain* 'to play'; *lukis* 'draw' → *melukis* 'to draw'), while aspect is expressed through free pre-verbal morphemes such as *sudah* 'already' and *tengah* 'in the process of' (Karaj, 2022; Nik Safiah Karim et al., 2008). A Malay-English bilingual child must therefore learn that ongoing action is marked inside the verb in one language but outside it in the other. As these grammatical properties emerge systematically across PT's developmental stages, verbs provide a particularly useful means of mapping children's development onto the PT hierarchy.

Verb learning also depends on the size of the developing lexicon. Clark (1993) describes semantic extension, in which children use a familiar word for a related concept when they do not know the target word. This strategy, however, requires an existing word that can be extended.

Floyd and Goldberg (2021) likewise show that conceptually related words strengthen one another and make retrieval easier. These theories suggest that some lexical knowledge is needed before these processes can work effectively. For bilingual children with unequal exposure, the weaker language may contain too few related words to support semantic extension and efficient retrieval, which may further slow verb learning.

Research on early bilingual development has tended to focus on vocabulary size and nominal morphology rather than verb acquisition (De Houwer, 2021; Paradis et al., 2011). Comparatively little attention has been given to how bilingual children acquire and use verbs across two typologically distinct systems (Mohamed Salleh et al., 2020; Mohamed Salleh, Di Biase, & Kawaguchi, 2023). This gap is especially apparent in Malaysia, where Malay-English bilingualism is widespread but bilingual verb development remains largely under investigated (Mohamed Salleh et al., 2022). The present study addresses this gap.

CURRENT STATE OF RESEARCH IN THE MALAYSIAN CONTEXT

Research on Malay-English childhood bilingualism consists largely of small-scale case studies or work on specific grammatical systems. Razak (2014) reviewed morphological and syntactic acquisition among Malay-speaking children and called for more empirical work on this population, whereas Razak et al. (2016) examined Malay children's syntactic development through LARSP profiling, contributing a structural account of how Malay grammar develops in monolingual contexts that serves as a useful baseline for bilingual comparisons.

Research on Malay-English bilingual children has focused mainly on nominal morphology. Mohamed Salleh et al. (2016) examined the development of plural expressions in one bilingual child and found that they emerged in sequences consistent with the PT hierarchy. Mohamed Salleh et al. (2019) examined the same child using additional data collected at age 4;8 and showed that changes in the child's linguistic environment influenced plural marking. In a separate study, bilingual primary school children at the earlier PT stages relied mainly on base forms and showed limited morphological marking in English (Mohamed Salleh et al., 2020). Mohamed Salleh et al. (2021) then extended PT to Malay, proposing the first PT-based hierarchy for the language from a bilingual case study; Mohamed Salleh, Di Biase, and Kawaguchi (2023) confirmed it longitudinally for plural marking, with limited bidirectional cross-linguistic influence; and Mohamed Salleh, Di Biase, Kawaguchi, and Syed Uzir (2023) applied PT at group level, showing preschoolers progressing through the predicted English plural stages under stage-matched instruction. Ismail and Salehuddin (2025) showed that the child-directed speech of the *Bing* cartoon offers young Malaysian children the high-frequency, short-utterance input that supports early language development.

Verb acquisition specifically, however, has received far less attention: to the researchers' knowledge, no prior study has examined verb form patterns across both Malay and English in a group of Malay-English bilingual preschoolers using a PT framework. Compounding this gap, no early language milestone scale currently exists for Malay-English bilingual children in Malaysia (Salehuddin & Mahmud, 2024), underlining the need for an empirical foundation on how this population acquires both systems. Filling the gap requires moving beyond single-child case studies and investigating verb development across a larger cohort.

It is also important to situate this study within a broader international literature on verb acquisition in bilingual children. Within PT specifically, recent studies confirm developmental schedules across typologically distant pairs, including Japanese-English (Itani-Adams & Di Biase,

2023), Indonesian-English (Kawaguchi & Hardini, 2022), and Malay-English (Mohamed Salleh, Di Biase, & Kawaguchi, 2023). Similar patterns have been reported in other bilingual contexts. Cantonese–English bilingual children acquired Cantonese aspect markers early but developed English verb morphology more slowly, reflecting differences in language structure and input (Yip & Matthews, 2007). French–English bilingual children also lagged behind monolingual peers in English morphology, particularly in tense marking, when French was dominant at home (Paradis et al., 2011). When two languages differ typologically and receive unequal input, verb development thus does not progress at the same rate in both. Three considerations follow for interpreting such asymmetry. Input conditions, rather than processing limits, may explain a lagging language (De Houwer, 2021; Paradis, 2023). Cross-linguistic influence can run in either direction (Mohamed Salleh, Di Biase, & Kawaguchi, 2023). Under the Developmentally Moderated Transfer Hypothesis, transfer is itself constrained by processability: a structure transfers only once the learner can process it (Pienemann & Lenzing, 2025). What PT adds beyond the input-based expectation is a single developmental yardstick: the hierarchy specifies which processing procedures each child’s output demonstrates in each language, rather than simply recording that one language is sparse.

PT has also been applied cross-sectionally (Charters, Dao, & Jansen, 2011; Mohamed Salleh et al., 2020, 2022). Charters et al. (2011) caution that in such designs a surface form may resemble the output of an advanced procedure while arising from a different, possibly L1-influenced representation. The present study therefore applies strict emergence criteria and acknowledges that cross-sectional data capture a point, not a trajectory.

PROCESSABILITY THEORY AS THE ANALYTICAL FRAMEWORK

This study employs Processability Theory (Di Biase et al., 2015; Pienemann & Lenzing, 2025) to analyse the children’s verb morphology. PT treats language development as an implicationally ordered sequence of processing procedures, each a prerequisite for the next, which allows the children’s verb output to be mapped onto a developmental trajectory rather than described through frequency alone. Table 1 presents this sequence (bottom to top) applied to L2 English morphology.

TABLE 1. Developmental Stages Hypothesis for L2 English Morphology (after Di Biase et al., 2015, p. 89; Pienemann & Lenzing, 2025, pp. 12, 21)

PT Stage	Processing Procedure	Structure	Example
4. Sentence Procedure	4. Sentence Procedure	SV agreement: 3rd person sg -s	<i>Peter loves rice.</i>
3. Phrasal Procedure	NP Procedure	Phrasal plural marking	<i>these girls three black cats</i> <i>many cats</i>
	VP Procedure	AUX + V: have + V-ed MOD + V be + V-ing	<i>they have jumped</i> <i>you can go</i> <i>I am going</i>
2. Category Procedure	Category Procedure	past -ed plural -s possessive ‘s verb -ing	<i>Mary jumped</i> <i>my brothers working</i> <i>Mary’s car</i> <i>he eating</i>
1. Lemma access	Lemma access	single words, formulas	<i>station here</i> <i>my name is Pim</i>

The learner begins at Lemma Access, producing single words and formulaic expressions (e.g., *good morning*, *how are you?*), then annotates lexical items at the Category Procedure through *-ing*, plural *-s*, possessive *'s*, or past tense *-ed*, before achieving phrasal agreement (e.g., *two cats*, *many dogs*, *I am going*, *you can go*, *they have jumped*) and, finally, subject-verb agreement (*'Peter loves rice'*).

For the verb domain, the classification of forms runs in parallel across the two languages. Bare verbs (*eat*; *makan*) involve lemma access only. English *-ing* attaches to a verb within a single word, as in *eating*, and is therefore classified at the Category Procedure. In *be + V-ing* forms such as *is eating*, the auxiliary and the verb must share grammatical information within the verb phrase, placing such forms at the Phrasal Procedure. Malay does not inflect verbs for tense: progressivity is encoded by the pre-verbal aspect markers *sedang* and *tengah* (Nik Safiah Karim et al., 2008; Razak et al., 2016; Sew, 2016). The hierarchy proposed by Mohamed Salleh et al. (2021) did not include aspectual constructions. The present study therefore extends the VP unification to include *tengah + V* alongside the *V + V* and *AUX + V* combinations already placed at this stage (see Table 2). *Tengah* functions as an aspectual auxiliary similar to English but it does not carry inflectional agreement. Evidence of unification therefore comes from its combination with the verb rather than from morphological marking. Isolated forms, such as *sleeping* and *tengah tidur*, may be memorised or elliptical rather than productive. Drawing on the general emergence criterion (Pallotti, 2007; Pienemann & Lenzen, 2025), the present study counted a form as productive only when it occurred with different lexical verbs and alternated with bare forms in the same session.

Originally formulated for second language acquisition (Pienemann, 1998), PT has since been confirmed across typologically diverse L2s, including English, Arabic, Japanese, Swedish, Italian, and Spanish (Bonilla, 2015; Di Biase & Bettoni, 2015; Di Biase et al., 2015; Kawaguchi, 2015; Mansouri, 2005; Pienemann & Håkansson, 1999).

For Malay, PT-based research remains limited to studies of one child, focusing primarily on plural marking (Mohamed Salleh, 2017; Mohamed Salleh et al., 2021). Longitudinal data from the same child provided further support for the hypothesised sequence (Mohamed Salleh, Di Biase, & Kawaguchi, 2023). A verb-specific, group-level application has not yet been undertaken. The present study moves in this direction, using the hierarchy of Mohamed Salleh et al. (2021) as a starting point and extending it to verb forms across 58 children.

TABLE 2. Developmental Stages Hypothesis for Malay Morphology
(based on Mohamed Salleh et al., 2021, extended in the present study)

Processing Procedure	Linguistic structure	Example
4. Sentence procedure	Interphrasal structure	“Yang” clause <i>Yang ini, saya suka</i> REL this, I like ‘this one I like’
	Relative clauses (topicalisation)	
3. Phrasal Procedure	Phrasal morphemes	Numeral classifiers, e.g. <i>dua ekor kucing hitam</i> Two tail (CL) cat black ‘Two black cats’
	NP unification	NP procedure (plural marking), e.g. <i>banyak kucing</i> many cat / ‘many cats’
	Phrasal morphemes	V + V and AUX + V, e.g. <i>nak makan</i> – want eat – ‘(I) want to eat’ <i>boleh main</i> – can play – ‘(I) can play’
	VP unification	<i>tengah tidur</i> – PROG sleep – ‘(is) sleeping’ (extension, this study)
2. Category Procedure	Lexical morphemes	Suffix <i>-an</i> changes grammatical category, e.g.

1. Word/Lemma access Words, formulas

main 'play' (V) → *mainan* 'toy' (N)
makan 'eat' (V) → *makanan* 'food' (N)
Reduplication: *kucing* 'cat' → *kucing-kucing* 'cats'
nak 'want', *kucing* 'cat', *anjing* 'dog'

METHODOLOGY

RESEARCH DESIGN

This study adopted a descriptive cross-sectional design within a mixed-methods framework. As a cross-sectional design, data were collected at a single point in time and developmental inferences were drawn from patterns across the sample rather than from repeated observations of the same individuals (Larsen-Freeman & Long, 1991). Each child was accordingly assessed once, with PT staging applied through the emergence criterion. Integrating quantitative and qualitative data captured complexity that a single method might miss (see Li et al., 2024). The quantitative strand measured the frequency and distribution of verb forms produced collectively by the children; the qualitative strand focused on the children's specific lexical choices in both languages.

PARTICIPANTS AND SETTING

The study involved 58 typically developing Malay-English bilingual preschoolers aged 5 to 6 from two national preschools in the Gombak district of Selangor, identified through purposive sampling as assigned by the Ministry of Education (Creswell & Creswell, 2017). Based on teacher reports, no child was reported as presenting an atypical developmental profile such as autism or other neurodevelopmental conditions, and the cohort was therefore categorised as typically developing for the purposes of this study.

LANGUAGE BACKGROUND AND INPUT

The children's language input environment was documented through teacher reports. Based on this profile, the participants were characterised as Malay-dominant sequential early bilinguals (Mahmud & Salehuddin, 2023), who began acquiring Malay first and encountered English mainly upon entering preschool. Both preschools operate under the National Preschool Standard-based Curriculum, which allocates 600 minutes of weekly instruction each to Malay and English (Ministry of Education, 2016). The English learning outcomes at this level are communication-oriented (listening and responding, communicating in simple sentences, reading and writing words and phrases); no grammar instruction or textbook is prescribed at preschool level, so lessons centre on vocabulary and routine communicative exchanges (Md. Zamin et al., 2022; Mohamed Salleh, Di Biase, Kawaguchi, & Syed Uzir, 2023). Neither *be* + V-ing in English nor *tengah* + V in Malay is an instructional target in either language; the children's exposure to these forms is naturalistic.

English exposure was limited to designated English lesson periods during school hours, within which teachers reported frequent recourse to Malay to support children's understanding of English instruction. Outside the classroom, Malay was the dominant language of the school environment, the surrounding community, and, in all likelihood, the home. This is consistent with the broader sociolinguistic profile of Malay families in the Gombak district, where Malay functions as the primary language of daily communication (Hashim, 2024). Despite the nominally

equal allocation of lesson time (Ministry of Education, 2016), the children's opportunities to hear and use Malay far exceeded their opportunities in English.

Two features of the background data should be noted. First, because data collection took place at school, the children's language environment was documented through teacher reports, and these described the classrooms and the cohort collectively rather than profiling each child individually. The reports covered classroom language practices and served to screen for atypical development, but they did not provide per-child measures of proficiency, exposure, or home language use. Second, no structured home language survey was administered. Individual variation in English proficiency, age of onset, and home practices within the cohort is therefore unmeasured, and the findings are accordingly interpreted at group level and delimited to this cohort. Future research should incorporate structured parent questionnaires and individual proficiency measures to obtain per-child input profiles.

INSTRUMENTATION

The primary data collection instrument consisted of ten picture elicitation prompts depicting familiar daily actions: *crying, dancing, drawing, eating, flying, reading, sitting, sleeping, smelling, and swimming* (see Appendix 1 for the prompts used). Picture elicitation is a well-established method in child language acquisition research, designed to systematically elicit target grammatical structures that may not occur frequently in spontaneous speech (Di Biase et al., 2015; Medojevic, 2014). The actions were selected because they are highly identifiable everyday activities for children aged 5 to 6, and because they represent action verbs that permit morphological marking in both languages, making them suitable for a verb-focused PT analysis.

Most prompts depict intransitive actions, which provide a more controlled elicitation context for preschoolers as the depicted event is self-contained; eating and reading, the main exceptions, allowed some variation in argument structure.

DATA COLLECTION PROCEDURE

Data were collected through individual sessions at each school to prevent peer influence. Each session began with brief play activities that familiarised the children with the researchers and the setting; no separate practice trial was used beyond this warm-up. All 58 children then received the same ten picture prompts, presented one at a time in the same fixed order, so that elicitation opportunities were identical across participants. For each prompt, the researchers pointed to the depicted action and asked the child in Malay: '*Apa yang berlaku dalam gambar ini?*', followed by the same question in English: '*What is happening in this picture?*' Children were invited, but not required, to respond in both languages. A child who did not answer was not pressed, and a missing response in either language was simply recorded as no output for that language before the session moved to the next picture. No corrective feedback or vocabulary guidance was given. Responses were not restricted to the intended target verb. Any verb that plausibly described the depicted action or state, such as *bau* 'smell' instead of *hidu* 'sniff', was included. Semantically unrelated responses, such as *sleeping* for the 'smell' prompt, were excluded.

Two properties of the prompts matter for the analysis: the Malay question contains no aspectual marker, so any *tengah* + V response was spontaneous rather than modelled, while the English question necessarily models *be* + V-ing ('is happening'); yet, as reported below, no child reproduced this construction. Each session lasted approximately 10 minutes per child, with a total

recording corpus of approximately 580 minutes across all 58 participants. All sessions were audio and video recorded to capture responses in full context.

DATA ANALYSIS

All recordings were transcribed using ELAN software (Sloetjes & Wittenburg, 2008). Transcription preserved each child's complete utterances rather than extracted verbs, with each recording segmented at the utterance level and the researcher's prompts and the child's Malay and English responses annotated on separate tiers. A response could accordingly take the form of a single word (*sleeping*), a phrase (*a kid sleeping*), or a clause (*a kid is sleeping*), and these formats were retained as distinct in coding, since they constitute different morphosyntactic evidence. Responses were coded according to the language the child actually used: a Malay-only answer to the English prompt was coded as Malay output and as no English output for that item, and vice versa. Two linguistics graduate research assistants independently checked the full transcriptions against the original recordings to ensure reliability, and any discrepancies were resolved by returning to the source recording. PT stage classification was carried out by the first author and checked in by the co-authors, with any disagreements resolved through discussion against the classification criteria set out in the framework section. Following transcription, the data were entered into Key Word in Context (KWIC) software to generate a word concordance for each participant, allowing lexical types and tokens to be calculated systematically.

Grammatical analysis then mapped the children's verb output onto the PT developmental hierarchy. Rather than measuring accuracy, the study applied the emergence criterion (Pallotti, 2007) to determine whether a specific grammatical structure had been productively acquired. Under this criterion, a structure is considered to have emerged when the child demonstrates formal variation, using the morpheme alongside its uninflected counterpart (e.g., *eat* and *eating*), and lexical variation, applying the morpheme across different words (e.g., *eating*, *reading*, *swimming*). Both types of variation must be present. For example, a child may say *eating* for the prompt [eat], *reading* for the prompt [read], and *sleep* for the prompt [sleep] in the same session. The use of -ing with two verbs shows lexical variation, while the use of both suffixed and bare forms shows formal variation. This indicates that the child is using -ing productively rather than repeating memorised forms. V+ing is therefore considered to have emerged. By contrast, a child who produces *eating* alone, or who attaches -ing to every verb without ever producing a bare form, does not meet the criterion, because the form may be a memorised whole or an unanalysed routine rather than a productive morpheme. The same criterion was applied to Malay *tengah* + V: the construction was credited only when it occurred with different lexical verbs and alternated with bare verb forms in the same session.

ETHICAL CONSIDERATIONS

Written informed consent was secured from the parents or guardians of all 58 participants, and formal permission was obtained from both schools. All data were de-identified through numerical codes, and children were informed in age-appropriate language that participation was voluntary and could be withdrawn at any time without consequence.

RESULTS AND DISCUSSION

This section reports the findings in relation to the two research questions:

1. What verb forms do preschoolers produce in Malay and English, and which PT stages do these forms reflect in each language?
2. How do the lexical usage patterns of Malay and English action verbs compare during these early stages?

VERB FORMS AND PT STAGES IN MALAY AND ENGLISH

Figure 1 presents the language choice among the participants in the elicitation session. Of the 58 children, 62% (n = 36) used only Malay verbs to describe the prompts, 35% (n = 20) used both Malay and English verbs, and 3.4% (n = 2) used only English verbs. The full data of each child's output are given in Appendix 2.

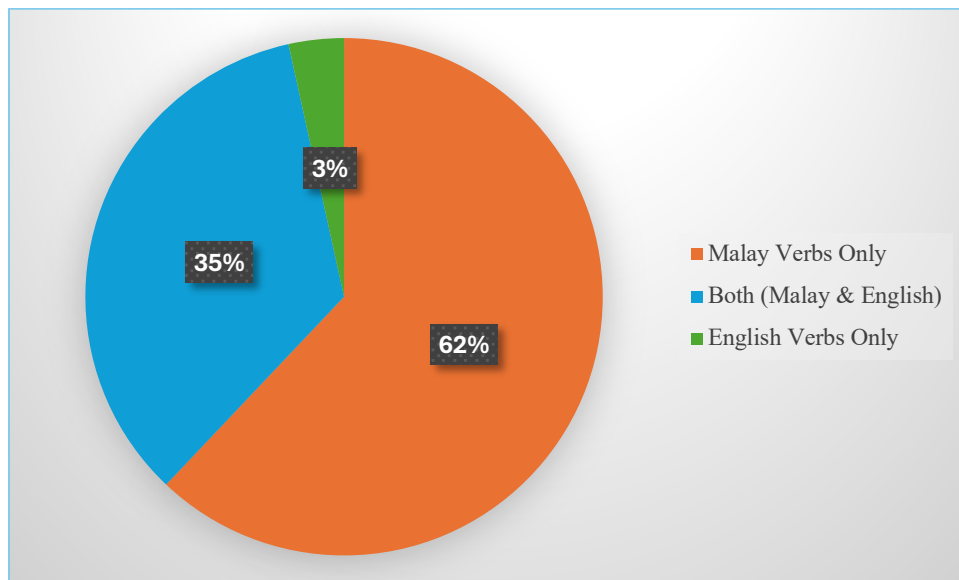


FIGURE 1. Language Choice Among the Children in the Elicitation Session (N = 58)

Table 3 presents the verb token production by language and morphological category.

TABLE 3. Verb Token Production by Language and Morphological Category (N = 58)

Language	Verb Form Category	No. of Children (%)	Total Tokens (%)	Examples of Verbs Used
Malay	Base Form	55 (94.8%)	440 (70.2%)	<i>makan, tidur, duduk, baca, lukis, nangis, bau</i>
	Inflected Form (<i>meN-/beR-</i>)	44 (75.9%)	77 (12.3%)	<i>berenang, melukis, menyanyi, menari, menangis</i>
	Progressive Form	20 (34.5%)	66 (10.5%)	<i>tengah makan, tengah duduk, tengah tidur</i>
English	Base Form	18 (31.0%)	29 (4.6%)	<i>sleep, eat, swim, sit, fly, dance, colour</i>
	Inflected Form (<i>V+ing</i>)	8 (13.8%)	15 (2.4%)	<i>swimming, sleeping, eating, flying, sitting, crying</i>
Total		58 (100%)	627 (100%)	

The children produced 627 verb tokens across both languages (Table 3), categorised into base forms (*tidur, sleep*), inflected forms (*melukis, swimming*), and the progressive marker (*tengah tidur*). Base forms were clearly preferred, particularly in Malay: 94.8% of the cohort produced at least one Malay base form, and the category accounted for 70.2% of all tokens.

The Malay inflected form ranked second (12.3% of output; 44 children), with examples such as *berenang, melukis, menyanyi*, and *menangis*. Since Malay affixation is closely associated with formal registers (Karaj, 2022), their production, even at a lower frequency, shows that the children could use forms associated with the formal variety. The progressive marker ranked third (10.5%; 20 children), always as the colloquial auxiliary *tengah* paired with a verb (*tengah makan, tengah tidur*).

English tokens constituted only 7% of overall verb production, confirming Malay as the collectively dominant language. English V+ing forms (15 tokens) were produced by eight children, seven of whom produced only one token each. Participant C20 produced the remaining eight tokens. Table 4 shows whether this participant's use of V+ing met the emergence criterion and which PT stage the output reflected.

The analysis now turns to the PT stages, applying the emergence criterion set out in the Data Analysis section. Table 4 presents the distributional analysis for English. As Appendix 2 shows, 39 of the 58 children produced no English verb during the session and therefore cannot be placed within the English PT hierarchy at this point in their development.

TABLE 4. English PT Verb Production Stages (N = 58)

Stage / Procedure	Structure	Total Tokens (N)	Children Meeting Emergence	Examples from Data
S-procedure	3rd person singular -s	0	0	—
Phrasal Procedure	Modal + V (can/will + V)	0	0	—
	be + V-ing (is/are + V-ing)	0	0	—
Category Procedure	Past -ed	0	0	—
	V+ing	+15*	1 (C20)	<i>sleeping, eating, flying, sitting, crying, drawing, swimming, reading</i>
Lemma Access	Default verb (base form)	+29	17	<i>sleep, eat, fly, sit, colour, dance, swim</i>

Among the children who did produce English verbs, 17 reached Lemma Access as their highest confirmed stage: 10 produced only base forms (*sleep, eat, fly, sit*), and 7 produced a single V+ing token each, insufficient evidence of productive morphological processing. Only one child, C20, reached the Category Procedure, producing 8 V+ing tokens across eight lexical items (*crying, drawing, eating, flying, reading, sitting, sleeping, swimming*) alongside the bare forms *smell* and *dance* in the same session, satisfying both the lexical and the morphological variation criteria. C20's productive use of V+ing placed the participant at the Category Procedure in English. However, C20 did not produce any auxiliary + V-ing construction and therefore showed no evidence of the Phrasal Procedure. No other participant produced this construction either.

TABLE 5. Malay PT Verb Production Stages (N = 58)

Stage / Procedure	Structure	Total Tokens (N)	Children Meeting Emergence	Examples from Data
Phrasal Procedure	VP unification (<i>tengah</i> + V)	+66	15	<i>tengah tidur, tengah makan, tengah nangis, tengah duduk</i>
Category Procedure	NP plural marking Suffix -an (nominalisation)	+2 0	1 (C38) 0	<i>ayam banyak, lembu banyak</i> —
Lemma Access	Base verb form	263	40	<i>makan, tidur, bau, lukis, nangis, kucing, ayam, monyet</i>

The children's developmental stages in Malay are mapped in Table 5. As established in the previous section, Malay is the dominant language for this cohort, and this dominance is clearly reflected in the higher PT stages demonstrated in Malay compared to English.

Twenty children produced the auxiliary *tengah* paired with a verb (66 tokens, e.g., *tengah makan, tengah tidur*). Applying the same emergence criteria as for English, *tengah* + V was credited as Phrasal Procedure evidence only where it occurred across different lexical verbs and alternated with bare forms in the same session: fifteen children (25.9%) met both requirements and are classified at the Phrasal Procedure, the highest stage in this dataset, while the remaining five, with a single *tengah* token each, are classified at Lemma Access. Because the Malay prompt contained no aspectual marker and aspect marking is not taught in the preschool curriculum (see Data Collection; Language Background and Input), the productions cannot be attributed to modelling or instruction. One child at this stage, C38, additionally produced NP plural marking (*ayam banyak, lembu banyak*); although the word order is non-target-like (Standard Malay requires *banyak ayam*), the productions demonstrate that the capacity for NP phrasal plural marking has emerged.

The Malay Category Procedure is operationalised through the nominalising suffix -an (*main* 'play' → *mainan* 'toy'), which falls outside this verb-focused analysis; no child produced it in any context. Notably, the Malay PT framework does not yet stage verbal prefixation (*meN-*, *beR-*) at the Category Procedure level despite its functional parallel with English -ed and V+ing. This gap is a limitation of the current framework that future research should address; here, Category Procedure shows zero emergence and prefixed verbs are treated as lexical items at Lemma Access.

The remaining 40 children are at Lemma Access, producing 263 bare verb tokens (*makan, tidur, bau, lukis, nangis*) without productive grammatical morphology. This contrasts with the negligible English output from the same group: their Malay verb repertoire is clearly more developed even where morphological processing remains at the foundational level. Two children produced no Malay verb output and cannot be placed within the Malay hierarchy.

COMPARISON OF ENGLISH-MALAY VERB USAGE PATTERNS

The second research question is a qualitative examination of what the children actually said in each language. Table 6 presents the lexical variations by prompt, showing a clear difference in range between the two languages.

TABLE 6. Lexical Variations in Malay and English by Elicitation Prompt

Prompt	Malay Lexical Variations (Frequency)	English Lexical Variations (Frequency)
Swim	<i>berenang</i> (33), <i>mandi</i> (19), <i>main kolam</i> (2), <i>main air</i> (1), <i>renang</i> (1) [Total variations: 5]	<i>swim</i> (3), <i>swimming</i> (2) [Total variations: 2]
Eat	<i>makan</i> (53), <i>gigit</i> (2), <i>memakan</i> (1), <i>suap</i> (1), <i>jilat</i> (1) [Total variations: 5]	<i>eat</i> (3), <i>eating</i> (1) [Total variations: 2]
Sit	<i>duduk</i> (43), <i>duduk kerusi</i> (3) [Total variations: 2]	<i>sit</i> (2), <i>sitting</i> (1), <i>chair</i> (5) [Total variations: 3]
Fly	<i>terbang</i> (40), <i>rebang</i> (1) [Total variations: 2]	<i>fly</i> (2), <i>flying</i> (1) [Total variations: 2]
Sleep	<i>tidur</i> (46), <i>ngantuk</i> (1), <i>mengantuk</i> (1) [Total variations: 3]	<i>sleep</i> (8), <i>sleeping</i> (6), <i>sleepy</i> (1) [Total variations: 3]
Smell	<i>bau</i> (28), <i>cium</i> (5), <i>hidu</i> (2) [Total variations: 3]	<i>smell</i> (1) [Total variations: 1]
Dance	<i>menari</i> (12), <i>nyanyi</i> (10), <i>dengar lagu</i> (9), <i>joget</i> (9), <i>menyanyi</i> (5), <i>dengar radio</i> (3), <i>nari</i> (3), <i>menjoget</i> (2), <i>dengar muzik</i> (2), <i>berjoget</i> (1) [Total variations: 10]	<i>dance</i> (2), <i>sing</i> (1) [Total variations: 2]
Read	<i>baca</i> (40), <i>tengok [buku]</i> (14), <i>membaca</i> (2) [Total variations: 3]	<i>reading</i> (1), <i>book</i> (4) [Total variations: 2]
Cry	<i>nangis</i> (42), <i>menangis</i> (5) [Total variations: 2]	<i>crying</i> (1) [Total variations: 1]
Draw / Colour	<i>lukis</i> (25), <i>tulis</i> (19), <i>melukis</i> (6), <i>menulis</i> (4), <i>warna/mewarna</i> (2) [Total variations: 5]	<i>colour</i> (6), <i>drawing</i> (1) [Total variations: 2]

The Malay data demonstrates a broader lexical repertoire across all ten prompts. For the prompt [swim], children produced *renang* and *berenang* together with related words such as *mandi* ('to bathe') and phrasal descriptions such as *main kolam* and *main air* ('to play with water'). Similar ranges appeared for the prompt [eat] (*makan*, *memakan*, *gigit*, *suap*, *jilat*) and the prompt [draw] (*lukis*, *melukis*, *tulis*, *menulis*, *warna*, *mewarna*). This is what Clark (1993) defines as semantic extension: extending a known word to related concepts. As noted earlier, Floyd and Goldberg (2021) similarly found that conceptually related items support one another in the mental lexicon, creating a retrieval advantage, though this depends on a vocabulary large enough to form an interconnected semantic network in the first place.

For the prompt [smell], the dominant response was *bau*. Although *bau* is lexically ambiguous in colloquial Malay ('to smell', 'smelly', or 'smells like'), it was coded as the verb 'to smell' in this picture-description context. *Cium* and *hidu* were less frequent alternatives.

For the prompt [dance], the children produced the widest range of Malay responses across the ten pictures (Table 6). Five forms directly described 'dancing' (*menari*, *nari*, *joget*, *menjoget*, and *berjoget*), while others described 'singing' (*nyanyi*, *menyanyi*) or 'listening to music' (*dengar lagu*, *dengar radio*, and *dengar muzik*). The picture contained musical notation (see Appendix 1), which likely prompted these music-related interpretations. This may explain why the children referred to singing and listening to music rather than general movements such as *gerak* 'move' or *lari* 'run'.

The prompt [sleep] produced the highest number of English responses: fourteen children responded with *sleep* (8) or *sleeping* (6), and one with *sleepy*. The word *sleep* is commonly heard in children's media and classroom routines, and since 'tidur' and 'sleep' do not sound alike, no similar Malay form competes during retrieval. This higher response rate is not, however, evidence of a higher developmental stage: nearly all responses were uninflected base forms at Lemma Access. English lexical access is thus word-specific, with simple, frequent words appearing earlier in production.

A recurring English pattern was noun substitution: chair for the sitting prompt, book for reading, flower for smelling. When the verb was unavailable, children named the most visible object instead, drawing on a related word they knew. As nouns are acquired earlier and accessed more easily than verbs under limited exposure (Marchman & Bates, 1994), these substitutions

confirm that the children's English lexical development is still at an early stage: an attempt to produce an English word, but not yet the grammatically appropriate verb.

Across all ten prompts, English production was limited to one or two lexical forms each, from a small number of children, with none of the phrasal and semantic range found in Malay. This restricted pattern is consistent with the critical mass hypothesis (Marchman & Bates, 1994), which suggests that children need a sufficient amount of vocabulary before they can develop wider semantic networks and use words more flexibly. The children in this study did not appear to have reached that point in English. This helps explain both the limited range of English verbs produced and the tendency to use nouns when the target verb was not yet available.

The quantitative and lexical findings show that Malay was dominant at the group level, while English verb development remained at an early stage. In Malay, the children reached higher PT stages, produced more verb tokens, and used a wider range of verbs. Base forms, however, were common in both languages.

These findings are consistent with both the PT literature and previous Malay-English research. The implicational pattern holds in both languages: no child displayed a higher procedure without the lower ones, in line with PT's core prediction (Pienemann & Lenzing, 2025). The Malay results reproduce at group level the sequence documented longitudinally for a single bilingual child (Mohamed Salleh, Di Biase, & Kawaguchi, 2023), and the English results parallel Mohamed Salleh et al. (2020), where Malay-dominant children likewise relied on base forms with limited morphological marking. The asymmetry itself reflects bilingual cohorts elsewhere in which the lower-input language lagged in verbal morphology (Paradis et al., 2011; Yip & Matthews, 2007). The Malay PT hierarchy, first proposed from single-child case studies, is thus confirmed at group level in a sample of 58 children.

Interpreting the asymmetry, however, requires separating general processing capacity from language-specific knowledge. The fifteen children who reached the Phrasal Procedure in Malay demonstrably possess the capacity to coordinate two elements within a phrase; what they lack in English is not that capacity but the English-specific lexical and morphological knowledge on which the same procedures must operate. The sparse English output therefore reflects insufficient English-specific resources under limited and unequal input rather than lower processability. What the PT analysis adds to this input-based account is a single developmental yardstick, specifying which procedures each child's output demonstrates in each language rather than recording only that English output is sparse.

The fixed Malay-first elicitation order also requires care in interpreting the English data, since the immediately preceding Malay exchange may have primed translation or licensed elliptical answers. Three observations argue against treating the English results as artifacts of this ordering. First, no child produced an English auxiliary construction even though the English prompt modelled one on every trial, and none of the 20 *tengah* producers transferred an equivalent structure into English. Under the Developmentally Moderated Transfer Hypothesis, a structure cannot be transferred, however recently activated, if the learner cannot yet process it (Pienemann & Lenzing, 2025). Second, priming would predict English answers modelled on the just-produced Malay response, whereas most children produced no English verb at all. Third, elliptical single V-ing forms were already excluded by the emergence criterion. The ordering may nonetheless have depressed English output somewhat, and the English stage attributions are accordingly conservative: the true developmental gap between the two languages can only be equal to or smaller than reported.

CONCLUSION

This paper examined the verb production patterns of 58 Malay-dominant sequential early bilingual preschoolers across Malay and English. The picture is one of clear asymmetry: Malay dominated in token frequency, morphological range, and PT stage reached, while English remained at its earliest point of development for most children. This asymmetry cannot be read as a difference in processing capacity alone. The fifteen children who reached the Phrasal Procedure in Malay demonstrably possess the capacity to coordinate elements within a phrase. What they lack in English is the language-specific lexical and morphological knowledge on which the same procedures must operate, under input conditions in which opportunities to hear and use Malay far exceeded those in English despite nominally equal lesson time.

The contributions are delimited accordingly. The study provides the first group-level, verb-focused application of PT to Malay, offering preliminary evidence that the implicational sequence formulated on single-child case studies holds across a 58-child sample: no child displayed a higher procedure without the lower ones, in either language. It also identifies verbal prefixation (*meN-*, *beR-*), not yet formally staged despite its parallel with English category-level morphemes, as a gap for future theoretical work on the Malay hierarchy. Both contributions apply to this cohort of Malay-dominant sequential early bilinguals and should not be generalised to children with different exposure profiles.

The pedagogical implications are directed at preschool educators working within the National Preschool Standard-based Curriculum and at the early primary teachers who receive these children. The study offers baseline evidence of where these children stand as they exit preschool, where grammar is not an instructional target: their English resources are lexical, sparse, and word-specific. For early primary schooling, where formal grammar instruction begins, this suggests prioritising vocabulary building first, since morphosyntactic structures are unlikely to develop without a robust lexical foundation. The recommendation is conditional, however, as the children's low English stages partly reflect limited input, and richer exposure is itself a precondition for progress.

These conclusions should be considered in light of several limitations. The two-preschool Gombak sample cannot represent the diversity of Malaysian preschool contexts, and language background was documented collectively through teacher reports rather than measured per child. The fixed Malay-first elicitation order may have depressed English output, which makes the English stage attributions conservative, and the picture task constrains what children can say relative to spontaneous speech. Above all, the cross-sectional design captures production at a single point in time. It can establish which PT stages are represented in the cohort but cannot demonstrate developmental change. A longitudinal follow-up into primary school, combined with individual exposure profiling, is needed to track whether and how quickly these children progress through the PT hierarchy in both languages as their English input increases.

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