

Exploring Pienemann's Processability Theory: A Psycholinguistic Perspective on Second Language Development

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ABSTRACT

The Common European Framework of Reference for Languages (CEFR) has become widely recognised in language education as a framework for describing learners' language proficiency and establishing expected learning outcomes. While proficiency frameworks provide useful information about what learners are able to do with a language, second language development may also be examined from the perspective of how learners gradually develop the ability to process and produce linguistic structures. This concept paper introduces Pienemann's Processability Theory (PT), a psycholinguistic theory of language acquisition which explains development in relation to the processing procedures available to learners at a particular stage. According to PT, learners progress through a developmental sequence in which increasingly complex linguistic structures become processable over time. The paper discusses the central assumptions and developmental hierarchy of PT, with particular attention to morphological development in English. It also considers how PT provides another perspective for understanding and profiling learner language alongside more familiar proficiency frameworks such as the CEFR. Although PT has been investigated across different languages and learner populations, research adopting the framework remains relatively limited in Malaysia. Recent studies involving Malaysian learners have begun to demonstrate how PT can be used to examine the development of English and Malay morphology. By introducing PT in an accessible manner, this paper highlights its potential contribution to second language acquisition research and language education, particularly for understanding the developmental processes underlying learners' grammatical production.

Keywords: Processability Theory, second language acquisition, psycholinguistics, morphological development, learner language

INTRODUCTION

Second language development can be understood and described from different perspectives. In language education, learners are commonly identified according to their level of proficiency, which provides an indication of what they are able to understand and communicate in the target language. One of the most widely recognised frameworks used for this purpose is the Common European Framework of Reference for Languages (CEFR). The CEFR describes language proficiency through six main levels ranging from A1 to C2 and provides a common reference for language learning, teaching and assessment (Council of Europe, 2020). Its levels and descriptors have become familiar reference points for teachers, curriculum developers and language learners in many educational contexts. The Council of Europe describes the levels as common reference points which can support the establishment of learning objectives and the development of curricula and teaching materials.

The CEFR is also widely recognised in the Malaysian education system. Its use provides educators with a common language to describe learners' broader communicative abilities. However, language proficiency can also be examined from another perspective. In Second Language Acquisition (SLA) research, researchers are interested in how the learner's linguistic system develops and why particular linguistic structures appear at

certain points of development. From this perspective, knowing the general proficiency level of a learner is useful, but it does not represent the only way of examining language development.

For example, a learner may already know several English words and communicate successfully using simple expressions but may not consistently mark plurality on nouns. Another learner may be able to produce lexical plurals such as cats and books but may not yet consistently produce structures such as three cats or many books. These productions provide information about grammatical development that is different from a general description of what the learner can communicate. Examining such developmental differences brings attention to the processing mechanisms involved when learners produce a second language.

One theory that attempts to explain this development is Pienemann's Processability Theory, henceforth PT. PT is a psycholinguistic theory initially developed to explain second language acquisition (Pienemann, 1998). Its main assumption is that learners can acquire and produce only those linguistic structures that their language processor is able to handle at a particular stage. Pienemann and Lenzing (2025) continue to define PT around this central assumption, describing the theory as an account of language development and variation based on processing constraints.

PT has been examined in the acquisition of a range of languages and among different learner populations. Nevertheless, compared with proficiency frameworks that have become familiar to language educators, PT remains relatively unfamiliar outside specialist areas of SLA and psycholinguistic research. This is particularly apparent in Malaysia, where research using PT to analyse learner development remains limited. Existing studies have examined English grammar among Malay-English bilingual primary school children (Mohamed Salleh et al., 2020), morphological development in Malay-English bilingual children (Mohamed Salleh et al., 2021, 2023a), and English morphological development among preschoolers (Mohamed Salleh et al., 2023b).

A recent study by Mohamed Salleh et al. (2026), for example, applied PT to the Malay and English verb production of 58 Malay-dominant bilingual preschoolers. The study provides a group-level, verb-focused application of PT to Malay and demonstrates how learners' linguistic output may be mapped onto different stages of processing development. Such studies suggest that PT may provide researchers with useful developmental information about learner language, although considerably more work is required before developmental patterns can be established across the diverse linguistic populations found in Malaysia.

This concept paper therefore introduces Processability Theory as a psycholinguistic perspective on second language development. It discusses the theoretical foundation and central assumption of PT before explaining its developmental hierarchy, with particular attention to English morphology. It then considers what PT contributes to the understanding and analysis of learner language. Finally, the paper discusses potential applications and directions for PT research, particularly within the Malaysian multilingual context.

LITERATURE REVIEW

Second Language Acquisition and Psycholinguistic Perspectives

Second language acquisition is a complex developmental process. Learning another language does not involve only learning vocabulary or memorising grammatical rules. Learners also need to retrieve linguistic information and organise it while producing language. Therefore, SLA researchers are concerned not only with what learners know about a language but also with how this knowledge becomes available during language use.

This distinction is particularly relevant when examining grammatical development. A grammatical structure may have already been introduced during formal instruction, yet learners may not necessarily produce the structure consistently. For example, learners may understand that English plural nouns normally require the suffix -s and may successfully complete a written grammar exercise involving plurals. However, the same learners may continue to produce bare nouns when speaking spontaneously. Having some knowledge of a grammatical structure does not necessarily mean that the structure can immediately be processed during language production.

Psycholinguistics provides one way of examining this issue because it focuses on the cognitive processes involved in understanding and producing language. One important influence on PT is Levelt's (1989) model of speech production. Levelt describes speech production as a process involving different operations through which speakers develop a message, retrieve appropriate lexical information and formulate an utterance. Language production therefore occurs incrementally rather than as a single operation.

Pienemann (1998) applied this processing perspective to second language development. If producing different linguistic structures requires different processing operations, it follows that learners may not be able to process every structure from the beginning of acquisition. Some structures place relatively little demand on the developing processor, whereas others require grammatical information to be coordinated across words or phrases. PT attempts to predict this progression by identifying a hierarchy of processing procedures.

This psycholinguistic perspective changes the question researchers ask about learner language. Instead of asking only whether a learner knows a grammatical structure, researchers may examine whether the structure has become processable in the learner's developing linguistic system. PT therefore provides a framework for examining the emergence of linguistic structures as part of a developmental process.

Pienemann's Processability Theory

Origins and Theoretical Foundation

Processability Theory was developed by Pienemann (1998) as a theory of second language development. It originated from earlier research investigating developmental sequences in SLA and the observation that learners appear to acquire certain grammatical structures in predictable orders. PT attempts to move beyond describing these sequences by explaining why they occur.

The theory proposes that language production depends on a series of processing procedures. These procedures become available progressively during acquisition. Pienemann's account draws particularly on psycholinguistic models of language production and Lexical Functional Grammar, or LFG, as a means of representing the grammatical information required during processing (Kaplan & Bresnan, 1982; Pienemann, 1998). LFG provides a grammatical representation through which relationships between linguistic elements can be described. Within PT, this representation is important because increasingly complex processing procedures involve the exchange and coordination of grammatical information across larger linguistic units. At lower stages, grammatical information may be processed locally within individual lexical items, whereas later procedures involve the coordination of information within phrases and across sentence-level structures. The technical details of LFG are extensive and are beyond the scope of the present paper. What is more important for understanding PT is the basic proposition that different grammatical structures require different amounts and types of information to be processed.

The processing hierarchy is implicational. This means that a higher procedure depends on the procedures that occur before it (Bettoni & Di Biase, 2015; Pienemann, 1998). A learner first needs access to words before grammatical information can be attached to them. Information within individual words becomes available before information can be coordinated across elements within a phrase. More complex processing later allows grammatical information to operate across phrases and sentences. Pienemann and Lenzing's (2025) current account retains this processing-based explanation as the psycholinguistic core of PT.

The Central Assumption

The central assumption of PT can be expressed quite simply. Learners are able to produce only those linguistic structures that they are developmentally able to process. Thus, exposure to a structure does not automatically result in its acquisition. Similarly, teaching learners a grammatical structure does not necessarily mean that the structure will immediately become part of their productive linguistic system.

For instance, consider a beginning learner of English who can produce the word *cat*. At this point, the learner has access to the lexical item. Later, the learner may distinguish between *cat* and *cats* by marking the noun with

the English plural suffix -s. The learner may subsequently produce structures such as three cats or many cats, which require information to be coordinated within the noun phrase. Although these examples are all related to plurality, they do not place identical demands on the language processor.

PT therefore views grammatical development as hierarchical. The learner does not simply accumulate grammatical structures independently. Instead, increasingly complex structures become possible as the processing procedures required to produce them become available. This developmental principle is one of the main reasons PT can be used to analyse learner morphology.

Importantly, developmental stages should not be interpreted as general proficiency levels. A PT stage indicates evidence for a particular processing procedure. It does not suggest that a learner has mastered every aspect of the language associated with that stage. Neither does it provide an equivalent to a CEFR level. The two frameworks address different questions.

The Processability Hierarchy

The general PT hierarchy progresses from access to individual lexical items towards the processing of grammatical information across increasingly larger linguistic units. The table below provides a simplified representation relevant to English morphological development. It follows the broader hierarchy used in PT work on English morphology, including Di Biase et al. (2015) and its recent application to Malaysian bilingual children by Mohamed Salleh et al. (2026).

Table 1. Developmental Stages in Processability Theory

Processing procedure	What becomes processable	Examples in English
Lemma Access	Individual words and formulaic expressions	<i>cat, eat, good morning</i>
Category Procedure	Grammatical information attached to individual lexical items	<i>cats, walked, eating</i>
Phrasal Procedure	Grammatical information coordinated within a phrase	<i>many cats, three black cats, is eating</i>
Sentence Procedure	Grammatical information coordinated across phrases	<i>Peter loves rice</i>

Learners begin with Lemma Access. At this stage, they mainly produce individual words and formulaic expressions. A learner may know names of animals, objects or actions and use expressions that have been learned as whole units. The learner therefore possesses lexical resources even though productive grammatical morphology may not yet be evident.

The Category Procedure becomes available when grammatical information can be processed at the level of individual lexical items. In English morphology, this includes structures such as plural -s, past tense -ed, and verb -ing (Di Biase et al., 2015). A learner who productively distinguishes cat from cats, for example, demonstrates more than lexical knowledge because grammatical information concerning number is now represented on the noun.

At the Phrasal Procedure, grammatical information can be coordinated between elements within a phrase. In a noun phrase such as many cats, information relating to plurality is represented across the phrase rather than solely on the noun. Similarly, verb phrase structures such as is eating involve more than one linguistic element. Recent PT descriptions treat noun phrase and verb phrase operations as forms of phrasal processing, although some applied descriptions present them separately when a more detailed analysis is required.

At the Sentence Procedure, grammatical information can be exchanged across phrasal boundaries. Subject-verb agreement in an English sentence such as *Peter loves rice* provides a common example. The grammatical properties of the subject are relevant to the form selected for the verb. The structure therefore requires processing

beyond a single word or phrase. As the present discussion focuses primarily on morphological development, the simplified hierarchy above is sufficient to illustrate the progression central to PT.

Determining When a Structure Has Emerged

An important methodological feature of PT is its emphasis on emergence rather than complete accuracy. A learner does not need to use a newly acquired structure correctly in every possible context before it can be considered part of the developing language system. Instead, PT research commonly examines whether there is evidence that the learner can productively process the structure.

Pallotti (2007) provides an operational discussion of the emergence criterion used in developmental research. In practical terms, researchers normally look for variation that indicates that a structure is not merely a memorised expression. For example, the occurrence of cats once does not necessarily show that a learner has productively acquired plural -s. If the learner produces cat and cats in appropriate contexts and also applies plural marking to another lexical item such as dogs, there is stronger evidence that plural marking has emerged.

This distinction is important when PT is used to profile learner development. The aim is not simply to count how many correct grammatical forms a learner produces. Instead, researchers examine the nature of the structures produced and determine which processing procedures those structures demonstrate. The same approach has been used in Malaysian PT studies investigating plural and verb morphology. In empirical research, such evidence can be obtained from spontaneous or elicited speech samples collected across different communicative contexts. Researchers can then examine whether the target structure occurs productively across different lexical items and contexts rather than appearing only as an isolated or memorised form. For example, the production of *apples* and *boats* in appropriate contexts provides stronger evidence of productive plural marking than the production of *apples* alone.

Developmental Readiness

The developmental hierarchy also raises questions about the relationship between acquisition and instruction. Pienemann's (1984) Teachability Hypothesis proposes that instruction is constrained by the learner's developmental readiness. In other words, instruction may support development when the targeted structure is within the learner's current developmental reach, but instruction cannot simply make the learner skip the processing procedures required for its production.

This does not mean that PT is a teaching method. PT is principally a theory of language development. However, its developmental predictions have informed instructional approaches such as Developmentally Moderated Focus-on-Form, or DMFonF. DMFonF combines a meaning-based approach with focus on specific linguistic forms according to learners' developmental readiness (Di Biase, 2002, 2008). For example, when learners have developed the ability to mark plurality on individual nouns, instruction can move towards more complex plural noun phrase structures such as *three books* or *two apples*. In this way, the form selected for instructional attention is related to the learner's current developmental stage rather than being introduced only according to a fixed grammatical syllabus.

This approach has been examined in the Malaysian preschool context by Mohamed Salleh et al. (2023b). In their 10-week longitudinal study, six Malaysian preschool children were involved, with three children receiving DMFonF instruction and three children receiving no intervention. The DMFonF lessons used communicative activities and focused on English lexical and grammatical plural constructions. The children first worked with English vocabulary before being exposed to plural forms such as *apples*, *bananas*, and *mangoes*, followed by more complex plural noun phrase structures involving numeral quantifiers, nouns, and plural marking, such as *two apples*. The children who received the DMFonF instruction demonstrated development in both lexical plural marking and plural noun phrase agreement, whereas the control group showed lexical development without the same grammatical development. These findings provide an example of how PT can be used to inform the timing and sequencing of instructional attention. However, the small number of participants means that the findings should be interpreted cautiously.

For example, in lessons with Malaysian preschool children, we used picture cards and simple communicative activities to introduce and practise vocabulary before directing attention to singular and plural forms. A fruit-themed activity involved identifying individual fruits such as *apple* and *banana*, followed by activities contrasting forms such as *apple-apples* and *banana-bananas*. This was later extended to more complex noun phrases involving plural agreement. Such activities illustrate how grammatical forms can be addressed within meaningful classroom activities while taking learners' developmental readiness into consideration.

Processability Theory as a Perspective on Learner Development

The main contribution of PT is that it provides a developmental perspective on learner language. Language development is often described through performance outcomes. A learner may be described according to a test score or an overall level of proficiency. PT approaches the same learner from a different direction by asking what linguistic structures have become processable.

Consider the development of English plural morphology again. A learner who mainly produces individual nouns demonstrates a different grammatical profile from a learner who productively marks nouns with plural -s. Similarly, a learner who produces *cats* and *dogs* demonstrates a different level of processing than one who can productively construct *three cats* and *many dogs*. PT provides a theoretical explanation for these differences rather than treating them only as different amounts of grammatical knowledge.

Although the present discussion uses morphological examples to illustrate the developmental hierarchy, PT also accounts for increasingly complex syntactic processing. At higher stages, grammatical information needs to be coordinated across larger linguistic units. For example, subject-verb agreement in a sentence such as *Peter loves rice* requires information from the subject to be coordinated with the form of the verb. More complex sentence structures may require further coordination across clauses. These higher-level operations show that PT is not limited to morphology, although a detailed discussion of syntactic development is beyond the scope of the present paper.

This makes PT particularly useful in research examining morphology. Morphological forms are observable in learner production and can be mapped onto the processing hierarchy when sufficient evidence of emergence is available. Researchers can therefore examine whether learners progress through predicted developmental sequences and whether the sequence remains stable across different learning conditions.

PT has been investigated across typologically different languages, including English, Swedish and Spanish (Bonilla, 2015; Di Biase et al., 2015; Pienemann & Håkansson, 1999). Later work has extended the framework to bilingual development and to younger populations. Pienemann and Lenzing (2025) describe this cross-linguistic applicability as an important part of PT because the hierarchy concerns general processing procedures while the linguistic structures through which those procedures are expressed depend on the language being acquired.

At the same time, PT does not account for every aspect of second language acquisition. Processing capacity operates alongside other influences on development. Learners differ in the amount and quality of language input they receive. Their linguistic backgrounds and opportunities to use the second language also vary. Therefore, identifying a learner's PT stage should not lead to the assumption that processing constraints alone explain all features of the learner's language.

Individual learner differences may also influence the conditions under which development occurs. Factors such as motivation, opportunities for interaction and attitudes towards the target language may affect how learners engage with the language. These factors do not necessarily contradict the processing constraints proposed by PT. Rather, they may influence the quantity and quality of language input and opportunities for language use available to learners. PT can therefore provide a processing-based account of development while recognising that language acquisition takes place within broader cognitive, social and experiential conditions.

This point is particularly important in bilingual and multilingual contexts. The study by Mohamed Salleh et al. (2026) provides a useful example. Among 58 Malay-dominant preschoolers, the children demonstrated

considerably more developed verb production in Malay than in English. Fifteen children reached the Phrasal Procedure in Malay through productive use of *tengah* with different verbs, while English verb production remained considerably more limited. The authors did not interpret this difference simply as lower processing capacity in English. Instead, they considered the children's unequal exposure and their available language-specific knowledge.

This illustrates an important point about PT. Processing procedures provide the developmental architecture, but learners also require sufficient linguistic resources in the particular language for those procedures to operate. A learner who demonstrates relatively advanced processing in one language does not automatically possess the necessary vocabulary or grammatical knowledge to produce equivalent structures in another language.

PT Research in the Malaysian Context

Although PT has an established international research history, its application in Malaysia is still relatively limited. Earlier Malaysian research concentrated mainly on specific grammatical structures or small groups of learners. Mohamed Salleh et al. (2020), for example, analysed English grammar among Malay-English bilingual primary school children and found developmental patterns consistent with the PT hierarchy. A subsequent study by Mohamed Salleh et al. (2021) extended PT-based morphological analysis to Malay through a bilingual case study.

Research has gradually expanded since then. The 2023b study by Mohamed Salleh et al. examined English vocabulary and plural morphology among Malaysian preschoolers using PT as the developmental foundation for DMFonF instruction. The experimental group progressed from lexical production towards lexical and phrasal plural structures, while the control group did not demonstrate the same grammatical development.

Most recently, Mohamed Salleh et al. (2026) used PT to analyse verbs in both Malay and English among 58 preschool children. Importantly, the study represents a move from earlier single-child and small-group studies towards group-level analysis and extends the developing PT framework for Malay beyond plural morphology.

Research involving older Malaysian learners, although still limited, also indicates that PT can be applied beyond early childhood populations. Wan Adnan and Lotfie (2018), for example, examined the use of English adverbials among Malay ESL learners at tertiary level using a Processability Theory framework. Abd Haris @ Mohd Nasir (2024) also examined English morphological acquisition among Malay-English bilingual secondary school students under different home language exposure using PT. These studies suggest that PT research in Malaysia is not restricted to preschool and primary school learners, although research involving different age groups and learner populations remains scarce.

Taken together, these studies indicate that PT research is developing in Malaysia, but the available empirical base remains small. The populations examined are still concentrated within particular age groups and linguistic backgrounds. There is considerably more to investigate among adolescent and adult learners, learners from different first-language backgrounds, and students at different levels of formal education. PT therefore remains a relatively underexplored theoretical framework within Malaysian SLA research despite its potential for examining learner morphology systematically.

Potential Applications and Future Directions

One possible application of PT is developmental profiling. Because PT identifies the processing procedures demonstrated in learner production, researchers can use it to examine where particular grammatical structures occur within a developmental sequence. Such profiling should not be confused with general proficiency assessment. PT does not produce an overall proficiency level comparable to A1, B2 or C1. Instead, it provides information about the developmental status of particular areas of the learner's grammar.

This distinction suggests that PT and proficiency frameworks such as the CEFR need not be viewed as competing approaches. The CEFR provides a common framework for describing communicative proficiency and is useful for curriculum planning and language assessment. PT addresses a different question concerning how particular

linguistic structures develop. The CEFR itself is considerably broader than a grammar scale and includes descriptions of communicative activities and competences.

Therefore, the potential value of PT lies in the additional developmental information it may provide. A learner may be identified according to a CEFR level while their grammatical production can separately be examined through PT. Future research could investigate whether learners classified within similar proficiency bands demonstrate comparable morphological development or whether substantial developmental variation exists within the same proficiency level. The purpose would not be to create a direct conversion between CEFR levels and PT stages. Such equivalence would be theoretically inappropriate because the two frameworks measure different aspects of language ability.

PT also has potential for longitudinal SLA research. Following the same learners over time would allow researchers to identify when particular grammatical structures first emerge and whether subsequent structures follow the predicted hierarchy. For example, speech samples could be collected from the same learners at several points during a period of development and analysed for evidence of newly emerging structures. Longitudinal research is particularly important because cross-sectional data can identify which structures are present at one point in time but cannot directly demonstrate how an individual learner moves from one developmental stage to another.

For Malaysia, further research could examine learners from different linguistic backgrounds. Malaysian language classrooms contain learners whose first languages and levels of English exposure differ considerably. This could include learners from Mandarin, Tamil, and other language-dominant backgrounds. A stronger empirical base would make it possible to examine whether PT developmental sequences remain stable despite these differences and how input and first language background influence the rate at which learners progress.

There is also room to extend PT research beyond the grammatical areas that have received most attention in Malaysia. Existing studies have examined English plurals and other morphological structures, while more recent work has begun examining Malay and English verb development. Other areas of morphology and syntax remain available for investigation. Research involving larger samples and different age groups would help determine how applicable PT is across the wider Malaysian learner population.

From an educational perspective, PT may also encourage greater attention to developmental readiness. If learners acquire grammatical structures according to processing constraints, the order of presentation in a textbook does not necessarily represent the learner's developmental sequence. This does not mean that curricula should be organised solely around PT. Language learning involves communicative, lexical and educational considerations that extend beyond grammatical processability. Nevertheless, information about developmental sequences may help researchers and educators understand why learners continue to experience difficulty with some grammatical structures despite repeated instruction. Future research could examine existing textbooks and classroom tasks to determine whether the grammatical structures presented correspond with learners' developmental readiness.

The current Malaysian evidence remains preliminary. It would therefore be premature to recommend PT as a replacement for existing assessment or curriculum frameworks. Its more immediate value lies in research and developmental analysis. With further empirical investigation, PT may provide a clearer picture of how Malaysian learners develop particular grammatical systems and how those developmental patterns interact with exposure and instruction.

CONCLUSION

Processability Theory provides a psycholinguistic perspective on second language development by focusing on the processing procedures underlying learner production. Its central assumption is that learners can produce linguistic structures only when the procedures required to process those structures have become available. Language development is therefore viewed as a gradual progression from relatively simple lexical processing towards increasingly complex grammatical processing.

This perspective provides information that differs from general descriptions of language proficiency. Frameworks such as the CEFR remain valuable for describing what learners can accomplish communicatively and for providing common reference points across educational contexts. PT instead allows researchers to examine the development of particular linguistic structures and interpret them within a psycholinguistically motivated sequence. There is therefore little reason to position one framework against the other.

Although PT has been investigated internationally for several decades, its use in Malaysian SLA research remains comparatively limited. Recent studies on English plural development and Malay-English verb production demonstrate that the framework can be applied to Malaysian learner populations and may provide useful information about morphological development. However, the available evidence remains concentrated among relatively small and specific populations.

Greater attention to PT could broaden how learner development is examined in Malaysia. Rather than viewing language development only through overall levels of proficiency, PT provides another perspective which focuses on the structures learners are developmentally able to process. Further longitudinal and cross-linguistic research would help determine how far this perspective can contribute to understanding the development of second languages within Malaysia's multilingual learning environment.

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