



Bilingual First Language
Acquisition in Malay and English:
a morphological and
suprasegmental study in the
development of plural expressions
in a bilingual child

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DEDICATION

To my dearest mother
Khas untuk Umi yang dikasihi

To my beloved husband and daughter
Untuk suami dan anakku yang tercinta

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STATEMENT OF AUTHENTICATION

The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in full or in part, for a degree at this or any other institution.

Signature: _____ **Date:** 27th March 2017

Rabiah Tul Adawiyah Mohamed Salleh

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ABBREVIATIONS

| | |
|--------|--------------------------------------|
| AusE | Australian English |
| BFLA | Bilingual First Language Acquisition |
| CL | Classifiers |
| CLI | Cross-linguistic Influence |
| DET | Determiners |
| DF | Discourse Function |
| DP | Determiner Phrase |
| F0 | Fundamental Frequency |
| FLA | First Language Acquisition |
| GF | Grammatical Function |
| L1 | First Language |
| L2 | Second Language |
| LFG | Lexical Functional Grammar |
| MalE | Malaysian English |
| MLU | Mean Length of Utterance |
| NP | Noun Phrase |
| NUM | Number |
| PART | Particles |
| PASS | Passive |
| PERS | Person |
| PL | Plural |
| PRED | Predicate |
| PT | Processability Theory |
| QP | Quantifier Phrase |
| REDUPL | Reduplication |
| REL | Relative pronouns |
| SBE | Standard British English |
| SDH | Separate Development Hypothesis |
| SG | Singular |
| SOV | Subject-Object-Verb |
| SPEC | Specifiers |
| SV | Subject-Verb |
| SVO | Subject-Verb-Object |
| TOP | Topic |
| ULS | Unitary Language System |
| VP | Verb phrase |
| XP | Open Phrase |

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ABSTRACT

This thesis investigates the development of plural marking in a child raised in Malay and English simultaneously, from the morphological and prosodic perspective. For the morphological plural development, the child's plural acquisition is analysed within the Processability Theory (PT) framework de Bot (1992) thus widening PT's typological range of application to a language such as Malay, which belongs to the Austronesian family (Dryer & Haspelmath, 2013). PT has been tested for morphological development in L2 English (Di Biase, Kawaguchi, & Yamaguchi, 2015; Johnston, 2000) and several typologically different languages as well as bilingual first language acquisition (BFLA) such as Japanese-English (Itani-Adams, 2013). However, PT has not been empirically tested for any language of the Austronesian family nor in a Bilingual First Language Acquisition (BFLA) constellation involving Malay and English. The Malay-English language pair is interesting because of the remarkably different linguistic mechanisms used for encoding plurality in the two languages; morphologically, Malay marks plurality through distinct forms of reduplication such as *rumah-rumah* 'houses', *buah-buahan* (plural form of *buah* 'fruit') and *bukit-bukau* 'hills' (Sew, 2007). In contrast, English uses morphological inflections *-s* suffixed to the stem, e.g., *cat/cats*, *dog/dogs*, *book/books* (Carstairs-McCarthy, 2002). Malay reduplication, as previously shown, involves more than a single word, however, functionally speaking it is equivalent to one word plus a marker of plurality. Thus, prosodic mechanisms play a crucial role in distinguishing between mere repetition and grammatical reduplication in Malay (Gil, 2005). Since plurality is expressed very differently in each language, this study investigates how a bilingual child develops simultaneously two grammatical systems. The participant in this research is a female child named Rina, who was raised in Malay-English environment from birth. This investigation comprises of two parts; first is the longitudinal investigation of her plural acquisition from age 2;10 to 3;10. During this period, Rina was living in Australia, where the environmentally predominant language was English. The second complementary part is an investigation of Rina's plural marking systems at age 4;8 when she had returned to Malaysia, where the predominant environmental language was Malay. For the longitudinal study, the database for the analyses was obtained from separate Malay and English recording

sessions, which were conducted weekly from age 2;10 to 3;10. Likewise, the data for Rina's plural expression at 4;8 was also obtained from separate Malay and English environment recordings. For the morphological plural development, results indicate that Rina developed two different systems to mark plurality in Malay and English. Her plural marking developed in the sequence predicted by PT. However, though she clearly distinguished the two languages, bidirectional influences from English to Malay and Malay to English were found in the corpus, both in the longitudinal study as well as at age 4;8. In the longitudinal study, it was found that in expressing plurals in Malay and English, Rina used various linguistic devices: one of the predominant strategies she employed in both languages was iteration, a strategy in which Rina expressed more than one objects by repeating the lexical item according to the number of individuated entities (hence four cats would be expressed as *cat cat cat cat*). Reduplication, the target grammatical Malay plural, only emerged at 3;8. Thus, we examine the prosodic development of the child's iteration up till the emergence of reduplication. Findings indicate that the development from iteration to reduplication is gradual; the main acoustic correlate that she employed during the longitudinal study was final-syllable lengthening. She only began differentiating various prosodic mechanisms (such as pausing, duration and pitch) to distinguish repetition and reduplication in her plural marking at age 4;8. This study offers a new perspective on the interplay between the two languages in the early stages of grammatical development in a bilingual child. The specific features of plurality in Malay and English and how they develop in the bilingual child may shed light on the applicability of PT to BFLA. Also, the link between the child's morphological development and prosodic mechanisms show that in acquiring the prosodic structures of reduplication, Rina creates partial and increasingly specific analyses of the grammatical forms, gradually approaching the conventional adult form.

CHAPTER 1

INTRODUCTION

1.1 Purpose and scope of the thesis

In this age of globalisation, bilingualism has become a norm. Various reasons for migrations, intermarriages, and educational opportunities make bilingualism inevitable for adults and children alike. There has been a growing interest in children acquiring more than one language. This reflects the awareness that bilingualism/multilingualism is a very common phenomenon in children (Genesee, 2015). In fact, it is estimated that two-thirds of the world's children grow up in a bilingual environment (Crystal, 2003). However, though bilingualism has been considered a norm, unfortunately, one of the most frequently articulated concerns about raising and educating bilingual children is the notion that they might be linguistically confused; this leads to the assumption that language development among bilingual children might be delayed and impaired (Genesee, 2015).

Therefore, research into language acquisition of young bilingual children is crucial, as it provides the opportunities for understanding how children develop two language systems simultaneously and what may be the interrelationship between the two systems within a single child. Studying bilingual children will yield valuable insight into the order of grammatical development between the different competing languages to which the children are exposed (Slobin, 1973). In Bilingual First Language Acquisition (henceforth BFLA), research investigating dual language development has increased significantly over the past two decades, both in the number of scholars pursuing the subject and in terms of geographic diversity (De Houwer, 2009). This includes studying English in combination with Southeast Asian languages such as Cantonese (Yip & Matthews, 2007), Mandarin (Qi, 2011) and Japanese (Itani-Adams, 2013). However, a thorough search into BFLA literature reveals that there are limited studies on Malay and English bilingual children.

Therefore, the primary aim of this thesis is to investigate Malay and English bilingual first language development. In particular, the goal is to investigate the morphological and prosodic development of the expression of plurality in a Malay-English bilingual child from age 2;10 (2 year and 10 months) up to 3;10 (three years and 10 months). I will also investigate the child's plural progression at age 4;8. Morphologically, plurality is encoded differently in Malay and English; Malay plurals

are expressed in various forms of reduplication such as *rumah-rumah* ‘houses’, where a lexical form is repeated, *buah-buahan* ‘fruits’, where the initial word is reduplicated with the addition of the suffix *-an*, and *bukit-bukau* ‘hills’, where the initial word is reduplicated by changing some parts of the word (Kroeger, 2005; Sew, 2007). On the other hand, the regular method of forming plurals in English is by adding suffix *-s*, for instance *cats* and *houses* (Carstairs-McCarthy, 2002). Therefore, it would be interesting to investigate how the different plural systems of Malay and English develop in a child exposed to the languages simultaneously.

The two distinct systems of plurality require the child to sort out what belongs to what system. This presents competition not only at morphological level (i.e. reduplication in Malay versus inflection in English) but also at the prosodic level. So, the grammatical Malay plural, reduplication, may require certain prosodic mechanisms, which are specific to Malay reduplication system. How does the child acquire this system? This study will also investigate from the prosodic point of view, the bilingual child’s acquisition of reduplication in Malay.

Other than the morphological and prosodic aspects of plural acquisition, I also examine the interdependence between lexical and grammatical domains in the bilingual child’s development. Research on bilingual children’s lexical development has mainly concerned with issues such as the size of vocabulary in each language, the relationship of the two lexical systems (whether the lexicon develop as one unified system or they separate from early on) and the development of translation equivalents (e.g. David & Li Wei, 2005). There has been little research on the relationship between lexicon and grammar in bilingual children. It is, therefore, imperative that more studies be conducted in this area because children who are acquiring two languages indeed provide an interesting case to assess the lexical-grammatical relationship across languages, as stated by Kohnert, Kan, and Conboy (2010) “input and experience vary naturally across the two languages while the cognitive development and brain maturation are held constant” (p.686). Hence, this study also seeks to investigate the lexical-grammatical relationship in each language, Malay and English of the bilingual child.

A further aim of this research is to observe the interaction between the two developing grammars. Dopke (2000) points this out in the debate of whether simultaneously bilingual children start out with one unified structural system (Volterra & Taeschner, 1978) or instantly distinguish between the two languages (De Houwer, 1990), cross linguistic influences of the children’s developing grammars are

sometimes overlooked. Grosjean (1995) captures the relationship between the two languages with the following perspective: “Bilinguals are not the sum of two complete or incomplete monolinguals but have a unique and specific linguistic configuration” (p.259).

The developmental framework that will be used to analyse the morphological development of plurality in English and Malay is Processability Theory (PT) (Pienemann, 1998). PT is a theoretical framework originally devised for second language acquisition and later applied to bilingual first language development (Itani-Adams, 2013). It is based on a language-processing model that provides predictions regarding the order of acquisition by language learners. PT’s predictions have been supported by several typologically different second language acquisition (henceforth L2) such as English, German, Swedish, Japanese, among others. Thus, it would be interesting to see whether PT is applicable for use in the acquisition of plurality in English and Malay in a simultaneous bilingual child.

Thus, to summarise, this thesis addresses the development of plural expressions from the morphological and prosodic point of views in a child raised simultaneously in Malay and English. For the morphological development, I used PT as the framework. The child’s acquisition of prosodic characteristics of Malay grammatical number marking is also explored in the study. The following section describes the organisation of the thesis.

1.2 Description of the thesis structure

This thesis comprises of seven chapters. Chapter 1, the introduction, presents the aims of this study. Before we discuss the study, it is imperative that we know the significant typological differences between Malay and English; these will be described in detail in Chapter 2 language features.

Chapter 3 presents the background of this study; the terminologies, concepts and past research pertinent to this thesis is discussed in this chapter.

Chapter 4, the methodology chapter, presents the research questions and methods employed in this empirical study. The research questions included, how the child acquires plurality in Malay and English, whether the child’s morphological plural development adheres to the sequence predicted by PT and whether the child’s linguistic development exhibits cross-linguistic influence. As mentioned earlier, I also include the prosodic analyses of the child’s plural development. The research questions included; what are the prosodic patterns of Malay reduplication and how

does the child acquire the prosodic systems of reduplication in Malay. After presenting the research questions, I elaborate the methods used to obtain data from the child. The child's linguistic background and how I analyse the data is described fully in the chapter.

Chapter 5 presents the results for the morphological development. First, the child's Mean Length of Utterance (MLU) throughout the period of investigation is discussed. Following MLU, I also examine the child's lexical development. This is to establish the lexical-grammatical relationship in her development. Then, her plural acquisition in Malay and English is described. After discussing the developmental pattern of plurals in each of the language, the applicability of PT framework is evaluated. Finally, I examine the child's cross-linguistic influences in her plural acquisition.

Chapter 6 presents the findings for the prosodic analyses. Studies on Malay prosody, particularly studies investigating the prosodic patterns of reduplication are scarce. So, to analyse the bilingual child's development of prosody, three acoustic studies were conducted; the first with several L1 adult Malay speakers (which serve as a benchmark in which to compare the child's utterances), the second with the bilingual child from when she was 2;10 up till 3;10 and the third study is also with the same child at age 4;8.

Finally, Chapter 7 discusses the main findings from Chapter 5 and Chapter 6. The connection between the morphological and prosodic development in the child's speech is also discussed. Before concluding the chapter, the overview of the findings in the thesis is presented. Limitations of the study as well as recommendations for future research are also included.

CHAPTER 2

LANGUAGE FEATURES

This chapter presents the significant typological differences between Malay and English that is pertinent to the study. The chapter is organised as follows; section 2.1 describes major features of Malay language. In the section, the main properties of the language are introduced such as the writing system, the sounds (the phonetics and phonological properties), the morphological and syntactical structures as well as its pronoun system. At section 2.2, the major typological characters of English language are described. Having discussed these two features of the languages, section 2.3 summarises the critical differences between Malay and English, focusing on the way the two languages mark plurality. The other variety of English exposed to the bilingual child throughout her developmental language acquisition is Malaysian English; thus, Malaysian English variety will be briefly reviewed in section 2.4. Finally, section 2.5 concludes the chapter.

2.1 Malay language

According to Tadmor, Malay – an Austronesian language spoken in Southeast Asia with over 250 million speakers – is the most widely spoken language in the region (2009). Malay is the official language in Malaysia, Brunei, Indonesia and one of the national languages in Singapore. Figure 2.1 indicates the areas in which Malay is spoken. *Bahasa Melayu*, literally translated as Malay language is the Indigenous name of the language, and there are two primary standard varieties of Malay language, namely *Bahasa Indonesia*, Indonesian language and *Bahasa Malaysia*, Malaysian language. For this thesis, the Malay variety used is *Bahasa Malaysia*, the variety spoken in Malaysia. Malaysia is a multiracial country with a population of 32 million; 68.6% of the population is Malay, followed by Chinese (23.8%), Indian (7%) and others (0.1%) (Department of Statistics Malaysia, 2017). Naturally, the diversity of the society leads to multilingualism. Due to its role as the medium of interaction between the multi-ethnic communities, *Bahasa Malaysia* is established as the national language in 1967 (Phoon, Abdullah, Lee, & Murugaiah, 2014). Malay is the first language of the Malay ethnic community; while for others, Malay is considered as their second language (Ahmad, 2005).

According to Omar (1982), there are four main sociolinguistic varieties of Malay in Malaysia, namely:

1. a. The standard royal variety
- b. The non-standard royal variety
- c. The standard non-royal variety
- d. The non-standard non-royal variety.

Of all these varieties, the third variety, the standard non-royal variety is the standard variety used in officialdom and the mass media throughout the nation while the fourth variety is the colloquial variety. For more information about the royal variety in Malaysia see Burhanudeen (1998). Before explaining the difference between the standard and the colloquial variety of Malay, I will first describe the main typological features of the language. These features are based on the standard Malay variety.

2.1.1 Writing/Orthography. There are two types of Malay writing systems, the Arabic-based script called *Jawi* and the current Romanised system called *Rumi* (Tadmor, 2009). The *Jawi* system originates from the Arabic scripts and developed after the Islamisation of the Malays. The earliest inscription in *Jawi* was found in 1303. When the British colonised the Malay Peninsula in the 18th century, they used Romanised scripts i.e. *Rumi*. English language has greatly influenced the spelling and writing systems of Malay language and it is used until now. Today, *Jawi* is rarely used in daily context in Malaysia. However, there are collaborations between government agencies, educational institutions as well as local Malaysian newspapers to revive the *Jawi* writing system by publishing weekly news in fully *Jawi* writing as well as digitising the *Jawi* scripts into software applications (Mohamad Salih, Abdul-Kahar, Wan Zahari, Mohd Khalid, & Abdul Rahim, 2015). As for *Rumi*, the current Romanised writing systems of Malay feature phonemic orthography, which means Malay words are largely spelled the way they are pronounced (Awang, 2004; Lee & Wheldall, 2011).



Figure 2.1. Areas where Malay is spoken, from Tadmor (2009, p. 792).

2.1.2 Phonetics and phonology. In Malay, there are 21 consonantal phonemes, as illustrated in Table 2.1. In this variety, glottal stop is considered a realisational variant and not part of the phonemic system (Teoh, 1994; Wan Ahmad, 2012). There are six vowel phonemes in Malay and unlike English, the vowel length is not phonemically contrastive in Malay phonemic system. Malay diphthongs include /oi/, /ai/ and /au/(Maris, 1980).

Table 2.1

Consonant phonemes in standard Malay

| | Bilabial | Labio-dental | Alveolar | Palatal | Velar | Post-Alveolar | Glottal |
|-------------|----------|--------------|----------|---------|-------|---------------|---------|
| Plosive | p b | | t d | | k g | | |
| Nasal | m | | n | ɲ | ŋ | | |
| Affricate | | | | | | tʃ dʒ | |
| Fricative | | f v | s z | | | ʃ | h |
| Approximant | | | ɹ | j | | | |
| Lateral | | | l | | | | |

Table 2.2

Vowel phonemes in standard Malay, from Tadmor (2009, p.795)

| | Front | Central | Back |
|------|-------|---------|------|
| High | i | | u |
| Mid | e | ə | o |
| Low | | a | |

In terms of the general prosodic structure, Malay is considered a “syllable-timed” language. Languages with syllable-timed criteria have approximately the same loudness, length, and pitch in the distribution of prosodic characteristics in a word (Fromkin, Rodman, & Hyams, 2011). Many languages possess syllables beginning with a consonant, but not all languages possess syllables ending in a consonant. There are still fewer languages, which exhibit syllables ending in more than one consonant (Lleo, Kuchenbrandt, Kehoe, & Trujillo, 2003). Malay language, however, only allows a single consonantal segment to occupy the syllable. Consonant clustering is non-existent in Malay, which is in contrast to English phonological structure. English

consonant clusters may consist of as many as three consonants (CCCV+) in word-initial position, such as *split* and as many as four consonants (+VCCCC) in word-final position, such as *twelfths*. In fact, English has “a distinct propensity for consonant clustering” (Celce, Brinton, & Goodwin, 2010). The basic syllable structure in Malay is (C) V(C) (Hassan, 1974; Maris, 1980; Onn, 1980; Tadmor, 2009). In Malay, most monosyllabic stems have a CV structure and it is a requirement for monosyllabic stems to have an onset (Ahmad, 2004). Teoh (1994) states that for Malay polysyllabic stems, there are four syllable structures: V, CV, VC and CVC. The following table summarises possible syllables in Malay morphemes:

Table 2.3

Syllable shapes in Malay morphemes, adapted from Tadmor (2009, p.796)

| Syllable shape | Syllable-initial | Syllable-final |
|----------------|-----------------------|---------------------|
| V | <i>i.kan</i> 'fish' | <i>ba.u</i> 'smell' |
| CV | <i>ba.tu</i> 'rock' | <i>a.pa</i> 'what' |
| VC | <i>um.pan</i> 'bait' | <i>ma.in</i> 'play' |
| CVC | <i>han.tu</i> 'ghost' | <i>da.pat</i> 'get' |

According to Omar (1992), phonologically, there are two major Malay varieties; the schwa-variety and the a-variety. The difference between these two varieties lie in the pronunciation of vowel /a/ and /r/ at the word final position (Sew, 2007, pp. 4-5); in the schwa-variety, the /a/ is pronounced as the schwa /ə/ such as *apa* 'what' /apə/, *kita* 'we' /kitə/, *suka* 'like' /sukə/ and the /r/ is silenced such as *bakar* 'burn' /baka/ and *belukar* 'bush' /beluka/ while the a-variety in contrast, pronounced the /a/ in full; hence *apa* 'what' /apa/, *kita* 'we' /kita/, *suka* 'like' /suka/ and the /r/ is realised as flapped /r/ in *bakar* 'burn' /bakar/ and *belukar* 'bush' /belukar/.

2.1.3 Morphology and syntax. Malay is considered an agglutinating language. Malay words consist of a number of morphemes combined together (Kroeger, 2005). However, compared to English, Malay might appear to be an isolating language, as stated by Goddard (2005), “most East and Southeast Asian languages are isolating in type and lack inflection. For the European language learners, this has the curious implication that verbs are unmarked for tense; they do not change their form to indicate the past, present, or future” (p.109). One prominent feature of Malay language that differs substantially from English and other European languages is the “lack of inflection” (Goddard, 2005, p.3). Inflection is changes in word shape

that affect the grammatical context of a particular word (Carstairs-McCarthy, 2002). Morphologically, in Malay, words are largely not inflected for tense, number, gender, or any grammatical case. The main morphological processes in Malay are affixation, compounding, and reduplication (Tadmor, 2009; Teoh, 1994).

Affixation plays an important role in the standard Malay variety. Standard variety is more elaborate in terms of verbal affixation. At schools, students are taught to use the correct prefixes and suffixes (Sew, 2007). There are four types of affixes in Malay; prefixes, suffixes, infixes and circumfixes. Circumfixes consist of morphemes attached to the stem simultaneously at the beginning and at the end of the word, e.g. prefix *ke-* and suffix *-an* in *ke-baik-an* ‘kindness’ from the root *baik* ‘kind’ or prefix *per-* and suffix *-an* in *per-temu-an* ‘meeting’ from *temu* ‘to meet’. Most often, the derivation of new words via affixation process in Malay will change the word class of the stem. For the colloquial variety, Malay speakers tend to use bare words (words without the morphemes attached). The following exemplifies the differences in terms of verbal morphology between the standard Malay and the colloquial Malay (from Sew, 2007, p. 14):

2. *Ali memukul adiknya dengan sebatang kayu* (Standard Malay)
Ali MEN-hit sibling-NYA with one-rod (CL) wood
‘Ali hits his younger sibling with a stick’
3. *Ali pukul adik dengan kayu* (Colloquial Malay)
Ali hit sibling with wood
‘Ali hits his younger sibling with a stick’

The second morphological process in Malay is compounding. Compounding involves the combination of two or more stems, which come together to form a complex word, for instance *tanda* ‘sign’ and *tangan* ‘hand’ combine in the compound *tandatangan* ‘signature’ (Sneddon, Adelaar, Djenaar, & Ewing, 2010). Compounding does not alter the word class of the stems combined. Compound words also function as a single lexical unit and the constituents cannot be separated. Some examples of Malay compound words are *kereta api* ‘train’ from *kereta* ‘car’ and *api* ‘fire’, *kakitangan* ‘staff’ from *kaki* ‘leg’ and *tangan* ‘hand’, *rumah sakit* ‘hospital’ from *rumah* ‘house’ and *sakit* ‘sick’, and *soal selidik* ‘questionnaire’ from *soal* ‘question’ and *selidik* ‘research’ (cf. Hassan, 2006).

The third morphological process in Malay is reduplication. Ahmad (2005) and Tadmor (2009) states that two types of reduplication should be distinguished; the lexical reduplication, where the reduplicated words are lexicalised e.g. *kupu-kupu* ‘butterfly’ and *gula-gula* ‘candy’, and morphological reduplication, where a reduplicated form is derived through regular reduplication process. Only the morphological reduplication constitutes derivational process in Malay. Reduplication plays a crucial role in Malay; the most important is in the encoding of plurality (Tadmor, 2009). In a pioneering study of Malay reduplication by Haji Omar (1975), she found that reduplication in the Malay written materials serves a variety of purposes, namely plurality, intensity, continuity of action and repetition of action. Sew (2007, p.5) summarises the findings of the types of Malay reduplication in the written discourse as follows:

4.
 - a. Full reduplication of the noun stem e.g. *kereta* ‘car’ to *kereta-kereta* ‘cars’
 - b. Reduplication of the stem in affixed verb stem e.g. *menjerit* ‘shout’ to *menjerit-jerit* ‘to shout and shout’
 - c. Partial reduplication of the first syllable of the noun stem e.g. *laki* ‘husband’ to *lelaki* ‘man’
 - d. Reduplication of the stem with segmental alternation e.g. *gunung* ‘mountain’ to *gunung-ganang* ‘ranges of mountain’
 - e. Reduplication of the verb stem with affixation e.g. *bantu* ‘help’ to *bantu-membantu* ‘to assist each other’

Based on the summary, reduplication reduplicates Malay nouns and verbs. However, the scope of this thesis is only on the encoding of plurality in Malay so the analyses will be limited to the reduplication of nouns. However, not all nouns can be reduplicated to show plurality in Malay. Reduplication designates plurality only on count nouns, not mass nouns. The following nouns do not reduplicate (Sew, 2007, p.23):

5. *udara* ‘air’ to **udara-udara* ‘airs’ (Mass noun)
6. *air* ‘water’ to **air-air* ‘waters’ (Mass noun)
7. *pasir* ‘sand’ to **pasir-pasir* ‘sands’ (Mass noun)

Malay nouns lack the feature of quantity and countability because a noun can be construed as being either singular or plural (Sew, 2007). Thus, the count-mass distinction is ambiguous in Malay. Although Malay nouns may be interpreted as either

singular or plural, Malay count nouns reduplicate to pluralise objects. Reduplication for count nouns is commonly a simple noun-noun (N-N) duplicate e.g., *pelajar-pelajar* ‘students’, *buku-buku* ‘books’, *anak-anak* ‘children’ (Sew, 2007; Tadmor, 2009). Related to N-N duplicate, Malay count nouns may also be reduplicated with the addition of suffix *-an*; N-N + *an* designates the meaning of varieties and distribution (Sew, 2007; Sneddon et al., 2010). Some examples of N-N + *an* is as follows (Sew, 2007, p.24);

8. *buah* ‘fruit’ to *buah-buahan* ‘fruits of all kinds’
9. *bunga* ‘flower’ to *bunga-bunga* ‘various kinds of flowers’
10. *biji* ‘seed’ to *biji-bijian* ‘various kinds of seed’
11. *padi* ‘rice’ to *padi-padian* ‘various types of grains’

Sew (2007) points out that *padi* ‘rice’ is a countable noun in Malay. In Malay, rice takes three different forms; *padi* ‘unhusked rice’, *beras* ‘uncooked rice’ and *nasi* ‘cooked rice’. Only *padi* is a countable noun while *beras* and *nasi* are mass nouns as there are no *beras-beras/beras-berasan* or *nasi-nasi/nasi-nasian*. Sew (2007) presented the following examples, stating that these nouns are not reduplicated with the suffix *-an* (p.25);

12. *meja* ‘table’ to **meja-mejaan* ‘table-table’
13. *rumah* ‘house’ to **rumah-rumahan* ‘house-house’
14. *kerusi* ‘chair’ to **kerusi-kerusian* ‘chair-chair’

One of the types of reduplication found by Haji Omar (1975) in her examination of Malay written materials is reduplication with segmental alternation e.g. *gunung* ‘mountain’ to *gunung-ganang* ‘mountains’. Kroeger (2005) termed this phenomenon as “modified reduplication” in which some parts of the duplicate is changed for example, *kuih* ‘cake’ to *kuih-muih*, *lauk* ‘dish’ to *lauk-pauk*, *saudara* ‘relative’ to *saudara-mara*, *rumpit* ‘grass’ to *rumpit-rampai*, and *batu* ‘stone’ to *batu-batan* (p.310).

Another structural property of plural expression in Malay is the construction of numeral classifiers. Malay is a classifier language and classifiers are used with a wide range of nouns, which include both countable and uncountable nouns (Goddard, 2005; Sew, 2007). Malay numeral classifier systems is considered to be complex and highly arbitrary (Dirin, 2000; Hassan, 2006; Othman, 2004). There are many exceptions to the rule in selecting numeral classifiers, for instance, the classifier *buah*

‘fruit’ is used for cars e.g. *sebuah kereta* ‘se-fruit (CL) car’, *biji* ‘seed’ is used for cups and plates e.g. *dua biji cawan* ‘two seed (CL) cup’ and *kaki* ‘leg’ is used for umbrellas e.g. *sekaki payung* ‘se-leg (CL) umbrella’ (Salehuddin & Winskel, 2009). In terms of quantification, both count and mass nouns can be preceded by numeral classifiers but only count nouns can be preceded by numerals without classifiers. This is shown in the following (Sew, 2007, p.28);

15. *empat ekor arnab* ‘four tail (CL) rabbit’ (Count nouns)
16. *empat arnab* ‘four rabbit’
17. *empat mangkuk minyak* ‘four bowl (CL) oil’ (Mass nouns)
18. **empat minyak* ‘four oil’

In colloquial speech, classifiers are optional. Goddard (2005) noted that although classifiers are more often used in the standard than the colloquial variety, there are some classifiers that are quite common in the colloquial speech of Malay speakers such as *orang* ‘people’ to refer to human beings and *ekor* ‘tail’ to refer to animals, e.g. *tiga orang guru* ‘three people (CL) teacher’ and *tiga ekor kucing* ‘three tail (CL) cat’. Pertaining to generic items in Malay, genericity in the language reflects “minimal marking tendency” (Sew, 2007, p.39). Therefore, generic entities in Malay, whether countable or uncountable, are expressed with singular forms for instance, *saya suka epal* ‘I like apple’ and *air adalah sumber hidup* ‘water is a source of life’.

In terms of word order, Hassan, Rohani, Osman, and Ayob (2006) state that the most predominant word order in Malay is Subject-Verb-Object (SVO). The common syntactic structure in Malay is that the subject precedes the predicate (cf. Hassan et al, 2006). The following exemplifies the common Malay word order:

19. *Dia makan nasi*
‘he/she(SG) eat rice’
20. *Kereta api sedang berjalan dengan laju*
Train now move with fast
‘The train is moving fast’
21. *Drebaranya keluar*
Driver-NYA out
‘The driver went out’

2.1.4 Pronouns. Choosing the correct pronoun to use in Malay is a complicated matter. The “social messages” that relate to social standing, respect and

deference are embedded in Malay speakers' use of pronouns (Goddard, 2005). Several factors need to be taken into consideration when selecting a pronoun such as the formality of the context, the relationship between the speaker and the referent of the pronoun, the age of the referent and even the ethnicity of the referent (Tadmor, 2009). The following table summarises the range of pronouns in Malay, adapted from Tadmor (2009) but with some modifications as Tadmor's summary are derived from *Bahasa Indonesia*, Indonesian language, which is slightly different from *Bahasa Malaysia*, Malaysian language:

Table 2.4

Pronouns in Malay, from Tadmor (2009, p.812), with some modifications

| Person | Singular | Plural |
|------------------------|---|---|
| 1st person | <i>aku</i> (informal) <i>saya</i> (formal) | <i>kami</i> (general) <i>kita</i> (general) |
| 1st and 2nd person | - | <i>kita</i> (general) |
| 2nd person | <i>engkau/kau</i> (informal) <i>awak</i> (general) <i>anda</i> (formal) | <i>engkau/kau</i> (informal) <i>kamu</i> (general) |
| 3 rd person | <i>ia</i> (inanimate things) <i>dia</i> (general) | <i>mereka</i> (general) |

In informal contexts and when addressing peers and inferiors, Malay speakers use first person pronoun *aku*, as opposed to *saya*, which is used in a more formal situation. For the second person pronoun, *kau* is used in an informal situation and *anda* is used in a more formal setting. Malay pronouns are indiscriminate in terms of gender; thus, for third person pronoun, *dia* is used to refer to he or she. *Ia* is used to refer to inanimate things.

However, despite the range of pronouns given here, Malay speakers might not use pronouns at all, as they opt for personal names, kinship terms or words for the person's occupation/role (such as Doctor, Professor, Madam, Sir, etc.) (Goddard, 2005). It is normal in Malaysia for a speaker to refer to themselves and the interlocutor by using kinship terms such as *abang* 'big brother', *kakak* 'big sister' and *adik* 'younger brother/sister'. These terms are not only used in family setting but also if there is a small difference in terms of age between the speakers. Also, when addressing the elderly, Malay speakers usually use *pakcik* 'uncle' or *makcik* 'auntie'. For Malay children, it has been observed that they tend to use their names as first person pronoun,

both when speaking to the elderly (parents, grandparents, etc.) or when speaking with peers (Mohd Noor, 2013).

Now that I have discussed the primary typological features of Malay language (writing, phonology, morphology, syntax and pronouns), I would like to explain the differences between the standard and the colloquial variety of Malay. This is because in the study, the parents and the family members of the bilingual child used the colloquial variety when interacting with the child. In terms of phonology, the family used the schwa-variety of Malay. The following section highlights the characteristics of the colloquial speech of Malay as compared to the standard variety.

2.1.5 The colloquial Malay variety. Goddard (2002) describes the colloquial Malay variety as “ the sort of oral language Malays use among themselves in informal everyday interaction. It can also be found in ephemeral printed materials such as entertainment and humour magazines and cheap novels, and in television and radio talk-back shows, comedies and dramas” (p.87). Previously, when discussing the major features of Malay language, I have mentioned a few differences between the standard and the colloquial variety. To repeat, the main difference between the standard and the colloquial speech is that firstly, the former is more elaborate in terms of verbal morphology. When speaking in informal context, Malay speakers tend to use bare verbs for example:

22. *Ali sedang memakan nasi* (Standard Malay)
Ali now me-eat rice

23. *Ali makan nasi* (Colloquial Malay)
Ali eat rice

Secondly, the use of classifiers. Classifiers are optional in the colloquial variety whereas in the standard variety, Malay speakers are required to use the construction. Finally, the use of copula *adalah* and *ialah* is the distinguishing feature between standard and colloquial Malay (Sew, 2007). The following examples illustrate the usage of copula *adalah* and *ialah* in standard Malay and its contrast with the colloquial Malay (Sew, 2007, p.2):

24. *Surat itu adalah untuk Ali* (Standard Malay)
Letter that is for Ali

‘That letter is for Ali’

25. *Surat itu untuk Ali* (Colloquial Malay)
 Letter that for Ali
 ‘That letter is for Ali’
26. *Ali ialah seorang pelakon* (Standard Malay)
 ‘Ali is se-people (CL) actor’
 Ali is an actor
27. *Ali pelakon* (Colloquial Malay)
 Ali actor
 ‘Ali is an actor’

The existence between these two varieties has led to the emergence of diagglossia in Malaysia. Diagglossia is defined as a sociolinguistic situation in which two varieties exist and are distributed based on the contexts in the speech community; one variety is used for specific formal situations while the other is used in informal speech (cf. Ferguson, 1959). The colloquial variety of Malay/Indonesian is often looked down upon due to the perception that it is a “low” and “broken” form of the language (Ewing, 2005; Gil, 2012). However, Gil (2012) argues that this should not be the case. His arguments are based on several observations; firstly, in terms of acquisition, colloquial Malay/Indonesian is the first variety acquired by preschool-age children; the standard variety on the other hand, is acquired only after the children has entered formal education. Secondly, in terms of distribution, the colloquial variety boasts millions of speakers with little knowledge of the standard variety while the standard Malay/Indonesian is only spoken by a few. Thirdly, Gil also states that the colloquial variety of Malay/Indonesian is more ubiquitous; it is used in a wide range of daily contexts, as opposed to the standard variety, which is only limited to specific formal settings. The colloquial variety came first; the standard variety only emerged by subsequent processes of language standardisation. For example, in Malaysia, the standardisation of Malay began in 1970s to cater for the pedagogical needs for science and technology (Sew, 2007). Finally, Gil also argues that in terms of grammar, the colloquial variety exhibits typical grammatical features of a Southeast Asian language while standard Malay/Indonesian tends to exhibit more grammatical properties of other languages that may have influenced the standardisation process such as English, Dutch and Arabic.

Now I will proceed with the description of English. Similar to the description of Malay, the description of English would focus primarily on its main typological features.

2.2 English language

Currently, it is an established fact that English is regarded as the global language (Crystal, 2004). English is spoken around the globe; it was estimated that in the early 2000s, almost 1.5 billion people around the world is competent in the English language. Based on Zhu (2001) and Crystal (1997), it is estimated that 427 million people speak English as their first language (L1) while 950 million speak English as their second language (L2) (Saville-Troike, 2012). Thus, there is a higher percentage of the world's population speaking English as L2 than L1. This is about a quarter of the world's population and this figure, unsurprisingly, continues to grow (Crystal, 2004).

According to Finegan (2009), the global spread of English around the world is attributed to several reasons, namely; the social prestige of English, the need for English in technological advancement as well as the simplicity of English inflections compared to other languages. In many English post-colonial countries, English fulfills a prioritised and privileged role (Kirkpatrick, 2010). English is regarded as a crucial tool for social and economic mobility. Thus, because of this role, the learning and use of English is greatly pursued by countless people, which, in turn, contributes to the global spread of English. Pertaining to technological advancement, the dissemination of American technologies in the 20th and 21st centuries led to the spread of English throughout the world. When talking about the inflectional structure of English, some scholars claim that the extension of English might have to do with its inflectional simplicity compared to languages like German and Russian. English inflections are few and relatively easy to learn compared to heavily inflected languages. Take English nouns, for example; the language has only two variants in speech, a marked variant for possessive singulars and all plurals, and unmarked one for all other functions. Other than a few exceptions like *teeth* and *oxen*, plurals are formed by adding /s/ or /z/ or /ez/ to the stems, which will be described later in the morphological section of English. There are no inflectional prefixes or infixes in English.

In terms of typological family, English and all its varieties is classified as a West-Germanic language of the Indo-European family languages, together with

German, Dutch and Frisian (Hawkins, 2009). In the following section, English phonetics and phonological characters are described.

2.2.1 Phonetics and phonology. This section provides an overview of the consonant and vowels in English language. The following tables describe the consonants and vowels in English. Due to the global status of the language, there are many variations of English; so, the descriptions will be based on the Standard variety of British English (SBE). There are 25 consonantal phonemes and 10 vowel phonemes in English.

Table 2.5

Consonants in English, taken from Meyer (2009, p.199)

| | Bilabial | Labiodental | Dental | Alveolar | Post-alveolar | Palatal | Velar | Glottal |
|----------------------|----------|-------------|--------|----------|---------------|---------|-------|---------|
| Plosives | p | | | t | | | k | |
| | b | | | d | | | g | |
| Nasals | m | | | n | | | ŋ | |
| Fricatives | | f | θ | s | ʃ | | | h |
| | | v | ð | z | | | | |
| Affricates | | | | | | tʃ | | |
| | | | | | | dʒ | | |
| Central approximants | (w) | | | ɹ | | j | w | |
| Lateral approximants | | | | l | | | | |

Table 2.6

Vowels in English, adapted from Ladefoged (2005, pp.28-30)

| | Front | Near-front | Central | Near-back | Back |
|------------|-------|------------|---------|-----------|------|
| Close | i | | | | u |
| Near-close | | ɪ | | ʊ | |
| Close-mid | eɪ | | | | əʊ |
| Mid | | | ə | | |
| Open-mid | | ɛ | | | ɔ |
| Near-open | | | | | |
| Open | | | | | ɒ |

There are three diphthongs in English, namely /ai/ in ‘fight’, /aʊ/ in ‘house’ and /ɔi/ in ‘boy’. However, it is important to remember that the system of vowels as illustrated here is somewhat an idealisation. Ladefoged and Johnson (2010, p.87)

characterise the vowel notions of height, frontness and backness as “labels that describe how vowels sound in relation to one another. They are not absolute descriptions of the position of the body of the tongue.” Unlike consonants, they further state that, “there are no distinct boundaries between one type of vowel and another.” However, though the categories are simply labels, it is the only convenient way for scholars to describe and compare vowels. If we compare English to Malay in terms of the sound systems, English has more consonants and vowel phonemes, as Malay only possesses 21 consonants and six vowel phonemes.

English is a “stress-timed” language (Fromkin et al., 2011); which means that certain syllables in a word are louder, slightly higher in pitch and the duration is also longer than other syllables in a word. Generally, at least one syllable is stressed in an English word. This is in contrast to Malay; Malay is a syllable-timed language in which there are no differences in terms of loudness, duration and pitch between the syllables in a Malay word.

2.2.2 Morphology and syntax. Inflectional and derivational morphemes play a crucial role in English word structure. Inflections do not change the meaning or part of speech of a word, but instead mark various grammatical relations. Table 2.7 summarises the inflectional morphemes in English.

Inflectional morphemes form a small class in English but derivational morphemes are a much larger class (Meyer, 2009). Derivational morphemes can be either prefixes or suffixes while inflectional morphemes can only be suffixes. Also, derivational morphemes change the meaning of a word as well as its parts of speech e.g. adding the prefix *dis-* to the base ‘like’ results in ‘dislike’, which is the opposite to the meaning of the base ‘like’ and adding the suffix *-able* to ‘like’ changes the form from verb to the adjective ‘likable’.

Table 2.7
Inflections in English, taken from Meyer (2009, p.153)

| Inflections | Descriptions | Examples |
|-------------|-------------------------------|--------------------------------------|
| -s | Singular | he/she <i>likes</i> movies |
| -s | Possessive | the child's toys |
| -s | Plurals | girl/girls |
| -ing | Progressive aspect | he/she is <i>leaving</i> |
| -ed | Past tense | he/she <i>talked</i> for an hour |
| -ed | Perfective aspect | he/she <i>has talked</i> for an hour |
| -er | Comparative form of adjective | mild/ <i>milder</i> |
| -est | Superlative form of adjective | mild/ <i>mildest</i> |

This thesis focuses on the plural expressions of the bilingual child in Malay and English, thus in what follows I will focus on plural morphology in English. Plurality in English is commonly expressed by suffixing the morpheme *-s* for most countable nouns. This *-s* suffix has three allomorphs: [s] (e.g. *cats or lamps*), [z] (e.g. *dogs or days*), and [əz] (e.g. *horses or watches*) (Carstairs-McCarthy, 2002; Ettliger & Zapf, 2011). Irregular suffixes expressing plurality include *-i*, *-ae* and *-a* (as in *cacti, formulae, phenomena*), as well as the suffix *-(r)en* that shows up only in *oxen, children and brethren* (Carstairs-McCarthy, 2002). Some English nouns are also isomorphic (in which the singular and plural forms are the same), for example *sheep, fish, and deer*. Regarding noun countability, the count-mass distinction is a salient grammatical feature in English. Only countable nouns such as *house, coin, and leg* can be paired with indefinite article while mass nouns like *water, money and butter* cannot take the indefinite article. This is due to the lack of conceptual bounding in the noun referents (cf. Bloom, 1994). Mass nouns in English are paired with mensural classifiers and unitisers, for instance *some water, much money, little butter, a drop of water, piece of glass, cake of soap* (Sew, 2007). Both mensural classifiers and unitisers provide a conceptual boundary to mass nouns, hence facilitating the distinction between count and mass nouns in English (Sew, 2007). In terms of numerals, countable nouns can be paired with numerals for example, *one woman, three dogs* but uncountable nouns, as discussed, must be paired with mensural classifiers or unitisers, such as *one glass of water, two pounds of sand and three plumes of smoke* (Gil, 2013). Generic entities in English are expressed with the plural suffix *-s* if they are countable, for instance *I like apples*; on the contrary, the uncountable generic entities use the singular form such as *I like tea, I like coffee*. However, generics in English can also be expressed through definite singulars, for example, *the tiger is a ferocious beast* and indefinite singulars, like *a tiger is a ferocious beast* (Hollander, Gelman, & star, 2002).

Pertaining to the syntactic structure, English word order is SVO (Subject-Verb-Object). In this regard, Malay and English are of the same group of word order. Based on the classification of syntactic structure of languages by Tomlin (1986), he found that SOV (Subject-Object-Verb) and SVO were the most preferred word order in the 402 languages he surveyed. The data from Tomlin are shown in the following table:

Table 2.8

Word order types and frequencies, taken from Tomlin (1986, p. 22)

| Word order | Frequency | Example languages |
|------------|-------------------------|--|
| SOV | 180 languages (44.78%) | Bengali, Gothic, Hindi, Japanese, Kurdish, Latin, Persian, Turkish. |
| SVO | 168 languages (41.79%) | Arabic (colloquial), English, French, Malay, Mandarin, Portuguese, Russian, Spanish, Vietnamese. |
| VSO | 37 languages (9.20%) | Arabic (literary), Aramaic, Hebrew, Irish. |
| VOS | 12 languages (2.99%) | Aneityan, Baure. |
| OVS | 5 languages (1.24%) | Apalai, Arecua, Hixkaryana. |
| OSV | 0 | |
| Total | 402 | |

The bilingual child in this thesis was exposed to Australian English variety (AusE). There are significant differences in linguistic features between the standard English reviewed here and AusE, especially in terms of lexical and phonological properties (cf. Burridge, 2010) but for plural morphology, there are no differences between them. Both varieties express plurality with the standard English grammatical features (suffix *-s* and so forth).

2.2.3 Pronouns. In English, situational contexts do not change the pronouns, as in Malay but its form changes depending on the grammatical role. The first-person pronoun, if it is in subject position and comes before verb, is *I* but if it comes after verb, it is *me* (Goddard, 2005). For example, *I am studying for a Russian test* (*I* is the subject of *am studying*) and *she asked me to study for the test* (*me* is the object of *asked*). This is in contrast to Malay pronouns, which stay the same regardless of position or grammatical role, for instance *saya* is used in both subject and object positions as in *saya sedang mengulangkaji untuk ujian Bahasa Rusia* ‘I am studying for a Russian test’ (*saya* is in subject position) and *dia menyuruh saya mengulangkaji untuk ujian Bahasa Rusia* ‘he/she asked me to study for a Russian test’ (*saya* in object position). The summary of English pronouns based on its grammatical role is depicted in the following table:

Table 2.9

List of English pronouns, taken from Finegan (2009, p. 73)

| | | 1 st person | 2 nd person | 3 rd person | 3 rd person | 3 rd person |
|----------|------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Singular | Nominative | I | you | he | she | it |
| | Accusative | me | you | him | her | it |
| | Genitive | mine | yours | his | hers | its |
| | Dative | me | you | him | her | it |
| Plural | Nominative | we | you | | they | |
| | Accusative | us | you | | them | |
| | Genitive | ours | yours | | theirs | |
| | Dative | us | you | | them | |

Up until now, I have described the major typological features of Malay and English; specifically, their general properties of phonetics and phonology, morphological and syntactical structures as well as the pronoun systems. In what follows, a summary of the plural morphology between Malay and English is presented.

2.3 Summary of the differences in plural expressions between Malay and English

Having reviewed the morphological plural structure in Malay and English, this section summarises the critical differences between these two languages and show among other things, the complexity of each of the systems the child has to learn simultaneously and eventually master. This is shown in the subsequent table:

Table 2.10

Summaries of the competing systems of plural, singular and generic expressions

| English | Malay |
|--|--|
| 1) The count-mass noun distinction is a grammatical feature of English. Mass nouns in English is classified with mensural classifiers and unitisers, e.g. <i>some cheese, two pounds of rice, a drop of water</i> (Sew, 2007). English also has an open class of words that are similar to classifiers, often rigid in their collocations, i.e. <i>a loaf of bread, a lump of cheese, a herd of cows, a school of fish</i> . | 1) The count-mass distinction is ambiguous in Malay. Malay nouns lack the feature of quantity because a noun can be construed either as singular or plural (Sew, 2007). Malay is also a classifier language. Classifiers are used for countable nouns and uncountable nouns, e.g. <i>Tiga</i> 'three' <i>ekor</i> tail (CL) <i>kucing</i> 'cat' (three cats); <i>tiga</i> 'three' <i>buku</i> 'book' (CL) <i>roti</i> 'bread' (three loaves of bread). |
| 2) The regular English plural is morphologically marked on countable nouns by the inflectional | 2) Though Malay nouns may be interpreted as either singular or plural, reduplication encodes |

| English | Malay |
|--|--|
| suffix -s. This -s suffix has three allomorphs: [s] (e.g. <i>cats</i> or <i>lamps</i>), [z] (e.g. <i>dogs</i> or <i>days</i>), and [əz] (e.g. <i>horses</i> or <i>watches</i>) (Carstairs-McCarthy, 2002; Ettliger & Zapf, 2011). | plurality in Malay. The reduplication for count nouns is commonly a simple N-N duplicate e.g., <i>pelajar-pelajar</i> 'students', <i>buku-buku</i> 'books' <i>anak-anak</i> 'children' (Sew, 2007; Tadmor, 2009). |
| 3) There are some lexically determined irregular plural forms, e.g., <i>children</i> , <i>women</i> . Some nouns are also isomorphic, e.g., <i>sheep</i> , <i>fish</i> , <i>deer</i> . | 3) There are lexically determined reduplications with the addition of the suffix <i>-an</i> . N-N+an designates the meaning of varieties, as in <i>buah</i> 'fruit' to <i>buah-buahan</i> 'fruits of all kinds' and <i>bunga</i> 'flower' to <i>bunga-bunga</i> 'various types of flowers' (Sew, 2007). Reduplication may also change some parts of the duplicate, e.g., <i>kuih</i> 'cake' to <i>kuih-muih</i> 'cakes', <i>lauk</i> 'dish' to <i>lauk-pauk</i> 'dishes' and <i>gunung</i> 'mountain' to <i>gunung-ganang</i> 'mountains' (Kroeger, 2005). |
| 4) Generic entities in English are expressed with plural -s if they are countable e.g. <i>I like apples</i> , but uncountable generic entities use the singular form e.g. <i>I like tea</i> , <i>I like coffee</i> . However, generics in English can also be expressed through definite singulars (e.g. <i>The tiger is a ferocious beast</i>) and indefinite singulars (e.g. <i>a tiger is a ferocious beast</i>) (Hollander et al., 2002) | 4) Genericity in Malay reflects "minimal marking tendency" (Sew, 2007, p. 39). Thus, generic entities in Malay, whether countable or uncountable, are expressed with singular forms e.g., <i>Saya suka epal</i> 'I like apples' <i>Air adalah sumber hidup</i> 'Water is a source of life'. |

* These lists are not meant to be exhaustive.

2.4 Malaysian English variety

Before the commencement of the data collection at age 2;10, the child was living in Malaysia with her parents and extended relatives. The mother chose to speak English, particularly the Malaysian English (henceforth MalE) variety to the child from birth. Hence, the child was exposed to the MalE variety for a period of time. At age 4;8, when the family returned to Malaysia, the child goes to English-medium school in which the dominant English variety used is the MalE. Therefore, it is apt that some features of MalE be explained here. The child's linguistic environment from birth up till the end of the investigation are shown in Figure 4.1 and Figure 4.2.

There are several earlier research investigating the indigenisation of Singapore/Malaysian English, such as Crewe (1977), Platt and Weber (1980) and Tongue (1974). Recent studies that investigate MalE in terms of its features, usage,

and development are those by Baskaran (2005), Hashim (2014), and Hashim and Tan (2012). Baskaran (2005) is a comprehensive study of the linguistic features of MalE so I will mainly refer to her work in describing the MalE variety.

English in Malaysia has undergone a process of nativisation, which is defined by Kachru (1992) as the process of adaptation of a language by non-native speakers who inject elements of their culture and first language into the target language. Schneider (2007) suggests that MalE is in Phase Three of Dynamic Model i.e. at the stage of “Nativization” of the Dynamic Model of Post-colonial English, where there is much variation due to phonological and structural transfer from Malay and other ethnic languages. In Malaysia, being a multicultural society, the local languages being incorporated into the indigenised English variety are Malay, Chinese and Tamil. Baskaran (2005) states that there are three varieties of MalE, namely:

28. a. The acrolect variety- the standard variety resembling the SBE although some local influence at the lexical and phonological levels is tolerated.
- b. The mesolect variety – the informal variety commonly used by Malaysians.
- c. The basilect variety – the patois form of English, or the uneducated style of speech communication.

With respect to the bilingual child in this thesis, she is exposed to the mesolect variety of MalE, as it is used by the mother and also by the teachers at the Malaysian school (at age 4;8 when she goes to school). The major differences between the mesolect variety with the SBE, according to Baskaran (2005), lie in the phonological, lexical and syntactic structures. Baskaran thoroughly examined the syntactic structures of MalE in her book-length study where she described the structures of the noun phrase (NP), the verb phrase (VP), and the clause structure. However, for the purpose of this thesis, I will only review the individuation in MalE (individuation is subsumed under NP structure in Baskaran’s study). The individuation relates to pluralisation of nouns in MalE.

2.4.1 Individuation in Malaysian English. Baskaran (2005) used the term “individuation” to refer to the individuating and pluralising in MalE of what is normally considered uncountable nouns in SBE. As discussed previously, in English, the count-mass distinction is a salient grammatical feature. The uncountable/mass nouns are those that are singular in form but meaning-wise, they are plural. However,

uncountable nouns are pluralised and changed to countable nouns in MalE. The following are some examples of individuation in MalE (after Baskaran, 2005, p.56);

- | | | |
|-----|---------|--|
| 29. | a. SBE | Her jewellery is exclusive. |
| | b. MalE | Her jewelleryes are exclusive. |
| | c. SBE | She lost three pieces of jewellery. |
| | d. MalE | She lost three jewelleryes. |
| | e. SBE | This morning's mail has been delayed. |
| | f. MalE | This morning's mails have been delayed. |
| | g. SBE | There were two items of mail registered at the office. |
| | h. MalE | There were two registered mails at the office. |
| | i. SBE | Is there any furniture in your flat? |
| | j. MalE | Are there any furnitures in your flat? |
| | k. SBE | Forty articles of furniture were damaged in transit. |
| | l. MalE | Forty furnitures were damaged in transit. |
| | m. SBE | Three cakes of soap were left in the sink. |
| | n. MalE | Three soaps were left in the sink. |

Thus, it will be interesting to see how the bilingual child pluralises the nouns in English during the time in which her exposure to MalE is high (at age 4;8).

2.5 Conclusion

This chapter presented the major typological features of Malay and English. As we have seen, these two languages are typologically different; these are evidently manifested from the expression of plurality between Malay and English. I also described briefly MalE as the child is exposed to the variety at some point in the development. Knowing the differences between these two languages will facilitate our understanding of the child's language acquisition in both languages. In the following chapter, the background of the study is discussed.

CHAPTER 3

BACKGROUND

In the previous chapter, the major typological differences between Malay and English are presented. Before explaining the study, this chapter will first present the necessary background information about the study of the bilingual child's plural acquisition in Malay and English. This chapter is organised as follows:

Section 3.1 provides a general overview of the theoretical approaches to First Language Acquisition. Section 3.2 then defines the terminologies and concepts from the field of Bilingual First Language Acquisition that are used throughout the thesis. Following this, section 3.3 presents a review of past research on bilingual children language acquisition germane to the current study.

In section 3.4, The notion of language mode, contexts and linguistic environment is described. Section 3.5 presents the new approach to understanding bilingualism, the translanguaging approach. In section 3.6, the relationship between lexical and grammatical development in monolingual and bilingual acquisition is discussed. As this study's major focus is plural acquisition, Section 3.7 presents related studies conducted on the acquisition of plurality and its related concepts in both monolingual and bilingual children. The theoretical framework used to analyse the morphological development of plurality in the bilingual child is the Processability Theory (Pienemann, 1998); this is presented in section 3.8. Section 3.9 summarises and concludes the chapter.

3.1 Theoretical approaches in First Language Acquisition

In this section, the main theoretical approaches in First Language Acquisition (FLA) research are briefly outlined. There are two primary theoretical approaches in child language acquisition, namely: a) the nativist, generativist, Universal Grammar (UG) and b) the constructivist, emergentist, and functionalist approach (Ambridge & Lieven, 2011). Language acquisition theories that assume some mechanisms of linguistic knowledge are innate, which means the structures exist from birth is considered nativist. The generativist, for instance, presupposes that children's grammatical knowledge, which consists of syntactical categories, inflectional morphology as well as phonological structures are innately specified (Radford, 1996). Nativist and generativist approaches are also called the UG approaches – the notion

that grammar across languages is hardwired and genetically determined. According to Ambridge and Lieven (2011), a theory might be considered a nativist (if it considers children have innate linguistic knowledge) but not generativist because generativist relates to grammatical knowledge. For example, the lexicalist theory of word learning assumes that children learn words by referring to the whole object, as opposed to parts of the objects. The lexicalist approach is nativist because it considers that children are born with such knowledge but not generativist because this knowledge revolves around the meaning of words rather than grammar.

The opposite of the nativist/generativist/UG approach is the constructivist/emergentist/socio-pragmatic/functionalist/usage-based theoretical proposals (Ambridge & Lieven, 2011). In contrast to the nativists, the approach that does not view children have any innate linguistic knowledge is a constructivist theory. The assumption is that children learn by generalising the adult input. However, we need to be reminded that although this approach does not view grammar as innate, the *ability to learn* grammar and acquire language is considered to be innate (Ambridge & Lieven, 2011). Constructivist proposals do not view the target adult grammar as a system of abstract rules, for example, a constructivist account would argue that the word, *kissed* is not produced by rule operation that combines suffix-*ed* to the stem but by generalising from similar word pairing such as *miss* to *missed* (Ambridge & Lieven, 2011). Hence in a constructivist account, children learn grammar by making analogous assumptions from adults' input. Another term to describe the constructivists is *emergentists*; this view arises from the notion that children gradually acquire the grammatical systems from using the language in communication. Socio-pragmatic is also another term to describe the constructivist approach; Tomasello (2001) posits that children's ability to learn language is related to their ability to deduce the interlocutor's attention focus as well as communicative intention. For instance, when adults produce a word while looking intently at an object, children may infer that adults are labelling the object in question.

In BFLA, many studies have been conducted within the nativist generativist framework, for example research on the syntax-semantic interface and syntax-discourse interface (e.g. Hulk & Muller, 2000; Montrul, 2011; Serratrice, Sorace & Paoli, 2004). For the usage-based model, studies by Akhtar and Tomasello (1997) and Paradis, Nicoladis, Crago and Genesee (2010) suggest that the acquisition of morphosyntax emerges in piecemeal fashion and input plays a role in bilingual children's language development.

Thus, for this study, these approaches will shed light on the findings and will explain to what extent the UG and adult input play a role in the child's dual language development. In the subsequent section, the terminologies and concepts of Bilingual First Language Acquisition is introduced.

3.2 Terminologies and concepts in Bilingual First Language Acquisition

The study of bilingualism, specifically the language acquisition of children raised in two languages has gained momentum recently. In fact, substantial number of journals and publications have been produced and myriad of conferences have been organised, which draw the attention from linguists from diverse geographical background (Serratrice, 2013a). The field that investigates language acquisition of children exposed to two languages from birth is termed as Bilingual First Language Acquisition (henceforth BFLA) (De Houwer, 2009). The definition of children exposed to two first languages simultaneously has been given different interpretations, for example, De Houwer (1990, 2009) proposes the stringent cut-off from birth to one week, while McLaughlin (1984) proposes the more lenient cut-off to three years of age. McLaughlin (1984) also broadly divides the acquisition into two phases; simultaneous acquisition, if a child is introduced to two languages before the age of three and successive acquisition if the child is exposed to bilingualism after age three. However, De Houwer (2009, p.5) found this categorisation too general, so she distinguishes between the contexts in which young children acquire language without formal instructions:

1. a. Monolingual First Language Acquisition (MFLA); children are exposed to one language from birth.
- b. Early Second Language Acquisition (ESLA); Initially, children are exposed to one language (in which they will learn to speak). After some time, children are exposed to another language.
- c. Bilingual First Language Acquisition (BFLA); For BFLA children, they are exposed to two languages concurrently. Also, the exposure from the two languages must begin within a week after birth (De Houwer, 1990). Unlike MFLA and ESLA, when BFLA children begin to speak, they tend to use words in each of the languages.

In this thesis, the term used to describe the bilingual child's learning situation is BFLA, as the child fits the description of a BFLA child; her exposure to Malay and

English begins from birth. In Chapter 4 Methodology, details of the timing and exposure of the learning contexts in each of the language of the bilingual child are provided.

Input is defined as the speech that children hear whether it is addressed to them or not (De Houwer, 2009). Input is a crucial factor in children's language development. The pioneering studies in bilingualism such as Ronjat (1913) and Leopold (1939) claim that the one-parent-one language input is the most effective method to raise bilingual children. However, there are other types of input variety in which children grow up to be bilingual speakers (Romaine, 1995). The varieties of language input exposed to bilingual children were first described by Harding and Riley (1986) and later expanded by Romaine (1995). The bilingual child's input variety is contingent on several important factors, namely; the native language of the parents, the predominant environmental language of the community and the parent's strategy in speaking to the child. The following describes the type of language input of bilingual acquisition as described by Romaine (1995, pp.183-185):

2. a. Type 1: one person-one language

Parents: the parents have different first languages with each having a certain degree of competencies in the other's language.

Community: the language of one of the parents is the language used by the community.

Strategy: the parents each speak their own language to the child.

Some studies conducted with type 1 input variety are by Ronjat (1913), Leopold (1939-1949), Taeschner (1983), De Houwer (1990), Dopke (1992b), Lanza (2004), Yip and Matthews (2007), and Itani-Adams (2013).

b. Type 2: Non-dominant home language/ one-language-one environment

Parents: the parents have different first languages.

Community: The language of one of the parents is the dominant language of the community.

Strategy: Both parents speak the non-dominant language to the child, who is fully exposed to the dominant language only when outside the home domain (e.g. nursery).

Studies conducted with type 2 input variety are Fantini (1985), Vihman (1985), and Deuchar and Quay (2000).

c. Type 3: Non-dominant home language without community support

Parents: the parents share the same native language.

Community: the dominant language is not that of the parents.

Strategy: the parents speak their own language to the child.

Studies conducted with type 3 input variety are Haugen (1969), Qi (2011), Kuang (2012) and Medojevic (2014).

- d. Type 4: Double non-dominant home language without community support
Parents: the parents have different first languages.
Community: the dominant language is different from either of the parent's languages.
Strategy: the parents speak their own language to the child from birth.
Studies conducted within type 4 input variety include Hoffman (1985) and Hakansson and Waters (2016).
- e. Type 5: Non-native parents
Parents: the parents share the same first language.
Community: the dominant language is the same as that of the parents.
Strategy: one of the parents always addresses the child in a language that is not his/her first language.
Studies conducted with type 5 variety include Saunders (1982,1988).
- f. Type 6: Mixed languages
Parents: the parents are bilingual.
Community: the community may also be bilingual.
Strategy: Parents code switch and mix the languages.

As shown from the types of the input variety, most studies in BFLA deal with type 1. Type 2 is similar to type 1 except in type 2, the language of the community is introduced later in the child's development and only limited to outside the home domain (Zhu & Li Wei, 2005). Similarly, in type 4, the language of the community is introduced later to the child as the parents who have different L1, neither is the language of the community, talk to the child in their respective language. According to Qi (2011), type 3 and type 6 is the most common input variety among immigrant communities in a host country such as in Australia. Although bilingual acquisition studies with type 6 input varieties are scarce, the situation is in fact, most representative of the bilingual communities worldwide. Type 5, in which the parents or one of the parents talk to the child in a language not of his/her L1, is the most common situation in Malaysia. English is the second language in Malaysia, and it enjoys a high prestigious status. Nowadays, in this age of globalisation, many Malaysian parents opt to speak English to their children at home (Hashim, 2014).

With respect to the bilingual child in this study, the types of input variety she received changed at times; the family moved from Malaysia to Australia and afterward, back to Malaysia. During this period, the family also changed the strategy in which they communicated with the child. For example, from birth to age 1;10, when the family stayed in Malaysia, the Mother chose to speak English (Malaysian English) to the child; this would be classified as the type 5 input variety as the Mother is a non-native speaker of English. When they stayed in Australia, the parents chose to speak Malay in the home domain, and this can be characterised as type 3 language input. When the family returned to Malaysia, the Mother reverted to addressing the child in Malaysian English. The child also received quite a strong bilingual Malay-English exposure as she went to school in Malaysia since most of the teachers and her peers were also Malay-English bilingual speakers; hence this type of exposure strongly suggests the type 6 input variety. In Chapter 4 Methodology, I will further elaborate the linguistic environment of the child throughout the period of investigation. In what follows, reviews of past BFLA studies are provided.

3.3 Studies in Bilingual First Language Acquisition

The study of BFLA began with Ronjat in 1913, which is the first scientific report on a bilingual French-German child, followed by Leopold (1939, 1947, 1949a, 1949b) on his bilingual English-German daughters. Leopold's study was a four-volume longitudinal description of his daughters' linguistic development in English and German. Based on his observations of his two daughters, Leopold posits that children begin with one unified system before gradually differentiating them, evidently reflected in his statement, "infants exposed to two languages from the beginning do not learn bilingually at first, but weld the double presentation into one unified speech system" (Leopold, 1954, p.20).

This proposal is expanded further by Volterra and Taeschner (1978). The authors make a critical assumption that a child acquiring dual languages, initially begins with one fused system before developing separate lexical and grammatical properties. This notion is termed the *Unitary Language System* (henceforth ULS). Volterra and Taeschner (1978) developed a model of bilingual acquisition based on their observations of three children growing up with two languages concurrently; one English-German speaking child and two Italian-German speaking children. The following table illustrates the acquisition stages as proposed by Volterra and Taeschner:

Table 3.1

Stages of bilingual acquisition, from Volterra & Taeschner, 1978

| Stage | Description |
|-------|--|
| I | The child has one lexical system from both languages. |
| II | Two different lexical systems develop, but the child applies one syntactic rule for both languages. |
| III | The child is able to differentiate the two languages lexically and syntactically. However, each language is associated with the parent/person using that language. |

In stage I, the authors proposed that children possess only one lexical system, which contains words from both languages. Children might only have one word in one language and might not have the equivalent term in the other language; hence translation equivalents are few. At this stage, Volterra and Taeschner believe that children are not aware that they are learning two different languages. In stage II, the lexical items from the languages are distinguished. However, children might apply one grammatical system for both languages. It is not until stage three that children may be able to differentiate between the two lexical systems and two separate systems of grammar. The data that Volterra & Taeschner (1978) obtained came from a one-parent-one language study so they make the conclusion that, “the child is truly bilingual” (p.311) when he/she can use each of the languages without associating that language to the person/parent using that particular language.

Evidence used to support ULS mainly stems from instances of code mixing and the seeming lack of translation equivalents among the bilingual children (Redlinger & Park, 1980; Volterra & Taeschner, 1978). The prevalence of mixing utterances makes it logical and plausible to think that children switch between the two languages because they think they are acquiring only one language (Deuchar & Quay, 1998; Swain, 1972, 1977). However, ULS has been criticised on conceptual grounds. Genesee (1989) pointed out that most of the evidence for ULS is simply descriptions and illustrative examples of the children’s mixing utterances rather than a systematic examination of why the utterances occur in the contexts. For example, Redlinger and Park (1980) claim that mixing is significantly reduced, as the bilingual children’s linguistic structures continue to develop. They interpret this as evidence of ULS; children begin with a unified language development (which explains the mixing), and afterwards, the children gradually distinguish between the two languages. However, Genesee (1989) states that mixing is not necessarily indicative of a fused language system; the children might have used words from the other language because, at that

stage, they still had limited vocabularies. So, they ‘borrowed’ words from the other language to better express themselves. In this regard, mixing is used to fill the gap in their lexical knowledge (Deuchar & Quay, 2000). Bialystok (2001, p. 108) aptly argues against ULS, stating, “It is one thing to notice that children appear to use languages interchangeably in the early stages, but it is another to argue that this behaviour indicates a lack of differentiation in children’s minds.” In other words, just because children tend to use mixing in their utterances, it does not necessarily mean that they mix the languages in their cognitive systems.

Another possible explanation for language mixing is simply that children mix languages because the input they hear from adults is also mixed in nature (Rowland, 2014). For instance, Goodz (1989) analysed the speech of 17 English-French children and their caregivers; the findings show that the frequency with which the children produced mixed utterances are highly correlated with the frequency in which their caregivers used mixing in speech. In fact, for bilingual parents, mixing at times, can be inevitable. Parents who opt to raise their children with the one-parent-one-language approach were also found to occasionally use mixed utterances in their speech (Nicoladis & Genesee, 1996). In her study investigating the language development in several Serbian-English bilingual children in Australia, Medojevic (2014) found that though the bilingual Serbian-English parents firmly insist that they only used Serbian in the home domain, their conversations indicate some level of code mixing and switching with English.

The evidence for ULS is far from conclusive, which leads researchers to agree that language mixing cannot be attributed to one unified linguistic system (Rowland, 2014). Current research opinion seems to strongly reject ULS and favour the Separate Development Hypothesis (SDH). De Houwer (1990) proposes the Separate Development Hypothesis (SDH), which states that “a bilingual child’s morphosyntactic development proceeds along separate, non-intersecting lines for each language” (1990, p.38). This position, in contrast to ULS, proposes that children raised in two languages separate the two linguistic systems from early on. In her groundbreaking research, De Houwer (1990) investigates the morphological and syntactic development of a Dutch-English bilingual child from age 2;7 to 3;4. The child, Kate, is exposed to both languages from birth, as the parents opt to raise her with the one-parent, one language input variety. De Houwer’s finding shows that the bilingual child develops two distinct linguistic systems concurrently; each language forms a separate, independent system and very little influence is noticeable from one

language to the other. Another early study by Genesee, Nicoladis, and Paradis (1995) found that although the two-year-old, French-English bilingual subjects tended to use code mixing in their utterances, they differentiated the languages by using the mother's language when communicating with the mother and the father's language when talking with the father.

A follow-up study by Genesee, Boivin, and Nicoladis (1996) also supported SDH; the two-year-old, bilingual children in the holophrastic stage distinguish the two languages by using the languages separately with monolingual interlocutors. Studies on bilingual perception too, have indicated that children can differentiate prosodic properties of the two languages at four months of age (Bosch & Sebastian-Galles, 2001). Recent research by Itani-Adams (2013) also supports SDH; the Japanese-English bilingual child's morphological and syntactic development in Japanese and English was similar to the findings from previous first language acquisition research in each of those languages. The child was found to develop language-specific acquisition in Japanese and English. Thus, on the basis on the current research findings, it may be concluded that the use of code mixing by bilingual children is not substantial evidence that they are developing an initial single language system. In Genesee's words (2001):

"...child bilingual code mixing does not reflect an incapacity of the language faculty to develop functionally differentiated systems during the initial stages of acquisition. Code mixing is more appropriately viewed in terms performance factors (e.g., proficiency) and not in terms of the child's fundamental underlying competence. Indeed, the pragmatic performance of bilingual children, even those in the one-word stage, reveals quite sophisticated pragmatic skills, skills that imply underlying differentiation, at least at the functional and possibly also at the representational levels" (p.157).

Currently, SDH has received numerous support from diverse research, which provides evidence that children develop two distinct linguistic systems (Bonnesen, 2009; Liceras, Fernandes Fuertes, & Perez-Tattam, 2008; Macrory , 2007; Mishina-Mori, 2002, 2005; Qi, Di Biase, & Campbell, 2006; Serratrice , 2001, 2002; Silva-Corvalan & Montanari, 2008; Zwanziger, Allen, & Genesee, 2005, among others). Now that the unanimous agreement in BFLA is that children are capable of

discriminating between the two languages early on, one question arises; do the two language systems develop independently or do they show interaction throughout the development? This issue is addressed by Paradis and Genesee (1996); they are the first to introduce the concept of *autonomous* and *interdependent* development. Autonomous development means that the two developing languages develop in almost-complete isolation, with very little interaction. Thus, children acquire the phonology, lexicon, and grammar of each of the language independently. This view is advocated by De Houwer (1990) and Meisel (2001). Interdependent development, on the other hand, is defined as “the systemic influence of the grammar of one language on the grammar of the other language during acquisition, causing differences in a bilingual’s pattern and rates of development in comparison with a monolingual’s (Paradis & Genesee, 1996, p.3). In this view, the two languages are believed to interact with each other, which leads to cross-linguistic influences (henceforth CLI). Interdependent development is advocated by Dopke (1998), Muller and Hulk (2001), Serratrice (2013b), and Yip and Matthews (2007).

The term *transfer* and CLI are sometimes used interchangeably in the field of BFLA. For example, Paradis and Genesee (1996,p.3) defines transfer as the “incorporation of a grammatical property into one language from the other”. Therefore, the most obvious instances of transfer will be those grammatical constructions that the bilingual speaker uses by taking one feature from language A into language B (the feature must be absent in language B). Also, such transfer should not be available in monolingual development. De Houwer (2009) on the other hand, uses the term CLI. De Houwer (2009) postulates that CLI is in evidence if bilingual children’s unilingual utterance in language A uses a structure from language B that does not exist in language A. CLI utterances are also not adult-like. De Houwer further states that clear examples of CLI in bilingual children are difficult to find; out of 4,144 utterances of her Dutch-English bilingual participant (De Houwer, 1990), only 10 utterances might indicate CLI. Similarly, in Sinka (2000), only 15 utterances of the Latvian-English bilingual children can be categorised as CLI. In this thesis, I opt to use the term CLI rather than transfer. The term transfer implies that the utilisation of the grammatical structure is permanent on the learner’s part. This is usually not the case because CLI is dependent on many variables and it is often temporary and fleeting.

Returning now to the issue of autonomous versus interdependent development; Paradis and Genesee (1996) tested their predictions by investigating language

development in two-and three-year-old, French-English bilingual children. Their findings support the autonomous view; firstly, the children tend to use more inflected verbs in French than in English. This finding indicates that children's usage of French inflections did not assist them in learning English inflections. Secondly, the children used negation differently in English and French. In French, the children produced the negator *pas* before as well as after the verb, as in *pas chercher les voitures* 'not look for the cars' and *ca tourne pas* 'that turns not' and in English, the negations are produced pre-verb, such as *me no go home*. In terms of pronouns, the children were also found to use pronouns specific to the language; for example, *il* and *elle* occurred only in French utterances while *he/she* occurred only with English utterances. Paradis and Genesee concluded that the bilingual children's grammatical acquisitions are identical to the development exhibited by monolingual children's in each of the language. Meisel (2001) also found the autonomous development hypothesis more convincing than the notion of interdependent development. His argument is based on the idea that in many bilingual acquisition studies, despite the developmental differences among the bilingual children, they will finally achieve grammatical competence comparable to monolinguals in each language.

However, as is often the case, evidence has been presented to contradict the autonomous view. Dopke (1998), for example, explains the cross-linguistic influences using the Competition Model (Bates & MacWhinney, 1989). In this model, the acquisition of grammar is viewed to be based on the competition of structural cues; cues or linguistic structures that occur frequently in the input and are more perceptually salient will be acquired compared to the cues of lesser strength. Within bilingual and multilingual contexts, since there are two different sets of input and multiple cues, it is purported that if the cues occur unambiguously and more frequently in the input, it will be used by bilinguals/multilingual to establish a grammatical rule. Dopke (1998) reports that the unusual structures in her two to four years old English-German bilinguals stemmed from the overgeneralisation of English V-O (verb-object) order to German. V-O and O-V (object-verb) are possible in German, but since English only allows V-O, thus making the rule more salient, the children use the structures in both languages.

Another influential theory proposing CLI is by Muller and Hulk (Hulk & Muller, 2000; Muller & Hulk, 2001). Their suggestion for CLI to occur is based on in the following criteria; firstly, the grammatical domain between the two languages must be

at the interface between syntax and pragmatics. Secondly, the languages must overlap structurally at the surface level. Serratrice (2013b, p. 7) explains the criteria:

“If the child’s grammatical analysis of a structure X in language A is potentially ambiguous and lends itself to analysis 1 and analysis 2, and the same structure X can only match analysis 1 in language B, then the prediction is that there will be unidirectional influence from language B to language A.”

In this CLI notion, Muller and Hulk (2001) assumes that language requiring the more complex syntactical analysis will be influenced. This assumption is derived from the general view that children, whether raised monolingually or bilingually, will choose the less complicated structure and overgeneralise it in all contexts. Muller and Hulk (2001) analyse object drop in Germanic and Romance languages; they believe that object drop will be susceptible to CLI as it lies between syntax and pragmatics. Also, there is a partial structural overlap; object drop is allowed in Germanic languages but it is not allowed in Romance language. Thus, the prediction is that children acquiring these two languages might be prone to omit the subject in the Romance languages due to the CLI from the Germanic languages. In fact, this is what the authors found in their study; the bilingual Dutch-French, German-French, and German-Italian children produced higher object omission in their French and Italian speech. Similarly, Serratrice et al. (2004) also found evidence for CLI in an English-Italian bilingual child’s subject realisation. In English, subject is obligatory but in Italian, the subject can be dropped if the referent has been established as the topic of the discourse. Serratrice et al. report that their participant used more subject pronouns in Italian compared to monolingual Italian children; the authors attributed this overt subject realisation as influence from the English language. Unsworth (2003) sets forth to test Hulk and Muller’s theory (2000) by examining the longitudinal corpus data from a bilingual German-English child. No signs of CLI are found though the conditions of syntactic interface are met.

Yip and Matthews’ (2007) findings also disprove Muller and Hulk’s theories. The subjects in Yip and Matthews’ study exhibits interactions from the two languages, Cantonese and English, despite the fact that these two languages are typologically distant and do not overlap. The Cantonese-English bilingual children are found to use *wh-in situ* in their English utterances preponderantly, which provides evidence for CLI from Cantonese. Yip and Matthews attribute CLI interactions to language dominance,

which they defined “for a child exposed to two or more languages simultaneously, if one of the languages develops faster than the other in terms of measurable differences such as mean length of utterance (MLU) differentials, there will be cross-linguistic influence from the dominant language to the weaker language” (2007, p. 42). In this definition, MLU is operationalised as the quantitative measure to determine language dominance.

Language dominance is a vast concept, which involves “a linguistic proficiency component, an external component (input) and a functional component (context and use)” (Silvina Montrul, 2016). In general, the dominant language of a bilingual child refers to the language in which the child is more proficient in, but there is no uniform definition of dominance in the literature although the term appears frequently in the discussion of BFLA (Kupisch, 2007). In BFLA, language dominance has always been considered one of the main factors to account for the direction of CLI. Many studies have reported that bilingual children tend to incorporate elements from the dominant language to the less dominant one (Gawlitzeck-Maiwald & Tracy, 1996; Aafke Hulk & van der Linden, 1996; Yip & Matthews, 2007). Dominance has also been interpreted in many different ways, invoking most often linguistic contact factors (Deuchar & Muntz, 2003; Genesee & Nicoladis, 2006; Li Wei, 2000; Petersen, 1988). Currently, many recent studies addressing the issue of dominance in bilingual children use standard measures to compare the two developing languages and determine which of the language is the stronger and which is the weaker one (Bonnesen, 2009; Cantone, Muller, Schmitz, & Kupisch, 2008; Lim, Rickard Liow, Lincoln, Chan, & Onslow, 2008; Matthews & Yip, 2011; Yip & Matthews, 2007). Most often, the weaker language is associated with protracted development and lacks the morphosyntactic properties, while the stronger (or dominant) language is posited to resemble that of L1 (Erika Hoff et al., 2012; Paradis, 2010; Paradis, Genesee, & Crago, 2011). Throughout this thesis, dominance is referred to; a) the bilingual child’s MLU profile i.e. the language with higher MLU at a given period is considered the dominant language b) the predominant environmental language (e.g. English in Australia, Malay in Malaysia).

Another recent explanation for CLI between the two developing languages is from the perspective of language processing, proposed by Nicoladis (2006, 2012) and Nicoladis & Gavrilla (2015). This theory is derived from the speech processing model by Levelt et al (1999). According to this speech model, competition between the two languages at the lemma level is the reason for the CLI to occur. At the lemma stage,

speakers have to choose words for the speech production but the speakers choose wrongly; so CLI in this view is regarded as a type of speech error. Nicoladis (2015) investigated the adjectival constructions in three-to-six-year-old Welsh-English bilingual children. Adjectives appear after nouns in Welsh (e.g. *Gwynnen mawr* ‘bee big’, *Botwm sgwâr* ‘button square’) and before nouns in English (e.g. big *flower*, *square globe*). There is no overlap between the adjectival constructions so, based on Muller and Hulk (2000,2001) theory, there should not be any occurrence of CLI in the study. However, Nicoladis (2015) found that the bilingual children produced adjectives before nouns in Welsh and adjectives after nouns in English. Nicoladis interpreted the CLI phenomenon in the study as a result of processing error; bilinguals have access to multiple linguistic constructions and this presents competition for speech production. Hence, this competition at times, lead to speech errors. In addition, Nicoladis states that most of the adjectival constructions were produced in the conventional order of each of the language and only a few were produced in reverse, which she claims to be consistent with the notion that CLI is a kind of speech error.

CLI has also been investigated in the form of interactions and interference in phonology; a recent study by Ni Luh Putu and Pastika (2016) who investigated the phonological development of a bilingual Indonesian-German child found that the child tends to use the Indonesian palatal approximant [j] to replace the front rounded vowel [ɥ] when speaking German. The study concludes that sound segments develop independently but there are also limited instances where cross-phonological systems occurred. This study substantiates an earlier study by Paradis (2001) who found that the phonology of 17 French-English bilingual children developed separately but the development is nonautonomous.

In this section, I have elaborated on the prominent studies in BFLA, beginning with studies advocating the unified language system up till the recent debates about CLI. The following diagram summarises the development of the empirical studies in BFLA.

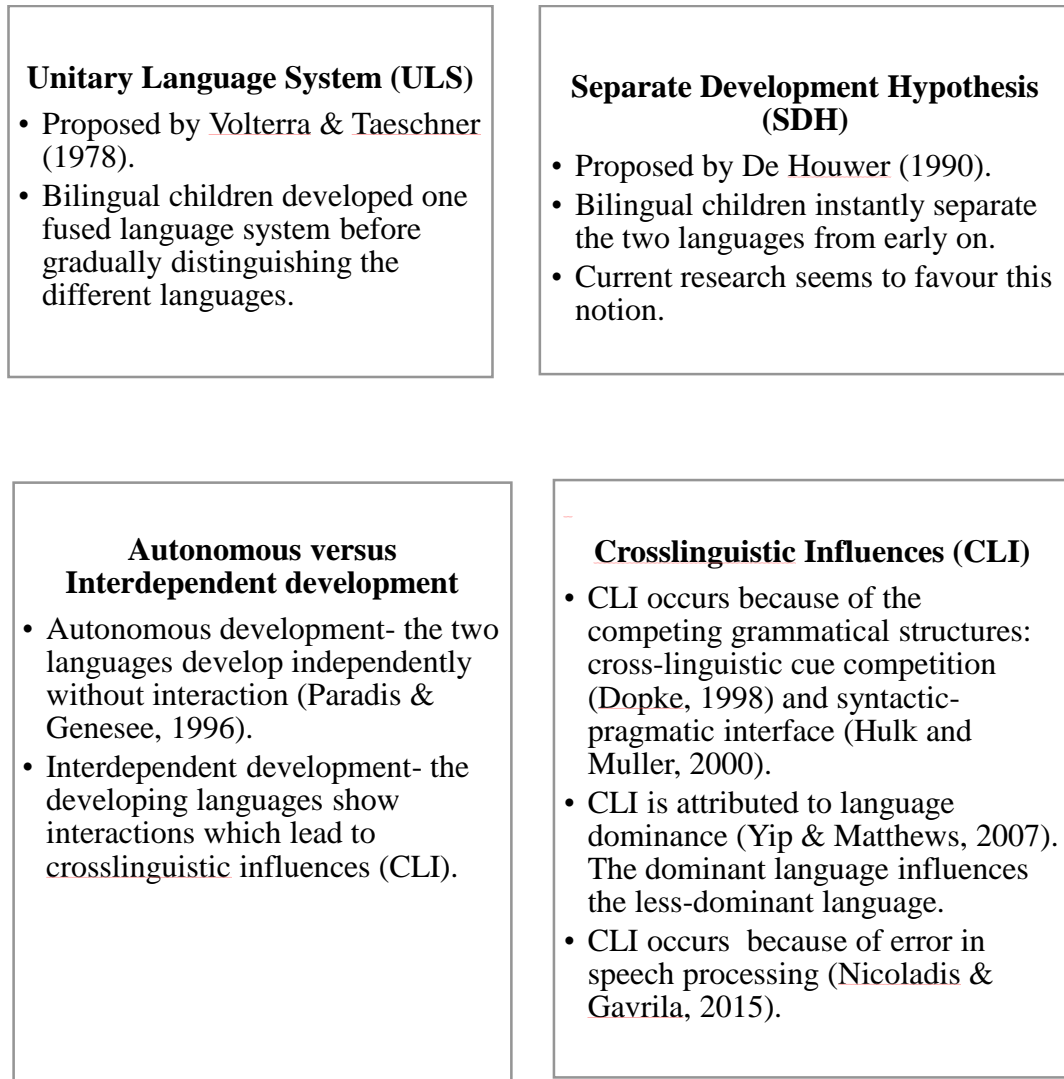


Figure 3.1. The summary of BFLA studies.

3.4 Language mode, contexts and linguistic environment

In this section, I will elaborate on the sociolinguistic dimensions of bilingual development. Grosjean (1998, p. 136), proposed the notion of “language mode”, which is defined as “a state of activation of the bilingual’s languages and language processing mechanisms at a given point in time. In their daily lives, bilinguals would find themselves constantly switching between monolingual and bilingual language mode; in monolingual mode, bilinguals would find themselves interacting with monolinguals in one of the languages they know, thus one language is active, and the other is deactivated. For bilingual mode, both languages are activated, as the bilinguals are interacting with other bilinguals who share their two languages. Thus, in bilingual

mode, bilingual speakers tend to use mixing and code switching. In his response to Muller's article (1998) on language transfer in BFLA, Grosjean states that it is highly likely that in obtaining data from the bilingual children, the bilingual researchers might have set the stage for bilingual mode. In fact, it has been observed that researchers rarely control the language mode of their bilingual participants (Odlin, 1989); this observation is also corroborated by studies in BFLA (Genesee, 1989; Goodz, 1989; Meisel, 1989). Consequently, because the participants are in bilingual mode, it is hard to distinguish whether the language mixing produced during the tests/recordings is truly an instance of language interferences or perhaps just normal mixing activated by the bilingual language mode. In this thesis, the monolingual and bilingual language mode can be observed in the contexts of the recordings (the recordings will be elaborated in Chapter 4 Methodology).

Talking about contexts, in many BFLA studies, those investigating the role of contexts are scarce (Lanza, 2004). There is far too much emphasis on the linguistic structures produced by the dual language acquirers rather than the situational contexts in which communication takes place. The contexts in which these bilingual youngsters acquire their languages are treated as a given background variable. However, bilingual children's knowledge of each of their developing languages is distributed in nature; for example, they may learn certain words from school domain and learn another set of words from home (Oller & Jarmulowicz, 2007). This property of bilingual learning is what Oller and Pearson (2002) termed as "the distributed characteristic"; children acquiring two languages tend to learn the vocabularies of each of the language without a translation equivalent in the other language. Thus, the concepts they learn in each language is lexicalised and distributed across the two languages, and this is particularly evident for young bilingual children (Oller, 2005). In the thesis, the distributive nature is evident in Rina's lexical mixing, which I will describe in the lexical development section (section 5.3).

Related to the contexts in which bilingual children learn the language is the input. De Houwer (2009) defines regular input as the daily contact with a language through interpersonal interaction or by overhearing the language. For bilingual children, the influence of input offer an interesting situation; whereas for monolingual children the input they receive is 100% from one language, bilingual children receive some fraction of the daily input from their two developing languages (Bialystok, 2001). In this study, the input I specifically refer to is the linguistic environment that the bilingual child is exposed to. According to Unsworth (2016), various factors may

affect bilingual children's linguistic environments, which include parental language strategy, the status of the language(s), siblings and birth order, amongst others. All these factors may influence the amount of input, hence contributing to the variability in bilingual children's language experiences. Input is also divided into two types; the quantitative and qualitative properties of input. These two properties of input may influence the rate of bilingual children's language development (Sorace, 2005). Studies investigating input quantity include the amount of exposure the bilingual children received at home versus at school (Chondrogianni & Marinis, 2011; Gathercole & Thomas, 2009) and their gradual cumulative exposure in the two languages (Gutiérrez-Clellen & Kreiter, 2003; Unsworth, 2013). While for input quality, the focus has been given to the "richness of children's language input" (Unsworth, 2016, p. 157) such as the input the children received from different sources (Jia & Fuse, 2007) and whether the interlocutors are L1 or L2 speakers (Place & Hoff, 2011). For this thesis, the linguistic environment included in the analyses is the quantitative input that Rina received, i.e. I examined her estimated amount of exposure in English and Malay in both the longitudinal study as well as the elicitation sessions at age 4;8.

One study that reported the effect of the linguistic environment on bilingual children's acquisition is by Barrena, Ezeizabarrena, and Garcia (2008), who investigates the effect of the linguistic environment on the development of the lexicon and grammar of Basque bilingual children in longitudinal and cross-sectional studies. The authors examine two variables in the input; the degree of exposure to Basque at home as well as the linguistic competence of the parents. The participants were divided into three groups; monolingual children (M), categorised as having more than 90 per cent Basque input, bilingual children with Basque-dominant input (BB), categorised as having 60-90% Basque input and bilingual children from non-dominant Basque family environment (BR), classified as having less than 60% input.

In the longitudinal study, no significant differences were found between the monolingual (M) and bilingual-Basque dominant (BB) group in terms of the production of vocabulary, MLU, and some grammatical suffixes. For the cross-sectional study, it was found that input exposure has a strong influence on the lexical and grammatical development from age 23-24 months and especially more so after 27-28 months when the mean vocabulary size exceeds 300 words. This finding shows that the differences between groups are more pronounced when the critical mass of their vocabulary is consolidating (Bates, Bretherton, & Snyder, 1988; Marchman &

Bates, 1994). In the cross-sectional study, it was also found that children from non-dominant Basque environment scored lower on vocabulary size, complexity and morphological production. Also, children whose both parents speak Basque indicate higher vocabulary size, longer MLU and more complex grammatical production. The conclusion reached by the authors is that the degree of presence of Basque influences the development of lexicon as well grammar of the bilingual children. As the bilingual child's linguistic environment in this study changed throughout the period of investigation, we will see whether the changes in the environment affect her language development as well.

3.5 Translanguaging and bilingualism

Translanguaging is a new approach to understanding bilingualism. Translanguaging is defined as “the deployment of a speaker's full linguistic repertoire without regard for watchful adherence to the socially and politically defined boundaries of named (and usually national and state) languages” (Otheguy, García, & Reid, 2015, p. 281). In translanguaging, “idiolect”, which is the speech convention of an individual, is viewed from the internal perspective, rather than the external point of view of the social construct that classifies the so-called languages. Language speakers, both monolinguals, and bilinguals, monitor their speech output to adapt to social interactions. However, this process appears to be stronger in bilinguals as they have a bigger set of lexical and structural properties as well as more complex socio-cultural boundaries (Otheguy et al., 2015). In a way, translanguage is related to the language mode discussed before, i.e. the speakers have to adjust which features to use in the respective monolingual or bilingual mode. Translanguaging, according to Garcia and Li Wei (2014), is a natural human instinct; evidence from research have reported that children as young as 18-months-old can use various semiotic properties when interpreting different forms of symbolic references (Namy & Waxman, 1998).

Building on the translanguaging approach, empirical studies have investigated the link between bilingualism/multilingualism and creativity, such as those by Beardsmore (2008), Kharkhurin and Li Wei (2015), Li Wei (2011) and Li Wei and Wu (2009). In the studies, code-switching behaviours are seen with a new perspective; it is not just the combination of two differing linguistic structures but also, “an expressive, creative and often multimodal performance” (Kharkhurin & Li Wei, 2015, p. 153). Because of their wider exposure as well as bigger lexical resources, bilinguals/multilinguals have potential creativity superior than monolinguals. For

bilingual infants, Kharkhurin (2012) argues that since the children are raised with cross-linguistic and cross-cultural experiences, this facilitates divergent thinking, which is imperative for creative thoughts. The findings in this study will also be analysed using the translanguaging approach, as it will further enhance our understanding between childhood bilingualism and creativity.

3.6 Studies on the relationship between lexical and grammatical domains

In the thesis, I also explore the lexical and grammatical relationship in the bilingual child's development of Malay and English. Therefore, in this section, studies investigating lexical and grammatical relationship in child language acquisition, both in monolingual and bilingual studies, are reviewed. Research on monolingual children has found a close relationship between lexicon and grammar, particularly in the early stages of acquisition. Based on English data, groundbreaking research such as Bates, Dale and Thal (1995), Bates and Goodman (1997), Bates and Goodman (1999), Fenson, Bates, Dale, Thal and Reznick (1994), Dale, Dionne, Eley and Plomin (2000) and Dionne, Dale, Boivin, & Plomin (2003) show a high correlation between vocabulary size and the development of grammar.

In their study of 1,803 English L1 children, Bates et al. (1995) reported a tight relationship between the size of the children's lexicon and the onset of grammar. Their findings indicate three level of development; firstly, word combinations appear when the vocabularies fall between 50-200 words. Secondly, verb morphology emerges when the vocabularies are within 400-600 words and finally, sentence complexity are observed to increase significantly when the children's vocabulary exceeds 400 words. The developmental nature of lexicon and grammar in their study is illustrated in the following graphs:

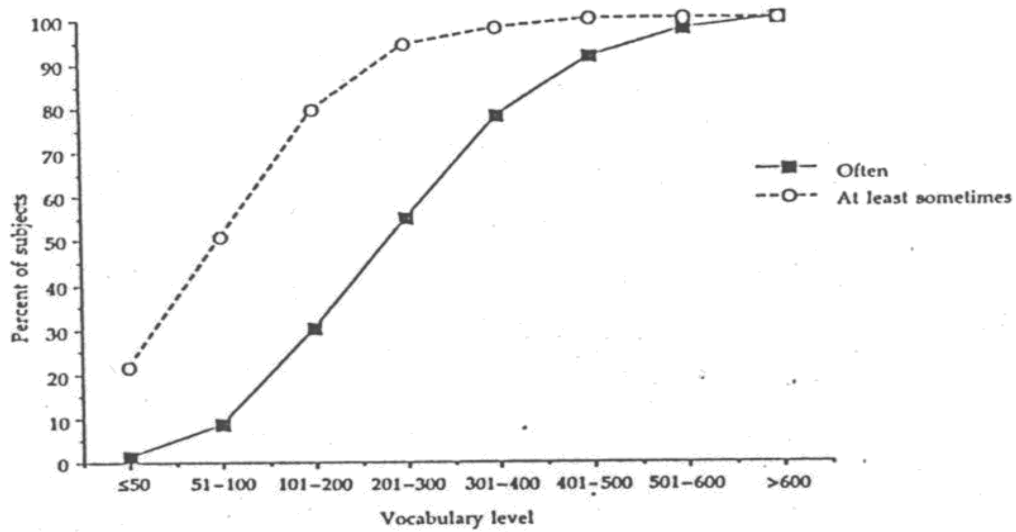


Figure 3.2. Percentage of subjects producing word combinations as a function of vocabulary size on the MacArthur CDI toddler scale, taken from Bates et al. (1995, p.39).

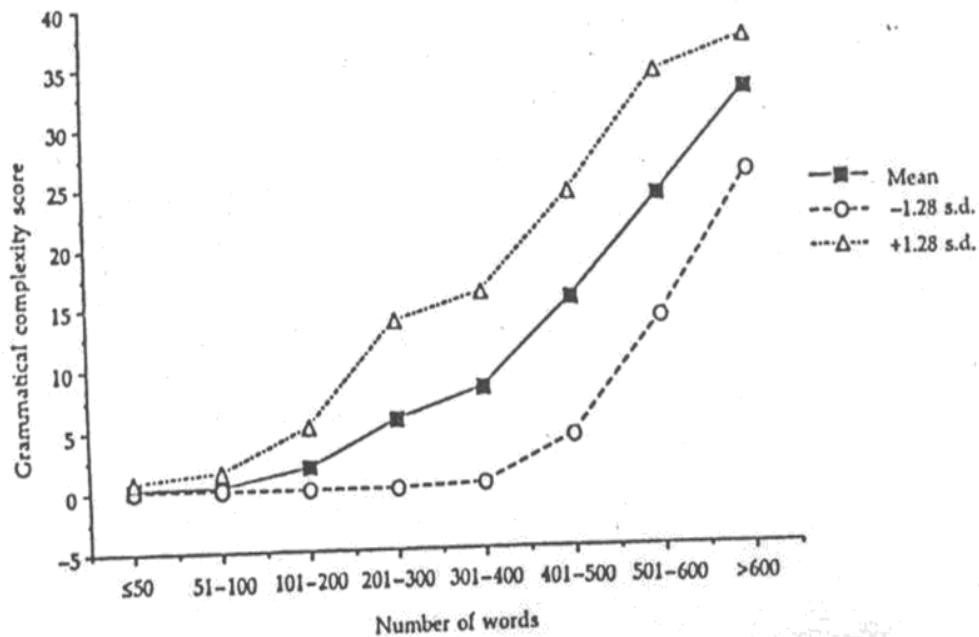


Figure 3.3. Grammatical complexity score as a function of vocabulary size on the MacArthur CDI toddler scale, taken from Bates et al. (1995, p.39).

Based on the findings, Bates et al. (1995) suggest, “grammatical development depends upon the establishment of a critical lexical base. Indeed, different grammatical events may each depend upon a different lexical base e.g. word

combinations emerge in the 50-100-word range; verb morphology emerges in the 400-600-word range” (p.11). Pertaining to the word range, Marchman and Bates (1994) proposed the notion of *critical mass hypothesis*; according to this notion, the morphological acquisition is contingent on the child’s acquisition of words, “most strongly after the number of items in a child’s vocabulary reaches a critical mass”(p.346). Marchman and Bates state that there seems to be a strong continuity between lexical and grammatical development. Bassano, Laaha, Maillochon, and Dressler (2004) support this notion, stating that “developments within morphosyntax are triggered by an increase in the size of the lexicon beyond a given level, thus providing support for the interdependence of lexical and morphosyntactic developments” (p.36).

The lexical-grammatical relation is also observed in other L1 acquisition, for example Italian (Caselli et al., 1995; Caselli, Casadio, & Bates, 1999), Hebrew (Maital, Dromi, Sagi, & Bornstein, 2000), Icelandic (Thordardottir, Weismer, & Evans, 2002), and Spanish (Jackson-Maldonado, Thal, Marchman, Bates, & Gutierrez-Clellen, 1993; Jackson-Maldonado et al., 2003).

For bilingual children, studies investigating the lexical grammatical relationship show that the bilingual children’s grammatical abilities are correlated with the size of the lexicon in the specific language. For example, the findings reported by Marchman, Martinez-Sussman, and Dale (2004) in their 113 Spanish-English bilingual participants is that the grammatical ability in Spanish is correlated by the size of Spanish lexicon and likewise, the grammatical ability in English is correlated with the size of the participants’ English lexicon. Conboy and Thal (2006) also report that the use of relational and function words in English-Spanish bilinguals are dependent on the growth in of vocabulary in each language. Similarly, the findings in Simon-Cereijido and Gutiérrez-Clellen (2009) also demonstrate high correlations between vocabulary and grammar in 196 Latino five-year-olds. Other than Spanish-English language pair, French-English bilinguals also exhibit similar developmental pattern; French grammar is influenced by the size of French lexicon and vice-versa (David & Li Wei, 2005).

In all these bilingual studies, the researchers could not find any cross-language correlations. The development of grammar in bilingual children is found to be proportional to the growth of the lexicon within the same language. Thus, they interpret the results as supporting the autonomous development of the two languages (De Houwer, 1990; Meisel, 1989). However, I believe more studies on different

language pairs are needed to understand the relationship between the emergence of grammar and the size of the lexicon in bilingual children. Specifically, the issues of mixing and code switching need to be highlighted with regard to the lexical-grammatical relationship in BFLA. Therefore, this thesis aims to address this gap by examining the correlation between lexicon and grammar in Malay and English bilingual child, hence shedding light on this issue.

In analysing the grammar-lexical association, I also analyse the bilingual child's composition of lexicon in Malay and English (this will be discussed in Chapter 5 Morphological development). Previous studies in L1 monolingual children have shown that nouns are the earliest and predominant lexical item acquired by children; Gentner and Boroditsky (2001) termed this phenomenon as 'noun-dominance'. 'Noun-dominance' phenomenon is supported by many studies, for example Fenson et al. (1994) report that nouns tend to dominate children's early words. Similarly, studies conducted on L1 children acquiring other languages such as Turkish (Gentner, 1982), Spanish (Jackson-Maldonado, Thal, Marchman, Bates, & Gutierrez-Clellen, 1993), and French (Bassano, 2000) also indicate the early appearance and strong presence of nouns in early lexical acquisition. In bilingual acquisition, initially, Itani-Adams' (2013) Japanese-English bilingual child exhibited higher usage of nouns in both Japanese and English. The child began learning the words in both languages with nominals, which is consistent with the 'noun-dominance' concept. However, in Japanese, Itani-Adams noted that the child increasingly continued using verbs that at age 4;7, the number of verbs becomes greater than nouns. So, for Japanese, the child began with noun-dominant and later on, her lexical acquisition shifted to become verb-dominant. For this thesis, we will see later in the analyses whether the Malay-English bilingual child acquires nominals first or some other lexical categories in her lexical acquisition

In this section, I have provided a review of studies related to grammar and lexical development in the monolingual and bilingual acquisition. In what follows, studies on the acquisition of plurality in FLA and BFLA is discussed.

3.7 The acquisition of plurality in FLA and BFLA

In this section, I will provide some overview of research investigating plurality and its related concepts in monolingual and bilingual children.

3.7.1 Counting and number concepts in language acquisition. Before acquiring the plural marker of a language, it is necessary that children recognised the concept of numbers. Thus, in many research, it has been documented that prior to marking more than one object, children first develop counting and number concepts. There is an extensive literature on the description of number development in children language acquisition. The main contribution to this field comes from the scholars in psycholinguistics, who often view children's early number sequence as a springboard for later mathematical learning. Studies investigating children's early number concepts have shown that young children can distinguish sets of small number objects; they can differentiate between one, two, three and four object entities (Dehaene, Dehaene-Lambertz, & Cohen, 1998; Starkey, Spelke, & Gelman, 1990; Wynn, 1992). The developmental progression of children's early number acquisition has been reported to be as follows; first, children develop a list of simple count-sequence routine at age two (e.g. *one two three*), but at this age, the count sequence appears to be devoid of meaning. Afterward, children become "one-knowers"- at this stage, "one" means one and all other numbers mean more-than-one. The following stage was reported to be the "two-knowers" stage, followed by "three-knowers stage"; children learn that "two" mean two, and later they learn the appropriate numerosity for number "one," "two" and "three". Previous studies also reported that by age three, children seem to have at least a rudimentary understanding that every number in numerical sequence has some increasing amount but it might take them a while to understand the numerosity of every count sequence (Sarnecka, Kamenskaya, Yamana, Ogura & Yudovina, 2007; Sarnecka & Lee, 2009; Skwarchuk & Anglin, 2002; Slusser & Sarnecka, 2011; Wynn, 1992,1995).

From these studies, what can be concluded is that the acquisition of numbers and numerical concepts are a drawn-out process for children. However, majority of the studies only investigate the development of number concepts in L1 English-speaking children. It is plausible to assume that if the development is a protracted process for monolingual children, it will take bilingual children longer time as they are faced with the challenges to express the same number concepts in two separate languages. In this thesis, we will see later on the link between the bilingual child's early number concept and her acquisition of plurality in each language. In the next section, I describe the major findings in research investigating plural acquisition in English monolingual children.

3.7.2 Plural acquisition in L1 English children. It has been reported in many languages that plural expression or number markers were acquired relatively early by children (Slobin, 1973). For English-speaking children, plural *-s* was found to be one of the earliest morphemes to be acquired. The pioneering research by Berko-Gleason (1958), Brown (1973), Cazden (1968), and de Villiers and de Villiers (1973) reported that the plural suffix *-s* is among the earliest morphemes acquired by L1 English children. Typically, children acquiring English produce their plural forms, for highly frequent nouns, at around 1; 6 (one year and six months) up to 2;6 (two years and six months). Similarly, parental reports also found that children learning English begin producing the regular plural *-s* at around 24 months (age 2;0) (Barner, Thalwitz, Wood, Yang, & Carey, 2007). Wells (1985) also found that plural nouns occur quite consistently in L1 English children around the age of 1;6, but the frequency of plural nouns as compared to the singular nouns is low. In other words, plurality is not a very common linguistic feature in children's speech.

In a seminal experiment, Berko-Gleason (1958) presented her respondents, children ranging from four to seven-years-old, with a single novel thing, which she named 'wug' and asked the children to provide the plural form. However, she found that even early school age children (six to seven-years-old) were not able to produce the regular plural *-s* consistently in all necessary contexts. Longitudinal observations show that though plural suffix *-s* were acquired early by English speaking children, it emerged in piecemeal fashion in the course of development (Lieven, Pine, & Baldwin, 1997; Mervis & Johnson, 1991).

In a relatively recent study by Clark and Nikitina (2009), which investigated plural marking productions in L1 English children (age two-to-three-years old) in longitudinal as well as cross-sectional studies, it was reported that the children express semantically compatible forms before acquiring the conventional English plural expressions. Plural *-s* were only used in a few items; their participants produced mainly quantifiers+ default form (e.g. *two blanket, two duck, more cookie*) and some used iteration with pointing gestures (e.g. *lamp lamp lamp*). Clark and Nikitina (2009) called these unconventional categories as the, "emergent categories". In what follows, I will first explain the concept of emergent categories as this notion play a crucial role in understanding plural acquisition of the bilingual child's in this study.

3.7.3 Emergent categories, conceptual development and iconicity. Emergent categories are categories in which children assign conventional meaning to

idiosyncratic forms to express certain conceptual categories. Clark (2006) contrasts the emergent categories with, “robust categories”; the latter are conceptual categories that do receive expressions in the language, so when children acquire them they can continue using the categories, as it is stable and supported in the linguistic environment. Across languages, Clark (2006) states that some categories are grammaticalised but not in others. So, when children begin acquiring language and try to express a conceptual distinction, they will first find semantically compatible forms. Some examples of emergent categories from L1 English children include the use of first person pronoun to mark degrees of agency. Instead of using *I* for first-person subject and *me* for first-person object, children age 1;8 to 2;8 were found to use *me* and *my* to mark activities in which they are in control and use *I* when they have little control in the activity; for example *My cracked the eggs, Me jump, My taked it off, I like peas, I like Anna* or *I want the blocks* (Budwig, 1989;1990).

Conceptual development is defined as the various conceptual distinctions that form gradual steps in children’s cognitive development (Slobin, 1973). Conceptual development is presumed to be similar across different populations. This position is supported by Clark (2004,2006) who states that prior to language acquisition, children begin by setting up conceptual representations to convey their experience. However, languages differ in how they encode experience; that is not all conceptual categories appear in all languages. Slobin (1979) encapsulated this idea aptly, stating that, “Language evokes ideas; it does not represent them. Linguistic expression is thus not a straightforward map of consciousness or thought. It is a highly selective and conventionally schematic map” (p.6). The iconic nature of a symbol also plays a role in children’s conceptual representation. Piaget (1962) defined iconicity as the resemblance between a symbol and its referents. Piaget also suggests that if there is a clear relationship between the symbol and its referent, then the item is rendered as easily accessible to young language learners. This proposition lends support to Slobin’s theory that iconicity plays a role in children’s language acquisition (1980). In the article, Slobin contends that children across all languages are “linguistic icon-makers” and they “will strive for transparencies in meaning-form correspondence in their acquisition of language” (p.231). In his other article, Slobin (1985a) lists some grammatical mistakes children made based on numerous child acquisition data in Polish, Hungarian, Turkish, Japanese, Portuguese and Hebrew. He concludes that the grammatical mistakes reveal the iconicity in grammar and that children “are not bad icon-makers at all!” (p.242).

When discussing about iconicity in language acquisition, I observe that most studies tend to associate iconicity to the concept of sound symbolism. Sound symbolism is defined as the systematic relationship between the sound of an utterance and its meaning (Hinton, Nichols, & Ohala, 1994). Studies in sound symbolism have reported that there is a strong relationship between the sound of a word and the semantic aspect of it; Ramachandran and Hubbard (2001) for example, conducted a study in which they asked L1 speakers of Tamil and English to match the shape with the words ‘bouba’ and ‘kiki’. Their findings show that 95% of the participants chose the round-shape object as ‘bouba’ and the jagged one as ‘kiki’. Based on this finding, the researchers interpreted that there is a relationship between the shape of the mouth and the shape of the objects; the rounded shape is described as ‘bouba’ because of the roundness of the mouth and the jagged object is described as ‘kiki’, which matches the pattern of the mouth when producing the word. In line with this ‘bouba/kiki’ finding, Daphne, Thanujeni, and Catherine (2006) replicated this study on young children; their goal is to investigate whether sound symbolism might influence early language development. Interestingly, the findings demonstrate that similar to adults in Ramachandran and Hubbard (2001), young children tend to match round shapes to words containing the vowels [a] and [u] and pointy shapes to words containing the vowels [i] and [e].

Pertaining to plural marking, there were also studies that found the correlation between the prosodic patterns of a word and the quantity of the items; in a study by Camarata and Gandour (1985), they reported that one language-impaired child who cannot mark English plural with the suffix -s, resort to suprasegmental strategy to express plurals. In Camarata’s following research (1990), he replicated this research on a normally developing child and found that the participant, age 2;7, used an increase in fundamental frequency (F0) and duration to signal plurals which is similar to the phonologically impaired child. In the findings of this thesis, some aspects of sound symbolism also appear in the bilingual child’s plural development, which I will describe in the results chapter (Chapter 5).

Returning to the discussion of conceptual development in language acquisition; pioneering work in the development of conceptual categories places these emergent categories in the field of cognitive development, moderated by the semantic structure inherent in the exposure language (Bowerman, 1985; Choi & Bowerman, 1991; Clark, 2006). In other words, when constructing a conceptual category, children also attend to the adult usage around them. Thus, children’s attention to the adult form

may explain why each child follows a particular developmental path during the acquisition process (Clark & Nikitina, 2009). Bowerman's pioneering work (1985) shows that children start establishing categories from their exposure language early in the acquisition; Bowerman's study leads others researchers to find similar patterns cross-linguistically (cf. Berman & Slobin, 1994; Choi, 1997; Slobin, 1991; 1996). Along the same line, Slobin (2001) proposes the notion of "typological bootstrapping" (p.441); each language children learn has a particular typological character and as they learned more linguistic constructions of the language, the lexicalisation patterns and grammaticised notions of the language is established. Slobin gave an example of a child acquiring Korean and a child learning English; Korean expresses path of motions using verbs while English uses particles. As the Korean child learns more linguistic forms of the language, he/she will learn that motion path is lexicalised in verbs and for the English child, he/she will soon learn that verb particles are used in structuring the locative and temporal relations. Thus, as a result of this typological bootstrapping, Slobin concludes that children will construct linguistic expressions in different ways, depending on what language they learn.

Previously, I used the word bootstrapping; the term *bootstrapping* was introduced by Pinker (1984) as a metaphor for language acquisition process to show that one type of information may lead to the development of another kind of information. There were many variants of bootstrapping theories in the literature; for example, semantic bootstrapping, the idea that semantics bootstrap the acquisition of syntax (Pinker, 1989), syntactic bootstrapping, the theory that children might use the syntactic categories to learn the meaning of words (Gleitman, 1990), and prosodic bootstrapping, the notion that children use prosodic cues (stress, intonation, etc.) to segment and categorise speech input (Gleitman & Warner, 1982). In the context of conceptual development, the typological features of a language may help bootstrap the children's language acquisition.

Up until now, I have discussed the concept of emergent categories, conceptual development and iconicity in children's language development. Regarding plural marking, when and how will children differentiate the notion between one and more-than-one? Slobin (1973) posits that the first linguistic forms to emerge in children's speech would be those which express meanings reflective of the cognitive development of the child's. Slobin also pointed out that formal linguistic complexity also plays a role in the acquisition of grammar; a child might have acquired the particular conceptual representation but lack the grammatical form to express it. For

example, it was found that children learning Egyptian and Palestinian Arabic may take up until age 12 and older to finally be able to produce the correct plural marking in Arabic (Ravid & Hayek, 2003).

For Malay L1 children, studies investigating plural acquisition among Malay first language acquirers are limited. In a study investigating the acquisition of Malay numeral classifiers in Malay L1 children, Salehuddin and Winskel (2009) found that the development of Malay numeral classifiers among six-to-nine-year-olds is a protracted process; the findings show that six year olds only produce 5.25% correct Malay numeral classifiers, followed by seven-year-olds with 18.20% and even the oldest children in the study, the nine-year-olds, only managed to produce 51.25% correct Malay numeral classifiers. This result is unsurprising because Malay numeral classifiers, just like the Arabic plural marking, are conceptually complex and highly arbitrary. It is not semantically transparent thus children might find the concept difficult to grasp.

Studies on emergent categories and conceptual development in children are mainly conducted on monolingual children (e.g. Bowerman, 1985; Bowerman & Levinson, 2001; Clark, 2006). Thus, investigating the development of conceptual distinctions and the production of emergent categories on bilingual population would further enhance our understanding as bilingual children are exposed to different language systems. In this regard, this thesis may help fill the gap as I analysed the different plural expressions developed by the child during her early years of language acquisition. The concept of plurality, as discussed in Chapter 2, is expressed differently in Malay and English. Thus, it would be interesting to see how the child learn these two typologically different languages and attempt to mark plurality in each language. Having said this, the following section describes prominent research investigating plural acquisition in bilingual children.

3.7.4 Plural acquisition in bilingual children. In section 3.7.2, many studies have reported that L1 English children produce the plural suffix *-s* around the age of 1;6 to 2;6. Thus, question arises whether plural marking development of bilingual children follows a similar timing to that exhibited by English-speaking children. In a study investigating morphological development of a Persian-English bilingual child, Keshavarz (2007) found that his bilingual participant produced the English plural suffix *-s* at age 1;11. In fact, the child's use of English plural *-s* reached 29 occurrences at 1;11. Some utterances with English plural *-s* produced by Keshavarz's participant

include *nuts, babies, ducks, socks* and *cars* (p.264). Interestingly, Keshavarz's finding is consistent with the timing of Brown's L1 children plural acquisition. Itani-Adams (2013) also found that her Japanese-English bilingual child produced the English plural *-s* relatively early, at age 2;4. Based on these studies, it appears that the timing of acquisition of the English plurals of these two bilingual children are similar to that of English monolingual children.

Previously, I cited De Houwer's (1990) groundbreaking work that led her to propose the notion of SDH. In her extensive study of the Dutch-English bilingual child from age 2;7 to 3;4, she also examined the child's plural formation in Dutch and English. In Dutch, a regular plural noun is formed by choosing between the plural suffix *-en* and *-s*; the choice depends on the final phoneme of the stem and whether the phoneme was preceded by schwa. Generally, singular words ending in a consonant preceded by schwa or ending with vowels form their plurals by adding the suffix *-s* and singular words ending in consonant not preceded by schwa pluralises with the addition of suffix *-en*. The findings show that, firstly, similar to Wells (1985), De Houwer (1990) found that the occurrences of plural noun phrase are infrequent in the child's speech. Secondly, De Houwer reports that Dutch and English plural morphemes are not used interchangeably; the plurals develop in language specific pattern. Kate (the child) used the plural morphemes of each language respectively and there is no evidence that the plural allomorph of one language having any effect on the other language. De Houwer interpreted this finding as evidence that the two languages exposed to the child is separated from birth i.e. the gist of SDH theory. As mentioned earlier, SDH has received numerous support from the current BFLA studies. Therefore, in the thesis, we will see later in the result section whether the child's plural acquisition developed according to the SDH theory.

To sum up, studies investigating specific plural development in BFLA are still very limited. The sequence of plural acquisition in bilingual children does not appear to be robust and so the present study is timely and well positioned to shed some light on this issue. In the following section, I will discuss the framework used in analysing the morphological plural development of the bilingual child.

3.8 Processability Theory (PT)

The developmental framework used to analyze Rina's morphological development of plurality in English and Malay is Processability Theory, henceforth (PT) (Pienemann, 1998, 2005a). PT is a theoretical framework originally devised for

second language acquisition . However, later on, Pienemann (2005a) and Hakansson (2005) state that PT can also be used in the analysis of the sequence of development in first language acquisition (L1) and Bilingual First Language Acquisition (Pienemann, Kessler & Itani-Adams, 2011). Indeed, recent studies investigating bilingual acquisition e.g., Itani-Adams (2013) and Medojevic (2014), also use PT as their framework.

PT is a language processing model that accounts for the developmental path followed by second language learners. It provides falsifiable predictions regarding the order of acquisition of grammatical structures. From the PT perspectives, language acquisition is a hierarchical and implicational process whereby learners successively go through each stage in the hierarchy. Each stage is a prerequisite for the next and learners can only produce a certain structure only if their language processor can handle it at that stage. The view of language processing in PT relies primarily on speech production model by Levelt (1989) which overlaps to some extent with the computational model of Kempen and Hoenkamp (1987) and Garrett's work (1976, 1980, 1982). The basic premises of the language processing in PT are as follows (Pienemann, 2005a, pp.3-4);

3. a. Processing components are relatively autonomous specialists, which operate largely automatically;
- b. Processing is incremental;
- c. The output of the processor is linear, while it may not be mapped onto the underlying meaning in a linear way;
- d. Grammatical processing has access to a grammatical memory store.

PT also relies on Lexical Functional Grammar (LFG) for the representation of grammar. LFG was conceived by Kaplan and Bresnan (1982) and further developed by J. Bresnan (2001), M. Dalrymple (2001) and Falk (2001), among many others. LFG is used in PT because of its typological and psychological plausibility; it provides a well-defined and explicit generative formal theory of language. These two feeder theories (Levelt's speech model and LFG), allow PT to make language-specific predictions about learners' language development, which can be applied cross-linguistically (Bettoni & Di Biase, 2015). Therefore, before explaining the stages in PT's hierarchy, it is important that some basic descriptions of Levelt's speech model and LFG that is relevant to PT are described.

3.8.1 A brief description of Levelt's language production model. PT adapts Levelt's (1989) model of language production which proposes that speech production involves several processing components; namely the Conceptualizer, the Formulator, and the Articulator. The model aims to describe the spontaneous speech production of adult speakers from intention to articulation. Figure 3.4 presents the blueprint for language production as proposed by Levelt (1989). This speech model attempts to describe language processing as it unfolds in real-time, and it is widely accepted in the the cognitive and psycholinguistic field. This speech model views language production as incremental and automatized i.e. not controlled by the speaker. So, when the speaker starts thinking about what to say, the intention is assumed to occur within the Conceptualizer. Once a speaker conceptualizes their intention of what to say and has selected the relevant information, the speaker creates the 'preverbal message' which serve as input to the Formulator. The Formulator is the component that is most important to PT. Levelt (1989) summarizes the role of Formulator as follows "it accepts fragments of messages as characteristic input and produces as output a phonetic or articulatory plan. In other words, the Formulator translates conceptual structures into a linguistic structure" (p.11).

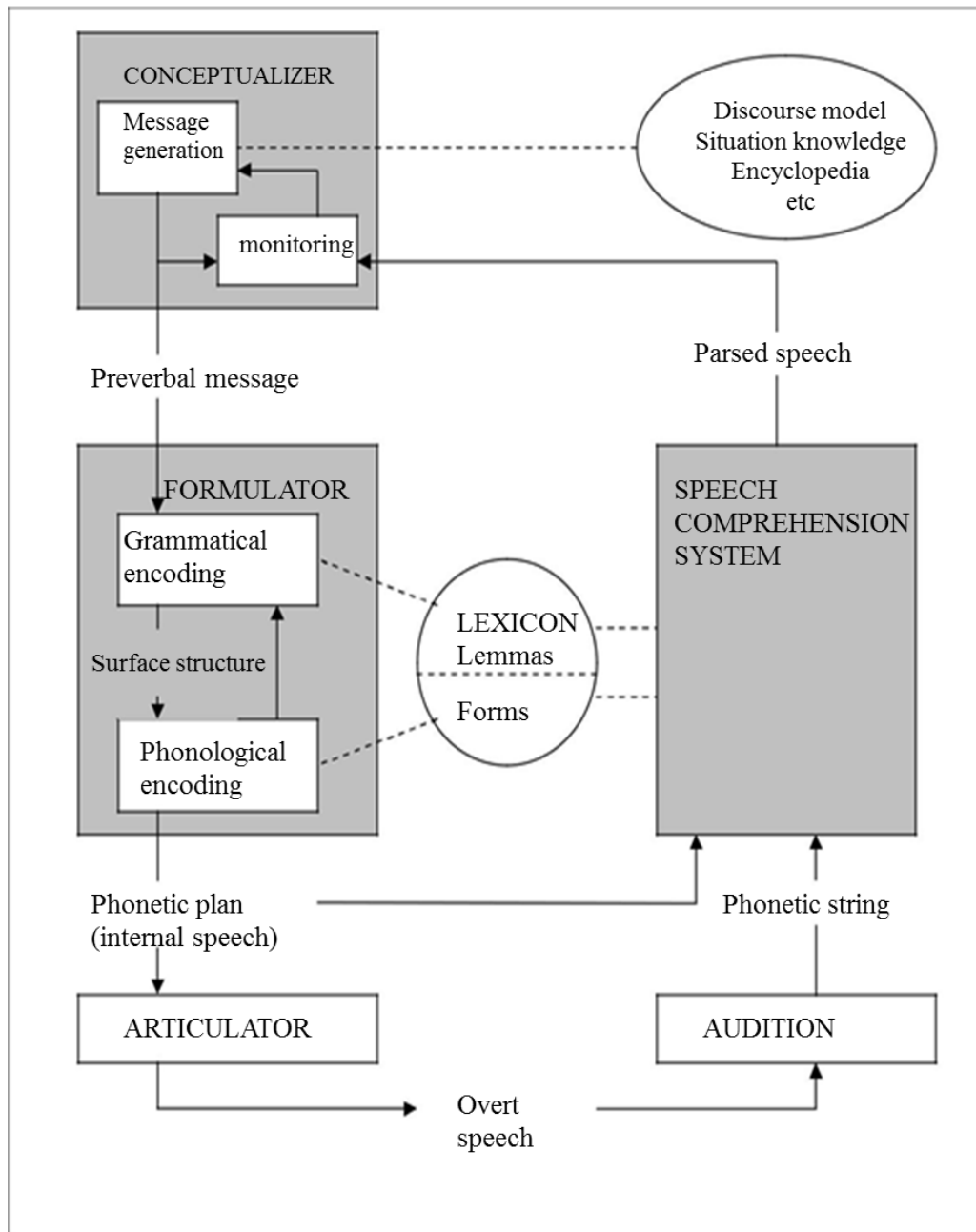


Figure 3.4. Levelt's model of language production (Levelt, 1989, p. 9).

When the formulator receives input from the Conceptualizer, its task is to convert the preverbal message into appropriate linguistic forms. The Formulator is the component that processes the speaker's morpho-syntactic production. Since the concept of Formulator is crucial in PT, let us look at how lexical entries are stored in the lexicon and then processed by the Formulator:

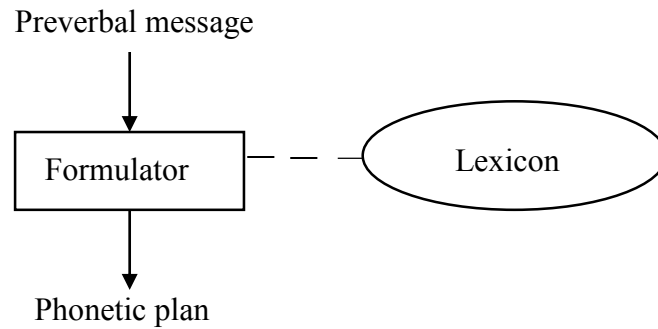


Figure 3.5. Levelt's Model: Language production from preverbal message to phonetic plan (after Levelt 1989: 9).

In Levelt's speech model, lexicon plays a central role. There are several different notions of what constitutes lexicon as well as its structure and functions (cf. Aitchison, 2003). Generally, the lexicon can be conceived as a repository for the lexical elements of a language i.e. the lexicon is the place where the information about the words is stored (Fabri, 2008). Pertaining to the role of lexicon in the speech model, Bettoni and Di Biase (2015) point out that "In Levelt's model, it is the lexicon - with its associated semantic, grammatical and phonological information – that primes the procedures and feeds forward the encoders" (p. 26). For mature native speakers, all these information is stored in their mental lexicon but L2 learners build up the lexicon gradually. Originally, Levelt's speech model only concerned the processing in mature L1 speakers. Later de Bot (1992) adapted it to accommodate to bilingual language production. In bilingual language processing de Bot (1992) proposed that there is one mental lexicon where the lexical items from different languages are stored together, one articulator which include sounds and prosodic patterns of both languages and two language-specific Formulators. The basis for postulating one articulator, according to de Bot, is motivated by the foreign accents that exist even in highly proficient L2 speakers.

Levelt's speech model was further refined over the years, and a more advanced understanding of the nature of the lexicon and lexical access in speech processing was proposed in Levelt, Roelof & Meyer (1999). Figure 3.6 illustrates the updated version of the speech model; note that similar to the previous model, the lexicon is placed at the center, implying its key role in the processing of speech. In the updated version of the speech model (Figure 3.6), information about words is stored in the lexicon on three levels; the conceptual, the lemma and the lexeme level. Bettoni and Di Biase (2015) point out that the conceptual level is not present in Pienemann's incorporation

of Levelt's (1989) speech model in PT; the lexicon consists of the lemma and lexeme levels only. In the current Levelt et al. (1999) theory of lexical access, the meaning of a word is stored at the conceptual level. At the lemma level, the word is given its category and other syntactic and combinatorial properties, and at the lexeme level, the word's formal properties are stored with its morphological and phonological features (Bettoni & Di Biase, 2015).

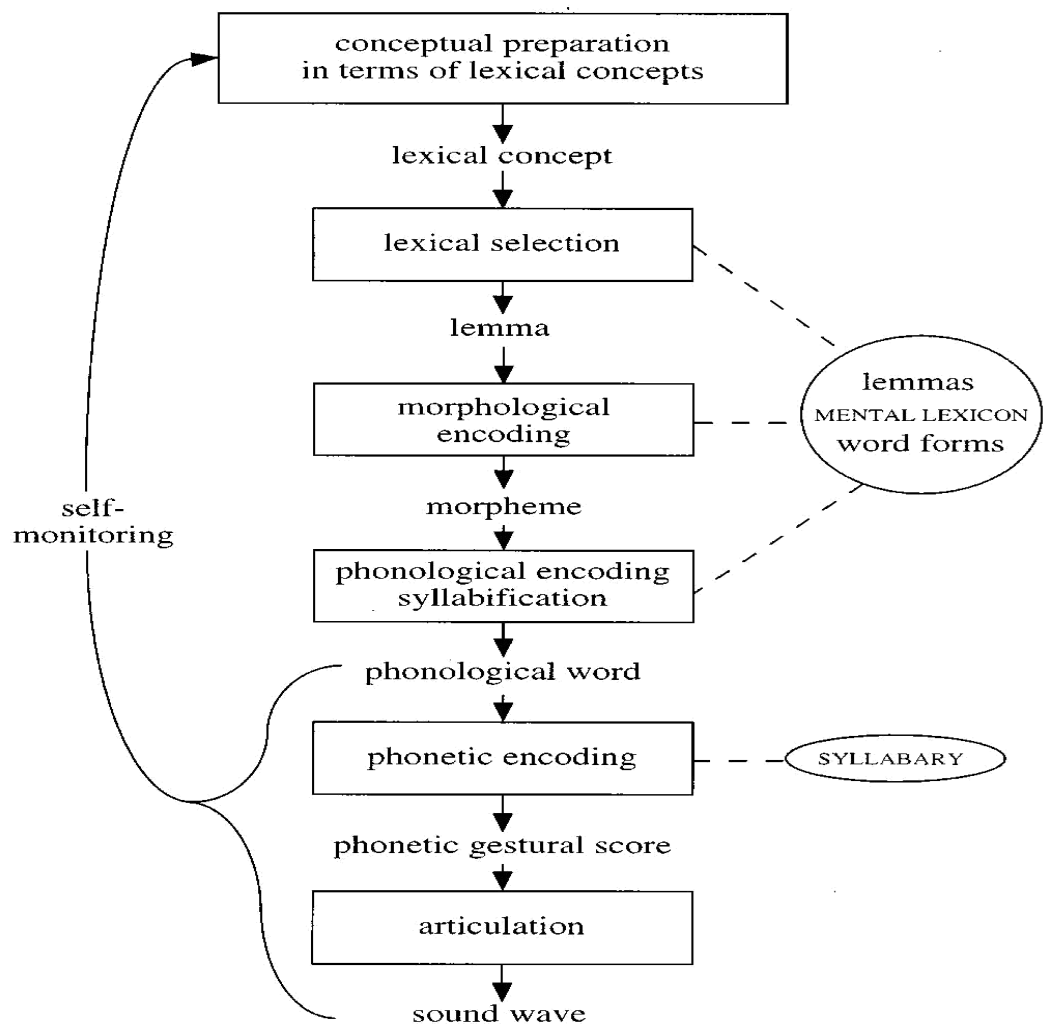


Figure 3.6. New speech processing model (after Levelt, Roelofs, and Meyer, 1999).

Following Bock and Levelt (1994, pp. 950-952) and Levelt, Roelofs and Meyer (1999: 3-4), Figure 3.7 illustrates a simplified representation of the three levels of the lexical entry *goat*.

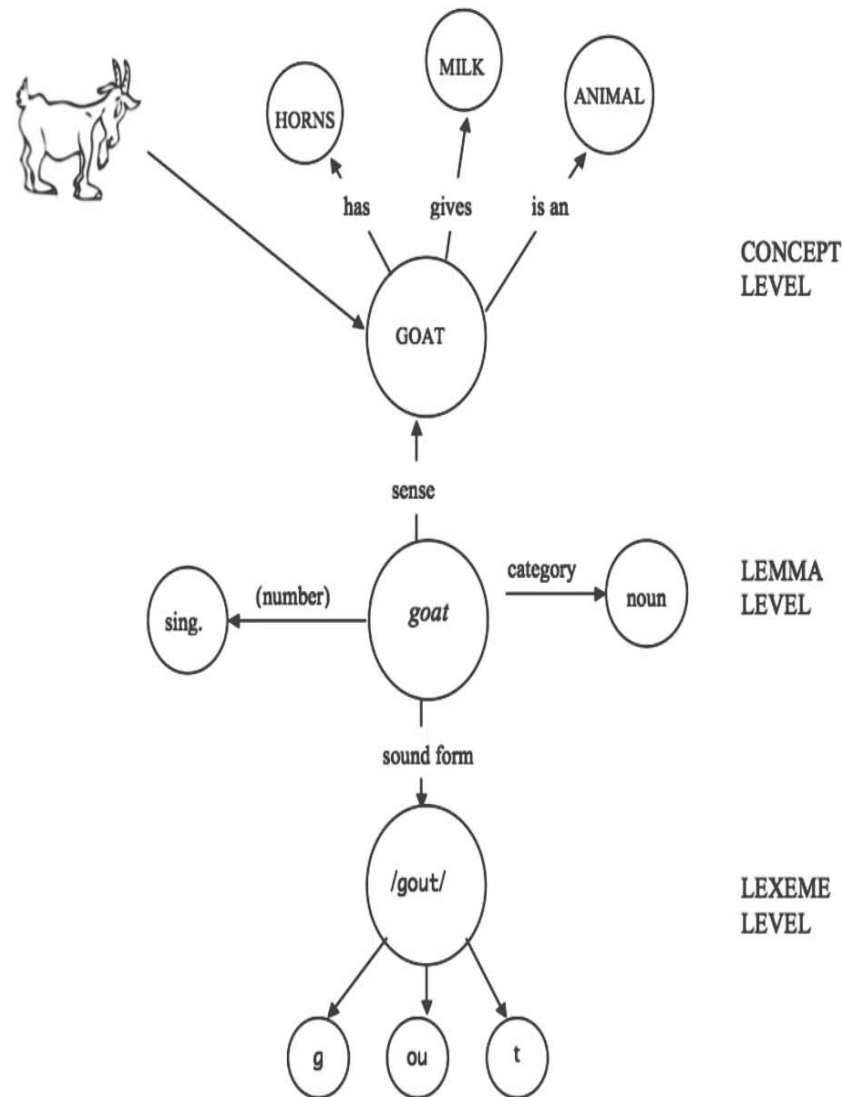


Figure 3.7. A fraction of the lexical network for the word *goat* (after Bettoni & Di Biase, 2015, p. 24).

Firstly, at the conceptual level, the meaning about the word *goat* is stored. *Goat* is a type of animal with horns that produces milk. At the lemma level, the syntactic features of the word *goat* are stored, for example, its lexical category (noun) and number features (singular or plural). In this case, *goat* is a noun and singular. Thirdly,

at the lexeme level, the morphological and phonological features of the language are assigned to the word. The word *goat* is monomorphemic and comprises of three phonological segments: /g/, /ou/, and /t/.

So, learning a new word is not as straightforward as it may appear at first sight and it is likely to be a gradual process since, beside its sound and its meaning, a child has to annotate each word for each of its syntactic and morphological features. That is, a child acquiring Malay and English will encounter the sound and its meaning (say *kambing* in Malay and *goat* in English) within her Malay environment and linguistic input, which allows her to put together sound and meaning. Gradually she will annotate the syntactic category and other morphological and syntactic features of the lemma, for instance, the plural form *kambing-kambing* in Malay and the syntactic combinations it can participate in (e.g., as subject or object of a sentence). This does not mean she already acquired the lemma in the other language, although at the conceptual level she has now met the specific concept-meaning relation. At this point it is plausible that she will use her knowledge of the lemma for the other language as well unless her production of the specific word is not supported in the linguistic environment for that language. Once she learns the new form for the ‘same’ concept (e.g., it can refer to the same physical entity or same picture from which she learned the first form) the child could then apply the other parts of her knowledge (such as syntactic information in the lemma) relating to that same concept, e.g., repeat either of the distinct forms in sequence in the presence of the stimulus.

The conceptual component of the lexical entry as proposed in the lexical retrieval theory (Levelt et al., 1999) may then help better account for the bilingual lexicon and the ease with which other components of the lemma may be used in either language. Having now summarised Levelt’s speech processing model adopted in current PT proposals such as Bettoni and Di Biase (2015), the next section deals with the other feeder theory crucial in PT i.e., Lexical Functional Grammar.

3.8.2 A brief sketch of Lexical Functional Grammar. Lexical Functional Grammar (LFG)¹ is a theory of grammar developed in the 1970s within the framework of Chomski’s (1965, 1993) Generative Grammar by Joan Bresnan and Ronald Kaplan (Fabri, 2008). It needs to be pointed out that, despite its origins, LFG is different from the original syntactically driven derivational grammar because in LFG grammar is

¹ CF. Asudeh and Toivonen (2010) for an up-to-date discussion of LFG.

lexically driven, i.e., the lexicon contains grammatical information that allows it to participate in the construction of meaningful linguistic structure. As Fabri points out, a ‘Generative Grammar’ model must be “explicit in a formal or logico-mathematical sense” (p. 32). Another prominent characteristic of LFG is that it is a unification of grammar, that it uses “feature unification” - features being components of the lexicon -to account for relations between lexical items within the phrase and between phrases, as I will illustrate later in this section. Kaplan and Bresnan (1982, p. 263) claim that “lexical functional grammar offers considerable expressive power for describing linguistic phenomena.” In developing this new grammatical model “Bresnan and Kaplan were concerned with the related issues of psychological plausibility and computational tractability” (Asudeh & Toivonen, 2010, p. 419). Paraphrasing these authors (p. 420), LFG, crucially, takes the different kinds of linguistic information as represented, in parallel, by different grammatical modules which are simultaneously present (i.e., they are not ‘derived’ from some deeper structure) each module with their own characteristic data structure and formal representation. The correspondence between the simple data structures of the distinct modules, essentially c-structure, f-structure and a-structure, is defined by formal mappings onto each other.

The architecture of LFG is modeled, as recognized by Pienemann (1998), on psychologically plausible lines. Significantly, “although LFG is essentially a generative approach ... (it) differs from the approach taken in a UG-based account in that LFG attempts to tie underlying competence to performance-related phenomena (e.g., feature unification in real time)” in Rothman & VanPatten’s (2013, p. 246) view. This indeed is the main reason for Pienemann to rely on LFG for Processability Theory, rather than other grammatical models, because it is “a theory of grammar that represents linguistic knowledge and is in line with cognitive features of language processing” (Pienemann 1998, p. 44). Consequently, in this thesis, I use LFG for grammatical representation, because it offers, in addition, a typologically plausible grammatical design as it is capable of dealing with the description of a wide range of typologically diverse languages, including non-configurational languages such as Walpiri and other Australian Aboriginal Languages (Bresnan, Asudeh, Toivonen & Wechsler, 2016, pp. 7-10). The Malay language itself, unlike English, would be located towards the non-configurational end of the linguistic configurability continuum.

As alluded to above, in LFG the sentence is represented at three parallel levels, namely, argument structure (a-structure), functional structure (f-structure) and constituent structure (c-structure). The a-structure represents the argument structure of the predicate in a sentence. Kroeger (2005, p. 53) defines predicate as the element of meaning which identifies the property or relationship being described, so in sentences such as *John is hungry*, *Mary snores*, and *John loves Mary*, the words *hungry*, *snores* and *loves* are the predicates and *John* and *Mary*, the participants selected by the predicates, are the arguments. Different predicates require certain number of arguments, for example, *hungry* and *snores* require only one argument but *loves* requires two. If a predicate is expressed with the correct number of arguments, the outcome is a well-formed clause (Kroeger, 2005). The a-structure then consists of a hierarchy of semantic roles such as agent, patient, theme and so on, which map on grammatical functions, such as SUBJ, OBJ, and so on. Although not all languages have exactly the same mapping of a-structure roles to grammatical functions, there are important constraints on the possible variations (Bresnan et al. 2016, p. 326).

The f-structure represents the internal, abstract structures of the language where grammatical relations are represented, and they are largely invariant across languages (Bresnan et al 2016, p. 42). It represents the grammatical information needed in interpreting the sentence semantically. Two kinds of information are encoded in the f-structure: information about the grammatical relationship between the syntactic elements in the sentence on the one hand and, on the other hand, the grammatical functions such as SUBJ (subject), OBJ (object), OBL (oblique) and so forth.

The c-structure on the other hand represents the surface structure, the actual words we speak or comprehend, their lexical annotation, internal phrasal structure, phrasal grammatical function and their position relative to each other (word order, information structure). Unlike f-structure, c-structure differs across languages. The interactions and mapping of these three structures are illustrated, for English, in Figure 3.8 with the sentence *Romeo kisses Juliet*;

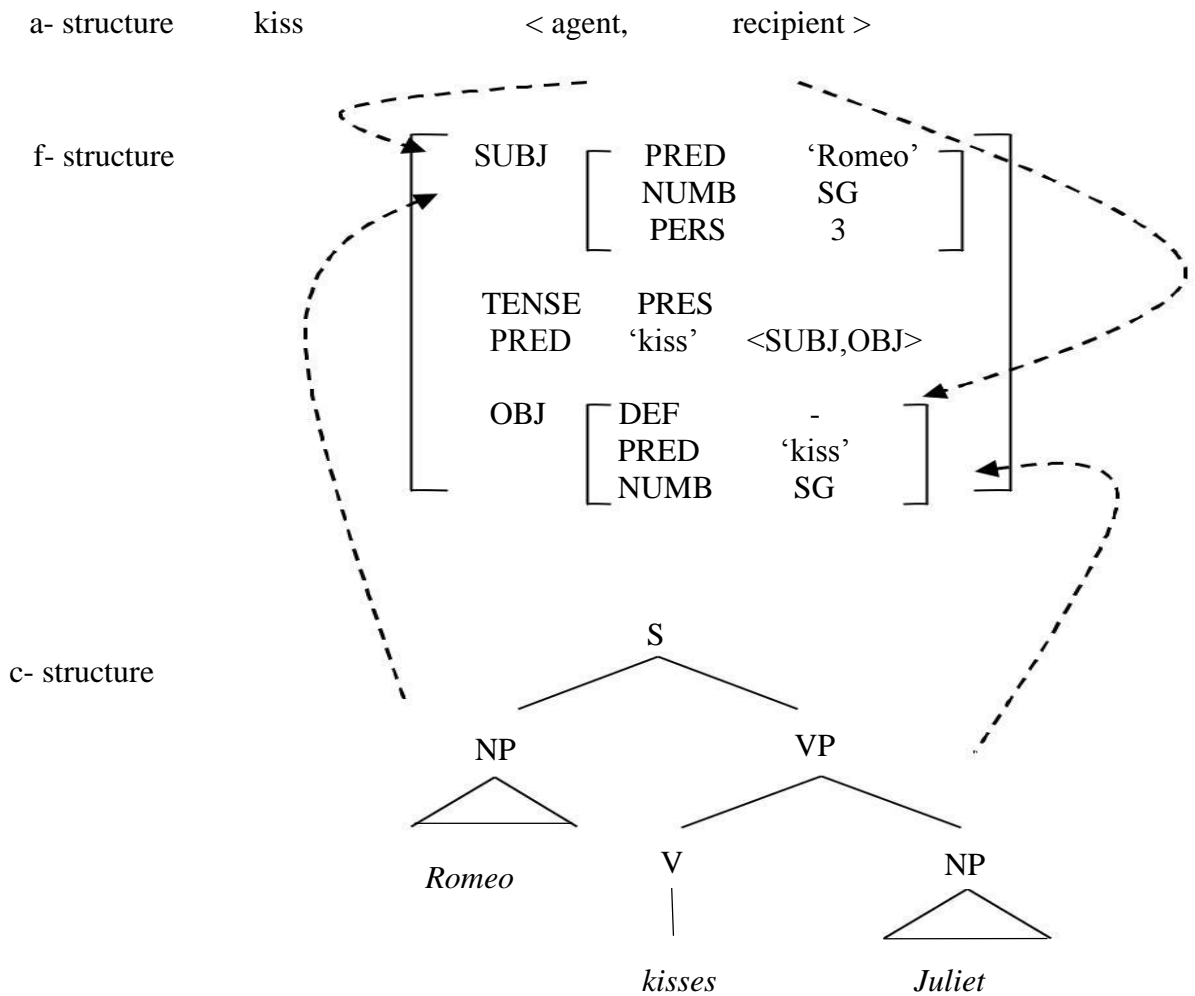
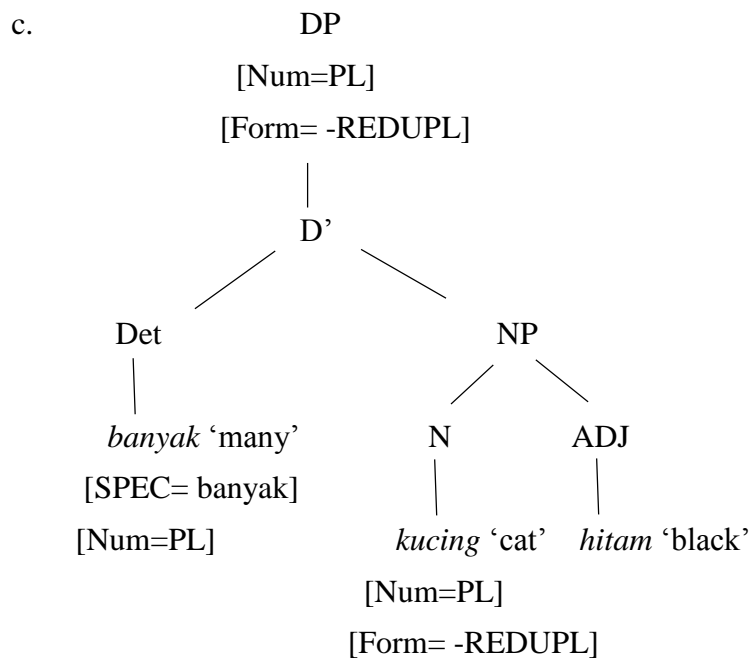
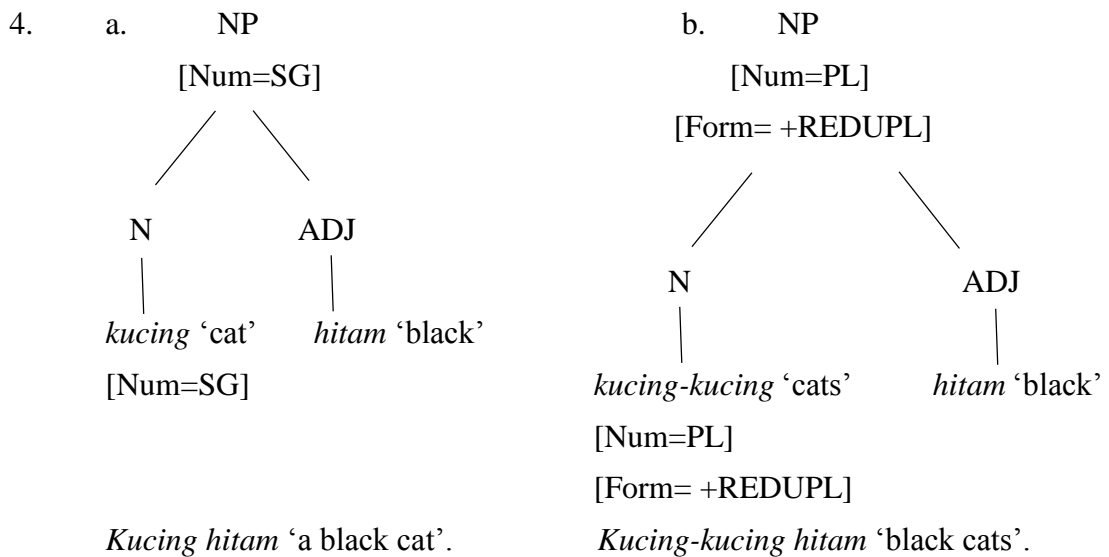


Figure 3.8. Three structures for *Romeo kisses Juliet* (after Bettoni & Di Biase, 2015, p.46).

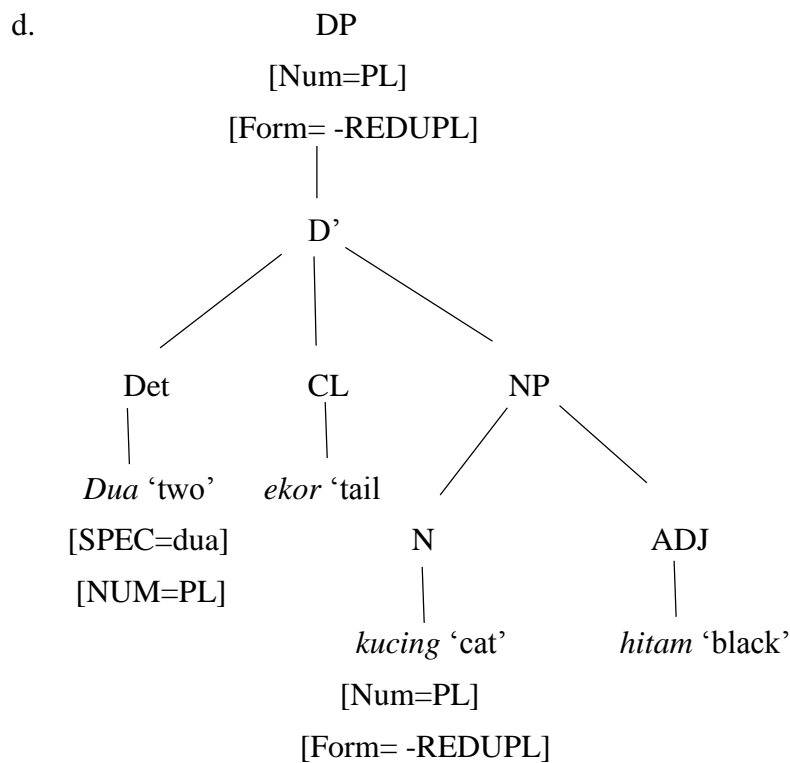
In *Romeo kisses Juliet*, the most prominent argument in a-structure, the agent (*Romeo*), and the most prominent constituent in c-structure (the one in the first position) are mapped into the most prominent grammatical function in f-structure (the SUBJ). When the hierarchically higher thematic role is given the highest available grammatical function and also occupies the most prominent position in c-structure, the mapping of these three structures is categorized as the unmarked/default mapping (Bettoni & Di Biase, 2015; Choi, 2001).

In LFG, as we have seen, the concept of feature unification is important. Take the lexical item *Romeo* whose grammatical function is marked as SUBJ; the value for its feature number (NUMB) is singular (SG), and the value of its feature person (PERS) is third. So the values of these features (SG and third-person) must be matched

(unified), in English, with the values of those same features in the verb *kisses* (marked by the morpheme *-s*). This matching and exchange of information regarding the shared diacritic features among the elements of the sentence are called “feature unification” in LFG terms. PT incorporates feature unification as a fundamental concept to account for learner’s gradual development from no unification to phrase-level unification, to longer distance unification across different kinds of phrases. In (4a-d) I present examples of Malay and in (5a-c) English LFG feature unification at phrase (NP) level:



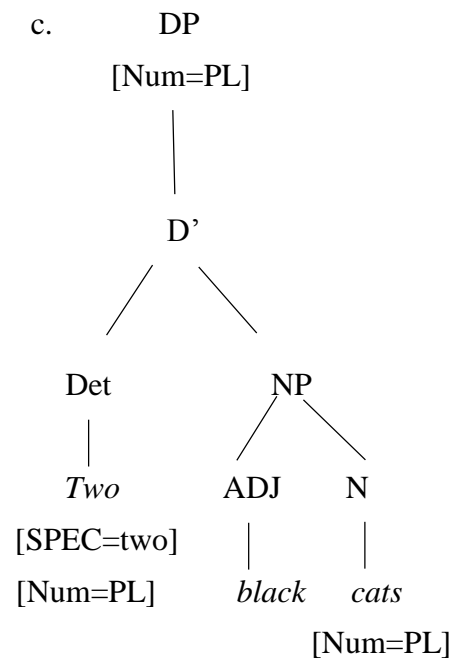
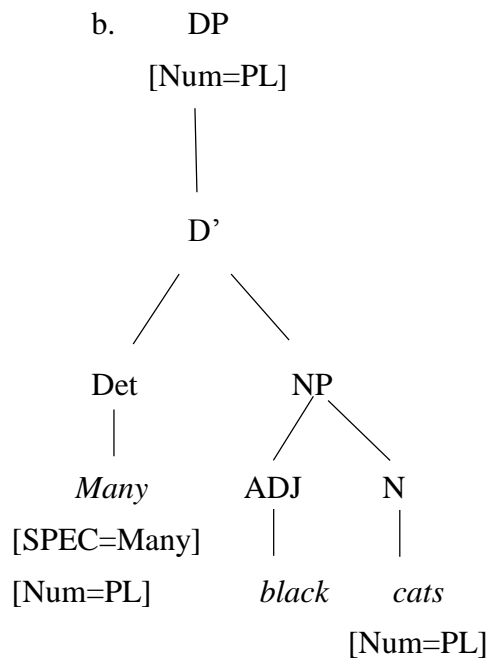
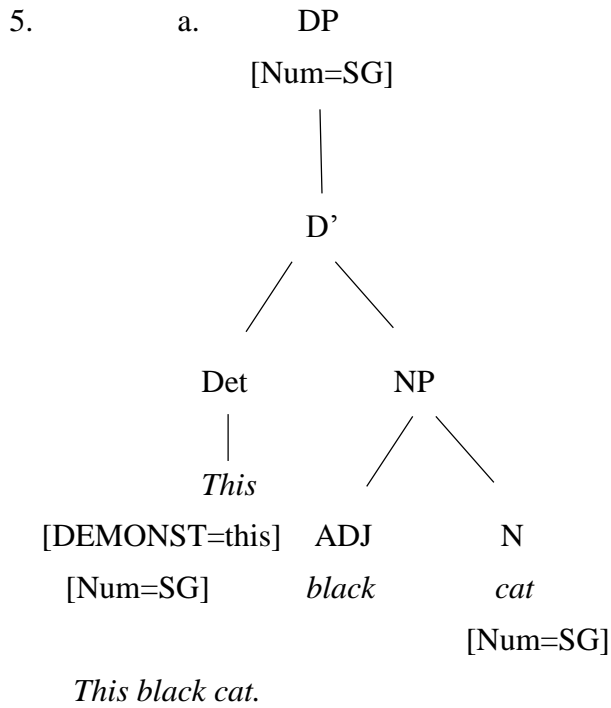
Banyak kucing hitam ‘many black cats’.



Dua ekor kucing hitam 'two black cats'.

In (4a), the NP for 'a black cat' is realised as *kucing hitam* in Malay. For plural NP in Malay, it is expressed commonly by a simple N-N reduplication as in (4b) or other forms of lexically specified reduplications. The presence of the quantifier *banyak* 'many' (4c), or other phrasal specifiers, block the reduplication form feature (c.f., Sew, 2007). Hence, the reduplicated noun form in Malay (e.g. *kucing-kucing*) cannot be further modified by numerals or quantifiers. In fact, e.g., **dua kucing-kucing* 'two cat-cat', **banyak kucing-kucing* 'many cat-cat' are ungrammatical. As discussed in Chapter 2, Malay is a classifier language. Classifiers are used for both countable and uncountable nouns. In the colloquial Malay variety, though classifiers are optional, according to Goddard (2005) there are several classifiers that occur frequently; one of the most common classifiers is *ekor* 'tail' used for NPs with animal referents. In (4d) 'two black cats' is realised as *dua ekor kucing hitam* 'two tail (CL) black cats'. Similar to *banyak* (4c), the use of a numeral such as *dua* 'two' but even a singular *se* (one) as in *seekor* 'one tail (CL)' blocks the reduplication of the noun form *kucing* 'cat'. This is in contrast to English, in which the use of the indefinite quantifier *many*, or indeed

any other definite or indefinite plural quantifier or plural demonstrative such as *these*, requires the use of the plural form for (countable) noun, as shown in (5a-c):



Many black cats.

Two black cats.

Therefore, *cats* in (5b-c) is obligatorily marked as plural with the morpheme *-s*. The grammatical features will not unify if the value feature NUM in *cat* is SG as in **many cat*. The NUM values must be compatible. According to Dalrymple & Mofu (2012), the behaviour of reduplication, numeral modification and classifiers may be related to the fact that Indonesian (and Malay), unlike English, do not make a countable/uncountable distinction. So, classifiers are optional and reduplication of numerically modified nouns is dispreferred in the presence of quantifiers and classifiers.

Thus, to produce grammatically acceptable forms of plural in both Malay and English languages, the bilingual child in this study must learn to unify the grammatical elements of quite distinct structures of plural marking and quantifying modification of NPs in each language with practically opposite patterns of unification. She also has to annotate each English noun as countable or uncountable. After briefly sketching LFG and its relevance to this study I will next explain how PT may account for morphological and syntactic development in learners. I wish to note here that Dalrymple and Mofu's (2012) generalisation about Indonesian/Malay languages lacking a differentiation between countable and uncountable nouns may actually not hold for some Malay varieties. For instance, in the Malay Malaysian variety reduplication is preferred in bare plural nouns (Sew, 2007). However, reduplication is ungrammatical with all uncountable nouns. Which means that there is at least one point in the system which differentiates, grammatically, between countable and uncountable nouns in Malay (Di Biase, personal communication, March 2017).

3.8.3 Morphological development in PT. The original version of PT (Pienemann, 1998, 2005a) hypothesizes learners' sequence of morphological development by utilizing the concept of feature unification from LFG. Learners have to combine certain grammatical features in the course of language processing before they can be considered to have acquired the particular structure. Language acquisition from the PT perspectives is a hierarchical process; learners have to go through each stage of development before proceeding to the next stage. Table 3.2 summarizes the universal sequence in the development of morphology in PT as proposed by Bettoni and Di Biase (2015) after Pienemann (1998, 2005a);

Table 3.2

Hierarchy of processing procedures in PT, morphological development (from Bettoni and Di Biase, 2015, p.56)

| Stage | T1 | T2 | T3 | T4 | T5 |
|--------------------|--------------------|------------------------|------------------------------|-----------------------------------|-----------------------------------|
| S-Bar Procedure | - | - | - | - | Interclausal information exchange |
| Sentence Procedure | - | - | - | Interphrasal information exchange | + |
| Phrasal Procedure | - | - | phrasal information exchange | + | + |
| Category Procedure | - | lexical form variation | + | + | + |
| Lemma access | words and formulas | + | + | + | + |

As in Levelt (1989) speech processing model and LFG, the lexicon plays a central role in PT. Words have to be added to the learners' lexicon before the word can be assigned its grammatical category. At the lemma access stage, learners are unable to activate any grammatical procedure because words are learned as a whole without further analysis. At the following stage, learners begin to annotate the lexicon, and this process activates the category procedure and the process of "syntacticisation" (Bettoni & Di Biase, 2015, p.56). At the phrasal procedure stage, as its name implies, phrasal morphology emerges. At this stage, learners are able to exchange information (i.e., feature unification) between the head of the phrase and its modifier. At the next stage (sentence procedure), learners are now able to exchange information across phrases of different kinds (e.g., across NPs and VPs). Finally, at the last morphological stage, learners activate the subordinate clause procedure. Learners are now able to exchange information between elements in different clauses that are related by subordination. For example, in the sentence *the doctor suggests that Kim eat less*; the clause marked as subordinate (*Kim eat less*) blocks the subject-verb agreement which characterizes, instead, the main clause *the doctor suggests* (Bettoni & Di Biase, 2015).

The difference between the original Pienemann (1998,2005a) and Bettoni and Di Biase (2015) is that the latter authors limit this schedule to morphological development while syntax is handled differently. For instance, the schedule does not include Pienemann's 'simplified' s-procedure in coincidence with the categorical

stage, to account for the ability of learners of e.g., English L2, to construct acceptable SVO sentences even though they have not yet acquired the morphological resources to mark Subject-Verb agreement. Bettoni & Di Biase (2015) do not require such ‘simplified’ procedure because syntactic development is handled separately, even though the morphological procedures are fundamental resources developing in parallel to syntax in languages where morphological agreement has a role. Malay does not display morphological agreement processes; hence this study follows Bettoni and Di Biase (2015), in the separation of morphological and syntactic development. In postulating an implicational hierarchy it is clear that PT regards language development as a process of accumulation of rules; learners begin with words, then they learn to annotate the words for category and features, and afterward they learn to construct phrases according to the syntactic category annotated in the lexicon (to construct NP, VP, PP etc.) and to combine such different phrases into clauses.

For the child’s morphological development in Malay and English, based on the above summary description, I hypothesize the linguistic outcomes of the PT stages for Malay based on the universal hierarchy in Table 3.2. The subordinate clause structure is not included (the top stage hypothesized for English morphology in PT) as I believe the child is unlikely to reach that stage within the age range of the study. The hypothesized structures of Malay and English predicted to emerge sequentially in morphological development are summarized in Table 3.3 and Table 3.4.

The sequence for English acquirers is well-established in the PT literature hence I will follow the hypotheses formulated for morphological development in Pienemann (1998, 2005) and Di Biase, Kawaguchi & Yamaguchi (2015); the structure for English is summarized in Table 3.4. However, this is the first study attempting to apply PT to the Malay language. So, on the basis of PT’s universal schedule, I hypothesize the developmental stages of Malay morphological development as summarised in Table 3.3. In working out the hypothesis for Malay PT sequence, I follow in particular the guide given by Bettoni and Di Biase (2015, p.74), “the best choice for a diagnostic structure on an untried language should fall on a structure that displays possibly the clearest one-to-one relationship between form and function, or the most representative, or default, structure of a stage in a particular schedule, the one with the most transparent conceptual meaning”.

Table 3.3

Morphological development: Hypotheses for Malay (based on Pienemann, 1998, 2005a; Di Biase, Kawaguchi & Yamaguchi 2015)

| Processing procedures | Linguistic processes | Malay Structure | Example |
|------------------------|---------------------------------------|--|---------|
| Interphrasal Procedure | Clause marking | Passive morphology <i>kucing kena kejar dengan anjing</i> cat KENA (PASS) chase by dog 'the cat is chased by the dog' | |
| Phrasal Procedure | Phrasal unification NP | a) <i>dua ekor kucing hitam</i> Two tail (CL) cat black 'Two black cats' (definite quantifiers with classifiers) | |
| | VP | (V + V and AUX + V). a) <i>nak makan</i> want eat '(I) want to eat' b) <i>boleh main</i> can play '(I) can play' | |
| Category procedure | Lexical morphemes (No unification) | Suffix <i>-an</i> marking of grammatical category of words e.g. <i>main</i> 'play'(V) <i>mainan</i> 'toy'(N), <i>makan</i> 'eat' (V) <i>makanan</i> 'food' (N) <i>minum</i> 'drink' (V) <i>minuman</i> 'beverage' (N). | |
| | | Reduplication, <i>kucing</i> 'cat' vs <i>kucing-kucing</i> 'cats' <i>anjing</i> 'dog' vs <i>anjing-anjing</i> 'dogs' | |
| Word/Lemma access | Words, formulas (No unification) | <i>kucing</i> 'cat', <i>anjing</i> 'dog', <i>apa khabar?</i> 'how are you?' | |

Table 3.4

Morphological development: Hypotheses for English (based on Pienemann, 1998, 2005a; Di Biase, Kawaguchi & Yamaguchi 2015)

| Processing procedures | Linguistic processes | English |
|-----------------------|------------------------|---|
| 4. S-Procedure | Interphrasal morphemes | SV agreement e.g. <i>Peter loves rice</i> |
| 3. Phrasal procedure | Phrasal morphemes | NP Plural e.g. <i>many cats, many dogs</i> AUX + V e.g. <i>they have jumped, you can go, I am going</i> |
| 2. Category procedure | Lexical morphemes | Past -ed e.g. <i>He jumped</i> Plural -s e.g. <i>my brothers</i> Possessive -s e.g. <i>Mary's car</i> Verb -ing e.g. <i>he jumping</i> |
| 1. Word/Lemma access | Words | <i>cat, dog.</i> |

For Malay PT development, at the first stage, the child will begin with learning single words. At the category procedure stage, the child will need to differentiate out at least one lexical category from others. For instance, she learns to distinguish a word such as *main* ‘to play’ (denotating a process, a verb-like word) and *mainan* ‘toy’ (denotating an individuated object, a noun-like word). Adding the suffix *-an*, helps distinguish objects from processes and this can be the basis for mentally annotating and marking nouns to distinguish them from (unmarked) verbs. Another form of marking nouns, as distinct from verbs, is that they can be reduplicated to mark plurality, e.g. developing from *kucing* ‘cat’ to *kucing-kucing* ‘cats’.

At the next PT stage, i.e. the phrasal procedure stage, the child is predicted to produce NP-like constructions such as *banyak kucing* ‘many cat’, and VP-like construction such as *nak makan* ‘want (to) eat’. At the sentence stage, I predict that to reach that stage, the child must be able to produce numeral classifiers such as *dua ekor kucing* ‘two tail (CL) cat’ and passive verb morphology in sentences such as *kucing kena kejar dengan anjing* ‘the cat is chased by the dog’ (cf. Nomoto and Abd.Wahab (2012) for the discussion of *kena* passives in Malay).

After discussing the general PT-based morphological development for Malay, the following section will elaborate specifically on the plural development based on the PT perspective.

3.8.4 Plural development in PT. There are several studies that investigate the emergence of English plural marking using PT framework; for example, Charters,

Dao, and Jansen (2011), Di Biase, Kawaguchi and Yamaguchi (2015) and Yamaguchi (2009, 2010, 2014,2016). These studies are conducted on ESL learners.

The studies cited here show that learners followed the PT sequence in terms of the emergence of plural marking, except for Charters, Dao and Jensen (2011). Charters et al. (2011) challenged PT sequence and reassessed the applicability of PT in predicting the emergence of plural NP agreement based on the findings in Dao (2007); the results in Dao's cross-sectional study of 36 ESL Vietnamese learners indicated that the NP plural agreement developed first before the marking of suffix *-s* on nouns. Charters et al. (2011) justifies the reverse order of acquisition by relating it to the nature of classifiers; Vietnamese is a classifier language so nouns in the language must be paired with a classifier to express countability. Malay is a classifier language as well although it does not distinguish countable from uncountable nouns, so it would be interesting to see if this sequence holds for another classifier language.

In any case, other PT-based research that specifically investigates the development of plural expression in English such as Yamaguchi's (2009) show otherwise; her Japanese-English ESL child's plural development is compatible with the sequence predicted by PT; the child first acquired plural marker *-s* on nouns and then developed the plural NP agreement (cf. Di Biase, Kawaguchi & Yamaguchi, 2015). Yamaguchi's finding is also supported by earlier studies, both longitudinal as well as cross-sectional (Johnston, 1985; Pienemann & Mackey, 1993). I postulate that the possible reasons for the discrepancy between Charter's et al.'s and Yamaguchi's results are due to methodological difference; the design of Charter et al.'s investigation is cross-sectional which only investigates the learners' development at a particular point in time, whereas Yamaguchi's study is a longitudinal research, which strongly suggests that she may have captured the growth more accurately. In addition to the design of the studies, the participants in Dao's (2007) study are instructed ESL learners while Yamaguchi's participant as well as those in Johnston's (1985) and Pienemann and Mackey's (1993) are naturalistic learners of English. ESL learners in Dao's study received explicit ESL instruction, not particularly well specified in their paper, which might have influenced the development of English NP plural agreement.

In parallel with morphological development, I also hypothesize certain stages for the child's plural development in this study. The proposed sequence for the child's plural development in English and Malay is shown in the following table;

Table 3.5

Hypotheses for Malay and English plural development

| Processing procedures | Linguistic processes | Malay | English |
|-----------------------|----------------------|---|---------------------------------------|
| 3. Phrasal procedure | Phrasal morphemes | Numeral classifiers (e.g. <i>dua ekor kucing</i> 'two tail (CL) black cat' NP agreement (e.g. <i>banyak kucing</i>) | NP agreement (e.g. <i>many cats</i>) |
| 2. Category Procedure | Lexical morphemes | Reduplication (e.g. <i>kucing-kucing</i>) | Plural-s (e.g. <i>cats</i>) |
| 1. Lemma access | Words | Words (e.g. <i>kucing</i>) | Words (e.g. <i>cat</i>) |

For both English and Malay, I hypothesize that the child begins at the lemma stage, followed by the category procedure. At the category procedure, the English plural that she will acquire is the plural marking *-s*, while for Malay, it would be total reduplication e.g. *kucing-kucing* 'cat-cat'. Finally, at the phrasal procedure stage, the child acquires the NP agreement for English e.g. *many cats* and the Malay blocking of reduplication with definite or indefinite modifiers e.g. *banyak kucing* 'many cat'. Only some of the classifiers are regularly used in Malay conversation and they are also often dropped. Children do not seem to use them regularly until much later (Salehuddin & Winskel, 2009) so I do not expect this child to acquire and produce classifiers within the time range of this study.

3.8.5 Syntactic development in PT. Previously, I have discussed the original version of PT which consider morphological and syntactic development within the same schedule. For syntactic development, the extension of the theory proposed by Pienemann, Di Biase and Kawaguchi (2005) assumes that learners begin with the least marked forms and proceed towards the more marked structures. Included among the PT hypothesis pertaining to learners' syntactic development we find the Unmarked Alignment Hypothesis, the Topic Hypothesis and the Lexical Mapping Hypothesis. However, more recently, Bettoni and Di Biase (2015), propose to drop the Unmarked Alignment Hypothesis and Topic Hypothesis replacing them with a single Prominence Hypothesis and proposing only some minor adjustment for the Lexical Mapping Hypothesis. The Prominence Hypothesis (Bettoni & Di Biase, 2015, p. 63) states that;

6. In second language acquisition learners will initially not differentiate between grammatical functions (GFs) and discourse functions (DFs), for example, between SUBJ and TOP. Differentiation begins when an element such as an XP, or other lexical material, is added to the canonical string in a position of prominence in c-structure, that is, the first in the sentence. This element may be TOP in declaratives or FOC in interrogatives leaving, crucially, the canonical string unaltered. At the next stage, learners will be able to construct non-canonical strings assigning prominence to any constituent in an unequivocal way.

Learners’ syntactic development based on the Prominence Hypothesis is illustrated in Table 3.6.

Table 3.6

PT: Syntactic development based on the Prominence Hypothesis (after Bettoni & Di Biase 2015; Kawaguchi 2015)

| Stage | Structures | Examples |
|---------------------------------------|---|---|
| Non-canonical word order | TOP _{XP} marked orders FOC _{XP} marked order | <i>Ice cream she likes</i> |
| XP _{DF} Canonical word order | TOP _{XP} SVO/SOV FOC _{WH} SVO/SOV | <i>Tomorrow they go home</i> |
| Canonical word order | SVO/SOV | <i>Mary jumped</i> <i>He working</i> |
| Lemma Access | Single words Formulas | <i>station, here</i> <i>My name is Pim</i> |

Generally, the Prominence hypothesis, which accounts for c-structure to f-structure mapping, predicts that learners begin with canonical word order and then gradually proceed to use a more marked word orders. The development of the learner’s mapping of thematic roles on grammatical functions (that is a-structure to f-structure mapping), is accounted for by the Lexical Mapping Hypothesis, originally proposed by Pienemann, Di Biase and Kawaguchi (2005), attempts to trace the learner’s syntactic progress “beyond the rigidity of canonicity towards a fuller flexibility of the optional choices allowed by their L2 in assigning GFs to thematic roles” (Bettoni & Di Biase, 2015, p. 68) . Lexical Mapping Hypothesis is now expanded to include further syntactic choices triggered by the speaker’s discourse or semantic

requirements. Bettoni and Di Biase (2015, p.68) formulate the Lexical Mapping Hypothesis as follows;

7. Second language acquirers will initially map the highest available role in the thematic hierarchy (e.g., agent, experiencer) onto minimally specified SUBJ/TOP. We call this default mapping. Next, they learn to add further arguments mapped onto grammatical functions (GFs) differentiating them from SUBJ (and OBJ, if present). They may also learn some exceptional verbs at this second stage. Finally, they learn to impose their own perspective on events, that is, to direct the listener's attention to a particular thematic role lower in the hierarchy by promoting it to SUBJ, and defocus the highest role by mapping it onto a GF other than SUBJ, or suppress it altogether. At this last stage learners may add further role information regarding causality, benefit, or adversity. They may also add to their lexicon particular subsets of Vs, such as unaccusatives, as well as further intrinsically exceptional Vs requiring their own mapping schema. We call this non-default mapping.

Learners' syntactic development based on the Lexical Mapping Hypothesis is summarised in Table 3.7.

Table 3.7

PT: Syntactic development based on the Lexical Mapping Hypothesis (after Bettoni & Di Biase 2015; Kawaguchi 2015)

| Stage | Constructions | Examples |
|--|--|--|
| Non-default mapping | Unaccusatives, passives, causatives, exceptional verbs constructions etc. | <i>Bob was beaten by Ted</i> <i>She made him cry</i> |
| Default Mapping and additional arguments | Agent/experiencer mapped on SUBJ, patient/theme mapped on OBJ, and other members of the a-structure hierarchy such as goals and locatives, mapped on OBL | <i>Mary put the butter in fridge</i> <i>She gives John a new bike</i> |
| Default mapping | Agent/experiencer mapped on SUBJ and Patient/theme mapped on OBJ | <i>John sleeping</i> <i>John fry egg</i> |
| Lemma access | Single words Formulas | <i>station, here</i> <i>My name is Pim</i> |

For the syntactic development, I hypothesise the linguistic outcomes of each structure in Malay based on the Prominence and Lexical Mapping Hypothesis. The structure for English syntax are already outlined in Table 3.6 and 3.7. Table 3.8 and 3.9 summarises the structures for Malay:

Table 3.8

PT: Syntactic development in Malay based on the Prominence Hypothesis (after Bettoni & Di Biase 2015; Kawaguchi 2015)

| Stage | Structures | Examples |
|---------------------------------------|---------------------------------|---|
| Non-canonical word order | TOP _{XP} marked orders | <i>Yang kejar kucing itu adalah anjing</i> REL chase cat that is dog 'The one that chases the cat is the dog' |
| XP _{DF} Canonical word order | TOP _{XP} SVO/SOV | <i>Anjing, ia kejar kucing</i> Dog, it chase cat 'The dog, it chases the cat' |
| Canonical word order | SVO | <i>anjing kejar kucing</i> <i>dog chase cat</i> 'the dog chases the cat' |
| Lemma Access | Single words Formulas | <i>kucing 'cat', anjing 'dog'</i> <i>Apa khabar? 'How are you?'</i> |

Table 3.9

PT: Syntactic development in Malay based on the Lexical Mapping Hypothesis (after Bettoni & Di Biase 2015; Kawaguchi 2015)

| Stage | Constructions | Examples |
|--|--|---|
| Non-default mapping | Unaccusatives, passives, causatives, exceptional verbs constructions etc. | <i>kucing kena kejar anjing di kawasan itu</i> cat KENA (PASS) chase dog at place that 'the cat is chased by the dog at that place' |
| Default Mapping and additional arguments | Agent/experiencer mapped on SUBJ, patient/theme mapped on OBJ, and other members of the a-structure hierarchy such as goals and locatives, mapped on OBL | <i>Ali bagi Abu basikal baru</i> Ali give Abu bike new 'Ali gives Abu a new bike' |
| Default mapping | Agent/experiencer mapped on SUBJ and Patient/theme mapped on OBJ | <i>Anjing kejar kucing</i> <i>dog chase cat</i> 'the dog chases the cat' |
| Lemma access | Single words Formulas | <i>kucing 'cat', anjing 'dog'</i> <i>Apa khabar? 'How are you?'</i> |

Empirical evidence supporting the Prominence Hypothesis is reported in several studies such as Bettoni and Di Biase (2011) for Italian, Di Biase, Kawaguchi & Yamaguchi (2015) for English, and Kawaguchi (2015) for Japanese. Results in Zhang (2007) and Itani-Adams (2009) support the earlier Topic Hypothesis for Chinese and for bilingual first language English-Japanese respectively. While for Lexical Mapping Hypothesis, studies supporting it include those by Bettoni, Di Biase and Nuzzo (2009) for Italian L2, Kawaguchi's investigation of Japanese L2 (2005, 2007, 2009, 2010, 2015), Keating and Kessler (2009) as well as Wang (2009) for English L2. In this thesis, apart from investigating the child's plural acquisition, the analyses also include the child's lexical development in Malay and English. Thus, these new PT hypotheses are tested for the first time in Malay-English bilingual development. In turn, this will provide a context for focusing on the development of plural marking in both languages.

3.9 Conclusion

This chapter outlined the background information pertaining to the study of a bilingual child language development in Malay and English. BFLA is a relatively new field in language acquisition, and it is still in its infancy. Research on the Malay-English constellation in BFLA is non-existent at the moment. Thus, this study contributes to the diversification of language pairs in the field of childhood bilingualism.

With regard to plural acquisition, studies investigating specific plural development in bilingual children is limited. The sequence of plural acquisition in children acquiring two languages is not robust, so the findings in this thesis will shed some light on the sequence of plural development in bilingual children.

This current study also opts to use Processability Theory (PT) as a framework to analyse the morphological and syntactic development of Malay and English of the bilingual child. There is only one other study investigating BFLA with PT, i.e., Itani-Adams' research on a Japanese-English bilingual child (2013). Being the first of its kind for Malay-English, this study also develops PT-based developmental hypotheses for the development of morphology and syntax in Malay early language acquisition, which is also applicable to Malay as a second language, given the original nature of PT. The longitudinal investigation conducted in this study also allows these hypotheses to be tested for Malay from the PT perspective. In the next chapter, the research questions of this thesis and the detailed methodology of the study are outlined.

CHAPTER 4

METHODOLOGY

The previous chapter presented a review of previous studies in Bilingual First Language Acquisition (BFLA) as well as outlining some remaining gaps observed in BFLA and in Processability Theory (PT). The current study investigates the development of plurals in Malay and English in a child raised simultaneously in these two languages. Specifically, this research examines the child's acquisition of the expression of plurality in Malay and English from age 2;10 to 3;10. I will also analyse the child's development at age 4;8.

This chapter presents the research method adopted in the current study. Firstly, the research questions that guide the current study will be introduced in section 4.1. Section 4.2 describes the research design adopted for this study. De Houwer (2009) stated that one common problem in BFLA is that researchers fail to be precise about the time of the children's exposure to the bilingual environments. Therefore, section 4.3 describes the child's linguistic background and reports the child's first regular exposure to Malay and English. Data collection procedures and methods of data analyses are described in section 4.4 and 4.5 respectively.

4.1 Research questions

The aim of this thesis is to investigate how plurals develop in Malay and English in a child acquiring these two languages simultaneously. This section presents the research questions that will guide the current study. Short explanations are also given to some questions:

- 1) Plurality is a conceptual category in many languages, but it is expressed differently in Malay and English. How does a child acquiring these two languages simultaneously develop the lexical and morphological devices to mark plurality? In particular:
 - a) How does the child develop linguistic expressions of plurality in Malay?
 - b) How does the child develop linguistic expressions of plurality in English?
 - c) To what extent does the morphological development of the plurals exhibited by the child in Malay and English followed the sequence of acquisition predicted by the Processability Theory (PT)?

- 2) Based on the findings in question 1, do the plural structures in Malay and English develop independently or do they indicate any interaction? In particular:
 - a) If cross-linguistic influence occurs in the child's plural encoding development in English and Malay, what is its nature?

This study also aims to observe the interaction between the developing grammars, focusing on the plural structure in Malay and English. Dopke (2000) points out that in the debate of whether simultaneously bilingual children start out with one unified structural system (Volterra & Taschner, 1978) or instantly distinguish between the two languages (De Houwer, 2009), the cross linguistic interaction between the children's developing grammars are often ignored. In BFLA literature, many terms to define the interaction between the two developing languages in bilingual children have appeared such as transfer, interference, interdependence, influence and convergence (Serratrice, 2013b).

In this thesis, I will adopt the term 'cross-linguistic influence' to indicate instances in which one language might have an effect on the other language of the bilingual child.

Question 1 and 2 will be answered in Chapter 5 Lexical and Morphological development. In Chapter 6, the focus of the study shifts to the prosody of reduplication in Malay. Thus, the third research questions are as follows:

- 3a) What are the prosodic patterns of disyllabic nominal reduplication in L1 adult Malay speakers?
- 3b) How does the production of disyllabic nominal reduplication in Malay develop prosodically in the child?

4.2 Research design

4.2.1 The case study approach. In investigating the acquisition of plurals in a simultaneous Malay-English bilingual child from a developmental perspective, the current study was designed as a longitudinal case study. The review in the literature of First Language Acquisition (FLA) and Bilingual First Language Acquisition (BFLA) evidently indicate that case study approach has a long-standing tradition in

the study of developmental language acquisition. In FLA, the landmark study by Brown (1973) was a longitudinal case study chronicling the language acquisition of three English speaking-children for several years. Following Brown, several prominent studies in FLA also used case studies; for instance de Villier and de Villier (1978) and Fletcher (1985) on the acquisition of English by English-speaking children, Smith (1973) on his son's acquisition of English phonology, and Tomasello (1992) on his daughter's developmental path to acquisition of verbs, among others.

Researchers were also conducting L1 longitudinal studies of languages other than English, for example Finnish, Samoan, Swedish, Spanish, Luo, and German. Many of the contributors to Slobin's (1985) volume on L1 acquisition of Japanese, German, Hebrew, Kaluli, and six other languages were based on parents' longitudinal diary or case studies of children's development in the various languages.

In BFLA, Li Wei (2010) pointed out that case studies are still the dominant approach in the field; single case studies are able to produce a large corpus of empirical data and longitudinal case studies are also very useful to reveal a pattern of development over time. Some early groundbreaking longitudinal case studies in BFLA are by Ronjat (1913) and Leopold (1939, 1947, 1949a, 1949b) who kept comprehensive diary records of their children growing up with two languages, Saunders (1988) on raising German-English bilingual children in Australia, Meisel (1994) on French-German bilingual children and De Houwer (1990) on a Dutch-English bilingual child. The case study approach continues to be fruitful until now; contemporary studies in the field of bilingual development include Deuchar and Quay's (2000) study of English-Spanish bilingual child, Lanza's (2004) case study of two bilingual children from Norwegian-American families, Itani-Adam's (2013) case study of a Japanese-English bilingual child and Qi's (2011) study of a Mandarin-English bilingual child living in Australia.

Obviously, one strength of longitudinal case studies in children's language acquisition is the depths of observation of the participant's development over time (Li Wei, 2010). By focusing on the development of a child or a small number of children, it is possible to perform a comprehensive analysis of the case and to include a triangulated perspectives from other participants and observers (Duff, 2008). Detailed case histories including the family background, linguistic environments and language learning situation are also more possible for a small number of informant than for a large number of individuals (Duff, 2008). This is also supported by Gass and Selinker (2008) who stated that:

Analyses of data obtained through longitudinal studies (and particularly in case studies) are often in the form of descriptive qualitative comments or narrative expositions. While quantification of data may not be the goal of such studies, the researcher may report the frequency of occurrence of some form. In the reporting of results from longitudinally collected data, there are likely to be specific examples of what a learner said and how his or her utterances are to be interpreted. This type of data is highly useful in determining developmental trends as well as in interpreting various social constraints and input influences on the learner's speech.
(p.55)

This is the case for this study as it involves the investigation of the developmental expressions of the child in Malay and English. This thesis also includes a detailed family and linguistic background of the bilingual child. Lanza (2004) points out that the main advantages of conducting a case study is in the opportunity to undertake a more holistic approach to the research questions at hand. Case studies allow for the usage of multiple sources of evidences and different types of data. It also allows for the closer examination of interrelationship of the variables, as Agar (1980) states, "Better to understand their interrelationship in a few cases than to misunderstand three of them in a population of 500"(p.123). In investigating the child's dual language acquisition, this study also uses different data types (see section 4.4) and different units of analyses (see section 4.5).

Another strength of longitudinal case studies is that they can generate hypotheses that inform the overall theory of language acquisition (Yip & Matthews, 2007). In fact, in BFLA, most recent contributions have come from detailed case studies rather than experimental studies involving a large number of children, for example, Gawlizek-Maiwald and Tracy's Bilingual Bootstrapping Hypothesis (1996) is based only on a single child, Lanza's (2004) hypotheses on language mixing is obtained from the investigation of two children, Bernardini and Schlyter's Ivy hypothesis for uneven development (2004) is derived from the study of three children, and language dominance hypothesis formulated by Yip and Matthew's (2007) is also derived from the study of their three Cantonese-English bilingual children.

It is claimed that the major limitation of case studies is that generalisation to a wider population may not be justified. Case studies, according to some researchers,

lack generalisability. Dromi (1987) argued with this issue of generalisability, stating that research is cumulative, and the growing number of case studies of child language development would provide researchers with a good base to compare the findings from one study with that from the other. Similarly, Platt (1988) mentioned that case studies are not conducted in isolation, and thus, they can be evaluated and compared to other similar studies in range. The findings in the present study can also be assessed with case studies from other language pairs or studies with monolingual children.

Another criticism directed against the case study method is that it lacks objectivity; the investigators might be too attached to the participants and hence, lose perspective of the research (Duff, 2008). However, nowadays, with the use of audio and video-recorders, researchers can make use of the recordings and inter-judge reliability checks can be made.

Thus, having mentioned all the advantages of case studies and despite the shortcomings claimed by some researchers, this approach is deemed necessary for this research as the child's linguistic development is constantly changing and it is only feasible to examine the change using the longitudinal design. The continuous observation during the period of investigation enables the researcher to capture any changes and any patterns of development that may emerge over time. It also allows the transcription and analysis of the data which covers a longer span of time.

4.3 Participant

The participant is a girl named Rina (pseudonym), age two years, 10 months (2;10) at the time the data collection commenced. Rina moved to Australia when she was one year, 11 months old (1;11). Rina was born in Malaysia and prior to the move, she lived in Malaysia with her parents. Rina is the firstborn and the only child in her family. Rina was exposed to both English and Malay from birth when she lived in Malaysia; her parents opted to raise her using the one-parent, one-language approach. Her parents, mother (henceforth referred to as Mother) and father (henceforth referred to as Father) were born in Malaysia and raised in monolingual Malay families. The family is a middle-class family; Father and Mother both acquired their bachelor degrees from local universities in Malaysia. Between Mother and Father, the medium of communication is Malay. The variety of English used by Mother to talk to Rina in Malaysia is Malaysian English (MalE).

In Malaysia, Malay was the predominant language spoken to Rina. With the exception of the interaction between Rina and Mother, which was in Malaysian

English, all the other domains from extended families, friends and outside home domain were conducted in Malay. Generally, in Malaysia, everyone except the Mother spoke Malay to Rina. However, when the family moved to Australia, Australian English gradually predominated Rina's language input. Australian English (AusE) became the language in which everyone spoke to Rina except the parents at home. Rina's linguistic environment is illustrated in detail in the following section.

Qi (2011) noted that most early studies in BFLA have mainly investigated bilingual children who were raised with the one-parent, one-language approach and involved only Indo-European languages (Ronjat, 1913; Leopold, 1947; De Houwer, 1990). Qi (2011) states that a bilingual child is more often exposed to context-bound language input and use in one language, one environment settings rather than the one-parent, one-language approach. Qi (2011) also pointed out that bilingual parents who speak their language to the children at home in a host country where the dominant language is different is the most usual circumstance among bilingual/multilingual communities. This is also the case with Rina when the family migrated to Australia. The following section describes the child's linguistic background.

4.3.1 Rina's linguistic environment. This section describes Rina's linguistic environment from the time she was born up until the time the data collection for this study commenced. This is exhibited in her typical sociolinguistics setting at various ages, which is summarised in the following table.

Table 4.1

Rina's linguistic environments

| Age | Settings | Context | Interlocutors | Input | Amount (hours per day) |
|--------|----------|---------------|-----------------|-------------------|---------------------------|
| 0-1;11 | Malaysia | Daily routine | Mother | Malaysian English | 4-5 |
| | | | Father | Malay | 3-4 |
| | | | Extended Family | Malay | 2-3 |

| Age | Settings | Context | Interlocutors | Input | Amount (hours per day) |
|-----------|------------------|---------------------|--------------------|--------------------------|------------------------|
| 1:11-2;10 | Australia | TV (cartoons, etc.) | | Standard British English | 1-2 |
| | | Outside activities | Peers, Neighbours | Malay | 0-1 |
| | | Daily routine | Mother | Malay | 3-4 |
| | | | Father | Malay | 0-2 |
| | | TV (cartoons, etc.) | Media | Australian English | 1-2 |
| | | Outside activities | Peers, Neighbours | Australian English | 0-1 |
| | Childcare centre | Teachers, peers | Australian English | 8 | |

As shown in Table 4.1, the first two years of Rina's life were dominated by interactions in the Malay language. When she started speaking at one year and three months (1;3), she began with Malay. Some utterances described by Mother at this stage were *ayah* 'father', *jom* 'let's', *opah* 'grandmother' and *tuk* 'grandfather'. Rina did not speak English at all though she understood Mother, who continued to talk to her in Malaysian English variety. This is not surprising because, during this period, Malay was highly activated and became Rina's "dominant" language. According to Meisel (2007), the nature of dominance and weaker language only pertains to the presence and frequency of use (i.e. performance rather than competence). It does not reflect the bilingual child's underlying knowledge of language. The language that is highly used and activated is considered the dominant language. In the context of Rina's life in Malaysia, Malay was the dominant language and English, because of the limited input condition, became her weaker language.

However, when Rina, Mother and Father migrated to Australia, English slowly became the dominant language. According to Mother, Rina said her first English word, *more* a month after she started attending a local childcare centre, at age two years (2;0). Mother and Father speak Malay to Rina at home. Rina goes to the childcare

centre four days a week from 7 am to 4 pm. On average, Rina is exposed to Australian English for eight hours daily and to Malay four hour daily. Her Malay language input is further decreased, as Father is frequently absent from home because of work. However, at times, Rina’s linguistic environment underwent some changes, especially if there were visits from relatives from Malaysia and trips to Malaysia, which usually lasted up to a month. During these times, Malay language was highly activated. The following graph estimated the proportion of Rina’s exposure to Malay and English environment from birth up to the end of longitudinal investigation, at age three years, 10 months (3;10);

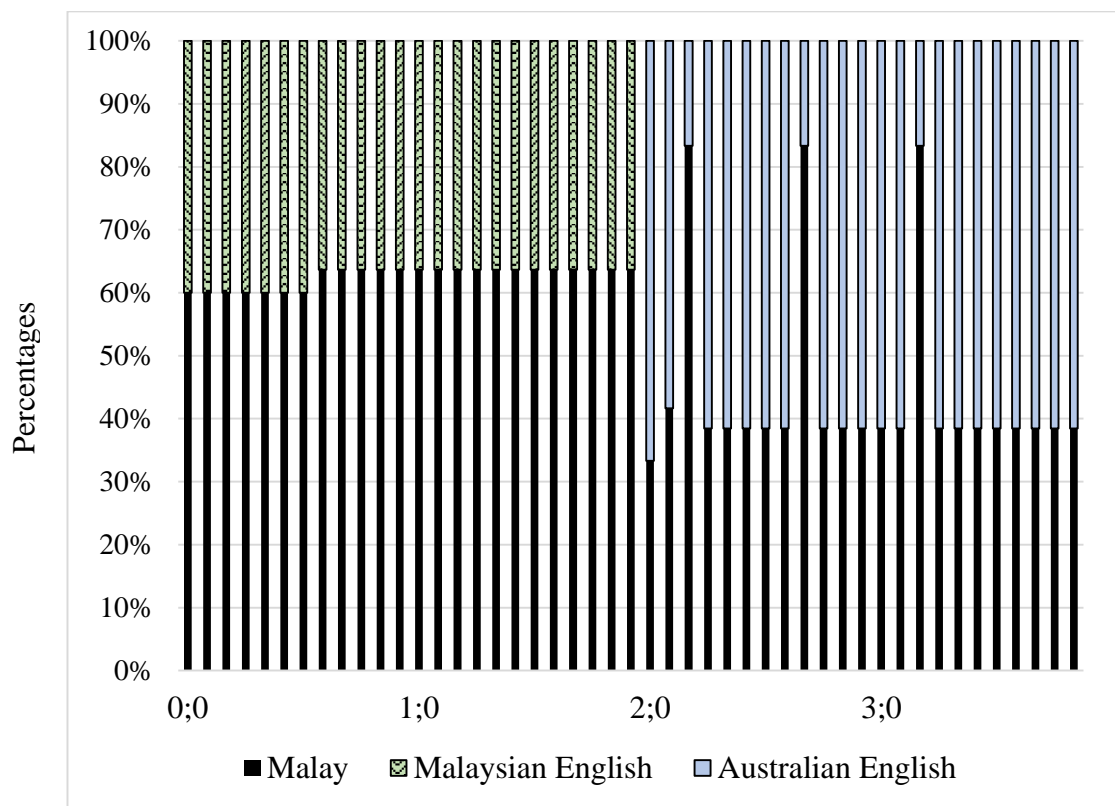


Figure 4.1. Proportion of Malay and English environments from birth to 3;10.

As figure 4.1 shows, the child’s environment varied from time to time. From birth to age 3;10, Rina was exposed to two different English varieties, Malaysian English (MalE) and Australian English (AusE). From birth to age 1;11, Rina’s linguistic environment was 60% in Malay language. This was the period when the family stayed in Malaysia. At age 1;11, when the family migrated to Australia, drastic change can be observed; Rina’s environment now shifted to 60% English dominant environment. At age 2;4 and 3;1, the family went for a trip to Malaysia for a month.

During these trips, the Mother no longer spoke English to the child in Malaysia. Rina was only exposed to English in Malaysia through media viewing, for example through watching television and videos on the Internet, which was estimated at 20% of the environment.

After the longitudinal investigation, I conducted recording sessions with Rina when she was 4;8. At 4;8, Rina has been staying in Malaysia for four months. In Malaysia, the family still maintained the bilingual environment; Rina goes to English-medium pre-school, and at home, Father and other family members (grandparents, uncles, aunties, cousins) speak in Malay. Mother, on the other hand, switched her role; whereas in Australia Mother spoke Malay to provide the Malay input, now Mother speaks English (Malaysian English) to Rina. The following figure summarises Rina's linguistic environment in Malaysia:

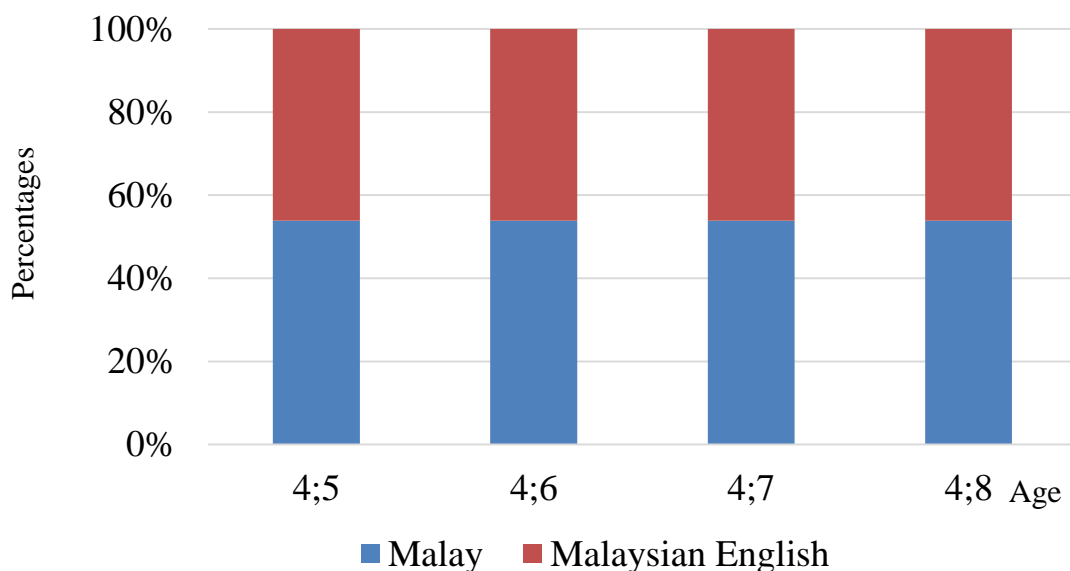


Figure 4.2. Proportion of Malay and English environments from 4;5 to 4;8.

On average, in Malaysia, Rina was exposed to 55% Malay language input and 45% to Malaysian English input daily.

4.4 Data collection

4.4.1 Types of data. In this section, the data collection procedures in the study is described. The corpus in this research consists of two main types of data: 1) audio

and video recordings, and 2) diary records kept by the parents by writing down the child's utterances as they occurred outside the recording sessions.

4.4.2 Diary data. The data for this study consist of Rina's spontaneous speech in her naturalistic settings. With the emphasis on plural development, the focus of the enquiry was the child's language use at home as well as outside the home domain. The study commenced when the child was 2;10. At age 2;10, the data was mainly obtained from the diary record of the parents. There were also sporadic audio recordings from 2;10 to 2;11 but most of the recordings at this time were conducted at home with the parents. Both the Mother and Father made notes about Rina's speech production, particularly at her plural output. The video recordings and the playgroup sessions with the other family began when Rina was 3;0. After the video recording had begun, Rina's parents took notes of Rina's speech only when she uttered something new outside the recording sessions.

4.4.3 Recording. Rina's speech was recorded using audio and video recorders simultaneously from age 2;11 until 3;10. Video recording was used to ensure the context was captured. Rina was recorded in two different sessions, one 30 minute to an hour English session and one 30 minutes to an hour Malay session on a weekly basis. For the English session, Rina was recorded while playing with other children whose first language is English, in the presence of her parent(s) and the other children's parents. At times, when the other children could not attend the English session, Rina was recorded interacting with Mother's friend who is a native speaker of English. However, due to her reserved and shy personality, Rina was reluctant to speak in many English recording sessions involving the other children and the Mother's friend. In playgroup sessions for example, some of the other children could be boisterous and because of this, Rina refused to speak. Therefore, to get her to speak more in English, the Mother conducted several English storytelling sessions at home. For the Malay session, Rina was recorded at home with the parents, usually with the monolingual Malay-speaking Father. The usual activities during the recording sessions were Rina playing with her toys, outings and shopping, eating meals and other daily routines. During both English and Malay sessions, in addition to recording her spontaneous speech, picture tasks eliciting linguistic expressions of single and multiple items are used.

The general notion in language acquisition studies concerning the data in longitudinal research is that the data should be spontaneously produced oral data. However, Larsen-Freeman and Long (1991, p. 26) mention that there are some inevitable issues with ‘naturalistic’ speech data; firstly the data might contain very little linguistic aspects which the investigators are interested to find because the participants might have no chance to produce them during the data collection period. Secondly, participants might also resort to avoidance strategy; they might not use the linguistic structures they deem too difficult. Thus, researchers might not be able to document fully the participants’ language performance.

Larsen-Freeman and Long (1991) suggested that to overcome these issues, it is recommended that researchers incorporate certain instruments to elicit particular linguistic features that they are interested in finding. This is also the issue in this study as plurality is not a common linguistic feature in children’s speech. Thus, to elicit plural expressions from the participant, picture naming tasks were included during the recording sessions.

The classification of the language context of each recording session is dependent on the language used by the adult interlocutors; thus, the recordings made with the English-speaking interlocutors were labelled the ‘English-context’ recordings, and those made with the Malay-speaking interlocutors were labelled the ‘Malay-context’ recordings. This is in line with language mode theory developed by Grosjean (1998) (see section 3.4).

In Rina’s case, it can be difficult to test a pure monolingual mode as the Mother is a Malay-English bilingual and the Mother was also present at most recording sessions. This created an obvious disadvantage as there was no control over the monolingual mode. However, there were several English recording sessions in the corpus in which Rina interacted with English-speaking peers, so these sessions will be used as control sessions. In Malay sessions, Rina was always recorded with the Father who is a monolingual Malay speaker, so this would serve as control sessions for the Malay language.

4.4.4 Equipment and technical issues. In terms of equipment used in the study, the audio recorder was Olympus linear PCM recorder and Rode microphones. As the sessions involve some activities with the other children, this study video-recorded the context using iPad Air 2 Video HD. During the recordings, the investigator encountered some technical difficulties. One recurring problem was that

if Rina was too active, the microphone might fall off from the designated spot (which was at Rina's collar, close to her mouth so the speech can be captured clearly). In such case, the adult participant or other person had to reattach the microphone to her clothes. Another issue was that at times when the children were running around from one area to the other (e.g., from the living room to the dining hall), the iPad video recorder might not be able to capture the whole context. At times, the researcher had to move the iPad regularly so that the contexts were duly recorded.

Some sessions also did not capture much verbal interaction. This was due to the mood of the child and the external factors such as TV broadcasts or videos from the Internet. In English sessions, Rina sometimes preferred to observe her peers rather than participated in the activities. In Malay sessions, there were times when Rina was moody and refused to participate in the activities. These factors could influence the amount of Rina's verbal interaction. When this happened, the recording session was either postponed or repeated at another time.

The corpus comprises of 90 recordings from when the child was 2;10 until she was 3;10. 45 recordings are in Malay sessions and 45 are in English sessions. Of the 90 recordings made, those transcribed and used for the analyses reported in this thesis are essentially 57 sessions; 27 sessions in Malay and 27 sessions in English. I also included the recordings when Rina was 4;8. There were two recording sessions at 4;8; one in Malay and one in English. These are listed in Table 4.2 and Table 4.3, with the age of the child (years; months; days), the interlocutors, the duration of the sessions, the activities conducted and the language context in an abbreviated form (M stands for Malay and E for English). The asterisk in the table marks the session in which picture task activity to elicit the plurals were included.

Table 4.2

Rina's age, interlocutors, duration and activities for the analysed Malay sessions

| Malay session | Rina's age | Interlocutor | Duration (minutes) | Activities |
|---------------|------------|------------------|--------------------|---------------------------------------|
| 1M | 2; 10:15 | Father | 10 | Playing with Father |
| 2M | 2;11;08 | Mother | 50 | Daily routines at home |
| 3M | 3;0;0 | Mother Father | 50 | Daily routines at home. |
| 4M | 3;0;8 | Mother Father | 68 | Eating meals. Daily routines at home. |
| 5M | 3;1;10 | Mother Father | 27 | Daily routines at home. |
| 6M | 3;2;10 | Mother Father | 37 | Daily routines at home. |

| Malay session | Rina's age | Interlocutor | Duration (minutes) | Activities |
|---------------|------------|------------------|--------------------|---|
| 7M | 3;3;1 | Mother Father | 55 | Playing toys and talking to Father via skype. |
| 8M | 3;3;20 | Mother Father | 60 | The child watched some videos and talked to Father via skype. Daily routines at home. |
| 9M | 3;3; 28 | Mother Father | 60 | Conversation with Mother while watching some videos. Rina talked to Father via skype. Daily routines at home. |
| 10M | 3;4;4 | Mother | 62 | Daily routines. |
| *11M | 3;4;14 | Mother Father | 34 | Playing cards and pictures. |
| *12M | 3;4;21 | Mother Father | 20 | Playing cards. Talking to Father via skype. |
| 13M | 3;4; 28 | Mother Father | 65 | Daily routines. Talking to Father via skype. |
| 14M | 3;5;0 | Mother Father | 64 | Daily routines at home. Talking to Father via skype. |
| *15M | 3;5;11 | Mother Father | 20 | Playing toys and talking to Father via skype. |
| *16M | 3;5;22 | Mother Father | 40 | Playing cards. Talking to Father via skype. |
| 17M | 3;6;5 | Mother Father | 35 | Playing with Father at home. |
| 18M | 3;6;10 | Mother Father | 50 | Playing with Father at home. |
| *19M | 3;6;21 | Mother Father | 41 | Playing cards and toys. Skype session with Father. |
| *20M | 3;6;25 | Mother Father | 51 | Playing cards and toys. Skype session with Father. |
| *21M | 3;7;10 | Mother | 28 | Playing cards and toys. |
| *22M | 3;8;0 | Mother Father | 17 | Playing cards and toys. |
| *23M | 3;8;26 | Mother | 30 | Playing toys and daily routines at home. |
| *24M | 3;9;3 | Mother Father | 23 | Playing cards with Father. |
| 25M | 3;9;20 | Mother | 11 | Playing toys. |
| 26M | 3;10;0 | Mother | 45 | Daily routine at home. |
| *27M | 3;10;8 | Mother Father | 28 | Playing cards at home. |
| *28M | 3;10;20 | Mother Father | 26 | Playing toys with Mother. Skype session with Father. |
| *29M | 3;10;28 | Father | 15 | Playing cards with Father. |

| Malay session | Rina's age | Interlocutor | Duration (minutes) | Activities |
|---|------------|--------------|--------------------|---------------------------------|
| *30M | 4;8;10 | Father | 85 | Playing cards with Father. |
| *31M | 4;8;10 | Father | 15 | Elicitation session with Father |
| Total duration= 1161 minutes, which is 19 hours and 25 minutes. | | | | |

Table 4.3

Rina's age, interlocutors, duration and activities for the analysed English sessions

| English session | Rina's age | Interlocutor | Duration (minutes) | Activities |
|-----------------|------------|--|--------------------|---|
| 1E | 3;1;10 | Mother Other Children Other Mother | 90 | Playgroup sessions with other children. |
| 2E | 3;3;25 | Mother Other Children Other Mother | 73 | Playgroup session |
| *3E | 3;4;8 | Mother's friend Mother | 49 | Storytelling session. The child interacted with Mother's friend in English via skype. |
| *4E | 3;5;10 | Mother | 37 | Storytelling session. |
| *5E | 3;5;18 | Other Children Other Mother Mother | 72 | Playgroup session with other children. |
| *6E | 3;5;28 | Mother | 55 | Playing toys |
| 7E | 3;6;10 | Other Children, Other Mother, Mother | 62 | Playgroup session. |
| 8E | 3;6;21 | Other Children, Other Mother Mother | 56 | Playgroup session. |
| *9E | 3;6;28 | Mother Mother's friend | 45 | Skype session with Mother's friend. |
| *10E | 3;7;0 | Mother | 20 | Storytelling session. |
| *11E | 3;7;7 | Mother | 31 | Storytelling session. |
| 12E | 3;7;15 | Mother, Librarian | 15 | Storytelling session at the library. |
| 13E | 3;7;20 | Mother | 79 | Playing toys and storytelling session. |
| *14E | 3;8;5 | Mother | 36 | Storytelling session. |
| *15E | 3;8;15 | Mother | 22 | Storytelling session |
| *16E | 3;8;27 | Mother | 20 | Playing toys. |

| English session | Rina's age | Interlocutor | Duration (minutes) | Activities |
|---|------------|---------------------------|--------------------|---|
| *17E | 3;9;4 | Mother | 25 | Playing toys and storytelling session. |
| 18E | 3;9;10 | Mother | 18 | Storytelling session. |
| *19E | 3;9;20 | Mother | 26 | Playing toys and storytelling session. |
| *20E | 3;10;00 | Mother | 14 | Playing cards. |
| *21E | 3;10;05 | Mother | 15 | Playing cards. |
| 22E | 3;10;20 | Mother Mother's friend | 20 | Talking with Mother's friend via skype. |
| *23E | 3;10;26 | Mother | 43 | Storytelling session |
| *24E | 4;8;10 | Mother | 45 | Playing cards. |
| *25E | 4;8;10 | Mother | 15 | Elicitation sessions |
| Total duration = 983 minutes, which is 16 hours and 25 minutes. | | | 983 | |

4.4.5 Transcription. The researcher transcribed all the recording sessions in both languages using ELAN 4.9.3 (Sloetjes & Wittenburg, 2008). ELAN is software used to create annotations on video and audio resources. Users can add unlimited annotations to the media observed. One important feature of ELAN is that annotations can be created on multiple layers called tiers. In this study, ELAN enables the researcher to annotate and tag the plural output of the child in the transcriptions. Orthographic transcription was the primary transcription method used in both Malay and English recordings. Phonetic transcription was also included to transcribe the non-targetlike pronunciation and idiosyncratic words produced by the child. The data was transcribed with one turn representing each speaker in a session.

Following Di Biase (2000), turn is referred to as “a normally continuous (including pause) utterance of a speaker, until the interlocutor (i.e. the other participant in the interaction) either takes his/her turn where he/she judges to be the end of the first speakers interrupts the first speaker’s utterance in order to take his/her turn” (p.100). The speaker codes used in the transcriptions were R for Rina, M for Mother, F for Father, and the other interlocutor’s initial. Since the transcriptions were done on ELAN, all the transcriptions were written on the ELAN tiers, which is written on a linear basis from left to right following the acoustic signals of the audio resources. All comprehensible utterances of the child and adults were transcribed, including those involving the other children and adult visitors. The following is a screenshot of ELAN taken from the ELAN website <https://tla.mpi.nl/tools/tla-tools/elan/>.

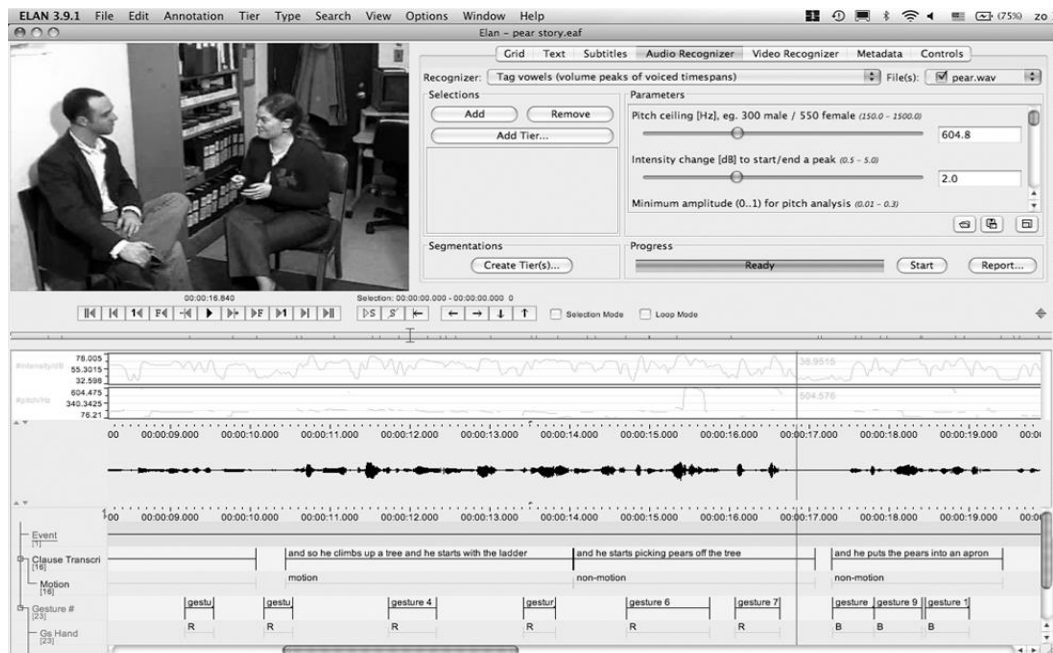


Figure 4.3. Screenshot of ELAN

Twenty-percent (20%) of the English and Malay transcriptions in this study were reviewed by the supervisors (for English) and a trained bilingual speaker of Malay and English reviewed the Malay transcriptions. Lanza (2004) contended that an ideal transcript should represent accurately what was recorded. However, this is argued by Wells (1985), who recounted an example from an informal experiment involving six language researchers transcribing a five-minute conversation of a father interacting with a young child. It was found that only 30 per cent of the recorded utterances were identical among the six transcriptions. Wells (1985, p. 47) further states that it is not possible to determine a single correct version of any recorded utterances. However, despite the difficulty of defining a ‘correct’ transcription, De Houwer considered it necessary for the transcriptions to be verified by another person, preferably by someone trained in linguistics and also sufficiently proficient in both languages the child was exposed to (1990, p. 81). Any discrepancy in the transcriptions was then re-checked and resolved by the researcher.

4.4.6 Data interpretation. Researchers who are familiar with child language data will agree that working a transcript is an arduous task. In interpreting the child’s speech, explicit criteria are needed. Thus, following the guidelines set by Lanza (2004,

pp. 103-104) with a slight modification to suit this study, several criteria were used in the analyses of this study to interpret the forms in the child language samples:

1. Phonetic similarity with the adult lexical forms.
2. Recurring usage of an idiosyncratic form with a given meaning if the first criterion fail. For example, at age 2;10, Rina replaced all the final -s consonant in Malay words with ʃ, e.g. [panas] to [panaʃ] ‘hot’, [atas] to [ataʃ] ‘up’ and [habis] to [habiʃ] ‘finish’.
3. Confirmation by the family members that a certain form in the corpus had a given meaning.
4. If the first three criteria failed, the researcher would refer to the situational settings and non-verbal communications which were captured in the video recordings to understand what the child meant.

Utterances, which did not meet these criteria were labelled as unintelligible and labelled as ‘X’. These utterances will not be included in the analyses of the child language speech. Lanza (2004, p. 104) states that this interpretation process is not just a task for linguists; in understanding children’s speech, parents too, always found themselves continuously interpreting young children’s speech, a process which is referred as the ‘negotiation of meaning’. Consider the following interaction between Rina and her Mother in a Malay session at age 3;4 (R for Rina and M for Mother):

5. R tu ziva
 that ziva
 ‘that (is a) ziva’
 M hm ziva?
 R zi cakap zi
 zi say zi
 ‘zi say (it) zi’
 M zi
 R bra zebra
 ‘bra zebra’
 M oh
 (laughing)
 R yes

In the conversation, the child was teaching the Mother the word ‘zebra’. Initially, she used the word ‘ziva’ which confused the Mother. Then, she pronounced

the word correctly and the Mother understood the message. This is a common example of the ‘negotiation of meaning’ in a daily parent-child interaction.

4.4.7 Data coding. As stated earlier, this thesis investigates Rina’s morphological and phonological plural productions in Malay and English. Thus, to process and analyse Rina’s transcribed utterances, the data were coded in two separate systems. In this study, ELAN is useful as it enables the researcher to relate the morphological as well as the phonological plural output of the child.

For the morphological analysis, each singular and plural output of the child in singular and plural contexts in the transcribed utterances were tagged in ELAN. The plural output in plural contexts in the corpus were then classified into several plural categories. These plural categories are generally based on formal categories of grammar. However, there were also some categories in the child’s language samples that are not listed in the formal grammar. For this kind of categories, the researcher used the categories employed in the previous plural acquisitions among English-speaking children in the literature. The categories are manifested in the following table:

Table 4.4

Plural categories coded in Rina’s speech

| Plural categories | Definition of the categories | Example from the corpus |
|-----------------------|--|--|
| Default form | When the child was shown a picture of plural items, the child used the same form she used for the single entity. | <i>cat</i> <i>dog</i> <i>kucing</i> (cat) <i>anjing</i> (dog) |
| Counting and pointing | When shown pictures of plural items, the child pointed and counted the items without uttering the noun. | <i>one two three four</i> <i>satu dua tiga</i> <i>empat</i> |
| Iteration | The child iterated the noun based on the number of the items. Thus, the more item she saw, the more she repeated the word. This category is based on the finding by Clark and Nikitina (2009), | <i>cat cat cat cat</i> <i>dog dog dog dog</i> <i>kucing kucing</i> <i>kucing</i> <i>anjing anjing anjing</i> |

| Plural categories | Definition of the categories | Example from the corpus |
|--|---|---|
| | who found that 6 children in their research used iteration in pluralizing English nouns. | |
| Iteration of noun with modifiers | This is like iteration in which the child repeated the noun based on the number of items. However, in this category the child added another element, the modifiers, to describe each of the entity. | <i>red bird orange bird yellow bird book green book purple book blue book brown</i> |
| Suffix -s | The child used the suffix -s to express plurals. There were also instances in which the child used Malay noun with suffix -s. | <i>cats dogs mainan 'toys' kucings 'cats'</i> |
| Incipient reduplication | The child used reduplication to express plurals. However, to avoid confusion with iteration, reduplication in the corpus was only classified as a plural category when the child used reduplication to refer to items more than two. As the child was just beginning to acquire this category, her reduplication utterances were labelled as <i>incipient reduplication</i> . | <i>cat-cat dog-dog kucing-kucing anjing-anjing</i> |
| English Indefinite quantifier + Malay default form | The child used English indefinite quantifier paired with Malay default form to mark more-than-one objects. | <i>More susu 'More milk' More air 'More water'</i> |
| Indefinite quantifier with default form | The child uses indefinite quantifiers such as <i>lots of</i> , <i>many</i> , <i>banyak</i> 'many' and <i>semua</i> 'all' with default form to express plurals in phrasal constructions. There were also instances in Malay context in which the child code-switched to English indefinite quantifier with English default form to describe plural. | <i>Lots of book All the ball Many crayon Many pig Banyak cat 'many cat' Banyak kucing</i> |

| Plural categories | Definition of the categories | Example from the corpus |
|--------------------------------------|--|---|
| | | 'many cat' <i>Semua kawan</i> 'All friend' |
| Indefinite quantifier with suffix -s | The child uses indefinite quantifiers <i>lots of</i> and <i>many</i> with the suffix -s to refer to more than one item. There were also instances in Malay context in which the child code-switched to English indefinite quantifier with suffix -s to describe plural. | <i>Lots of books</i> <i>Lots of toys</i> <i>Many apples</i> <i>Many bees</i> |
| Numeral quantifier with default form | The child uses numeral quantifiers such as <i>ten</i> and <i>two</i> with default form to express plurals in phrasal constructions. | <i>Ten flower</i> <i>Two car</i> <i>Dua kek</i> |
| Numeral quantifier with suffix -s | The child uses numeral quantifiers such as <i>four</i> with suffix-s to express plurals in phrasal constructions. | <i>Four brooms</i> <i>Two cats</i> |
| Prolonged vowel | The child prolonged the frequency of a particular vowel in a word to differentiate it from a single item. This category is based on Camarata's finding (1990), in which he found that his subject, a 2;07 normally developing English-speaking child, used an increase in fundamental frequency (Fo) and duration to signal plurals. | <i>Frooog</i> <i>Bolaaaaa</i> (ball) <i>Bukuuuuu</i> (buku) |

These plural categories were then counted and converted into charts and graphs in excel for further analyses. After the transcription in ELAN, the transcribed utterances are transferred to Praat (Boersma & Weenink, 2016) for acoustic analysis. The analyses are elaborated in the following section.

4.5 Data analysis

4.5.1 Utterances and mixed utterances. Before I proceed to the method of data analyses in this study, I will first define the unit of speech analysed. In child

language acquisition, the utterance has been a unit of speech in which language researchers investigate the acquisition of various linguistic phenomena. Crystal (2008, p. 505) defines utterance as a “stretch of speech preceded and followed by silence or a change of speaker”. However, this definition is too broad and may apply to a one-word response and a lecture. With regard to child’s speech, Ochs (1979) has stated that an utterance “should have a single intonation contour and single breath group”(p.63). Lanza (2004) specified that she used this criterion of a single intonational contour to identify utterance boundaries in the participants’ speech. Similarly, following this practice, this research also classified a single utterance based on a single intonational contour of the child’s speech.

In the study, I found a number of mixed utterances in Rina’s speech. Following Lanza (2004), mixed utterances in this study is defined as the combination of elements from the Malay and English languages in the child’s single utterance. I would also like to highlight that in several BFLA studies (Itani-Adams, 2013; Qi, 2011) mixed utterances has not been considered in the analyses of the data and keep separated from language-specific development. This might be attributed to the fewer number of mixing utterances compared to the language-specific utterances. However, by excluding the mixed utterances, it might not give an accurate estimate of the child’s overall language development. Lanza (2004) also states that mixed utterances, though fewer in number, is important as it can wholly show bilingual children’s language development. In this study, mixed utterances give a comprehensive representation of Rina’s syntactic development (e.g. in Malay context: *ini fish*/ “this (is a) fish” (3;0); *kotor car*/ “(a) dirty car” (3;3); in English context: *no telur*/ “no egg”(3;1); *I want keluar*/ “I want (to go) out” (3;6).

4.5.2 Mean length of utterance (MLU). This section describes the method of analysis for the morphological aspect of Rina’s language development. Mean length of utterance or MLU is the average morphemes per utterance in a child’s speech production. MLU is calculated by counting the morphemes in each utterance, sums over them and divides by the number of utterances, as in example 6 (Lust, 2006, p. 126):

6. Computing MLU
 dat bunny 2
 dat bunny get juice on it 6
 sloppy bunny 2

bunny hops 3
 Total: $13/4 = 3.25$ MLU

Brown (1973) considered MLU as, “an excellent simple index of grammatical development” (p.53) rather than age because the addition of linguistic knowledge usually leads to increase in children’s length of utterances. When he compared the children in his study by age, Brown observed a high degree of variability. This leads him to the conclusion that matching the children by MLU are preferable to get them to be at the similar complexity level than by matching them with age. Brown then developed five stages of linguistic development based on MLU values of 1.75, 2.25, 2.75, 3.5 and 4.0. MLU 1.75 is parallel to Stage I and MLU 4.0 parallel to Stage V. This stage will be elaborated further in Chapter 5 when I compare Rina’s English MLU with Brown’s MLU stages. Since Brown’s groundbreaking work (1973), MLU has been used widely in children language acquisition studies as a gross measurement of grammatical development. In the context of bilingual children, MLU can be used to indicate progress in both languages as well as to show the relative dominance between the two developing languages (Dopke, 1998; Itani-Adams, 2013). In this study, MLU is used to show Rina’s basic progress in English and Malay during the period of investigation.

In this study, MLU was calculated by counting words instead of morphemes from both Malay and English (MLU word). Words rather than morphemes were calculated because of the issue in determining whether a morpheme was used productively by the child (Dopke, 1998; Hickey, 1991). In a comparative study investigating the correlation between MLU word (henceforth MLUw) and MLU morpheme (henceforth MLUm) in a typically developing English-speaking children by Parker and Brorson (2005), they found that both the MLUw and MLUm are perfectly correlated, which shows that MLUw can be used reliably as MLUm. Similar to Dopke (1998), Parker and Brorson also point out that researchers do not have to make the decision whether the child is using the morpheme productively when using MLUw. Conveniently, MLUw can also be used to compare across languages as it will alleviate the concerns about MLU inflation in highly inflected languages (Arlman-Rupp, Van Niekerk-de Haan, & Van de Sandt-Koenderman, 1976; Hickey, 1991; Parker & Brorson, 2005). In this study, given Rina’s language ability during the period of investigation, the researcher believes that using MLUw will give a better estimate of her general language progress in Malay and English than MLUm. To calculate MLU in Rina’s Malay utterances, Malay reduplicated words in her utterances such as

mainan-mainan ‘toys’ and *kucing-kucing* ‘cats’ were counted as one word. There were also some inflections found in Rina’s Malay words such as prefix *ter-* (one of the functions of *ter-* prefix in Malay language is that once it is combined with an adjective, it carries a superlative meaning) in *tercantik* ‘the most beautiful’ and suffix *-nya* (*-nya* is a pronoun form, equal to ‘it’ in English) such as *cantiknya* ‘it’s beautiful’, *banyaknya* ‘it’s a lot’, and *comelnya* ‘it’s adorable’. These words were counted as one word instead of two unit of morphemes. Similarly, English words in Rina’s utterances which has inflections, such as suffix *-s* and *-ing* (e.g. *cats*, *dogs*, *playing*, *wearing*) were calculated as one word. Following Itani-Adams (2013), the utterances that belonged to the following categories were excluded from MLU calculation:

7.
 - a. onomatopoeias
 - b. counting numbers, (e.g., 1, 2, 3, 4, ...)
 - c. backchannelling and fillers (e.g., hhm, mhm)
 - d. exclamation (e.g., ah, wow)
 - e. repeated word and/or particles within an utterance

MLU values were calculated separately according to the utterance type; English, Malay and mixed utterances. It should be noted that since the MLU count is differentiated based on the utterance type, it was not possible to calculate the MLU based on 100 utterances. Therefore, similar to Dopke (1998), Lanza (2004) and Qi (2011), the MLU computed in this research is fewer than 100 utterances. A sample of each of Rina’s utterance type (Malay, English and mixed), together with glosses and some contextual notes are given in Table 4.5. English words are italicised in the mixed utterances.

Table 4.5

Sample of Rina’s utterance type from age 2;10 to 3;10

| Time of utterance | Utterances | Gloss and contextual notes |
|-------------------|------------------------------|----------------------------------|
| 2;10 Malay | Rina makan | Rina eats |
| 2;11 English | look car | Look at the car |
| 3;0 Mixed | napa ada <i>monkey</i> ? | Why is there a monkey? |
| 3;1 Malay | meh Rina pegang | Come let Rina hold it |
| 3;2 English | look love heart | (She saw a heart-shaped picture) |
| 3;3 Mixed | Rina tak main <i>game</i> | Rina is not playing any game |
| 3;4 Malay | napa dalam kotak ada mainan? | Why is there a toy in the box? |

| Time of utterance | Utterances | Gloss and contextual notes |
|-------------------|--|-------------------------------------|
| 3;5 English | present for Cinderella | A present for Cinderella (doll) |
| 3;6 Mixed | <i>no I want cakap English</i> | No I want to speak in English |
| 3;7 Malay | ayah beli kereta banyak | Father bought many cars |
| 3;8 English | I want the pink one | (asking for a pink toy) |
| 3;9 Mixed | <i>because orang jahat nak datang</i> | Because an evil person will come |
| 3;10 Mixed | <i>last day we go beli princess cake</i> | Yesterday we bought a princess cake |

There have been recurring issues raised by researchers concerning the use of MLU as an adequate tool to measure children's language abilities. Dopke (1998) and De Houwer (2009) argued that as a measure of comparison across languages, MLU might be problematic as MLU is not comparable if the languages involved are of different morphological types. For instance, if a child is acquiring Turkey and Cantonese. if a child is acquiring Turkey (an agglutinative language) with Cantonese (an isolating language), then the child's MLU is not comparable (Yip & Matthews, 2007). This is resolved by the usage of MLUw, which I have previously discussed. However, in children language acquisition, there are yet to be alternative instruments developed to evaluate the language development in general. MLU in this study is used with the combination of qualitative analyses and generally serves to approximate the child's linguistic development at certain points in time.

4.5.3 Lexical development. MLU, as discussed before, measure the child's grammatical development. There is strong evidence showing that the emergence of grammar is highly dependent upon vocabulary size (c.f. Bates and Goodman, 1997). Thus, to see whether the size of Rina's vocabulary affect the MLU development, I also analysed Rina's lexical development in Malay and English quantitatively and qualitatively. For quantitative analyses, I first establish the size of Rina's lexicon in the longitudinal study (from 2;10 to 3;10). Rina's lexicon size at 4;8 in Malay and English is also included. The analyses of the word types are performed using KWIC, a corpus software tool designed to make word frequency lists, concordances and collocation tables by using electronic files. KWIC listed the words alphabetically, together with the contexts before and after each word. KWIC also provide an index of the lexical items indicating the number of occurrences in the corpus. For the qualitative analyses, I analysed Rina's composition of lexical items at a certain developmental point; at 2;10, 3;4, 3;6 3;10 and 4;8.

4.5.4 Acquisition criteria: Emergence criterion. Determining the acquisition point among learners has been a controversial methodological issue in language acquisition research. In early studies on morpheme acquisition (Brown, 1973; J. de Villiers & de Villiers, 1973; Dulay & Burt, 1974; Hakuta, 1976), acquisition is identified based on the criteria proposed by Cazden's (1968), "Point of acquisition is defined as the first speech sample of three such that in all three the inflection is supplied in at least 90 percent of the contexts in which it is clearly required" (p.435). Brown (1973) further explained the notion of obligatory context as applied by Cazden:

...one can set an acquisition criterion not simply in terms of output but in terms of output-where-required. Each obligatory context can be regarded as a kind of test item which the child passes by supplying the required morpheme or fails by supplying none or one that is not correct. This performance measure, the percentage of morphemes supplied in obligatory contexts, should not be dependent on the topic of conversation or the character of the interaction. (p. 255)

As manifested in Brown's explanation, obligatory context only takes into account the learners' correct production of a particular structure. Errors were treated the same as no suppliance. Thus, based on this notion, Brown (1973) considered learners to have 'acquired' the morpheme only when they reached 90 percent of correct target-like usage. Some studies, following Brown's obligatory context, set lower percentage for the accuracy rate; for example 60 percent (Vainikka & Young-Scholten, 1994), 75 percent (Ellis, 1988) and 80 percent (Andersen, 1978).

According to Pallotti (2007), these different accuracy rates might raise some issues as the criterion level seems arbitrary and the application of varying accuracy percentage might lead to different acquisition sequence in the same data set. Instead of describing the acquisition process in the interlanguage, the high accuracy rate percentage corresponds to learners' level of mastery (Pienemann, 1998). Pienemann (1998) also argued that the analyses using accuracy rate "does not have the potential of describing the dynamics of interlanguage development even though it produces a neat rank order of accuracy of morpheme insertion" (p.137).

Similarly, Zhang (2002) points out that accuracy rate tends to gloss over the acquisition process, stating that "accuracy-based approach ... did not demonstrate the process of how the learner goes about learning a particular form. The step-by-step

progression of a grammatical item from its earliest and most immature form to fully target language-like use is not revealed” (p. 81). Zhang’s statement is indeed very relevant to our study as accuracy rates might have a high tendency to gloss over the child’s language development and treat the errors the child produced during the developmental period as the same with no suppliance.

Therefore, some researchers have suggested using acquisition criteria based on the emergence of linguistic structures rather than calculating learners’ accuracy rates (Bardovi-Harlig, 2000; Meisel, Clahsen & Pienemann, 1981; Pienemann, 1998). This study follows the emergence criterion proposed by Pienemann (1998). The emergence criterion was first used by ZISA (Zweitspracherwerb Italienischer und Spanischer Arbeiter) group. It considers the first appearance of a grammatical structure as the beginning of the acquisition process, though the rules from the previous stage may not be mastered by the learners in all possible contexts. The emergence concept may be applied to morphological development but a further ‘refined’ analysis must be implemented to distinguish between learners’ formulaic expressions and their productive usage of morphology (Pienemann, 1998). The “refined analyses” in this thesis is achieved by distributional analysis, which is described in the following section.

4.5.5 Distributional analysis. In this study, the quantitative examination of the productivity of the plural structure was done through a distributional analysis. The productivity of a particular plural structure was determined by the presence of alternate forms and linguistic environments. For example, if the suffix *-s* occurs with only one lexical item *dog*, even if *dogs* occurs 20 times throughout the corpus, we cannot determine whether suffix *-s* is used productively. However, if suffix *-s* occurs with another lexical item, such as *books* and *cats* (and also some Malay words, an example in the corpus, *mainans*), then we may consider that the linguistic rule of *-s* to indicate plurality is applied. Pienemann (1998) claims that “it is more informative to atomise linguistic contexts as much as possible in distributional analyses to determine which contexts or even which lexical items are related to which particular interlanguage rules” (p.139).

The result of this distributional analysis was qualitatively applied to the emergence criteria to examine the emergence of the plural structure. Di Biase and Kawaguchi (2002) stated that emergence is regarded when, “the rule is supplied more

than once in lexically and structurally varied environments” (p.290). Thus, following this practice, any plural structure in Rina’s speech is classified as emerged when:

8.
 - a. The structure occurs in more than one lexical variation, i.e., with at least two different lexical items.
 - b. The lexical items must occur in a different form within the same set of data.

In-depth analyses of each of the plural structures, with illustrative examples from the corpus, are discussed in Chapter 5. Up till now, I have discussed in detailed about the methods of morphological analysis conducted in this study. As mentioned earlier, I also examined the prosodic aspect of Rina’s plural utterances. Therefore, the following section describes the method for the prosodic analyses conducted in this study.

4.5.6 Prosodic analyses. Rina’s plural utterances were also examined in terms of its prosodic properties. The prosodic investigation was carried out by using acoustic analyses. Acoustic analysis of Rina’s plural output, particularly her iteration and reduplication utterances were conducted using Praat software (Boersma & Weenink, 2016). By using acoustic analysis, better accuracy can be achieved as simple transcription methods might not be able to capture the contrast made by the participants (Scobbie, Gibbon, Hardcastle, & Fletcher, 2000). Similarly, in their research, Theodore, Demuth and Shattuck-Hufnagel (2012) used acoustic analyses as they found that that simple transcription method could not accurately describe the children’s acquisition of onset and coda consonants. Thus, following the practice of the previous studies, I also use acoustic analysis as a method to measure the prosodic patterns of the child’s plural utterances. The methods for prosodic analyses will be explained in detail in Chapter 6 prosodic analyses.

4.6 Concluding remark

This chapter presented the research questions asked in the current empirical study. The chapter also described the participant in this study, Rina and presented the methods used for various linguistic analyses. In the following chapter the results obtained from the study are analysed and discussed.

CHAPTER 5

LEXICAL AND MORPHOLOGICAL DEVELOPMENT

The previous chapter presented the the detailed description of the various methods employed and research questions to be answered through this study. This chapter subsequently reports and discusses the results of the present longitudinal study of the development of plural expressions using the corpus of a child, Rina, who is raised in Malay and English simultaneously. The analyses for the plural development includes the times when Rina is 2;10 up till 3;10. I also include analysis of Rina's plural expression when she is 4;8, nearly a year after the longitudinal study has ended.

This chapter is organised into several sections; section 5.1 presents Rina's mean length of utterances (MLU) in the two languages. Rina's MLU development in both languages as well as her mixing MLU will be presented and this will help us understand her overall language progress throughout the period of investigation. Related to her overall language progress, Section 5.2 describes Rina's lexical development in the study. Afterwards, Rina's plural development in Malay and English is described in section 5.3. Following Rina's plural acquisition, the applicability of Processability Theory (PT) in Rina's plural development in both languages is discussed in section 5.4. Being a bilingual child, it's unsurprising that Rina's plural output manifested influences from English to Malay as well as Malay to English. Thus, section 5.5 discusses the findings on cross-linguistic influences (CLI) in Rina's expression of plurality. Finally, section 5.6 concludes the chapter.

5.1 Mean length of utterance (MLU)

In Chapter 4, the questions around the validity of MLU in comparing development across languages were elaborated (Dopke, 1998; Parker & Brorson, 2005; Yip & Matthews, 2007). To recap, although the inadequacies of MLU as a measurement of children's linguistic complexity have been questioned, it is still used widely in children language acquisition, which warrants its use in this study. In the bilingual context, MLU is useful in showing children's progress in both languages and in showing the relative dominance of the two developing languages (Dopke, 1998). Therefore, in this study, Rina's MLU development in Malay, English and also mixed utterances are presented to show her general development during the period of

investigation. It is followed by a comparison of Rina's MLU development with monolingual Malay and English MLU cited in previous research. Rina's mixed MLU is also presented as it will give a complete picture of Rina's general morpho-syntactic development.

5.1.1 Rina's Malay and English MLU. Figure 5.1 provides an overview of Rina's MLU development in Malay and English.

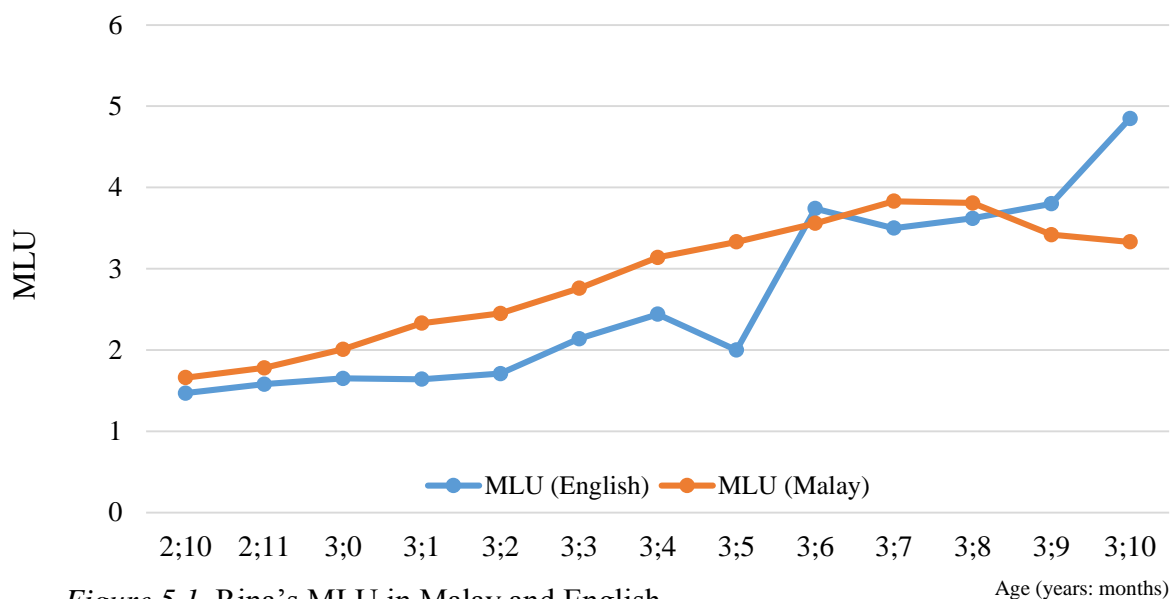


Figure 5.1. Rina's MLU in Malay and English.

The corresponding data for each language can be found in Appendix I. Generally, based on the figure, the MLU for both Malay and English language gradually increases during the period of investigation except for one session at 3;5 with her English MLU and two sessions at 3;9 and 3;10 with Malay MLU. The increasing MLU values in Malay and English also demonstrates Rina's progressing ability to express herself in both languages. It appears that Rina's Malay MLU from age 2;10 to 3;5 was consistently ahead of her English MLU. There was a period, at age 3;6, where the gap between both languages nearly closes. At 3;9 and 3;10, Rina's Malay MLU slightly dropped from MLU 3.81 at age 3;8 to MLU 3.42 at age 3;9 and finally reaching MLU 3.33 at age 3;10. In general, Malay MLU developed steadily and did not show any rapid increase at any age during the period of investigation.

English MLU on the other hand, begins slower than Malay. However, a prominent increase can be seen at age 3;6; Rina's English MLU increases rapidly from MLU 2.0 at age 3;5 to MLU 3.74 at age 3;6. Rina's English MLU continues to develop after 3;6 and it appears that another spurt emerges at 3;9 when her English reaches MLU 4.85. It is interesting to note that when Rina's English MLU underwent rapid increase at 3;9 and 3;10, her Malay MLU drops. Based on the MLU findings, we can say that from age 2;10, to 3;5, Rina's MLU fits the profile of a "Malay-dominant" bilingual speaker. From 3;9 to 3;10, the situation is reversed; Rina has become more dominant in English than in Malay.

In Rina's situation, we can see from figure 5.1 that her dominant language, which is based on her MLU, varied throughout the investigation. She is more dominant in Malay in the beginning but then she becomes more dominant in English at the end of the investigation. This finding supports the general agreement that dominance is not static; it varies over time based on individual's experiences (Lanza, 2004; Leopold, 1939; Qi, 2011). I will now discuss Rina's MLU based on Brown's stages (1973) in English L1 acquisition.

5.1.2 Comparison of Rina's Malay and English MLU based on Brown's stages. In this section, Rina's Malay and English MLU is compared based on Brown's stages. In his ground-breaking work, Brown (1973, p. 271) described five chronological stages of development based on a child's MLU as given in the following table:

Table 5.1

Brown's MLU stages

| Stage | Range of MLU |
|-------|--------------|
| I | 1.75 |
| II | 2.25 |
| III | 2.75 |
| IV | 3.50 |
| V | 4.0 |

I applied the range of MLU values by Brown (1973) to Rina's two developing MLUs. The following tables and Figure 5.2 indicate Rina's Malay and English MLU in relation to Brown's stages.

Table 5.2

Rina's English MLU based on Brown's stages

| | MLU | Age | Brown's stage |
|-----|-----------|-----------|---------------|
| I | 1.47-2.14 | 2;10-3;03 | 1.75 |
| II | 2.44-2.0 | 3;04-3;05 | 2.25 |
| III | - | - | 2.75 |
| IV | 3.74-3.80 | 3;06-3;09 | 3.50 |
| V | 4.85 | 3;10 | 4.0 |

Table 5.3

Rina's Malay MLU based on Brown's stages

| | MLU | Age | Brown's stage |
|-----|-----------|-----------|---------------|
| I | 1.66-2.01 | 2;10-3;01 | 1.75 |
| II | 2.33-2.45 | 3;01-3;02 | 2.25 |
| III | 2.76-3.33 | 3;03-3;05 | 2.75 |
| | 3.42-3.33 | 3;09-3;10 | |
| IV | 3.56-3.80 | 3;06-3;08 | 3.50 |
| V | - | - | 4.0 |

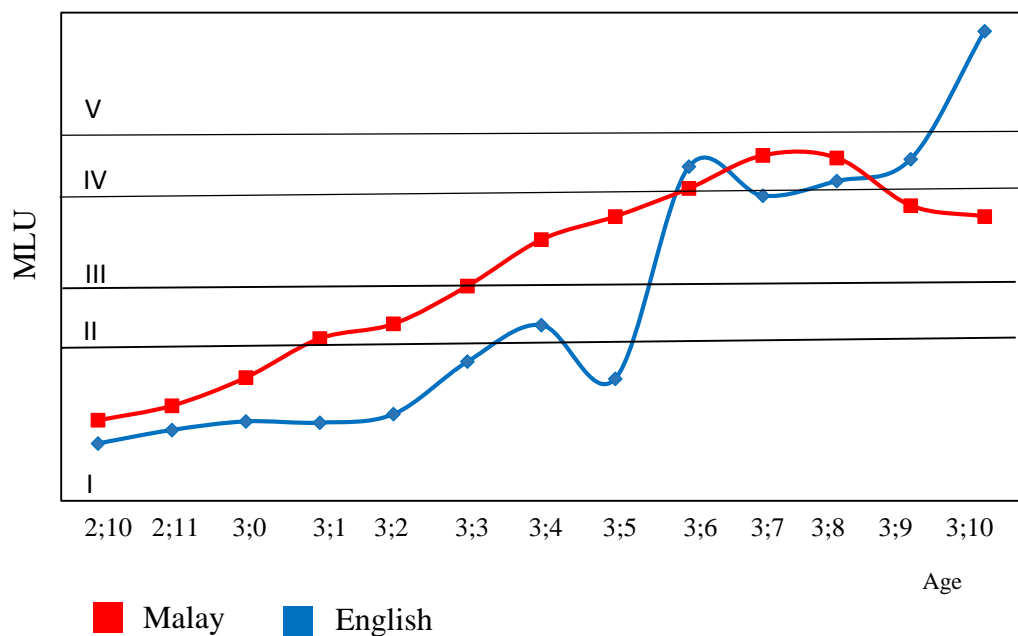


Figure 5.2. Rina's English and Malay MLU based on Brown's stages.

The horizontal lines in Figure 5.2 with numbers I, II, III, IV and V indicate the beginning of each of Brown's MLU stages. Based on the information provided, both Malay and English MLU had reached Brown's stage I at the beginning of this study (2;10). However, each MLU indicates a different pattern of development. For example, Malay MLU reaches level II faster than English MLU, which is at age 3;1. Two months after stage II, at 3;3, Malay MLU reaches stage III. Rina's Malay MLU reaches stage IV when she is 3;6. However, at 3;9, her Malay MLU drops to stage III. Rina's Malay MLU never reaches stage V of Brown's stage during the period of investigation.

As mentioned, Rina's English MLU reaches level II slower than her Malay MLU, which is at age 3;4. The following month, at 3;5, English MLU reverts to stage I. However, surprisingly, after this drop, English MLU rises to stage IV in the next month. Rina's English MLU remains at stage IV from 3;6 to 3;9. At 3;10, her English MLU finally reaches Brown's highest stage (stage V).

In summary, Malay and English MLU show different pattern of development in nearly all Brown's stages. The only time Rina's two MLUs reach the same point is at age 3;6, which is at stage IV. English reaches stage V while Malay does not reach stage V during the period of investigation.

5.1.3 Comparison of Rina's MLU to that of Malay and English L1 MLU.

In this section, Rina's MLU with that of Malay and English-speaking children reported in First Language Acquisition (FLA) is compared. For Malay acquisition among Malay L1 children, the data for MLU was obtained from Razak (2014). This MLU is gained from the Language Assessment, Remediation, and Screening Procedure (LARSP), originally developed by Crystal (1992) and adapted into Malay by Razak, Aziz, Lim, and Jin (2011). This adapted Malay-LARSP is tested on 130 typically developing Malay children within the age range of 1;0 to 3;11 years old. The following is the mean MLU for age group 1;0 up to 3;11.

Table 5.4

Mean MLU for Malay L1

| Age range | Mean MLU |
|-----------|----------|
| 1;0-1;11 | 1.15 |
| 2;0-2;11 | 1.61 |
| 3;0-3;11 | 2.34 |

Unfortunately, there are not many research and studies on Malay L1 acquisition. Hence, not many detailed information can be obtained except for the mean MLU and the age range in which Malay children develop their first language. As Razak (2014, p.135) states about studies of Malay L1 development in Malaysia “these studies provided a general picture of Malay child language development, and at best show that the language abilities of Malay children are varied and increase with age”. Concerning Rina’s development, at the commencement of the study (at age 2;10), her Malay MLU begins with 1.66, which is comparable to the mean MLU for the age range of 2;0 to 2;11. At age 3;0, Rina’s Malay MLU is 2.01. At age 3;1, Rina’s Malay MLU reaches 2.33 and this value is again similar to the mean MLU for age range of 3;0-3;11. Generally, it may be concluded that Rina’s Malay MLU is comparable to that of Malay L1 children. Figure 5.3 compares Rina’s mean Malay MLU with monolingual Malay children’s MLU. It appears that Rina’s MLU is higher than the MLU profile exhibited by the L1 Malay children.

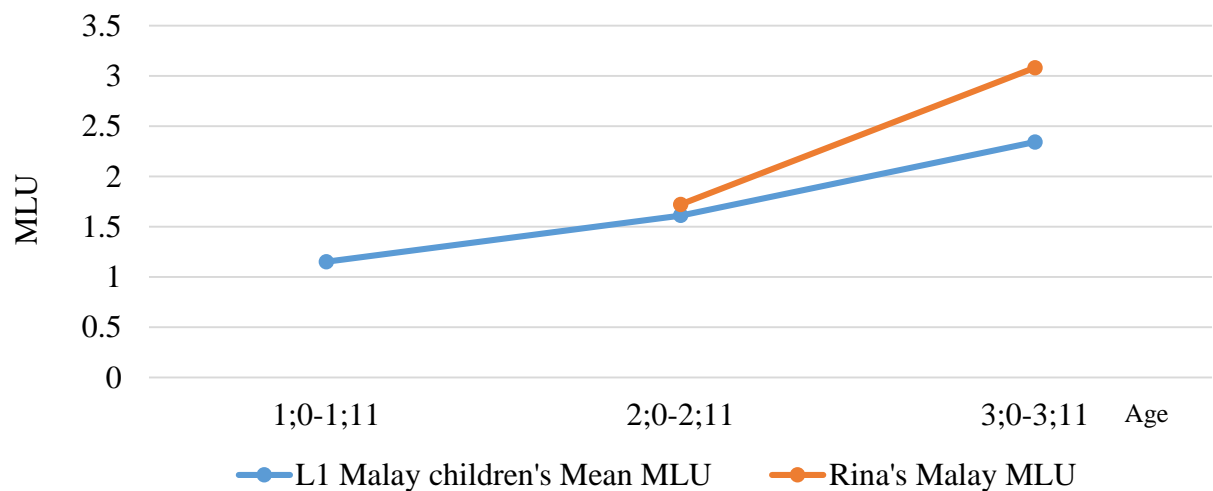


Figure 5.3. Rina’s Malay MLU compared to L1 Malay children’s mean MLU.

I will now compare Rina’s English MLU to that of English L1 children. The data for English L1 children are obtained from Miller and Chapman (1981), who gather the MLU for 123 typically developing English-speaking children, age seventeen months up to five years of age. Miller and Chapman calculate the mean MLU of their participants, beginning from 18 months up till 60 months, with three months’ interval between them. It needs to be pointed out here that Miller and

Chapman based their MLU values on morphemes whereas for this study, Rina’s MLU was based on words. Thus, it is unsurprising if Miller and Chapman’s MLU values are higher than Rina’s.

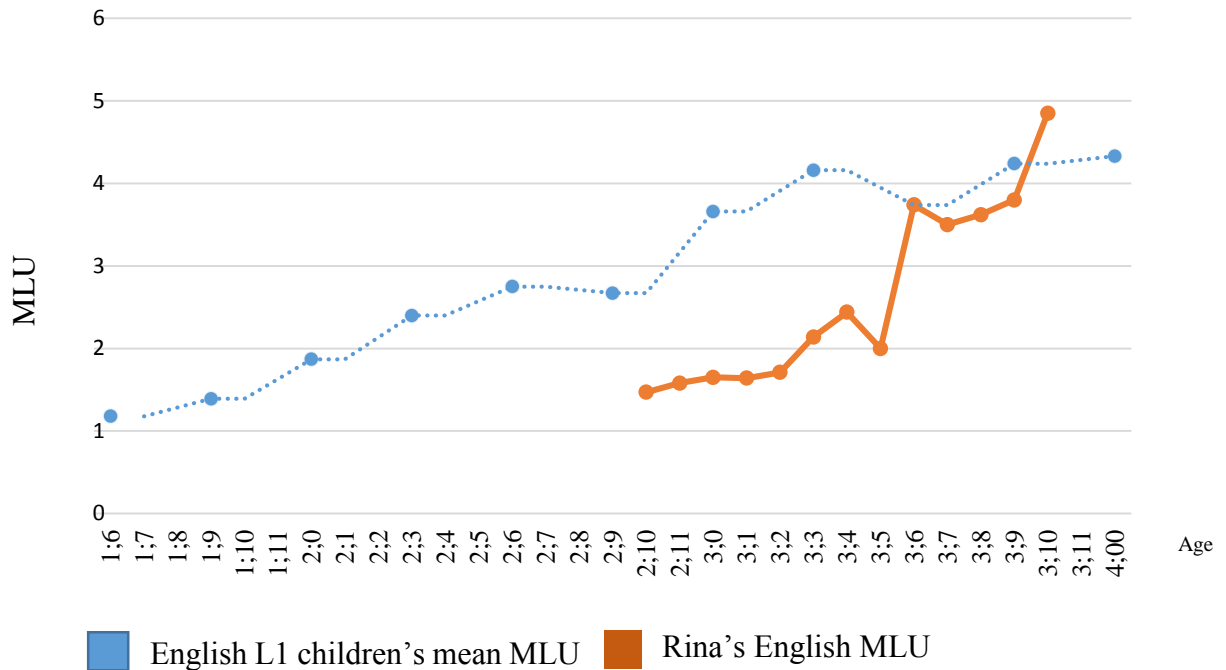


Figure 5.4. Miller and Chapman’s mean English MLU and Rina’s English MLU.

In Figure 5.4, Miller and Chapman’s mean MLU along with Rina’s English MLU are presented. Rina’s English MLU develops slower compared to English L1 children from age 2;10 to 3;5. However, at 3;6, Rina’s MLU shows a rapid increase and after this increase, her English MLU development shows a close resemblance to Miller and Chapman’s mean MLU. In fact, Rina’s English MLU continues to increase that at age 3;10, Rina’s MLU is even higher than Miller and Chapman’s MLU. The similarity between Rina’s MLU and Miller and Chapman’s MLU from age 3;6 onwards indicate that during this time, Rina’s MLU is within the average range shown by English-speaking children.

5.1.4 Summary of Rina’s language-specific MLU. From the discussion of Rina’s Malay and English MLU, the following facts can be concluded. Firstly, throughout the period of investigation, each of Rina’s MLU continues to increase. This also indicates that the morphosyntax of both Malay and English is developing steadily. However, each MLU shows a different pattern of development. Malay MLU develops steadily up till 3;8 before it drops at 3;9 and 3;10. English MLU begins slower but it

increases rapidly at age 3;6 onwards. Concerning L1 children, the data from previous studies show that for Malay language acquisition, Rina's development is comparable. Rina's English MLU develops slower from age 2;10 to 3;5 but at age 3;6 onwards, Rina's English MLU develops in a similar manner to that reported for English L1 children. The following section will discuss Rina's mixed utterances.

5.1.5 Rina's MLU in mixed utterances. In this section, I shall discuss Rina's MLU in mixed utterances. Following Lanza (2004), the term 'mixed utterance' is used to refer to Rina's utterances, which consist of the combination of elements from Malay and English in a single utterance. Gawlitzek-Maiwald (2003) further adds that mixed utterance is a type of production in which two or more structures from different languages are coactivated. Similarly, Grosjean (1995) also states that coactivation and competition of the two languages are the norm for bilingual speakers. Research in BFLA has always focused on the language-specific MLU of the bilingual children and not considered the MLU of mixed utterances (Bernardini & Schlyter, 2004; Itani-Adams, 2013; Qi, 2011). This might be because of the small occurrences of mixed utterances compared to the language-specific utterances (Keshavarz, 2007). However, as Lanza (2004) states, bilingual children's MLU of mixed utterances are crucial, as it will give us a more accurate and comprehensive estimate of their overall language development. In their studies, Dopke (1992a), Lanza (2004) and Keshavarz (2007) found that though mixed utterances are fewer in numbers, they nonetheless surpass the values for language-specific MLU. These authors state that this is unsurprising, given that mixed utterances are a combination of elements from the developing languages. In Figure 5.5, Rina's mixed MLU is presented, along with her Malay and English MLU for comparison.

Like the previous studies (Dopke, 1992; Lanza 2004; Keshavarz 2007), Rina's mixed utterances were smaller in numbers in comparison to Malay and English ones. However, Rina's mixed utterance MLU is consistently higher than her language-specific MLU from age 2;10 to 3;3. Then, from age 3;4 to 3;5, Malay MLU slightly surpass her mixed MLU. At age 3;6, as previously discussed, Rina experiences a rapid increase in her English MLU. At 3;6, all Rina's MLU (English, Malay and mixed) seem to be at the same level (English MLU 3.74, Malay MLU 3.56, mixed 3.68). From 3;7 to 3;8, Rina's mixed utterance MLU is lower than Malay and English MLU. At 3;10, when English MLU increases her mixed MLU increased as well.

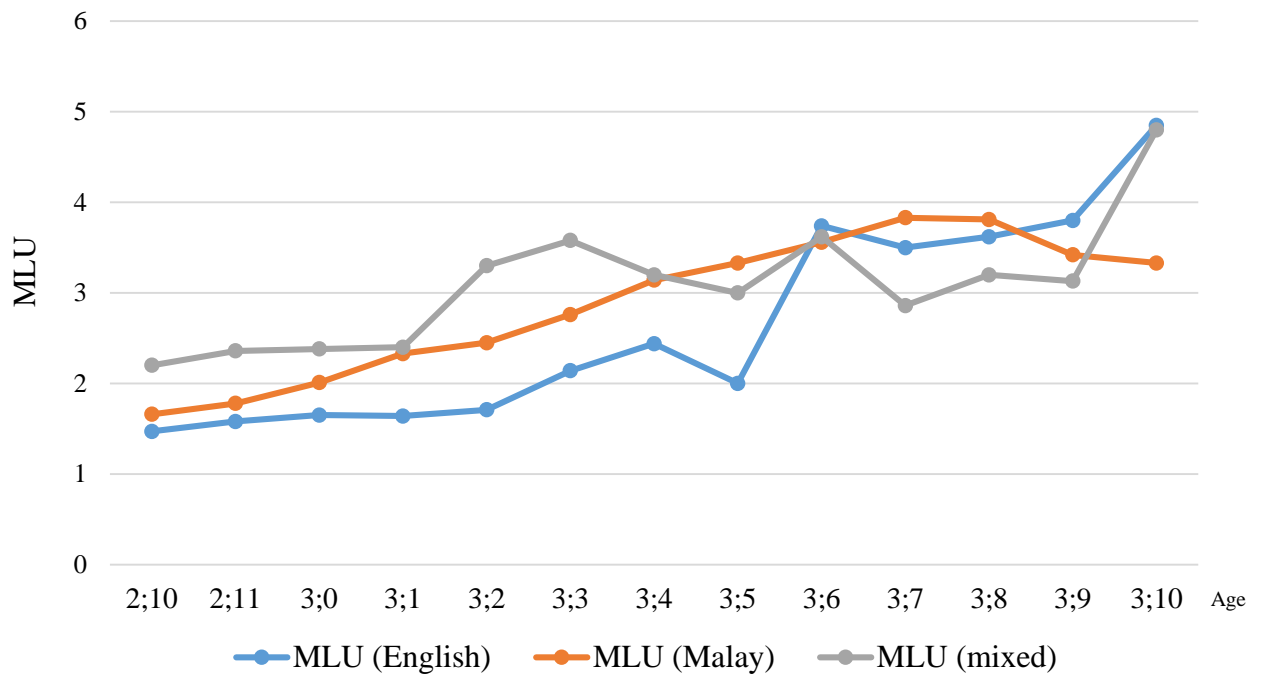


Figure 5.5. Comparison of Rina’s MLU in English, Malay and Mixed.

At 2;10 to 3;3, Rina produces longer utterances when she combines words from both languages. Thus, in Table 5.5, some sample of Rina’s Malay, English and mixed utterances are presented. Notice how her mixed utterances are consistently longer than her language-specific utterances. Her utterances during this period suggest that when her Malay and English is still at the two-word stage, she resorts to combining the resources from both languages to help expressivity. This finding seems to be compatible with Deuchar and Quay’s (2000) view, who argues that their bilingual participant uses mixed utterances because of the limited lexical resources in the early language development. In the following table, Rina’s utterances are given in *Italics*. The translation equivalents are written below each utterance.

Table 5.5

Rina’s Malay, English and Mixed utterances from the corpus

| Age | Malay | English | Mixed |
|------|---|--|---|
| 2;10 | <i>Rina makan</i> Rina eat 'Rina (want to) eat' | <i>No school</i> '(I) don't want to go to school' | <i>Give me susu</i> 'Give me milk' |
| | <i>Jom main</i> Let play 'Let's play' | <i>Gimme it</i> 'Give me it' | <i>I want main</i> I want play 'I want to play' |

| Age | Malay | English | Mixed |
|------|---|---------------------------------------|--|
| 2;11 | <i>Nak tu</i> Want that '(I) want that' | <i>Go away</i> | <i>I touch tu</i> I touch that |
| | <i>Nak buka</i> Want open '(I) want (to) open this' | <i>My turn</i> | <i>Rina suka sit</i> Rina like sit 'Rina like (to) sit' |
| | <i>Nak pergi jalan</i> Want go walk '(I)want to go outside' | <i>Water more</i> 'more water' | <i>Suka main water</i> Like play water '(I) like (to) play with water' |
| | <i>Ambil mainan</i> Take toy '(I) take the toy' | <i>Look painting</i> | <i>Cikgu buat painting</i> Teacher made painting '(The) teacher made (the) painting' |
| 3;0 | <i>Nak ayah</i> Want father '(I) want father' | <i>More jelly</i> | <i>Letak sini crunch</i> Put here crunch 'Put here the coco crunch' |
| | <i>Baru makan</i> Just eat '(I) have just eaten' | <i>Mommy sit</i> | <i>Napa ada monkey?</i> Why have monkey 'Why is there a monkey?' |
| | <i>Rina main ni</i> Rina play this 'Rina is playing this' | <i>That butterfly</i> | <i>Rina nak shower</i> Rina want shower 'Rina wants (to) shower' |
| 3;1 | <i>Rina main bawah</i> Rina play down 'Rina is playing down here | <i>Play it</i> | <i>It's rumah</i> It's house 'It's (a) house' |
| | <i>Tu ayah punya</i> That father belong 'That belongs(to) father' | <i>Please packing</i> | <i>My house tu</i> My house that 'That is my house' |
| | <i>Nak makan</i> Want eat '(I) want (to) eat' | <i>Like pasta</i> '(I) like pasta' | <i>Please holded ni</i> 'Please hold this' |
| | <i>Rina nak lain</i> Rina want another 'Rina want another one' | <i>Look love heart</i> | <i>Princess ambil kek pink</i> Princess take cake pink 'Princess takes a pink cake' |

| Age | Malay | English | Mixed |
|-----|--|--|--|
| 3;2 | <i>Rina pegang</i> Rina hold 'Rina is holding (this)' | <i>Mommy please</i> | <i>Boleh princess baju?</i> Can princess clothes? 'Can (I) wear a princess dress?' |
| | <i>Ayah duduk sana</i> Father sit there 'Father sits over there' | <i>No my</i> 'No, this is mine' | <i>Sky ada matahari</i> Sky have sun 'The sun is in the sky' |
| | <i>Rina makan gula</i> Rina eat sugar 'Rina eats sweets' | <i>I want play</i> 'I want to play' | <i>Ni elephant minum</i> This elephant drink 'elephant drink this' |
| 3;3 | <i>Kita main</i> We play 'We are playing' | <i>I coming</i> | <i>I want that ni</i> I want that this 'I want this' |
| | <i>Tu seluar dia</i> That pant 3SG 'That (is) his/her pants' | <i>Beautiful princess</i> | <i>I think Rina nak</i> I think Rina want 'I think I want' |

Based on the sample utterances, from 2;10 to 3;3, Rina's mixed utterances are further ahead her language-specific utterances. Her mixed utterances are at multi-word speech while her Malay and English utterances appear to be at the two-word stage. It seems that by drawing on elements from both her developing languages through mixed utterances, Rina pushes the limit of her linguistic productions.

If we look at Rina's English utterances from 2;10 to 3;3, it seems that she is producing what Hoff (2009) termed as *unanalysed wholes*; phrases or expressions that children memorised wholly and used in early speech development such as *I want* or *I don't know*. For Malay utterances, Rina tends to omit the subject e.g. *nak tu* 'want that', *nak buka* 'want (to) open', and *nak ayah* 'want father'. This could possibly be because Malay language is a null subject language (Razak, 2014). Interestingly, Rina's Malay utterances at 2;10 resembles 2-year-olds Malay monolingual children as reported by Simanjuntak (1990). Most of the children's utterances in Simanjuntak's study are also null object and subject such as *Mak, makan* 'Mum, eat' and *nak ikut* 'want (to) follow'.

To further understand Rina's mixed utterances, I further analysed her mixed MLU based on contexts. As mentioned in Chapter 4, Rina is recorded in two separate contexts; the Malay and the English context. In both the Malay and English sessions, the Mother, who is a Malay-English bilingual speaker is present. This situation unfortunately created a bilingual language mode (Grosjean, 1998). In the Malay

contexts, though Mother speaks fully in Malay with Rina but Rina, knowing the Mother’s bilingual identity, takes the advantage of producing code-mixed utterances.

Figure 5.6 indicates Rina’s mixed MLU in English and Malay contexts. For English context, I only have data beginning at age 3;0 since the English recordings begin at this age.

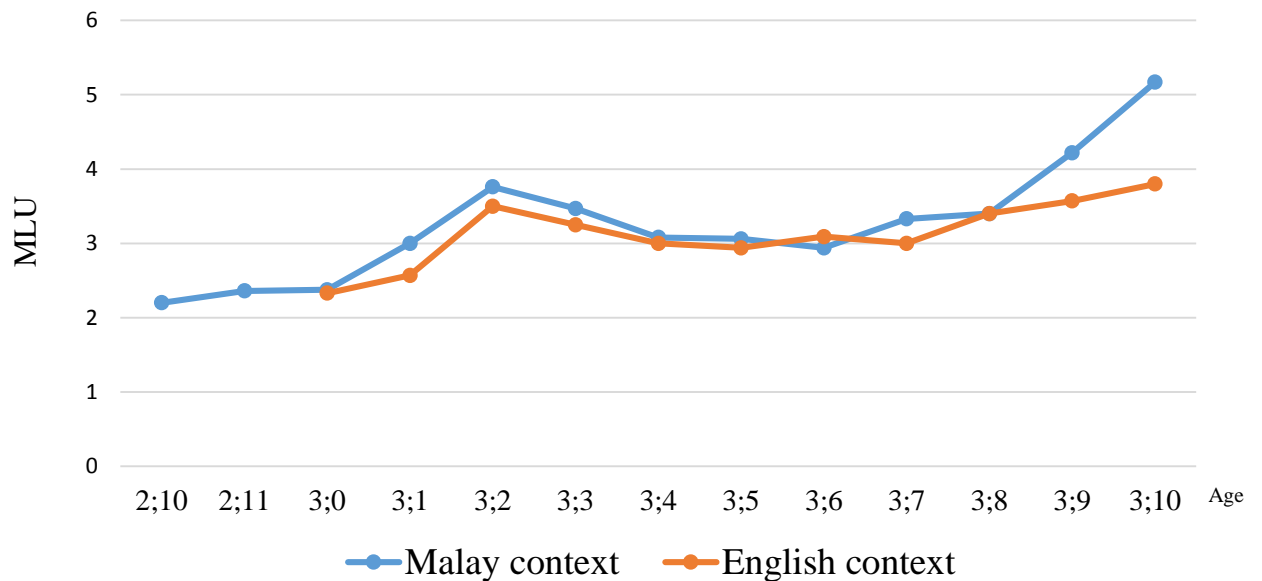


Figure 5.6. Rina’s mixed MLU in Malay and English contexts.

The findings show that Rina produces higher MLU mixed utterances in Malay context than in English context. Her mixed MLU in Malay context further increased at 3;9 and 3;10. Interestingly, this corresponds with her rapid increase in English MLU (see Figure 5.1) This seems to suggest that as Rina becomes more dominant in English, she produces more mixing in her weaker (i.e. less dominant) language, Malay. Table 5.6 indicates some sample of mixed utterances Rina produced in Malay and English at 3;9 and 3;10. All Rina’s utterances were in italic and the translation equivalents were below the utterances.

Table 5.6

Rina's mixed utterances in Malay and English context at 3;9 and 3;10

| Age | Malay context | English context |
|------|--|---|
| 3;9 | <i>Rina nak bread and cheese</i> 'Rina want bread and cheese' | <i>I want duduk rumah</i> I want stay home 'I want to stay at home' |
| | <i>I said tu</i> 'I said that' | <i>This is all lampu</i> This is all lamp 'These are all lamps' |
| | <i>tengok I do like that</i> 'see I do like that' | <i>This broom sapu</i> This broom sweep 'The broom sweeps' |
| 3;10 | <i>letak sini all the toys</i> 'put here all the toys' | <i>I got from bilik</i> I got from room 'I got from the room' |
| | <i>I want buka lampu</i> I want open lamp 'I want to turn on the lamp' | <i>She is pengsan</i> 'She is fainted' |
| | <i>Ni new stroller baru</i> This new stroller new 'This is a new stroller' | <i>Don't tutup that</i> 'Don't close that' |

5.2.6 Summary of mixed MLU. Being a bilingual child, Rina has the tendency to produce mixed utterances by combining lexical items from her two languages, Malay and English in one utterance. In the longitudinal study, the finding shows that her mixing rate is quite similar in Malay and English contexts, albeit slightly higher in the former. However, at 3;9 and 3;10, when her English specific MLU goes through a rapid increase, her mixed MLU also increases in Malay context; in other words, Rina tends to use more English utterances in the Malay context. Now that I have elaborated on Rina's Malay, English and mixed MLU, the discussion will proceed with her lexical development.

5.2 Lexical development

In this section, I examine Rina's lexical development over the course of the study. Her composition of lexical items was analysed at particular developmental points in the longitudinal study, i.e., at 2;10, as an initial lexical baseline in each of the languages, and then at intermediate sensitive points such as 3;4, 3;6; and 3;10, where significant MLU spurts occur and the end point of the study, i.e., at age 4;8. The

lexicon is central to grammatical development; certain numbers of lexical items must be acquired for grammar to start developing. This is the “critical mass hypothesis” advocated by Bates and Goodman (1997,1999) and Marchman and Bates (1994) (See 3.6).

5.2.1 Lexicon at 2;10. The first recorded session, at age 2;10 establishes the kind of baseline existing at the beginning of the study. This session is conducted in a Malay context at home. At this point, Rina’s lexicon consists of approximately 56 types of Malay lexical items and 36 English lexical items. These figures do not indicate the exhaustive number of lexical items but rather the lexical items Rina utters in the particular recording session at 2;10 when her Malay MLU is 1.66, and her English-based MLU is 1.47, and her Mixed MLU is 2.2. Notice that the mixed MLU, where she makes use of resources in both languages, is higher by comparison to either language separately.

In terms of lexical categories, Rina’s lexical items are classified into several broad categories, namely nouns, verbs, modifiers, numerals and relational words (demonstratives, pronouns, prepositions and so forth). The rationale for such broad categories is because Rina is still acquiring the languages so the lexical categories, unlike adult speakers, are still developing. Table 10.1 in Appendix II illustrates Rina’s whole composition of lexical items at 2;10. Based on the table, the highest type of lexical items in Rina’s lexicon at 2;10 in Malay context is nouns (26%). This is consistent with Gentner and Boroditsky (2001)’s notion of ‘noun-dominance’ in early word learning in L1 monolingual children.

In the analyses of verbs, I will be examining Rina’s argument structure. The arguments in this section will be classified based on their thematic roles (a-structure), as outlined by LFG. Looking at the argument structure used by Rina, we gain a partial sketch of her grammatical development at this age. Rina produced utterances such as the following:

1. a. *Rina makan*
Rina eat
‘Rina is eating’
- b. *Rina nak*
Rina want
‘Rina wants’
- c. *Nak tu*

- want that
'(I) want that'
- d. *Rina nak susu*
Rina want milk
'Rina want some milk'
- e. *Rina nak main*
Rina want play
'Rina wants (to) play'

In terms of Malay morphological development based on PT (see Table 3.3), at 2;10, Rina is at the category stage, reflected in her use of *main* 'to play' (1e) and *mainan* 'toy' (2c). *Main* in Malay is a verb while adding the suffix *-an* changed the stem to noun *mainan*. For the syntactic development based on Prominence and Lexical Mapping Hypothesis (see Table 3.6 and 3.7), Rina is at the canonical word order and default mapping stage, reflected in her use of *Rina nak susu* (1d) and *Rina nak main* (1e). The word order in Malay is SVO and it also allows for null subject (Razak, 2014); thus, other than the SVO utterances, Rina also produces substantial number of null subject utterances in her Malay speech, in which the subject/agent or object/theme is dropped, for instance *Rina makan* (agent + verb) (1a), *Rina nak*, (agent + verb) (1b) and *nak tu* (verb + theme) (1c). Rina does not produce any productive verbal morphological process at 2;10; her English productions are still at the word level or lemma stage in PT, such as *no, go away, up, down, please, more, gimme it* (for a complete list of Rina's utterances at 2;10, refer to Table 10.2).

However, if we look at Rina's mixed utterances at 2;10, a more complex grammatical structure can be discerned. Her sentence productions, albeit consisted of two different languages, may be considered a well-formed clause, constituting of the arguments and predicate, such as:

2. a. *I touch tu*
I touch that
'I touch that'
- b. *I touch ni*
I touch this
'I touch this'
- c. *Give me mainan*
Give me toy
'Give me toy'

- d. *Give me air*
 Give me water
 ‘Give me some water’
- e. *I want main*
 I want play
 ‘I want (to) play’

Based on the examples, it seems that Rina’s expressive strategy is to resort to using words from both her languages. This is reminiscent of what Pearson, Fernandez, and Oller (1993) termed as “total conceptual vocabularies”, i.e., the vocabularies of all the developing languages of the bilingual child. Mixing in this context is a strategy that allows Rina to pool all her linguistic resources together to assist her in expressing herself more clearly for the listener, in this case her mother, who shared both languages. This may help explain why her mixed MLU is higher than her MLU in each separate language at 2;10. Mixing also brings out the creative aspect of Rina’s linguistic production. Rina produced *my kashoes* when requesting for her pair of shoes. Upon further analysis, *kashoes* is the combination of Malay word *kasut* ‘shoes’ and English *shoes*.

Turning now to Rina’s use of pronouns; the most common first person singular pronouns in Malay are *saya* ‘I’, used in formal occasions and *aku* ‘I’, used informally among peers. However, Rina uses her name to refer to herself, especially when producing Malay utterances. This is similar to the finding in Mohd Noor’s study (2013); the L1 Malay children she investigates use their names as first-person pronoun. When speaking English, interestingly Rina tends to use *I* and *me*. So, in terms of pronoun use, Rina has begun distinguishing the two languages early; in Malay, she uses her name as a first-person pronoun, comparable to L1 Malay children and in English, she uses *I* and *me*.

5.2.2 Lexicon at 3;4. At age 3;4, Rina’s Malay MLU is 3.14. Previously, at 2;10, the highest type of lexical items is nouns but at 3;4, verbs are the highest word type in Malay (23.6%). The whole composition of Rina’s lexical items in Malay context is summarised at Table 10.3. In terms of argument structure, Rina tends to omit the subject/agent in her Malay utterances, which may be attributed to the null subject aspect of the language. The following examples illustrate this phenomenon:

3. a. *nak buka*

- want open
'(I) want (to) open (something)'
- b. *nak tengok*
want watch
'(I) want (to) watch (something)'
- c. *nak main game*
want play game
'(I) want (to) play game'
- d. *nak main rabbit*
want play rabbit
'(I) want (to) play (with the) rabbit'
- e. *nak bagi Snow White*
want give Snow White
'(I) want (to) give Snow White (something)'

In all the examples above, Rina omits the agent/subject, and at times, she also drops the object/theme. There are a few adult-like clauses at this age, such as *Rina nak ambil ini* 'Rina want take this' (agent + verb + verb + theme) and *Rina suka ini* 'Rina like this' (experiencer + verb + theme).

Turning now to Rina's pronouns in Malay. Similar to 2;10, Rina uses her name as a first-person pronoun when speaking in Malay and used *I* when producing English utterances as in *I want this*. When referring to mother and father (second-person pronoun), she uses *mommy* and *ayah* 'father'. The following exemplifies Rina's mixed utterances at 3;4 in Malay context:

4. a. *ni rabbit*
this rabbit
'this is a rabbit'
- b. *ni ball*
this ball
'this is a ball'
- c. *nak banana*
want banana
'I want banana'
- d. *Nak buku princess*
want book princess
'I want a princess book'
- e. *I want air*

I want water
 ‘I want water’

- f. *I want buku*
 I want book
 ‘I want a book’

Rina uses English lexical items to describe objects in Malay context such as *banana*, *ball*, and *rabbit*. In the corpus, I found that she does not appear to have the equivalent terms in Malay such as *pisang* ‘banana’, *bola* ‘ball’ and *arnab* ‘rabbit’. This may suggest that she has not acquired the Malay equivalent terms thus she fills the gap by using the lexical items from English.

The word *princess* is acquired by Rina from the English context, so when speaking in Malay, Rina used the word *princess*. *Princess* is literally translated as ‘*puteri*’ in Malay. The word *puteri* is mainly used in traditional Malay folklores; however, being in Australia at that time, Rina was not exposed to the word *puteri*. There are also English utterances that Rina mixed with Malay nouns as in example (4e) and (4f).

Having quickly surveyed Rina’s lexicon in Malay context, we now turn to the English context at age 3;4. Her English MLU at 3;4 is 2.44. In English context, the highest type of lexical items is nouns (42.3%) (see Table 10.5). In the English recording sessions, Rina does not speak much so her total word tokens are 52 and word types are only 27. Consistent with her English MLU, at this stage, her English utterances are still at the two-word stage, for example *more water*, *more banana* and *wait wait* (see Table 10.6). Interestingly, there is one English utterance that Rina produces at 3;4 in which the agent/subject is not realised, for example:

5. a. *want watch that*

This sentence is similar to her pro-drop strategy in the Malay context. In terms of pronouns, Rina used *I* to refer to herself as in *I want apple*. *I want apple* is also the only instance of adult-like clause in English at 3;4, which consists of SVO. Even though Rina produces limited English utterances at 3;4, interestingly, there are no mixed occurrences with Malay found in English context.

So, based on PT’s morphological development, Rina’s Malay is at the phrasal procedure stage, reflected in her use of VP such as in (3a, b, c, d, e). For English, Rina is still at the lemma level (word level). For syntactic development, Rina has started

producing SVO in English so we may consider that she has reached the canonical word order (Prominence hypothesis) and default mapping (Lexical Mapping Hypothesis) stage, whereas for Malay, she is also at the canonical word order and default mapping stage.

5.2.3 Lexicon at 3;6. Figure 5.1 shows that Rina's English MLU increases significantly at 3;6. At 3;4, Rina's English MLU is 2.44, followed by MLU 2 at 3;5 and her English MLU increases rapidly to 3.74 at age 3;6. Thus, in this section, I will first describe Rina's lexicon in English context.

The total word tokens in English context that Rina produced at 3;6 are 732 with 192-word types. The highest word types are nouns (37.5 %), followed by verbs (16.1%). In terms of the argument structure, the English sentences she produced at this age are adult-like, in the sense that it constitutes arguments and predicate. For example:

6.
 - a. *Abang wearing my dress*
Big brother wearing my dress
'The boy is wearing my dress'
 - b. *She wearing my dress princess*
 - c. *I want open it*
'I want to open it'
 - d. *I want story*
'I want a story'
 - e. *I want blow candle*
'I want to blow the candle'
 - f. *I want jumping*
'I want to jump'
 - g. *I want black hair*
 - h. *Barbie want story*
'Barbie wants a story'

Rina has also started producing verbal morphological process, such as her use of *-ing* in *wearing* (6a, b) and *jumping* (6f). Rina also produces suffix *-s* in her English lexical items. The following are examples from the corpus in which suffix *-s* are used:

7.
 - a. *daddy dads go aeroplane*
 - b. *a horse and little girls*
 - c. *elephants*
 - d. *it is showers*
 - e. *not yets daddys heres*
 - f. *I colours*
 - g. *my doll eats*
 - h. *Is go my sleep now*

The emergence of verbal morphological process at 3;6 is consistent with the critical mass hypothesis proposed by Marchman and Bates (1994); according to whom verbal morphology only emerges when a child's vocabulary ranged between 400-600 words and sentence complexity will increase markedly when the child's vocabulary exceeded 400 words. Based on the examples, we can see a significant difference between her English linguistic structure at 3;4 when she only has less than 100 English words and at 3;6 when she started acquiring more words. Looking at suffix *-s*, it seems that the child attaches the suffix not only to content words (e.g. *girls, dads, colours* etc.) but also function words (e.g. *here's, yets, Is*). The suffix *-s* at this age is her overgeneralisation of the salient morphological marking of *-s* in English. In other words, Rina just learned that *-s* is the most prominent feature of English and she generalised the suffix to all English lexical items.

Regarding pronouns, Rina used *I* consistently in the English context. When talking to the mother, she has yet to use the second-person pronoun. Mixing in English contexts at 3;6 is very minimal. She only uses Malay kinship term *abang* 'big brother' to refer to a boy who seems to be a little bit older than her. Thus, similar to her use of *princess* in Malay context, *abang* is also a lexicalised concept in Malay, and there is no translation equivalent in English.

Turning now to Rina's lexicon in Malay context at 3;6. In the Malay recording sessions, Rina produced 1143 word tokens and 224-word types. These figures appear to be double as against the English context. However, upon further examination, mixing from English turns out to be very high, which adds to the greater number of the tokens. Overall, verbs are the highest word types (19%) followed by nouns (12.8%). Similar to the previous months, Rina's Malay utterances reflected the null subject aspect of the language. The following illustrates some examples of Rina's utterances in the Malay context:

8.
 - a. *nak keluar pensil*

- want out pencil
'(I) want to take out the pencil'
- b. *nak ambil ini*
want take this
'(I) want to take this'
- c. *tolak ini*
push this
'(I) push this'
- d. *nak peluk ni*
want hug this
'(I) want to hug this'

Regarding pronouns, Rina used her name as the first-person pronoun when speaking in Malay and used *I* and *me* when speaking in English. In the corpus at 3;6, there are also high occurrences of mixing and code-switching to English in the Malay context. The following illustrates some examples of Rina's mixed utterances in Malay context at 3;6:

9. a. *Rina nak slime*
Rina want slime
'Rina wants slime'
- b. *Rina nak warna blue*
Rina want colour blue
'Rina wants the blue colour'
- c. *Ini macam whites*
this like whites
'this is like white'
- d. *kuda tak stand up*
horse not stand up
'the horse does not stand'

Slime is another lexicalised item Rina acquired from English. There is no translation equivalent in Malay so when Rina asked for *slime* in Malay context (9a), she uses the English word. Another noticeable mixing from English at 3;6 is her use of words for colours in English e.g. *blue*, *red*, *white* and so forth. Rina tends to use English words for colours in Malay context, possibly because she acquires the words from the childcare domain.

From the PT perspectives, at 3;6, morphologically, Malay is at the phrasal stage, reflected in the substantial number of VP productions in Malay (8a, b, c, d, e) while English is still at the category stage, as Rina has yet to unify the grammatical elements in a phrase. Syntactically, in English Rina produces *mouse it kick the cat by leg* (see Table 10.8), which is consistent with XP_{DF} canonical word order stage (Prominence Hypothesis). For Lexical Mapping Hypothesis, Rina is at the default mapping stage. For Malay syntactic development, Rina is also at the same stage, evidenced by the following utterances (see Table 10.10):

10. a. *slime Rina nak warna blue*
 slime Rina want colour blue
 ‘slime Rina wants the blue one’
- b. *kereta Rina nak susun kereta*
 car Rina want arrange car
 ‘car Rina wants to arrange the car’

5.2.4 Lexicon at 3;10. Another significant MLU increase is at 3;10. Rina’s English MLU goes from 3.8 at age 3;9 to 4.85 at 3;10. Her Malay MLU, however, drops slightly from 3.42 at age 3;9 to 3.33 at 3;10. I will first describe Rina’s lexical items in English context at this age.

Rina produced 528 total word tokens and 157 word types. As in previous months, the highest word type is nouns (38%), followed by verbs (14%) (see Table 10.11). In terms of argument structure, Rina produces complete arguments in her English utterances, exemplified in the following:

11. a. *I want this one*
 b. *I want pink boat*
 c. *I ask you*
 d. *you catch other one*
 e. *I caught this one*
 f. *you bought that*
 g. *I give for baby*
 h. *It get shiny shoes*

At 3;10, English irregular past tense emerges, such as *caught* and *bought* (10e, f). Regarding pronouns, Rina uses first-person pronoun *I* when speaking English at 3;10. Interestingly, the second-person pronoun *you* emerge at this age. In the previous months, she uses *mommy* as a second-person pronoun when communicating with the mother but at 3;10, Rina uses *you*. In terms of mixing, there is no lexical mixing from Malay found in the English recording sessions.

Turning now to Rina's lexical items in Malay context at 3;10. Similar to the previous months, the analysis identifies that verbs formed the largest percentage of Rina's word types, at 15%. Interestingly, the second largest percentage of lexical categories in Malay contexts is the English verbs, at 12.5%. Nouns constitute 12.1 % of her utterances, which is then followed by English nouns at 11.2 %. What these figures reveal to us is that in the Malay context at 3;10, there is a substantial number of lexical mixing from English (see Table 10.13).

Unlike the previous months where there are high frequencies of subject and object omission, the child's Malay utterances at 3;10 are well-formed clauses where there are subject and object. The following illustrates Rina's Malay utterances at 3;10:

12. a. *Rina nak tengok*
Rina want watch
'Rina wants to watch'
- b. *Rina tak main ni*
Rina not play this
'Rina is not playing with this'
- c. *Rina suka budak*
Rina like kid
'Rina likes the kid'
- d. *Rina suka ini*
Rina like this
'Rina likes this'
- e. *Rina nak tengok dua selipar*
Rina want look two slipper
'Rina wants to look at the two pair of slippers'

In terms of Malay pronouns, Rina uses her name as first-person pronoun. Interestingly, there are several occurrences of *dia* 'he/she' as third person pronoun when she refers to other people in her conversations. Some examples of third-person pronouns in her utterances include:

13. a. *Sebab dia macam monster sikit*
because he/she like monster a bit
'because he/she looks like a monster'
- b. *Dia macam best*
He/she like best
'he/she is fun'

- c. *Napa dia tak mahu?*
Why he/she not want
'why he/she does not want (it)?'
- d. *Semua cantik dia dress*
all beautiful he/she dress
'All her dress is beautiful'

Mixing from English is high at this age. Most of her utterances in Malay context at 3;10 are mixed with English lexical items. This corroborates the high mixed MLU in Malay context discussed previously. Some examples from the corpus are:

- 14. a. *ayah cakap tu ayah cakap quiet*
father say that father say quiet
'father said to be quiet'
- b. *mommy mana the ball?*
mommy where the ball?
'mommy where's the ball?'
- c. *mommy semua toy letak sini*
mommy all toy put here
'mommy, put here all the toys'
- d. *hurry hurry lepas tu pergi sekolah*
hurry hurry hurry after that go school
'hurry, after that we're going to school'
- e. *tunggu ayah datang ayah beli gula and jelly and toys*
wait father come father buy candy and jelly and toys
'when father comes, he will buy candy and jelly and toys'

In terms of PT, morphologically, In Malay and English Rina is at the phrasal stage, reflected in her use of Malay NP quantifiers *banyak kucing* 'many cat' and *dua kek* 'two cake' and her use of English NP quantifiers *many cats* and *two cats*. Syntactically, Malay and English is at the noncanonical word order stage (Prominence Hypothesis), evidenced by her use of Malay relative clause *yang ini Rina tak nak main* REL this Rina not want play 'This, Rina does not want to play' (see Table 10.14) and her English utterances *All the fish I put here* and *later baby come I give you* (see Table 10.12). For Lexical Mapping Hypothesis, both the languages are at default mapping stage.

Now that I have discussed her lexical growth during the longitudinal study, the following section describes her lexicon in Malay and English at age 4;8, after the child returns to Malaysia.

5.2.5 Lexicon at 4;8. Unlike the longitudinal study where the data is mainly obtained from Rina's naturalistic speech, at 4;8, the data is from elicitation sessions in English and Malay. Thus, there are lesser tokens and types, as Rina does not have the opportunity to speak more freely in the sessions.

Rina's English MLU at age 4;8 was 5.76. In the English recording session, the total tokens of words are 433 with 109 word types; the largest percentage of the word types is nouns (22.2%), followed by numerals (16.6%) and verbs (16.6%). Numerals are among the highest because the elicitation session requires the child to describe singular versus plural objects. In terms of argument structure, she produces clauses with complete arguments, such as the following:

15. a. *I just looking only*
- b. *We see something*
- c. *I gonna take the dog*
- d. *You said cows*
- e. *I like flower flower*

Regarding pronouns, Rina uses *I* and *we* as a first-person pronoun and *you* as a second-person pronoun. During the longitudinal study, mixing from Malay in English are minimal but at 4;8, there are no occurrences of lexical mixing with Malay found in the session at all.

Turning now to her lexical items in Malay context 4;8. Previously in the longitudinal study, there is extensive mixing from English in the Malay context. Interestingly, at age 4;8, there is no mixing from English found in the corpus. Rina speaks fully in Malay with Father. Given that her Malay exposure is higher at age 4;8, initially I found it strange that her Malay MLU is lower than her English. Her Malay MLU is 5.06 whereas her English MLU is 5.76. However, upon further analysis of the Malay utterances, Rina speaks the colloquial variety of Malay. As discussed previously in Chapter 2, this variety is morphologically 'simpler' than the standard variety of Malay; the affixations are seldom used, which makes the language appear to be isolating (Goddard, 2005). Many of Rina's utterances in Malay are shortened, for example:

16. a. *tidak apa* 'it's OK' to *takpe*

- b. *tidak ada* ‘do not have’ to *takde*
- c. *Sekejap* ‘a moment’ to *jap*
- d. *ini/itu* ‘this/that’ to *ni/tu*
- e. *hendak* ‘want’ to *nak*
- f. *sahaja* ‘only’ to *je*
- g. *dekat* ‘at/to’ to *kat*

Nik Safiah Karim, Onn, and Haji Musa (1993) pointed out that many sentences in the colloquial variety are shorter than the standard Malay variety. This might explain Rina’s Malay MLU, which is lower than her English despite having high input from the linguistic environment. The total number of tokens of Malay words in the session is 429 with 96 word types; verbs constitute the largest percentage of word type (27%). In terms of the argument structure, Rina dropped the subject and object when speaking Malay; this is as mentioned previously, indicative of the null-subject aspect of the language. The following are some examples from the corpus:

- 17. a. *Rina cari dua*
Rina search two
‘Rina is searching for two (something)’
- b. *Rina letak*
Rina put
‘Rina put (something)’
- c. *ayah ambil*
father take
‘father takes (something)’

Pertaining to pronouns, similar to the previous months, Rina used her name as a first-person pronoun and used *ayah* ‘father’ as a second-person pronoun. There is one instance in which she used *saya* ‘I’ but in that context, Rina is imitating the TV broadcaster she heard as in *saya nak buat ni* ‘I want to do this’. *Saya* ‘I’ is used in Malay in formal settings.

From the PT perspectives, morphologically, I consider Rina to be at the phrasal stage in Malay and English as there are no passive sentence found in her Malay utterances and she has yet to produce the SV agreement in English as well. In terms of syntax, the corpus at 4;8 shows that she is at noncanonical word order stage (Prominence Hypothesis) and default mapping stage (Lexical Mapping) in both languages; reflected in the utterances *kad ni Rina letak ataslah* card this Rina put on

top-PART ‘this card, Rina put on top’ (see Table 10.18) and *so soft the cat I want it* (see Table 10.16).

5.2.6 Summary of lexical development. To summarise, from 2;10 to 4;8, Rina continues to acquire more words in Malay and English. Her development of grammar is dependent on her lexicon size; as Rina acquires more words, we see that her grammar gradually develops throughout the study. In terms of the composition of the lexical items in each language, in Malay, the largest percentage of word types are verbs and in English, nouns. Figure 5.7 and 5.8 charts the cumulative growth of nouns and verbs in the study. At 2;10, Rina produces more nouns in Malay. In the following months, verbs predominate the lexical categories. In English, she begins producing more verbs at 2;10; however, it needs to be reminded that at 2;10, the recording session is in Malay context. Beginning at 3;4, nouns constitute the largest word types in the child’s English utterances. This finding is similar to Itani-Adams’ Japanese-English bilingual child (2013); the child first produces nouns in both languages and later, she shows a language-specific pattern of development; verbs are used more in Japanese and nouns in English.

From the PT perspectives, Rina’s morphological development in each language develops according to the hypothesized PT sequences. Syntactically, in terms of word order (Prominence hypothesis), Rina reaches the non-canonical word order in both languages but in terms of mapping of the arguments (Lexical Mapping Hypothesis), the corpus shows that she is at the default mapping stage in Malay and English. Table 5.7 summarises the findings.

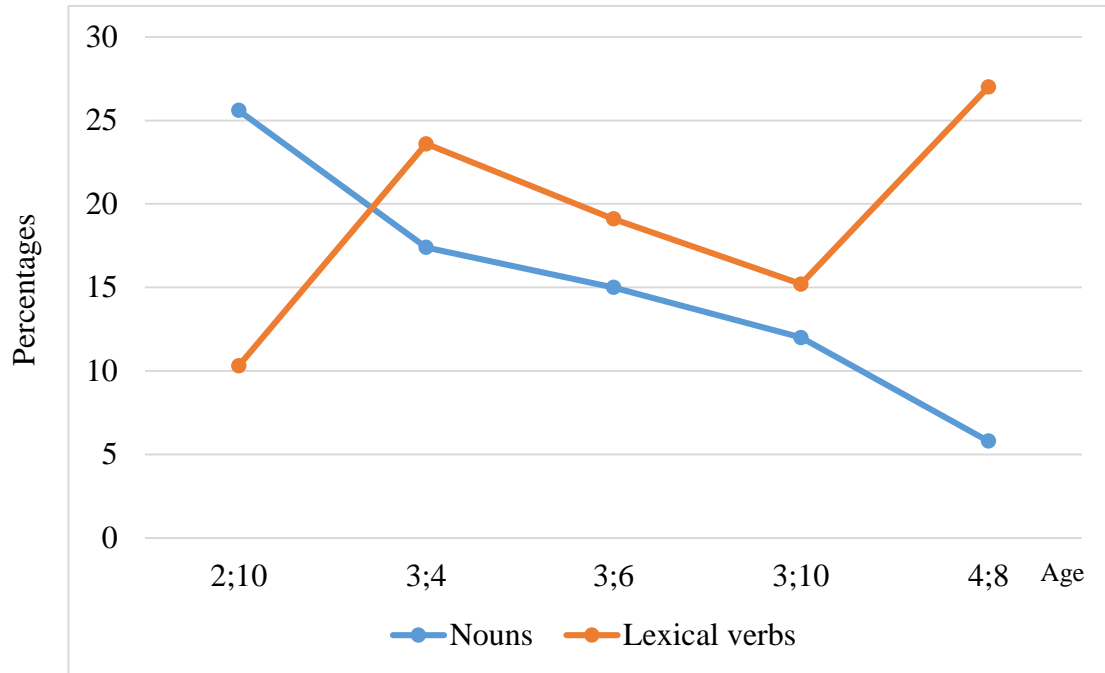


Figure 5.7. Rina's cumulative growth of nouns and lexical verbs in Malay.

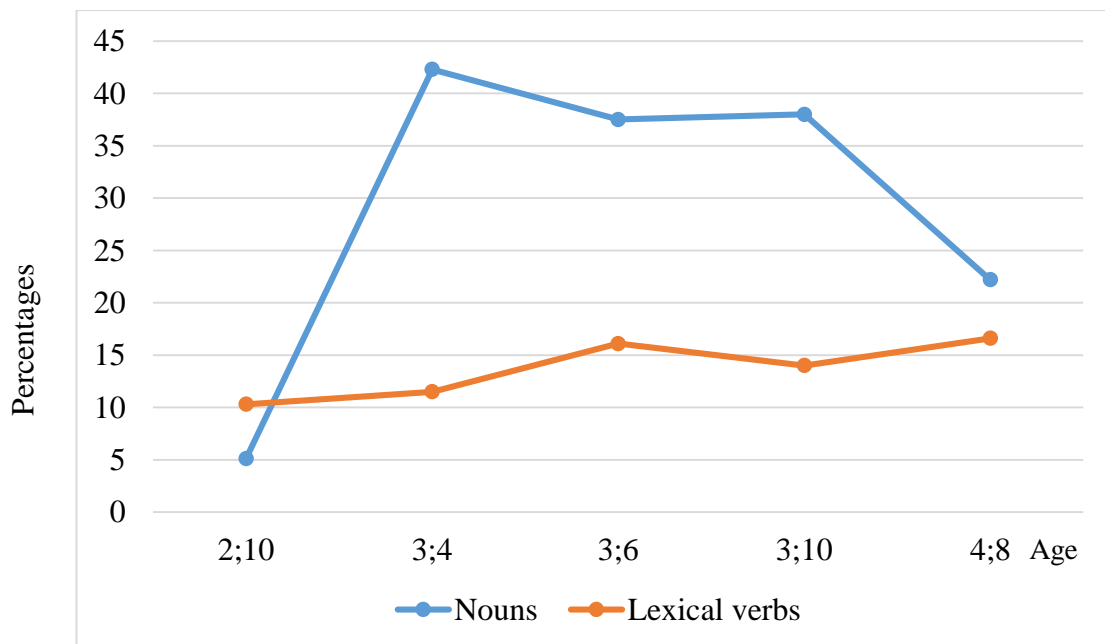


Figure 5.8. Rina's cumulative growth of nouns and lexical verbs in English.

Table 5.7

The summary of Rina's morphological and syntactic development based on PT

| Age | Morphological development | | Syntactic development | | | |
|------|---|--|---|---|---|---|
| | Malay | English | Malay | Prominence Hypothesis English | Lexical Mapping Hypothesis Malay | Lexical Mapping Hypothesis English |
| 4;8 | Phrasal procedure, VP and NP; 1) <i>bagi dekat Rina je</i> Give at Rina only 'Give to Rina only' | Phrasal procedure, MOD +V <i>I can take I want, I can say flower</i> | Noncanonical word order, <i>kad ni Rina letak ataslah</i> card this Rina put above-PART 'this card, Rina put on top' | Noncanonical word order, <i>so soft the cat I want it</i> | Default mapping, <i>ayah ambil ini</i> Father take this 'Father take this one' | Default mapping, <i>I gonna take the dog</i> |
| 3;10 | Phrasal procedure, NP plural unification; <i>banyak kucing</i> 'many cat', <i>dua kek</i> 'two cake'. | Phrasal procedure, NP plural unification; <i>Many cats, two cats.</i> | Noncanonical word order, <i>yang ini Rina tak nak main</i> REL this Rina not want play 'this one, Rina does not want to play' | Noncanonical word order, <i>All the fish I put here, Later the baby come, I give you.</i> | Default mapping, <i>Rina nak tengok itu</i> Rina want watch that 'Rina wants to watch that' | Default mapping, <i>I want pink boat</i> |
| 3;6 | Phrasal procedure, VP; <i>nak main princess</i> | Category procedure, | XP _{DF} canonical word order, | XP _{DF} canonical word order, | Default mapping, <i>Rina nak keluar itu</i> | Default mapping, <i>I want black hair</i> |

| Age | Morphological development | | Syntactic development | | | |
|------|---|---|--|--|---|---|
| | Malay | English | Prominence Hypothesis | | Lexical Mapping Hypothesis | |
| | | | Malay | English | Malay | English |
| | want play princess '(I) want to play with the princess' | <i>lemons, pens, jumping, wearing</i> | <i>kereta Rina nak susun kereta</i> car Rina want arrange car 'the car, Rina wants to arrange the car' | <i>mouse it kick the cat by leg</i> | Rina want out that 'Rina wants to take that one out' | |
| | <i>nak mainan princess</i> nak toy princess '(I) want the princess doll' | | | | | |
| 3;4 | Phrasal procedure, VP; <i>nak bagi Snow White</i> want give Snow White '(I) want (to) give Snow White' | Lemma access/single word and formula <i>wait, banana, more water</i> | Canonical word order SVO, <i>Rina tak nampak game</i> Rina not see game 'Rina cannot see the game' | Canonical word order SVO, <i>I want apple</i> | Default mapping, <i>Rina nak epal</i> Rina want apple 'Rina want an apple' | Default mapping, <i>I want apple</i> |
| 2;10 | Category procedure, <i>main</i> 'to play' (V) and <i>mainan</i> 'toy'(N). | Lemma access/single word and formula, <i>no, go away, up, down.</i> | Canonical word order SVO, <i>Rina nak main</i> Rina want play 'Rina wants to play' | Lemma access/single word and formula | Default mapping, <i>Rina nak susu</i> Rina want milk 'Rina wants milk' | Lemma access/single word and formula |

In general, while all areas of language develop in parallel, some areas seem to develop faster than others. This finding may be summarised as:

Lexicon > Syntax > Morphology > Lexical Mapping

Now that I have discussed Rina's lexical and general grammatical development, the following section will focus on the description of Rina's plural development in Malay and English.

5.3 Development of plural-marking

In their studies investigating the emergence of pluralisation in L1 English children, Clark and Nikitina (2009) found that prior to the emergence of the conventional plural forms (suffix *-s* and so forth), the children produced "emergent categories", semantically compatible linguistic expressions to express the conceptual distinctions (see section 3.7.3).

In the result of Rina's plural development, we will see several emergent categories that Rina employed in her attempt to distinguish singularity and plurality. It is important to remember that Rina is a bilingual Malay-English child, so some of her utterances are mixed utterances. In what follows, the findings of the plural development in the longitudinal study (from 2;10 to 3;10) as well as the complementary study (at 4;8) are discussed. In describing the findings in Malay contexts, I divide Rina's plural acquisition into two periods; firstly, from age 2;10 to 3;3 (i.e., first six months of the investigation). Secondly, from age 3;4 to 3;10 (i.e., the following six months of the investigation). This is done because of the sheer volume of the findings and to make the results easier to analyse.

For Rina's plural development in English contexts, the findings begin at age 3;4. The recordings for English context with English-speaking families started at age 3;0 but Rina does not speak throughout the playgroup sessions though she plays with the other children. So, there are no contexts for plural expressions until age 3;4. The only time she speaks during the playgroup sessions is with Mother, which is in Malay. Thus, I consider that utterances to belong in Malay context. Rina only starts to participate in the activities in the English context at age 3;4. I will now begin describing the findings for Rina's plural output in Malay context from 2;10 to 3;3.

5.3.1 Rina's plural development from 2;10 to 3;3 in Malay context. Table 5.8 lists frequency counts of Rina's plural expressions in Malay language context from

2;10 to 3;10, during the whole period of the longitudinal investigation. The plural categories coded in Rina's speech are elaborated in Table 4.4. As shown in the table, Rina employed various linguistic means to mark plurality in Malay context. In this sub-section, I will first discuss the findings from 2;10 to 3;3, the first six months of the investigation. During this period, Rina produced six categories to express plurality: (i) default form; (ii) counting and pointing; (iii) English indefinite quantifier + Malay default form; (iv) iteration; (v) iteration of noun with modifiers and; (vi) prolonged vowel. Figure 5.9 indicates Rina's plural output from 2;10 to 3;3

Table 5.8

Rina's plural development in Malay contexts from 2;10 to 3;10

| Plural categories | 2;10 | 2;11 | 3;0 | 3;1 | 3;2 | 3;3 | 3;4 | 3;5 | 3;6 | 3;7 | 3;8 | 3;9 | 3;10 |
|---|-------------|-------------|-------------|--------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|---------|-------------|
| Default form | 3 (27.3) | 3 (20) | 2 (28.6) | | 2 (28.6) | 2 (22.2) | 2 (10.5) | 1 (5.9) | | 12 (41.4) | | 11 (25) | |
| Counting and pointing | 6 (54.5) | 9 (60) | 1 (14.3) | 3 (75) | 2 (28.6) | 4 (44.4) | 8 (42.1) | 7 (41.2) | 4 (11.8) | 6 (20.7) | 2 (5.3) | 2 (4.5) | 2 (5) |
| English Indefinite quantifier + Malay default form | 2 (18.2) | | | | | | | | | | | | |
| Iteration | | 2 (13.3) | 1 (14.3) | 1 (25) | 2 (28.6) | 2 (22.2) | 9 (47.4) | 8 (47.1) | 12 (35.3) | 1 (3.4) | 29 (76.3) | 20 (45) | 18 (45) |
| Iteration of noun with modifiers | | | | | 1 (14.3) | | | 1 (5.9) | 15 (44.1) | 6 (20.7) | 2 (5.3) | | |
| Malay noun + suffix-s | | | | | | | | | 2 (5.9) | | | | 2 (5) |
| Incipient reduplication | | | | | | | | | | | 2 (5.3) | 1 (2.3) | 2 (5) |
| Indefinite quantifier + default form | | 1 (6.7) | 1 (14.3) | | | | | | | | | | 7 (17.5) |
| Numeral quantifier + default form | | | | | | | | | | | | | 1 (2.5) |

| Plural categories | 2;10 | 2;11 | 3;0 | 3;1 | 3;2 | 3;3 | 3;4 | 3;5 | 3;6 | 3;7 | 3;8 | 3;9 | 3;10 |
|---|------|------|-------------|-----|-----|-------------|-----|-----|-----|-------------|---------|-------------|-------------|
| English noun + suffix-s | | | | | | | | | | 4 (13.8) | | | |
| English indefinite quantifier +English noun+ suffix -s | | | | | | | | | | | 2 (5.3) | 3 (6.8) | 5 (12.5) |
| English indefinite quantifier + English default form | | | | | | | | | | | 1 (2.6) | 5 (11.4) | |
| English numeral quantifiers+ English default form | | | | | | | | | | | | | 2 (5) |
| Prolonged vowel | | | 2 (28.6) | | | 1 (11.1) | | | | | | | 2 (4.5) |
| Total percentages | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Total plural output | 11 | 15 | 7 | 4 | 7 | 9 | 19 | 17 | 34 | 29 | 38 | 44 | 40 |

*The number in the bracket indicates the percentages of the frequencies in each session.

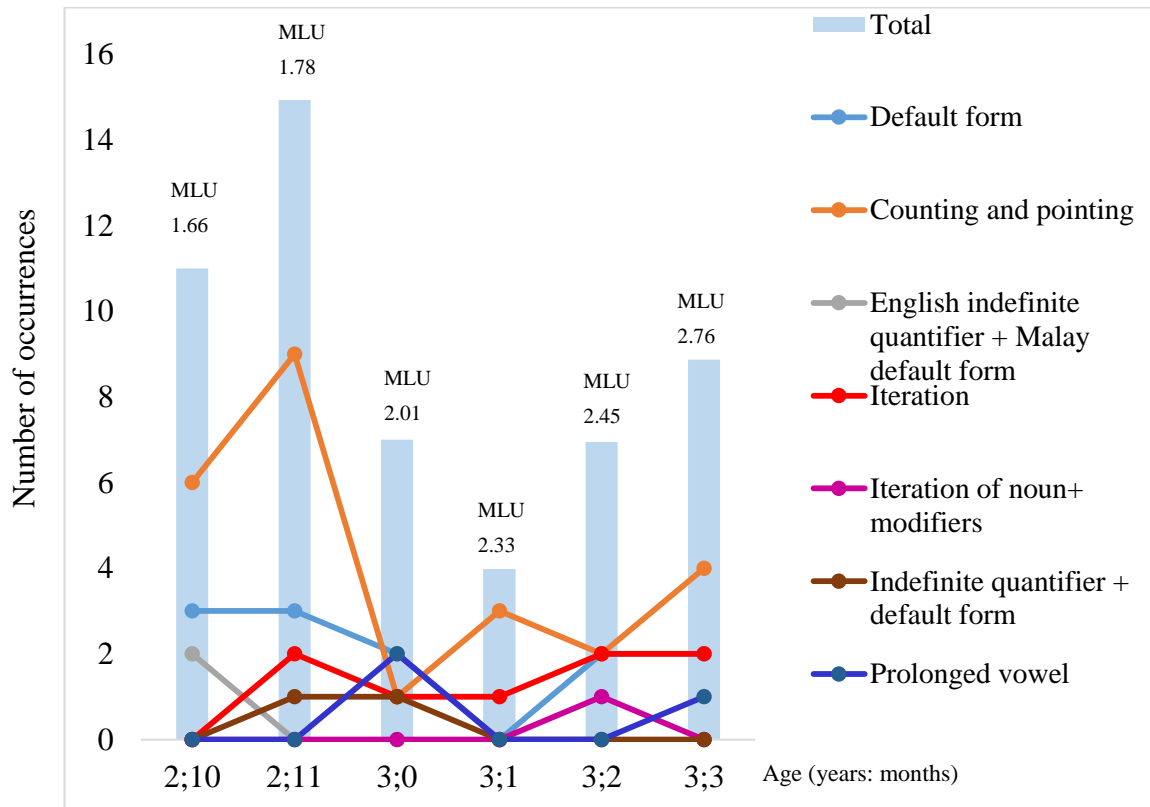


Figure 5.9. Rina's plural development from 2;10 to 3;3 in Malay context.

Throughout these six months, counting and pointing (e.g. *one three four five thirteen one three, satu dua empat lima* 'one two four five'), default form (e.g. *mainan* 'toy, *timun* 'cucumber') and iteration (e.g. *buku buku buku* 'book book book', *bird bird bird*) are the recurring plural strategies adopted by Rina. At the beginning of the study, at age 2;10, Rina expresses plurals predominantly through counting and pointing. It should also be noted that Rina only counts plural items, not the singular ones. When Rina counts plural items, the noun referents are omitted. This is reflected in the following example from the corpus (M for Mother and R for Rina):

18. M Rina ni apa?
Rina this what?
'Rina what (are) these?'
R one three four five one two
(pointing to each of the apple)
19. M Rina nak yang mana?
Rina want REL which?
(showing one book)
'Rina, which one do you want?'

- R em
M Rina nak mommy baca satu buku ke banyak buku?
Rina want mommy read one book PART many book?
‘Rina wants mommy (to) read one book or many books?’
R one one two four five seven one two
(pointing to each of the book)

It is also important to note that whenever Rina counts the items to encode plurality, it is always accompanied by the kinaesthetic element; that is the pointing to each of the object. Studies investigating counting in children found that typically, by age two to three, children can recite count sequence routine (e.g. *one two three four five*, etc.)(Wynn,1992;1995). This is supported by Pollmann (2003) who investigates the acquisition of number words in Dutch and English based on data available in CHILDES². In his article, Pollmann (2003) posits that children acquire number sequence as a list of word forms without meaning. Pollman gives examples from Childes in Dutch and English, which I find interesting as the children’s counting utterances is identical to Rina’s counting structure (the examples below are taken from Pollman, 2003, p.9);

20. Mother wat voor dieren staan er nog meer op?
‘what other kinds of animals are there?’
Child een twee drie vier zeven acht negen tien.
‘one, two, three, four, seven, eight, nine, ten’
21. Mother can you get the blocks out? [. . .] the blocks, yes.
Child one
Mother one, mm.
Child one, two, three, four, eight, eight, nine, ten, eight, nine, ten.
Mother one
Child two, three, four, five, eight.
Mother six
Child eight
Mother seven
Child eight, nine, ten.
Mother Right

In example (20) and (21), the children start counting when they encounter plural objects (the animals and the blocks). Like Rina, both children also used numerical sequences without the noun referents. It appears from the data presented

² CHILDES, an acronym for Child Language Data Exchange System, is a corpus of first language acquisition data, freely accessible online at <http://chilDES.psy.cmu.edu/>.

here that the children (including Rina) seem to associate number words with amounts and collectives.

Rina also uses default form to signal plurals. Rina's use of default form is exemplified in the following conversations;

22. M oh Rina makan apa tu?
oh Rina eat what that?
'oh what are you eating?'
- R nugget
- M nugget? ni banyak jadi kita panggil apa?
nugget? this many so we call what?
'nugget? These (are) many so what we call them?'
- R nugget
23. M Rina nak coklat ke banyak coklat?
Rina want chocolate PART many chocolate?
(showing one chocolate and a bowl of chocolates)
'Do you want (a) chocolate or many chocolates?'
- R coklat
(pointing to the bowl of chocolates)
'chocolate'

In example (22) and (23), when asked by the Mother about the many nuggets and chocolates, Rina describes them by using the default form when evidently in the contexts, she is referring to more than one entity.

Finally, at age 2;10, Rina also uses English quantifiers *more* with Malay default form. The following are the instances in which Rina used *more* when signalling plurals:

24. R more susu
'more milk'
- M em?
- R nak more susu
want more milk
'(I) want more milk'
25. R more more nasi
'more more rice'
- M Rina nak nasi lagi?
Rina want rice more?
'Rina wants more rice?'
- R nak more nasi
want more rice
'(I) want more rice'

Conversation (24) and (25) occur during mealtime. In both the exchanges, Rina is asking for more food, hence *more susu* ‘more milk’ and *more nasi* ‘more rice’. Both *more* in the conversations are paired with mass nouns. In these particular conversations, what they indicate is the distributive nature of mixing in Rina’s utterances. I believe that Rina might have acquired the English word *more* from the school domain so at home, she combines the word *more* with home-based food items such as *susu* ‘milk’ and *nasi* ‘rice’.

The following month, at 2;11, counting and pointing are still Rina’s preferred strategy to mark plurals, followed by the default form. Two new strategies emerge at 2;11; iteration (*jelly jelly jelly*, *buku buku* ‘book book’) and Malay quantifier with default form (*banyak mainan* ‘many toy’). For iteration, Rina iterates based on the number of objects; Rina pluralises three jellies as *jelly jelly jelly* and pluralises two books as *buku buku* ‘book book’. Similar to counting, iteration is also accompanied by the pointing gesture. In this context, I consider Rina’s utterance *buku buku* as iteration rather than reduplication because of the pointing gesture. The contextual properties of Rina’s iteration and reduplication utterances are elaborated in Chapter 6 (see Table 6.4).

For Malay quantifier with default form, Rina produces *banyak mainan* ‘many toys’ when she sees a pile of toys. According to Sew (2007), Malay quantifiers instantiate noun referents. Sew lists six types of quantifiers in Malay language; one of them is *banyak* ‘many/much’ in which he categorises as quantifiers of large amount. *Banyak* can modify both count and mass nouns. In the examples, *banyak kerusi* (p.45) ‘many chairs’ and *banyak wang* (p.45) ‘much money’, *banyak* is followed by the stem rather than reduplicated words. Sew then tests the quantifier and noun reduplications on seven Malay native speakers. In his finding, five of the informants thought *banyak* could not quantify the full noun reduplications as the reduplication structure is already expressing plurality. Thus, Sew concludes that reduplications in Malay are not modifiable by numbers and quantifiers.

At age 3;0, default form (*timun* ‘cucumber’), counting and pointing (*one two empat* ‘one two four’), iteration (*buku buku buku* ‘book book book’) and Malay quantifier with Malay default form (*banyak mainan* ‘many toy’) co-exist as Rina’s plural output. Interestingly, one new strategy emerges at 3;0; the prolonged vowel. Prolonged vowel is a strategy adopted by Rina in which she extends the duration of a vowel in a word to mark plurals. There are two occurrences of prolonged vowel at age 3;0. In the corpus, when asked by the Mother whether Rina wants an orange or

oranges, she points to a bowl of oranges and produces *orange* in which the duration of the first vowel /o/ was extended. Rina's generic *orange* and *orange* in which she refers to more-than-one oranges are then compared. Table 5.9 illustrates the difference in /o/ in her generic *orange* and plural *orange*. The analysis of the vowel /o/ is conducted on Praat software³;

Table 5.9
Rina's /o/ duration in generic and plural orange

| Word | Duration of the vowel /o/ |
|------------------|--|
| Orange (generic) | 0.065662 seconds |
| Orange (plural) | 1. 0.557226 seconds 2. 0.438745 seconds |

The finding verified the duration contrast used by Rina when she marks the many oranges. When Rina refers to many oranges, the /o/ was consistently longer in duration. In fact, this finding is similar to the result found by Camarata (1990) ; in the case study, Camarata found one normally developing English-speaking child, aged two years and seven months, increases the fundamental frequency (F0) and duration of lexical items to signal plurals.

Counting and pointing continues to be Rina's preferred strategy in encoding plurals at age 3;2 and 3;3. In the corpus, there is one instance which Rina combined the Malay and English numerical sequences. The subsequent example illustrates how Rina mixed the counting sequences:

26. M Rina apa tu?
Rina what that?
'Rina what is that?'
- R satu dua tiga one satu one
'one two three one one one'

In this context, Mother asks Rina to describe the picture of an assortment of cakes. Rina goes on counting and pointing at the picture. Interestingly, she begins counting in Malay *satu dua tiga*, followed by *one satu one*. In the second set of counting, Rina combines Malay number *satu* 'one' with *one* in English.

³ PRAAT is a computer software for the analysis of phonetics in speech. PRAAT is elaborated further in Chapter 6.

One new plural strategy produced by Rina at 3;2 is the use of iteration of noun with modifiers. This is similar to iteration in the earlier months but unlike before, iteration this time is produced with modifiers describing the items. An example from the corpus is as follows:

27. M ni apa?
 this what?
 ‘what is this?’
 R ni princess baby ni Rina baby
 this princess baby this Rina baby
 ‘this is a princess baby this is Rina baby’

In this conversation, Mother is asking Rina about her dolls. Rina names the dolls *baby* so she describes the first doll as *princess baby* and the second doll as *Rina baby*. The second doll is described as *Rina baby* because of the resemblance of the doll with Rina’s hairstyle. Another interesting thing that I observe at age 3;2 and 3;3 is Rina’s use of *gula-gula* ‘candies’. In Malay, *gula-gula* is a lexicalised reduplicated form which carries both the meaning of one candy and many candies. *Gula* on the other hand, means sugar. There are several occurrences in the recording at age 3;2 and 3;3 that Rina uses *gula* to refer to one candy, as in *Rina ambil gula* ‘Rina take (a) candy’. It appears that Rina conceptualises the word *gula-gula* to mean two candies so when she refers to one candy, she uses the word *gula*.

So, to summarise, from 2;10 (MLU 1.66) to 3;3 (MLU 2.76), we can see several competing strategies used by Rina to express plurals in Malay language context. The most prominent strategy Rina uses in plural expression during this period is counting and pointing (without the noun referents). It is also interesting that when I compare the other children’s use of counting as presented by Pollman (2003), they are similar to Rina’s structure of counting; the nouns are omitted, and though the children do not know the exact numerosity of the counting sequence, they tend to associate it with more-than-one items. Another important observation is that when Rina’s MLU exceeds 2 at age 3;2, she starts using the iteration of nouns with modifiers. So, when her MLU is below 2, she uses counting and pointing but as her MLU develops, she begins using more lexical items to describe the plural objects. The following discussion will proceed with her expression of plurality in Malay context from 3;4 to 3;10.

5.3.2 Rina's plural development from 3;4 to 3;10 in Malay context. In this section, the results for Rina's plural expressions from age 3;4 to 3;10 are described. Previously from 2;10 to 3;3, the data is obtained from Rina's naturally occurring speech; her conversations with the parents at home. Occasionally, to gauge the plurals from Rina, Mother and Father show some pictures and ask her to describe them during her daily routine activities. However, realising that plurality is not a common feature in children's speech, I devised elicitation methods to further obtain Rina's plural output. Rina is shown pictures of singular and plural items and are asked to describe the pictures. This method is used sporadically from age 2;10 to 3;3 but at age 3;4 onwards, regular elicitation sessions with Rina are organised in the recording sessions. Figure 5.10 charts frequency counts of Rina's plural expressions in Malay language from age 3;4 to 3;10.

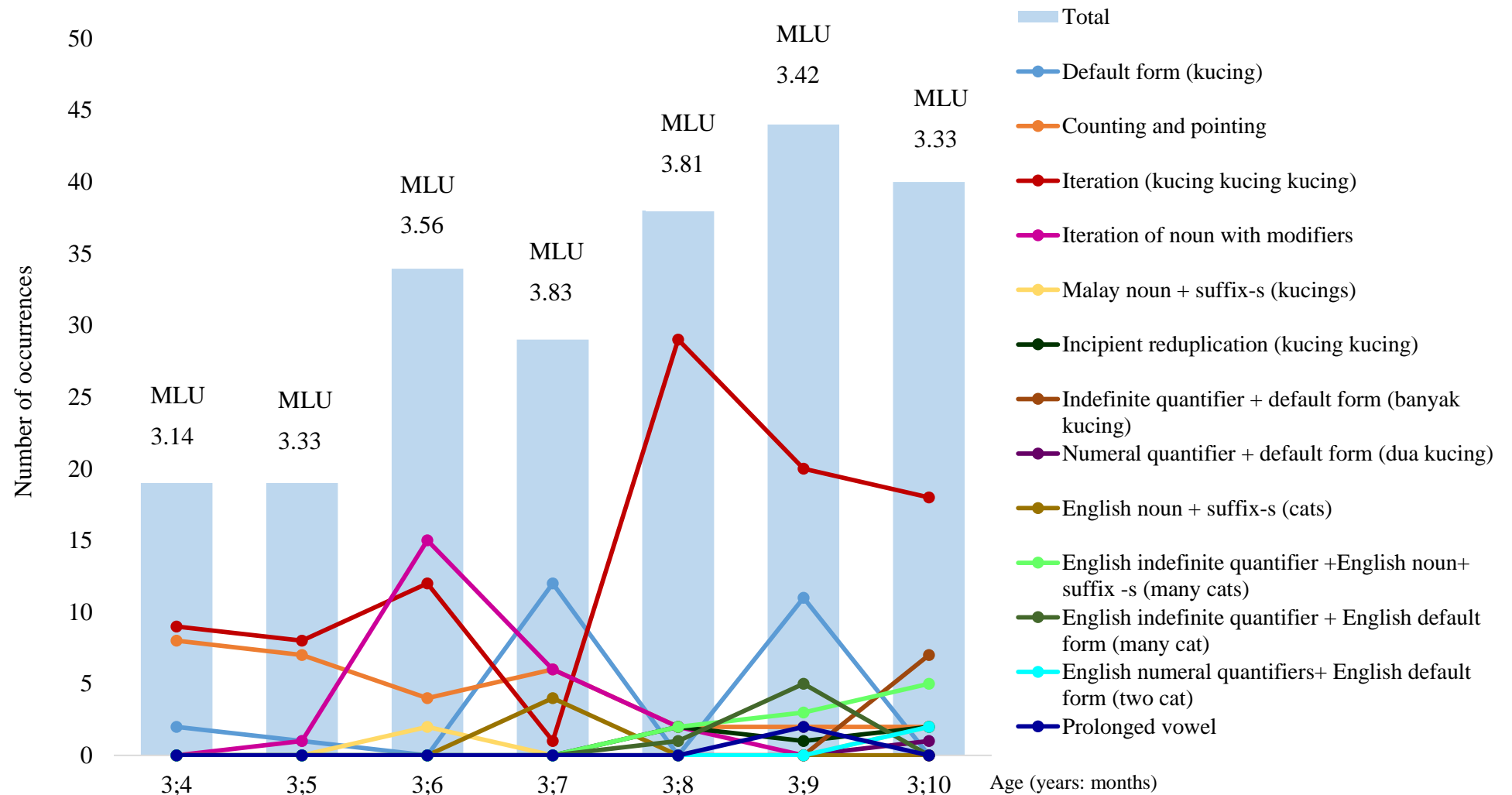


Figure 5.10. Rina's plural development from 3;4 to 3;10 in Malay context.

From 3;4 to 3;10, it appears that iteration (e.g., *kucing kucing kucing kucing* ‘cat cat cat cat’) is the preponderant linguistic means that Rina uses to pluralise entities in Malay context. Figure 5.10 shows that iteration is the highest plural expression from 3;4 to 3;10, except for 3;6 and 3;7, when it drops against an increase in the use iteration of noun with modifiers (at 3;6) and the use of default forms (at 3;7). At 3;4, iteration constitutes 47.4% of her plural utterances, followed by 47.1% at 3;5, 35.3% at 3;6, 3.4% at 3;7 (this is the only time that it dropped significantly), 76.3% at 3;8 and 45% at age 3;9 and 3;10.

The following exemplifies some of Rina’s iteration utterances in the corpus, (M for Mother, F for Father and R for Rina):

28. M ni apa ni? kucing-kucing
 this what this? cat-cat
 ‘what is this? cat-cat’
 R Rina nak cat cat cat cat cat cat
 ‘Rina wants cat cat cat cat cat cat’
 (pointing to each of the cat) (Age 3;4)
29. M Rina ni binatang apa?
 Rina this animal what?
 ‘Rina what animal is this?’
 R cow
 M cow? lembulah kalau ini lembu yang banyak kita panggil apa?
 cow? cow-PART if this cow REL many we call what?
 ‘cow? It’s *lembu* if this is (a) *lembu* what about these?’
 R ni cow cow cow cow cow
 ‘this cow cow cow cow cow’ (Age 3;5)
30. M apa ni? ni semua apa?
 what this? this all what?
 ‘what are all these?’
 R ni quack quack quack quack quack quack quack quack quack quack
 quack quack quack
 ‘these (are) quack quack quack quack quack quack quack quack quack quack
 quack quack quack quack’
 (pointing to each duck in the picture)
 M oh ini itik-itiklah
 oh this duck-duck-PART
 ‘oh these (are) duck-duck’ (Age 3;6)
31. M OK ni apa ni?
 OK this what this?
 ‘OK what are these?’
 R aa buku buku buku
 ‘aa book book book’

- (pointing to each book) (Age 3;7)
32. F apa tu?
 what that?
 ‘what is that?’
 (showing a picture of one rabbit)
 R arnab
 ‘rabbit’
 F yang ini?
 REL this?
 ‘what about these?’
 (showing a picture of many rabbits)
 R arnab arnab arnab arnab arnab arnab arnab
 ‘rabbit rabbit rabbit rabbit rabbit rabbit rabbit’
 (pointing to each of the rabbit)
 F dua kali je arnab-arnab
 two time only rabbit-rabbit
 ‘twice only rabbit-rabbit’
 R bukan arnab arnab arnab arnab arnab arnab arnab
 ‘no rabbit rabbit rabbit rabbit rabbit rabbit rabbit’
 (pointing to each of the rabbit) (Age 3;8)
33. F ni apa?
 this what?
 ‘what is this’
 (showing a picture of many cats)
 R kucing kucing kucing kucing kucing kucing kucing
 ‘cat cat cat cat cat cat cat’
 (pointing to each of the cat) (Age 3;9)
34. R mommy mommy ada beg beg beg beg
 mommy mommy exist bag bag bag bag
 ‘mommy mommy there (are) bag bag bag bag’
 (pointing to each bag)
 M oh yeke?
 oh yes-PART?
 ‘oh really?’ (Age 3;10)

When Rina iterates plural items, the utterances are always accompanied with pointing gesture to each of the items as well. This strategy is indeed iconic; it reflects Rina’s one-to-one form function mapping; every object is represented with a lexical item and Rina also individuates each entity in the plural context with her pointing gesture. As exemplified in example (30) and (32), when Rina iterates the objects, Mother and Father tried to correct her utterances by overtly teaching Rina to reduplicate. This overt correction that the parents provide is what Demetras, Post, and Snow (1986) and Bohannon and Stanowicz (1988) termed as *negative evidence*; any

verbal cue that differentiates ill-formed from a well-formed speech in children's utterances. Pinker (1989) states that though parents might provide feedback on the grammaticality of the children's speech, it might not lead to immediate effect on children's language acquisition; if the child is not ready, no amount of explicit feedback will result in 'instant' acquisition. Pinker's statement is indeed consistent with Rina's case; though the parents teach Rina to reduplicate, she refuses to do so, and these attempts are generally, futile as Rina continues to iterate nouns to signify plurals. Most of the times, Rina argues with Father, whom I observe always explicitly instructs Rina to limit her iteration utterances to only twice. The following exchange exemplifies an instance of Rina's arguing with Father:

35. F Rina yang ini kangaroo-kangaroo
 Rina REL this kangaroo-kangaroo
 'Rina these are kangaroo-kangaroo'
 R bukan ni kangaroo kangaroo kangaroo kangaroo kangaroo
 no this kangaroo kangaroo kangaroo kangaroo kangaroo
 'no these (are) kangaroo kangaroo kangaroo kangaroo kangaroo'
 F kangaroo-kangaroo lah
 kangaroo-kangaroo-PART
 'it's kangaroo-kangaroo'
 R no kangaroo kangaroo kangaroo kangaroo kangaroo kangaroo
 (yelling) (Age 3;9)

Iteration is the predominant strategy Rina used from 3;4 to 3;10 but at 3;6, another form of iteration appears; iteration of noun with modifiers. This strategy is like iteration, but Rina adds another element to the iterated nouns; the modifiers describing each of the nouns. Iteration of noun with modifiers have emerged previously at 3;2 and 3;5 but the occurrences are limited. The following exchanges indicate how Rina uses iteration with modifiers to signify plurals:

36. M ni playdoh yang ini apa?
 this playdoh REL this what?
 'this is (a) playdoh what about these?'
 R ni playdoh white and red and black
 this playdoh white and red and black
 'this is white and red and black playdoh'
 (pointing to each playdoh) (Age 3;5)
37. M OK Rina yang ini apa?
 OK Rina REL this what?
 'OK Rina what is this?'
 R green green bird green yellow em

- M OK
R red red blue red bird orange bird yellow bird green bird blue bird and green bird
(pointing to each bird in the picture) (Age 3;6)
38. M mommy tak tau Rina tau ini
mommy not know Rina know this
‘mommy don’t know but Rina know this’
R em book green book purple book blue book brown
(pointing to each book) (Age 3;6)
39. M ni apa Rina?
this what Rina?
‘what is this Rina?’
R monkey
M monkey? monyetlah yang banyak ni apa?
monkey? monkey-PART REL many this what?
‘monkey? it’s *monyet* what about these?’
R baby monkey ayah monkey mommy monkey
‘baby monkey father monkey mommy monkey’
(pointing to each monkey) (Age 3;6)

In examples (36), (37), and (38), when describing the items (*playdohs, birds and books*), Rina describes the colour of each of the entity while simultaneously pointing to the picture. The adjectives precede nouns in example (37) (English word order), but the nouns precede adjectives in (36) and (38) (Malay word order). In example (39), Rina is shown a picture of singular and plural monkeys. Mother corrects Rina’s utterance, giving her the equivalent Malay term of monkey *monyet* but Rina continues using the word *monkey* and iterates the noun, hence *baby monkey ayah monkey mommy monkey*. In this utterance, Rina assigns ‘family roles’ to the monkeys, hence the small monkey is the *baby monkey* and the two bigger monkeys are the *ayah monkey* ‘father monkey’ and *mommy monkey* ‘mother monkey’.

There is also the use of suffix *-s* attached to Malay nouns in Rina’s plural output 3;6. Rina’s use of suffix *-s* with Malay nouns at 3;6 is indeed, parallel to the significant increase of suffix *-s* in English context (see section 5.3.3). The following conversations from the corpus illustrates Rina’s use of suffix *-s* in Malay context at this age (3;6):

40. R mommy I want mainans
‘mommy I want toys’
(pointing to a bucket of toys)
M Rina nak mainan-mainan?

- Rina want toy-toy?
 ‘Rina want toys?’
 R No mainans
 (pointing to a bucket of toys)
41. R kucings Rina suka kucings
 ‘cats Rina like cats’
 M Rina suka kucing-kucing?
 Rina like cat-cat?
 ‘Rina likes cats?’
 R kucings I said kucings

In example (40) and (41), Rina uses Malay nouns *mainan* ‘toy’ and *kucing* ‘cat’ with the suffix *-s* to indicate plurality. In the following month, at 3;7, Rina does not produce Malay noun + suffix *-s*; instead, I found several occurrences in which she expresses plurality by code-switching to English noun + suffix *-s* (English plural). The following examples show Rina’s code-switching utterances at 3;7:

42. M gambar apa ni?
 picture what this?
 ‘what is this picture?’
 R itik
 ‘duck’
 M kalau banyak?
 if many?
 ‘if (there are) many?’
 R duckies
43. M yang ini burung kalau yang ini?
 REL this bird if REL this?
 ‘this is (a) bird what about these?’
 R em birds

In example (42), when asked about a picture of one duck, Rina responds correctly, uttering *itik* ‘duck’. However, when there are many ducks, Rina describes them as *duckies*. In example (43), Mother tells Rina that one bird is *burung* in Malay and asks her to describe a picture of a flock of birds. Instead of answering in Malay, Rina code-switches to English, hence *birds*.

At 3;7, iteration decreases significantly, and the default form becomes Rina’s primary plural expression. Some instances of Rina’s using the default form to indicate plural is shown in the following examples:

44. M ni dalam Bahasa Melayu apa?
 this in language Malay what?
 ‘what is this in Malay language?’
 (showing a picture of one rabbit)
 R arnab
 ‘rabbit’
 M kalau yang ini?
 if REL this?
 ‘what about these?’
 (showing a picture of many rabbits)
 R arnab
 ‘rabbit’ (Age 3;7)
45. M OK ni apa?
 OK this what?
 ‘OK what is this?’
 (showing a picture of one banana)
 R banana
 M pisang
 ‘banana’
 R pisang
 ‘banana’
 M kalau banyak macam ni?
 if many like this?
 ‘if (there are) many like these?’
 (showing a picture of many bananas)
 R pisang
 ‘banana’ (Age 3;7)

It is unclear why Rina prefers the default form at 3;7. However, she continues to iterate when expressing plurals in the subsequent months (from age 3;8 to 3;10). Reduplication, the target grammatical Malay plural, begins to appear at age 3;8 (two occurrences), 3;9 (one occurrence) and 3;10 (two occurrences). In this study, as Rina is still learning to reduplicate plural objects, I term her use of reduplication as *incipient reduplication*. The main difference between iteration and reduplication is that for iteration, Rina iterates based on the number of items. For reduplication, Rina’s output is considered as reduplication if she reduplicates items more than two; for instance, if Rina produces *banana banana* when prompted to describe a picture of more-than-two bananas, I take this occurrence as evidence of reduplication. Another important cue is that when iterating, Rina points to the object but I observe that when Rina starts using reduplication to signify plurals, there is no pointing involved. This seems to suggest that when Rina has begun using reduplication, the grammatical marking of plurality in Malay, there is a lower reliance on iconic gestures.

Previously, I discuss negative evidence provided by Mother and Father. In the example (35), Rina refuses to use reduplication to express plurals. However, despite her refusal, there are a few occurrences of incipient reduplication in Rina's speech when she refers to plural objects. Interestingly, at 3;8 and 3;9, all Rina's occurrences of incipient reduplication appear when the recording is conducted by Father, who explicitly instructs Rina to reduplicate when she encounters more-than-one objects. The following exchanges are instances in the corpus when Rina uses reduplication in the presence of Father;

46. F yang ini apa?
REL this what?
'what is this?'
(showing a picture of a banana)
R banana
F yang ini pula?
REL this also?
'what about this one?'
(showing a picture of many bananas)
R banana banana
F ha pandai
'ha clever' (Age 3;8)
47. F ni?
'this?'
(showing a picture of one Peppa Pig)
R Peppa Pig
F yang ini apa?
REL this what?
'what is this?'
(showing a picture of many Peppa Pigs)
R Peppa Pig Peppa Pig (Age 3;8)
48. F yang ini apa?
REL this what?
'what is this?'
(showing a picture of a bird)
R burung
'bird'
F pandai yang ini pula?
clever REL this also?
'clever what about this?'
(showing a picture of many birds)
R burung burung
'bird bird' (Age 3;9)

At 3;10, I observe that Rina has started to produce incipient reduplication even without the presence of the Father. She still uses iteration predominantly when pluralising objects, but there are two occurrences when she only limits the iteration utterances to only twice. The two occurrences of incipient reduplication at 3;10 is shown in the following exchanges:

49. M cantik yang ini apa gambar ni?
 beautiful REL this what picture this?
 ‘it’s beautiful what is this picture?’
 (showing a picture of one Cinderella)
 R Cinderella
 M yang ini banyak?
 REL this many?
 ‘this one many?’
 (showing a picture of many Cinderellas)
 R Cinderella Cinderella
50. M OK yang ini?
 OK REL this?
 ‘OK this one?’
 (showing a picture of a bag)
 R Frozen backpack
 M Kalau banyak macam ini?
 if many like this?
 ‘if many like this?’
 (showing a picture of many bags)
 R em Frozen backpack Frozen backpack

In example (49) and (50), it is evident that Rina has started producing reduplication to express plurals. Interestingly, in example (50), Mother shows a picture of many bags, in which Rina described as *Frozen backpack-Frozen backpack*⁴. Instead of describing the items as *bag-bag*, Rina describes the picture on the bags first. This is, in fact, similar to Rina’s use of iteration with modifiers discussed earlier; the lexical items are iterated with modifiers. In this case, Rina reduplicates the objects with modifiers.

Up till the end of the longitudinal investigation, at age 3;10, Rina has yet to use any alternative form of lexically-determined reduplication such as those with suffix *-an* (e.g. *buah-buahan* ‘fruits’, *sayur-sayuran* ‘vegetables’) or those with changes in the repeated word (e.g. *kuih-muih* ‘cakes’, *lauk-pauk* ‘dishes’).

⁴ Frozen is a Disney animated movie. The child is very elaborate in describing the bags; she describes the picture on the bag first.

Finally, the target noun phrase (NP) for Malay quantifiers (indefinite and numeral quantifiers with default form, e.g. *banyak kucing*, *dua kucing* ‘many cat’, ‘two cat’) emerges at 3;10. Malay indefinite quantifier *banyak* has previously appeared at 2;11 (one occurrence) and 3;0 (one occurrence). At 3;10, there are seven occurrences of Malay indefinite quantifiers and one occurrence of Malay numeral quantifier. The following examples reflect Rina’s use of Malay indefinite and numeral quantifiers at age 3;10:

51. R mommy Rina nak main banyak playdoh
 Mommy Rina want play many playdoh
 ‘mommy Rina want to play many playdohs’
52. R ni semua kawan Rina
 this all friend Rina
 ‘This is all Rina’s friends’
 M oh yeke?
 oh yes-PART?
 ‘oh really?’
 R semua kawan
 all friend
 ‘all friends’
53. M Rina buat apa tu?
 Rina make what that?
 ‘What are you doing?’
 R Rina nak buat kek
 Rina want make cake
 ‘Rina want to bake (a) cake’
 M nak buat kek?
 want make cake?
 ‘(you) want to bake (a) cake?’
 R nak buat dua kek
 want make two cake
 ‘(I) want to bake two cakes’
 (showing many muffin pans)

In example (51), Rina tells Mother that she wants to play with more than one playdohs, hence *banyak playdoh*. In example (52), Rina tells Mother that all the children in the picture are her friends. She repeats the utterance, saying *semua kawan* ‘all friend’. For numeral quantifier, Rina produces *dua kek* ‘two cake’. Interestingly, when Rina uses *dua* ‘two’, what she means in the context is more-than-one, not necessarily indicative of the amount two.

However, though I only found in the corpus that NP for Malay quantifiers emerge at 3;10, Rina has begun using the phrasal constructions earlier (at age 3;8) with English quantifiers paired with English default form (e.g. *many cat, two cat*). One primary difference in Rina's plural development between English and Malay contexts lies primarily in her code-switching activities; Rina tends to code switch to English in Malay context but rarely would she code-switch to Malay in English context when describing plural objects. Previously, at 3;7, she code-switches to English plural *-s* in Malay contexts. In the development of plurals in English context, we will see later that at age 3;8, Rina begins using numerous English quantifiers to express plurality. Interestingly, at the same time that she produces English quantifiers in English context, she also uses the same strategy in Malay context, albeit in lower frequencies. Rina's use of English quantifiers as markers of plurality in Malay context is reflected in the following conversations:

54. R mommy mommy macam mana kita nak main tak ada all the toys?
mommy mommy how we want play not exist all the toys?
'mommy mommy how are we going to play without all the toys?'
M em?
R tak ada all the toys
not exist all the toys
'without all the toys' (Age 3;8)
55. M ni apa?
this what?
'what is this?'
(showing a picture of a book)
R buku
'book'
M ha pandai yang ini?
'ha smart what about this?'
R lots of books
M ha?
R lots of books
M buku-buku?
'book book?'
R lots of book (Age 3;9)
56. M dalam ni ada apa?
inside this exist what?
'what is inside here?'
R lots of toys
M ha?
R wanna play lots of toys? (Age 3;10)

In example (54), Rina informs Mother that there are no toys around. Her utterances are mainly in Malay, except for *all the toys*, in which she repeats twice to emphasise her point. In example (55), when describing a picture of many books, Rina switches to English, saying *lots of books* twice. When Mother corrects her utterance by saying *buku-buku*, she responds with *lots of book* (without the plural suffix *-s*). In example (56), Mother asks Rina the contents of a box, in which Rina answers in English, hence *lots of toys* and then she asks Mother to play with her, repeating *lots of toys* in the question.

Now, I have discussed Rina's development of plural acquisition from age 3;4 to 3;10 in Malay context. Generally, iteration is Rina's preferred strategy for plural expressions in Malay. Reduplication, the grammatical marking of plurality in Malay only emerges at age 3;8. As discussed before, iteration is an iconic strategy to express plurality of items. When iterating, Rina also points to each of the items. However, when she starts using reduplication to express plural, she gradually stops pointing to the object. This possibly suggests that iteration is gradually grammaticalised by the child when she stops relying on iconic one-to-one strategy and begins to limit her iteration utterance to only twice (reduplication). Another main observation in Rina's plural acquisition in Malay is her code-switching utterances in Malay context. When her English MLU becomes higher than her Malay MLU (beginning at age 3;8), Rina starts to code-switch more in Malay context than in English. This is also reflected in her plural marking in Malay; she code-switches to NP English quantifiers to mark plurals and only later, at age 3;10, she starts producing Malay NP quantifiers.

In the previous discussions, in the first six months of the investigation (from 2;10 to 3;3), counting and pointing is most frequent in Rina's plural productions. However, as Rina's Malay MLU increases, counting and pointing slowly decreases as Rina opts to use other linguistic means to express plurality. Figure 5.11 indicates Rina's gradual decrease of counting and pointing throughout the longitudinal study. At age 2;10 and 2;11, Rina's counting and pointing represents 55% to 60% of her plural marking strategy. The strategy drops at 3;0, with only 14.3 % but then it rapidly increases to 75% of her plural expressions at age 3;1. After 3;1, Rina's use of counting and pointing slowly declines until it becomes only 5% of her total plural utterances at age 3;10.

In Figure 5.12, Rina's use of iteration as her plural marking strategy in Malay contexts from age 2;10 to 3;10 is exhibited. As previously discussed, iteration becomes Rina's prominent strategy to mark plural beginning at age 3;4, with 47.4 %. Iteration

continues to increase except at age 3;6 (35.5%), which is preceded by iteration with modifiers (44.1 %) and at age 3;7, with only 3.4%. At age 3;8, iteration forms 76.3% of Rina’s plural expressions and continues to be her preferred strategy in Malay until age 3;10.

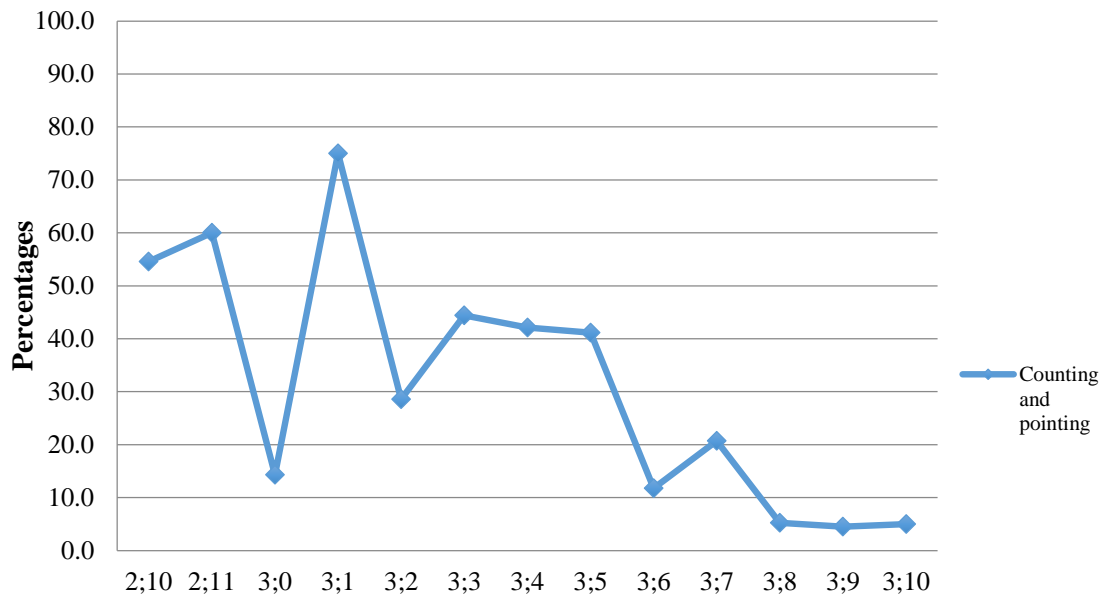


Figure 5.11. The percentages of Rina’s counting and pointing in Malay contexts throughout the longitudinal investigation.

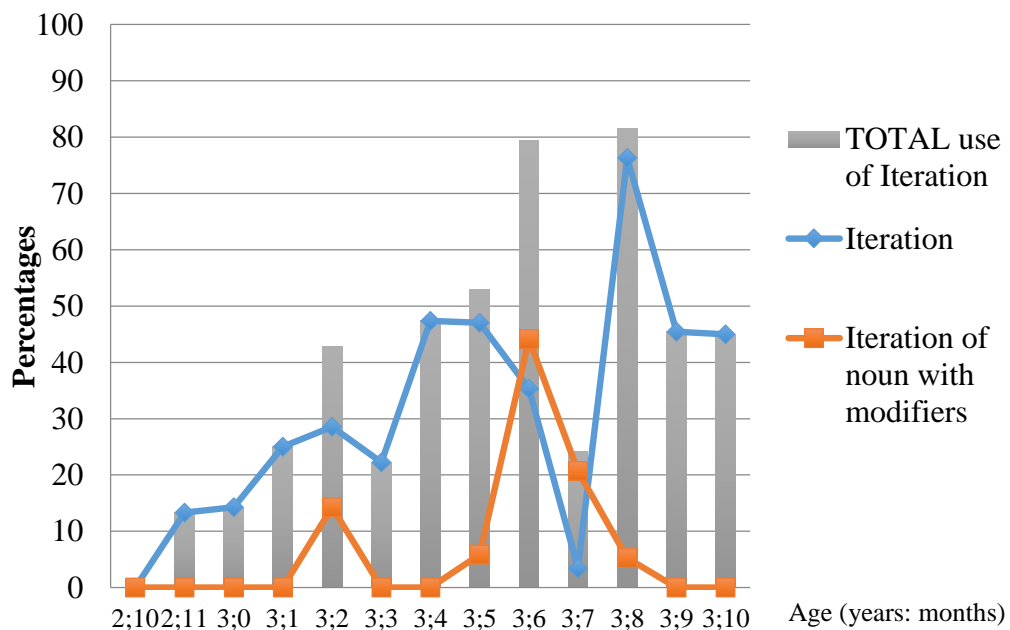


Figure 5.12. Rina’s use of iteration from 2;10 to 3;10.

To summarise the discussion for plural development in Malay context, the following diagrams (Figure 5.13) illustrates Rina’s path to the grammaticalisation of plural number in Malay, bearing in mind that the appearance of a new form does not mean the automatic dropping of earlier forms. The main plural strategies in Rina’s grammaticalization of number marking in Malay are counting and pointing, iteration, incipient reduplication and NP quantifiers. In Figure 5.14, the development of these expressions is shown.

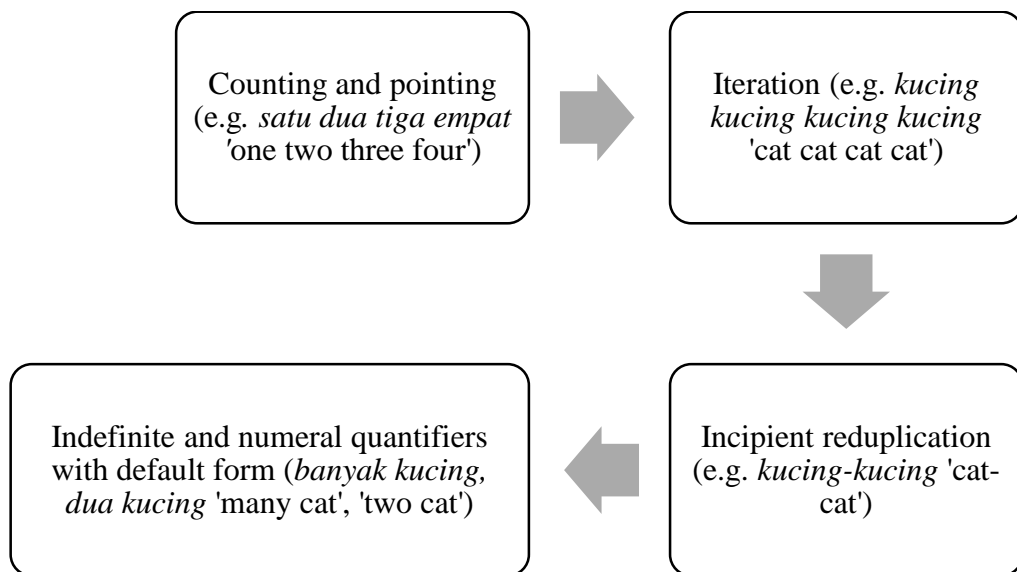


Figure 5.13. Summary of Rina’s plural development in Malay contexts from 2;10 to 3;10.

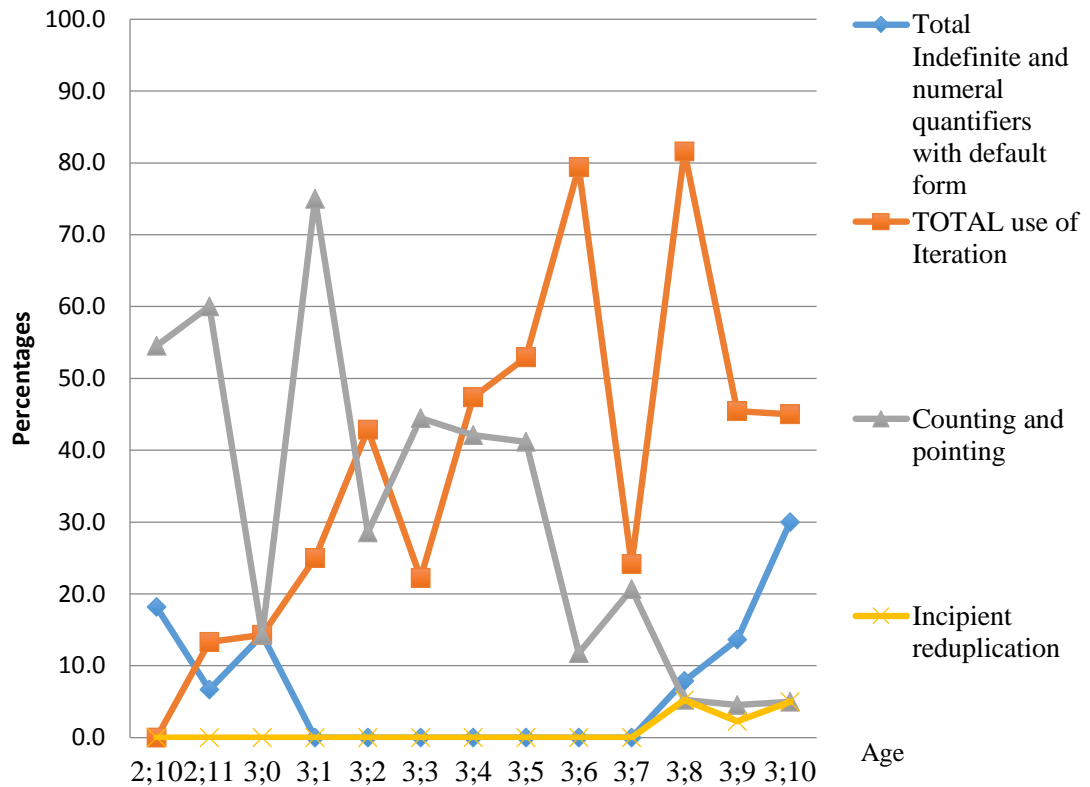


Figure 5.14. The development of the primary number marking strategies from age 2;10 to 3;10 in Malay contexts.

5.3.3 Rina’s plural development from 3;4 to 3;10 in English context. In this sub-section, the results for Rina’s expression of plurality in English context are discussed. To gauge English output from Rina, I conducted playgroup sessions with other families whose first language is English. The playgroup begins when Rina is 3;0. However, because of her reserved personality, Rina does not speak during the playgroup sessions in the first several months, though she does play with the other children. It is until age 3;4 that Rina begins participating in the playgroups sessions, and hence I managed to obtain some plural output from her. However, another issue arises in the playgroup sessions; the other children who are more boisterous and loquacious than Rina, tend to dominate the sessions and thus, it is still difficult to gauge Rina’s production of one versus more than one objects.

Given the limited amount of Rina’s plural output in the playgroup sessions, Mother conducted English storytelling sessions at home to elicit Rina’s expression of plurality in English. Throughout the sessions, when Mother encounters a picture of singular and plural objects, Mother asks Rina to describe the items. Rina’s plural development in English context from age 3;4 to 3;10 is manifested in Table 5.10 and Figure 5.15.

Table 5.10

Rina's plural development in English context from 3;4 to 3;10

| Plural categories/Age | 3;4 | 3;5 | 3;6 | 3;7 | 3;8 | 3;9 | 3;10 |
|--------------------------------------|----------|----------|-----------|-----------|----------|-----------|-----------|
| Default form | 3 (37.5) | 3 (33.3) | 11 (23.4) | 7 (14.5) | 6 (14.3) | 2 (3.8) | 1 (2.1) |
| Counting and pointing | 1 (12.5) | | 1 (2.1) | 12 (25) | | 4 (7.5) | 6 (12.5) |
| Iteration | 4 (50) | 5 (55.5) | 3 (6.4) | 5 (10.5) | 8 (19) | 9 (17) | |
| Noun + suffix -s | | 1 (11.1) | 31 (66) | 22 (45.5) | 11 (26) | 11 (20.7) | 2 (4.2) |
| Numeral quantifier + default form | | | 1 (2.1) | 1 (2) | 3 (7.1) | 5 (9.4) | 15 (31.3) |
| Numeral quantifier + suffix -s | | | | | 3 (7.1) | 1 (1.8) | 1 (2.1) |
| Indefinite quantifier + default form | | | | 1 (2) | 6 (14.3) | 18 (34) | 19 (39.6) |
| Indefinite quantifier + suffix -s | | | | | 3 (7.1) | 2 (3.8) | 1 (2.1) |
| Prolonged vowel | | | | | 2 (4.7) | 1 (1.8) | 3 (6.3) |
| Total percentages | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Total plural output | 8 | 9 | 47 | 48 | 42 | 53 | 48 |

*The number in the bracket indicates the percentages of the frequencies in each session.

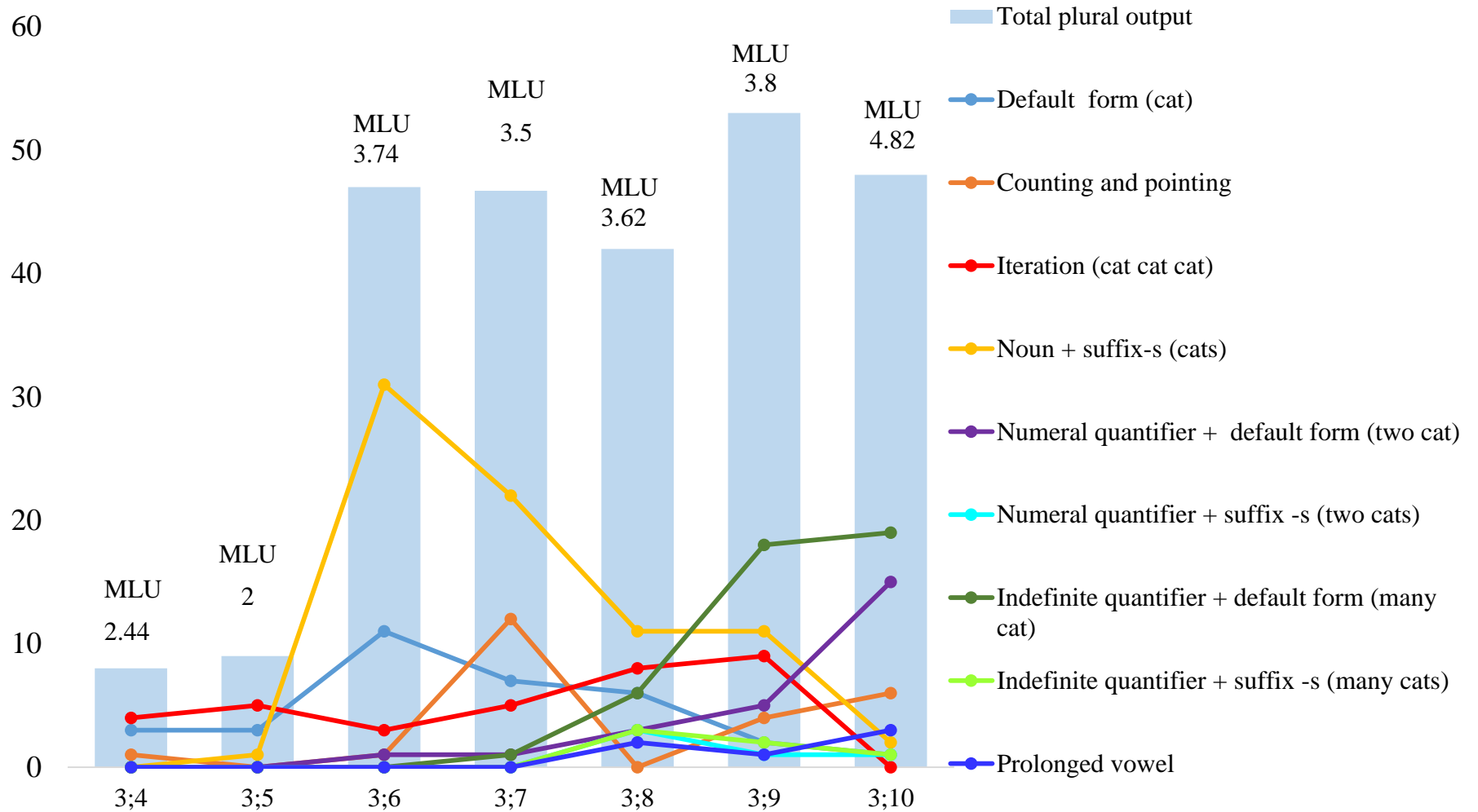


Figure 5.15. Rina's plural development in English context from 3;4 to 3;10.

In Table 5.10 and Figure 5.15, a different pattern of plural strategies can be discerned. Unlike Malay context, in English context, Rina begins with a low plural output at age 3;4 and 3;5, in parallel with a low English MLU at that age. Rina's English MLU is 2.44 at age 3;4 and 2 at age 3;5 while her Malay MLU is significantly higher (3.14 at age 3;4 and 3.33 at age 3;5). Thus, it is unsurprising that her plural productions in English context is much lower than in Malay context.

At 3;4 and 3;5, the most frequently used plural strategies in English produced by Rina is default form (e.g. *cat*) and iteration (e.g. *cat cat cat cat*). Similar to iteration in Malay context, when Rina iterates, she repeats the noun based on the number of items and she also points to each of the entity. The following describes Rina's default form and iteration to mark plural objects in English context:

57. M wow what are these?
 (showing a picture of many bags)
 R bag
 M oh are you sure?
 R yeah bag (Age 3;4)
58. M wow what a beautiful princess who is this princess?
 (showing a picture of one Snow White)
 R em Snow White
 M what about these?
 (showing a picture of many Snow Whites)
 R Snow White Snow White Snow White Snow White Snow White Snow
 White Snow White Snow White Snow White
 (pointing to each of the picture) (Age 3;4)
59. M what is this animal?
 (showing a pig figurine)
 R moo pig
 M moo? are you sure?
 R pig
 M what about these?
 (showing several pig figurines)
 R pig pig pig pig pig pig
 (pointing to each pig) (Age 3;5)

In example (57), Rina describes a picture of many bags with the default form *bag*. In (58) and (59), Rina iterates the noun for each item (*Snow White* and *pig*) while simultaneously pointing to every object. At 3;5, there is also one occurrence of noun

+ suffix *-s* (e.g. *cats*). However, I found that Rina uses default form and noun + suffix-*s* interchangeably when marking plurals in English. The following example manifests Rina's use of both structures when describing plural objects:

60. M can you see what's in Rapunzel's hands?
 R flowers
 M yes, flowers
 R flower
 M flowers?
 R flower
 M flowers?
 R shower (Age 3;5)

In example (60), Mother is reading a storybook for Rina. When Mother asks Rina to describe the items held by the character, Rina first answers with noun + suffix *-s* (*flowers*). Rina then repeats her answer, this time by uttering the default form (*flower*). When Mother insists on the word *flowers*, Rina responds for the third time, uttering the default form (*flower*). Finally, Rina says *shower*, which interestingly sounds like the word *flower*. Another example indicating Rina's default form is in the following:

61. M ok so it's Belle's birthday the Beast is having a big party and these are Belle's friends
 R yes Belle friend
 M you mean Belle's friends
 R Belle friend (Age 3;5)

In this context, Mother tells a story to Rina and shows her the character's friends (*Belle's friends*). Rina echoes Mother's utterance, however, without the possessive *-s* and the plural *-s* (*Belle friend*). Mother corrects her, but Rina still produces the default form *Belle friend*.

At 3;6, there is a surge in the occurrences of plural output, mainly the noun + suffix- *s* (e.g., *cats*, *dogs*). The MLU spurt from 3;5 to 3;6 reflects the child's lexical and grammatical development in English. The child acquires more words in English hence the greater plural output. The correlation between the child's lexical growth and plural output is supported by Sansavini et al. (2006, p. 200), who state that "grammatical abilities develop not only as a function of age but also depend crucially on lexical abilities. Indeed, word combinations are usually absent when children still

produce less than 100 words and remain infrequent until the vocabulary reaches 300 words”. The relationship between lexicon size and grammatical abilities are addressed in Section 5.2; the findings show that Rina produces grammatical inflections as she acquires more lexical items in English.

Noun + suffix-*s* is the most prominent plural strategy in English contexts at 3;6. The results show that Rina produces thirty-one occurrences of noun + suffix-*s*. However, Rina also uses the default form and noun + suffix -*s* interchangeably when describing plural items. The following conversations show Rina’s use of suffix -*s* in marking plurals at 3;6:

62. M what are these?
 (showing a picture of many lemons)
 R lemons
 M good what about these?
 (showing a picture of many crayons)
 R crayons
63. M OK what is that?
 (pointing to a pile of toy cars)
 R is it cars?
 M what?
 R car
 M cars?
 R car
64. M oh what are these animals?
 (showing a picture of many elephants)
 R elephants
 M em?
 R elephant
 M em?
 R elephants
65. M this is a horse can you see the horse?
 R yes horse and little girl
 (pointing to a girl in the storybook)
 M sorry what?
 R little girls
 (pointing to the girl in the storybook)

In example (63), when asked about the many cars, Rina initially produces *cars*. However, when she repeats the noun, she uses the default form *car*. Even when Mother has explicitly corrected her utterance, she still produces the default form *car*. In example (64) too, we can see the interchangeability of the default form and noun + suffix *-s* in Rina's speech. Initially, Rina describes the many elephants as *elephants*, but afterward she uses *elephant* and finally reverts to noun + suffix *-s*, *elephants*. Similarly, in example (65), in the beginning, when Rina describes a picture of one girl, she produces *little girl*. When she repeats the description, she uses *little girls*. In the corpus, Rina also attached suffix *-s* to English closed-class words. Some of the recorded utterances that show Rina's use of suffix *-s* are as follows:

66. R mommy daddy not here yets
67. R mommy daddy heres
68. M sue and nick they're both taking a bath
 R baths shower air bawahs
 'baths shower water down'

In example (66), Rina attached the suffix *-s* to the word *yet*, hence *not yets*. In (67), Rina describes water inside a bathtub as *baths shower air bawahs*. Rina attached the suffix *-s* at *bath* and Malay word *bawah* 'under'. *Air bawah* is literally translated as 'water down' which is semantically compatible as bathtub shower is filled with water from below, as compared to water from the shower head, which Rina conceptualises as *air atas* 'water up'. Other than *bawah*, other Malay word that Rina attaches with suffix *-s* is *mainan* 'toy' and *kucing* 'cat'.

Noun + suffix *-s* then drops significantly at 3;9. At that point Rina starts using indefinite quantifiers + default form (e.g. *many cat*). From 3;9 to 3;10, the use of quantifiers with default form (e.g. *many cat*, *two cat*) predominates Rina's plural strategies with the consequent drop of noun + suffix *-s*. This finding suggests that when the child starts to mark plural with indefinite quantifiers such as *many* and *lots of*, she tends to drop plural suffix *-s* on nouns thus marking plural on only one element in the noun phrase (NP), which avoids redundancy and lessens processing cost. Interestingly, this finding is consistent with Clark and Nikitina (2009)'s finding; their English L1 children use quantifiers + 'bare-stem forms' (e.g. *two duck*, *two blanket*) when

expressing pluralities in English. The following examples reflect Rina's quantifiers + default form in the corpus:

69. R ayah has two car
 'father has two car'
 M really?
 R ayah don't have many car
 'father doesn't have many car'
 M oh
 R ayah have one two car
 'father has two car' (Age 3;9)
70. R I see all the snake
 M you mean snakes
 R all the snake (Age 3;9)
71. M what is this picture?
 R many pig
 M I can't hear you louder please
 R many pig I said (Age 3;9)
72. R I see many ball and many fish and many sheep and many fish and many
 cookie and many ice cream
 M oh wow (Age 3;10)
73. M what's that?
 R All the balloon (Age 3;10)

In example (69) to (73), it is shown that Rina uses quantifiers + default form when describing more-than-one objects. In example (72), when Mother asks her to describe the plural objects in a book, Rina describes all the items in one utterance, using the conjunction *and* to connect each entity.

The target NP for English quantifiers, i.e., indefinite and numeral quantifiers with suffix *-s*, (e.g., *many cats*, *two cats*) emerges at 3;8 (three occurrences), 3;9 (one occurrence) and 3;10 (one occurrence). However, similar to Rina's use of plural *-s*, she also tends to use the quantifier + suffix *-s* interchangeably with quantifier + default form. The following instances indicate Rina's production of quantifier + suffix *-s* in English context.

74. R I want all the boats toys

- M All the what?
R All the boats I want (Age 3;8)
75. M what's that?
R many monkey many monkeys
M em?
R many monkeys (Age 3;8)
76. R I see two seal two seals (Age 3;9)
77. M Do you know what is this?
R many pig
M sorry I can't hear you
R many pigs (Age 3;10)

In (74), at first, Rina refers to toy boats as *boats toys*, attaching the suffix *-s* to both *boat* and *toy*. When Mother asks her to clarify her utterances she produces *all the boats*, omitting the word *toy*. In example (75), (76) and (77), Rina uses the quantifiers + default form (*many monkey*, *two seal*, and *many pig*) with the target English NP quantifiers, the quantifiers + suffix *-s* (*many monkeys*, *two seals* and *many pigs*).

Based on the data, Rina appears to exhibit piecemeal acquisition of the plural suffix *-s* in English context. Previously at 3;6 she uses the noun + suffix *-s* (e.g. *cats*) interchangeably with the default form (e.g. *cat*) and when she starts using the phrasal constructions to mark plurals, she begins with the quantifiers paired with the default form first (e.g. *many cat*) and later, she uses the quantifiers with suffix *-s* (e.g. *many cats*) interchangeably with the default form (e.g. *many cat*). The findings of Rina's acquisition of plural suffix *-s* in English is similar to the results in English L1 children's acquisition of suffix *-s*. Previous research show that the acquisition of suffix *-s* among L1 English children is a gradual, sporadic affair; children first exhibit word-by-word acquisition followed by slow extensions of the conventional plural suffix *-s* to the other nouns (Clark & Nikitina, 2009; Zapf, 2004; Zapf & Smith, 2003).

Although Rina's use of suffix *-s* in English NP quantifiers have been sporadic, we may assume that with the emergence of such constructions (e.g. *all the boats*, *many monkeys*) at age 3;8, she becomes able to process and produce grammatically required plural agreement between the quantifiers and the head noun of the phrase thus establishing a fully grammatical phrasal construction in English beginning at 3;8. Interestingly, this sequence is completely parallel to that found by Di Biase, Kawaguchi and Yamaguchi (2015) in a five-year-old Japanese background child who

moves to Australia at five years of age which could be characterised as SLA or late bilingual acquisition.

Overall, in terms of plural development in English, Rina begins with nonconventional (default form, iteration, quantifier + default form) to conventional marking of plurality (noun + suffix *-s*, quantifier + noun + suffix *-s*). There is also some sharing of strategies in English context; iteration and prolonged vowel are used in both Malay and English contexts, though in English context, because of the presence of other competing strategies, iteration and prolonged vowel appear in much lower frequencies. Another important observation in English context is Rina's lack of code-switching activities; Rina tends to code-switch in Malay context than in English. All the examples presented in English context evidently indicate that Rina only produces English utterances in English context. To summarise, Figure 5.16 charts Rina's development of plural expressions in English:

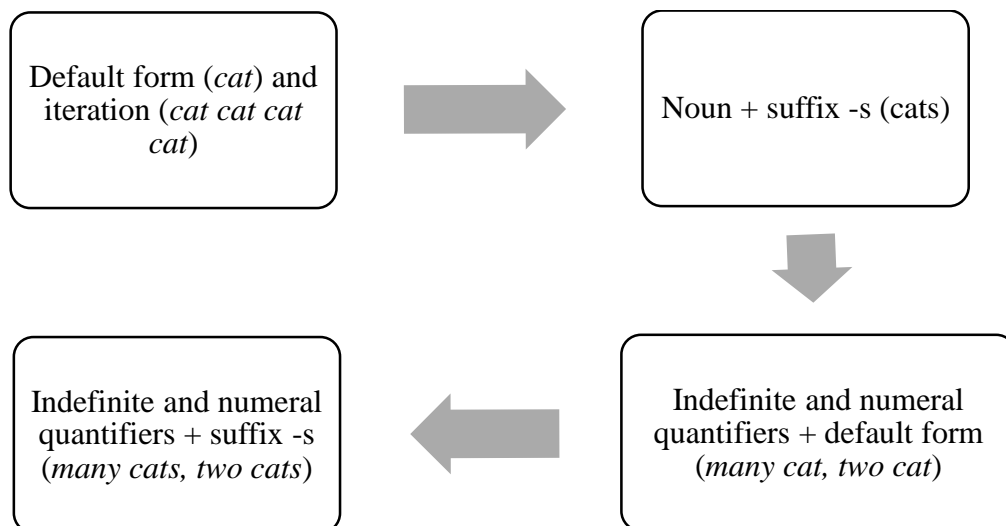


Figure 5.16. Summary of Rina's plural development in English context from 3;4 to 3;10

In the English context, the primary plural expressions that Rina develops throughout the study are default form, iteration, noun + suffix *-s*, quantifiers + default form (indefinite and numeral quantifiers) and quantifiers + suffix *-s* (indefinite and numeral quantifiers). In Figure 5.17, the development of these primary number marking strategies is shown.

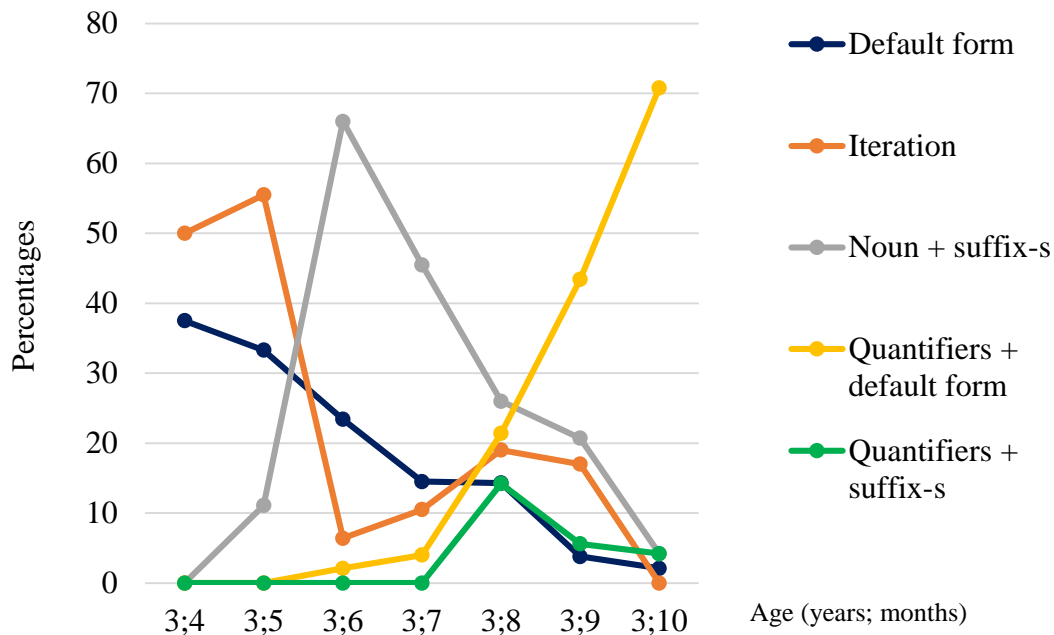


Figure 5.17. The development of the primary number marking strategies from age 3;4 to 3;10 in English context.

5.3.4 Rina's plural development at 4;8 in Malay and English. This subsection is the second complementary part of Rina's plural marking systems at age 4;8 when she returns to Malaysia, where the predominant environmental language is Malay.

The recording sessions were conducted in Malay and English; Malay session is carried out by Father and the English session is conducted by Mother. I observe that Rina does not code-switch and mix the languages. During the longitudinal study previously, Rina tends to code-switch to English during the recording sessions for Malay context whereas now at 4;8, Rina speaks Malay in Malay context and speaks English in the English recording session. In the sessions, Father and Mother show Rina pictures of singular and plural objects to elicit her expression of plurality. The following section elaborates the findings from the recording sessions in Malay and English.

5.3.4a Rina's plural output at 4;8 in Malay. In the Malay recording session, Rina produces twenty-four tokens; eleven single tokens, twelve reduplicated tokens and one iterative token. Single tokens refer to utterances Rina produces in describing

single objects, reduplicated tokens refer to utterances Rina produces which consist of reduplicated noun forms, and iterative token is the utterance which include iteration. Rina uses Malay default form to describe all the single objects and uses reduplication when describing twelve of the plural prompts. Only one plural prompt is described with iteration. The following table exhibits Rina’s plural output in Malay context at 4;8:

Table 5.11

Rina’s plural output at 4;8 in Malay context

| Plural categories | Number of occurrences | Examples from the recording |
|-------------------|-----------------------|--|
| Reduplication | 12 | <i>arnab arnab</i> ‘rabbit rabbit’ <i>itik itik</i> ‘duck duck’ <i>ayam ayam</i> ‘chicken chicken’ <i>bunga bunga</i> ‘flower flower’ |
| Iteration | 1 | <i>buku buku buku</i> ‘book book book’ |

Some examples of conversations in the recording between Father (F) and Rina (R) are presented here:

78. F OK Rina apa ni?
OK Rina what this?
‘OK Rina what is this?’
(showing a picture of a monkey)
- R monyet
‘monkey’
- F oh pandai yang ini pula?
oh smart REL this also?
‘oh smart what about this?’
(showing a picture of many monkeys)
- R monyet monyet
‘monkey monkey’
79. F Rina nampak tak apa ni?
Rina see not what this?
‘Rina (do you) see what (is) this?’
(showing a picture of a flower)
- R bunga
‘flower’

- F OK yang ini?
OK REL this?
'OK what about this?'
(showing a picture of many flowers)
- R bunga bunga
'flower flower'

When Rina produces reduplication, she does not point to the object. There is also one occurrence of iteration; interestingly, when she produces iteration at 4;8, the pointing gesture is also absent. Previously in the longitudinal study, her iteration is always accompanied with pointing to each of the item. Her numerous production (twelve out of thirteen prompts) of reduplication in her expression of plurality suggests that she has already acquired reduplication as a grammatical number marking in Malay. Now that I have described the findings in Malay context, I will proceed with Rina's plural utterances in English context.

5.3.4b Rina's plural output at 4;8 in English. In the English recording session, Rina produces eleven single tokens and eighteen plural tokens. Rina uses English default form when describing pictures of singular object. For more-than-one prompts, the highest occurrences are reduplication, followed by indefinite quantifier + default form, default form and iteration. The following table illustrates Rina's plural categories in English context:

Table 5.12

Rina's plural output at 4;8 in English context

| Plural categories | Number of occurrences | Examples from the recording |
|--------------------------------------|-----------------------|--|
| Reduplication | 12 | <i>dog dog</i> <i>duck duck</i> <i>chicken chicken</i> <i>cow cow</i> <i>bird bird</i> <i>monkey monkey</i> |
| Indefinite quantifier + default form | 4 | <i>many chicken</i> <i>many ball</i> |
| Default form | 1 | <i>rabbit</i> |
| Iteration | 1 | <i>flower flower flower</i> |

At age 4;8, Rina uses reduplication as her primary strategy to pluralise English nouns. Similar to reduplication in Malay context, when Rina uses reduplication, the pointing gesture is absent. The following examples exemplify Rina's reduplication utterances in marking plurality in English at 4;8:

80. M so what is this picture?
 (showing a picture of one dog)
 R a dog
 M yeah yeah what about this?
 (showing a picture of many dogs)
 R a dog dog
 M are you sure?
 R yeah dog dog look it
81. M what is this?
 (showing a picture of one rooster)
 R chicken
 M and this
 R chicken chicken
 (showing a picture of many roosters)
 M (laughing)
 R can you can you see because it's many chicken
82. M what about this?
 (showing a picture of one ball)
 R em ball
 M OK this?
 (showing a picture of many balls)
 R this time I gonna say two because there's many ball see?
 M many what?
 R many ball see? can I please say ball ball?
 M up to you
83. M so what about this?
 R a cow
 M oh good then this picture?
 R em cow cow
 M you mean cows?
 R why you said cows only?
 M sorry?
 R you said cows not two why?

- M why? because in English if there are many you have to put the s so
 cows
- R s like this cows?
- M yes now tell me about this picture
- R monkey
- M then can you tell me about this one?
- R monkey monkey

Examples (80) to (83) shows that Rina uses Malay number marking, reduplication, to mark plurals in English. In example (83), interestingly, Rina notices that Mother uses *cows* instead of *cow cow* and she asks Mother to clarify the utterance. Mother explains the reason for suffix *-s* but when asked to describe the next prompt, Rina uses reduplication again, despite the overt teaching that Mother provides earlier. I postulate that Rina's use of reduplication in English context at this age is because of the influence of linguistic environment. This issue is further elaborated in Chapter 7 (see section 7.7). The next section discusses Rina's plural development based on the framework of Processability Theory (PT).

5.4 Rina's plural acquisition based on Processability Theory (PT)

In this section, I will discuss Rina's plural development in the longitudinal study (from 2;10 to 3;10) based on the framework of Processability Theory (PT). For Rina's plural development, this research has some parallel with Yamaguchi's study (2009) (see section 3.8.4), as this study is also longitudinal in design and involves a child participant acquiring English. The difference is that Rina is acquiring English as her bilingual first language while Kumi (Yamaguchi's participant) comes to Australia at age 5 and is considered an early ESL learner. I will first discuss the findings for Rina's plural development in Malay language based on PT. The result is shown in Table 5.13.

Table 5.13

Rina's plural development in Malay based on Processability Theory

| Stage | Structure | 2;10 | 2;11 | 3;0 | 3;1 | 3;2 | 3;3 | 3;4 | 3;5 | 3;6 | 3;7 | 3;8 | 3;9 | 3;10 |
|--------------------|--------------------------------------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Phrasal procedure | Numeral quantifier + default form | | | | | | | | | | | | | +1 |
| | Indefinite quantifier + default form | | | | | | | | | | | | | +7 |
| Category procedure | Reduplication | | | | | | | | | | | +2 | +1 | +2 |
| | Iteration | | +2 | +2 | +1 | +2 | +2 | +9 | +8 | +12 | +1 | +29 | +20 | +18 |
| Lemma | Counting | +6 | +9 | +1 | +3 | +2 | +4 | +8 | +7 | +4 | +6 | +2 | +2 | +2 |
| | Default form | +3 | +3 | +2 | | +2 | +2 | +2 | +1 | | +12 | | +11 | |

* thicker vertical lines show that a PT stage has been reached and the dotted lines show the intermediates stages

In general, the results indicate that Rina's plural acquisition in Malay develops according to the sequence based on the PT hypothesis (see 3.8.4). Rina begins with the default form (lemma access), followed by reduplication at the lexical stage and finally she reaches the NP agreement at the phrasal stage.

To highlight the implicationality of Rina's plural progress, I put in the table thicker vertical lines, indicating that a particular stage based on PT has been reached. The dotted vertical lines in the table show the intermediate stages in Rina's plural development; these steps are the stages Rina takes before she reaches the PT stages. In their investigation of Arabic and Swedish based on PT framework, Mansouri and Håkansson (2007) found certain structures within a particular PT stage that appear frequently, which leads them to conceptualise the 'intrastage' sequence in learners' language development. In what follows, I explain Rina's development based on the PT stages:

i. Lemma/word level

At 2;10, Rina began with the word, the default form to mark plurals. Within this lemma access level, counting also emerges. I consider counting as a stage in lemma access because the counting sequence is learned as a whole, which is similar to formulaic expressions. Based on Rina's data, counting is important as Rina continues using this mechanism to mark number from 2;10 to 3;10.

ii. Category procedure i.e. lexical procedure

The category procedure in Malay is reached at age 2;11; firstly, with iteration. Iteration is Rina's categorial identification of Malay nouns. Previously, I hypothesise that at the Malay lexical stage, Rina would acquire reduplication. What I did not expect before embarking on the study is the existence of iteration. Iteration is considered a lexical procedure in PT as the lexical item is annotated and given a syntactic category. In Rina's case, she uses iteration as a stepping stone before acquiring reduplication. Rina reaches the hypothesised PT lexical stage at 3;8, when reduplication emerges.

iii. Phrasal procedure

For the phrasal stage, Rina reaches the hypothesised Malay PT stage at 3;10, i.e. Malay quantifiers + Malay default form (*banyak kucing* 'many cat', *dua kucing* 'two cat').

For English plural development, Table 5.14 illustrates the application of PT in Rina's English developmental sequences. Generally, the results reveal that in terms of

processing procedures, she acquires English plural expressions in the following order; word or lemma > category or lexical procedure > phrasal procedure. In the following, I explain Rina's English PT stages:

i. Lemma/Word level

At age 3;4, Rina has already reached the lemma/word stage. She uses default form and counting to pluralise nouns in English.

ii. Category procedure i.e. lexical procedure

The first stage of the lexical procedure in Rina's English plural is the iteration, which she reaches at 3;4. Similar to iteration in Malay, iteration in English is also an intermediate stage before she acquires the hypothesised PT lexical level, noun + suffix *-s*. The marking of suffix *-s* on nouns emerges at age 3;5 with one occurrence followed by thirty-one occurrences in the following month. Thus, beginning at 3;5, Rina has reached the second lexical stage of English plural. After 3;5, Rina used suffix *-s* on nouns predominantly to mark plural in English.

iii. Phrasal procedure

The first phrasal stage Rina reaches in her marking of plurality in English is the numeral quantifier paired with default form (e.g. *two cat*) at 3;6 followed by the indefinite quantifier + default form (e.g. *many cat*) at 3;7. The use of quantifiers + default form continues to predominate Rina's plural strategy from 3;8 to 3;10, which suggests that Rina regards morphological marking as redundant when the concept is clearly shown with other linguistic devices, such as numerals and quantifiers (e.g. *two and many*). Also, it could possibly suggest that when she pairs the quantifiers with default form, it is to lessen the processing cost. The target English NP agreement, i.e. quantifiers + suffix *-s* emerges a bit later, at 3;8. Based on Rina's English plural sequence, the noun+ suffix *-s* emerges first, followed by English plural NP.

The results in this study contradict Charter et al.'s (2011) claim and corroborate findings in other PT studies who also found that English plural *-s* was acquired earlier than the phrasal plural *-s* in their L1 and L2 learners (Di Biase et al, 2015; Dyson, 2009; Itani-Adams, 2013; Yamaguchi, 2009,2010; Yamaguchi & Kawaguchi, 2014; Zhang & Widyashtuti, 2010).

Table 5.14

Rina's plural development in English based on Processability Theory

| Stage | Structure | 3;4 | 3;5 | 3;6 | 3;7 | 3;8 | 3;9 | 3;10 |
|--------------------|-----------------------------------|-----|-----|-----|-----|-------|--------|--------|
| Phrasal Procedure | Numeral quantifier + suffix -s | | | -1 | -1 | +3/-3 | +1/-5 | +1/-15 |
| | Indefinite quantifier + suffix -s | | | | -1 | +3/-6 | +2/-18 | +1/-19 |
| Category Procedure | Noun + suffix -s | | +1 | +31 | +22 | +11 | +11 | +2 |
| | Iteration | 4 | +5 | +3 | +5 | +8 | +9 | |
| Lemma | Counting | +1 | | +1 | +12 | | +4 | +6 |
| | Default form | +3 | +3 | +11 | +7 | +6 | +2 | +1 |

* thicker vertical lines show that a PT stage has been reached and dotted vertical lines show the intermediate stages

Thus, based on the analyses, Rina's plural acquisitions develop within the constraints defined by PT in Malay and English. However, there is a clear difference in the timing of emergence for each PT stage in Malay and English. This is illustrated in Figure 5.18.

The dotted lines in Figure 5.18 show the intermediate stages (e.g. counting, iteration, English quantifiers+ default form) that Rina goes through before reaching the hypothesised PT stages in each language. Based on the figure, English lemma/word level develops later than Malay. However, Rina's English lexical and phrasal develop much faster than her Malay lexical and phrasal stage. English reaches the lexical level at age 3;6 and phrasal at 3;8 while Malay reaches lexical level at 3;8 and phrasal at 3;10. In Itani-Adams' study (2013), she also found that her bilingual child's Japanese and English PT stages develop at different times. She attributes this phenomenon to the linguistic complexity of the structures investigated. The different emerging times in PT stages, according to Itani-Adams, is also evidence supporting Separate Development Hypothesis(SDH). However, in this study, I postulate that this is not due to SDH, but rather because of the effect of the linguistic environment during the child's stay in Australia. Naturally, the language that receive higher and richer input from the environment will develop faster. This issue will be discussed further at Chapter 7 (see section 7.7). Now that the applicability of PT in Rina's plural development is discussed, I will address the issue of cross-linguistic influence (CLI) in Rina's plural development.

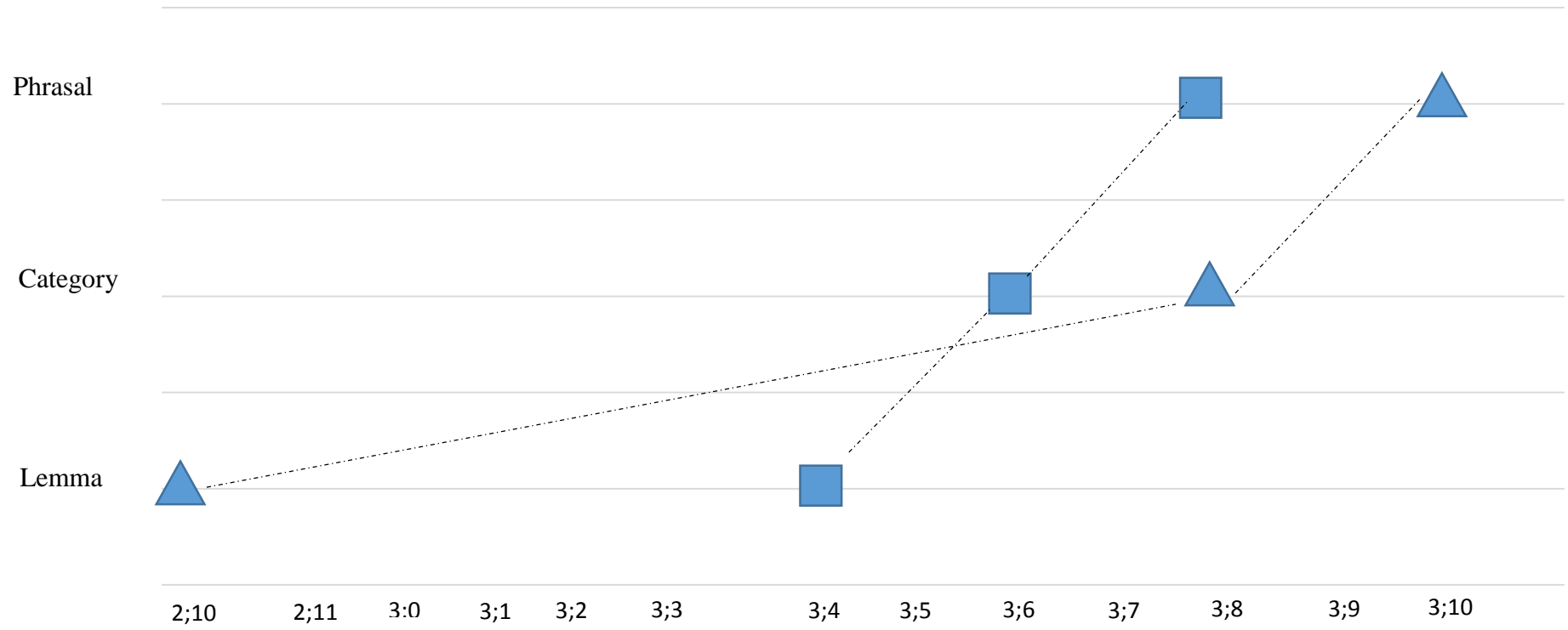


Figure 5.18. The emergence of PT stages matched against Rina's age

Malay
 English
 intermediate stages in the development

5.5 Cross-linguistic issues in Rina's plural acquisition

Based on the findings for plural development in Malay and in English during the longitudinal study, it is obvious that there are systematic differences in marking plural in the two languages. The categorial identification to mark plurality for Malay nouns, based on Rina's perspective, is iteration while for English, Rina appears to associate plurality with noun+ suffix *-s*. Nevertheless, despite having two different systems of marking plurals in English and Malay, it is also manifested that some plural categories that appear in one language are also used occasionally in the other language. To repeat the findings, in Malay context throughout the longitudinal study, iteration is Rina's preferred strategy to signify plurals (from 3;4 to 3;10, with the exception of 3;7). For instance, iteration, which the child uses to mark plurals predominantly in Malay context is also strongly employed in English context (e.g. *cat cat cat, dog dog dog dog dog*) albeit with lower frequencies than in Malay. Likewise, the plural suffix *-s* which the child frequently uses in English context from age 3;6 to 3;8, also appears occasionally in Malay context (e.g. *mainans* 'toys', *kucings* 'cats').

In addition, the findings also indicate that Rina tends to code-switch more in Malay context than in English. As discussed earlier, Rina uses phrases for English quantifiers (e.g. *many cat, two cat*) in Malay context. This suggested that Rina's performance is more advanced in English during this time, which is corroborated by her higher English MLU from 3;9 to 3;10 (see Figure 5.1). Thus, it seems that Rina uses the strategy she acquires in her more dominant language (English) to the less dominant one (Malay) but she also uses iteration strategy for marking plurality in English. Therefore, although the expression of plurality in each language is increasingly differentiated, we can see noticeable CLI; both from the more linguistically dominant language to the less dominant and vice-versa. Language dominance is a dynamic and complex construct. There are many intertwining variables to be accounted in determining the dominance of a language in bilingual children, which usually includes language competence, performance and experience (La Morgia, 2016). In this thesis, dominance has been observed to vary according to the environment the child operates in and that is more reliably measured by computing MLU for each language the child is exposed to, as proposed by Yip and Matthews (2007, p. 40).

In the second complementary part of the investigation, when Rina is 4;8, the finding shows that at the lexical level, Rina does not mix the languages. That is, during the recording sessions, no instances of code-switching and mixing could be found. It

appears that at this age, she has fully distinguished the two languages. One prominent CLI that at 4;8 is her use of reduplication in her expression of plurality in English (see 5.3.4b). This phenomenon is attributed to the effect of linguistic environment. I discuss the effect of linguistic environment on Rina's plural acquisition further at section 7.7.

To recap, Rina distinguishes her two languages, Malay and English, both in the longitudinal study as well as later on at age 4;8. However, the developing languages do not develop autonomously; the linguistic structures manifest bidirectional interactions and cross-linguistic influences (CLI), from English to Malay as well from Malay to English.

5.6 Summary of Rina's plural development

In this chapter, I have described Rina's MLU, lexical and her plural development in Malay and English from age 2;10 to 3;10 as well as at age 4;8. To summarise the findings, for MLU, Rina's MLU continues to develop throughout the study, which is indicative of her development of morphosyntax in each language. In terms of lexical development, Rina's lexicon size also continues to increase in the study. The findings also show the link between lexicon size and grammatical development; that is grammar only develops when the child has acquired a certain number of words in each language.

In terms of plural development, in Malay, the findings are divided into two longitudinal period; from age 2;10 to 3;3 and 3;4 to 3;10. At age 2;10 to 3;3, Rina marks plurality predominantly through counting and pointing (e.g. *satu dua tiga empat* 'one two three four'). Other strategies also co-exist at this time such as default form (e.g. *kucing* 'cat') and iteration (e.g. *kucing kucing kucing kucing* 'cat cat cat cat'). At 3;4 to 3;10, when Rina has acquired more words in Malay and English, the occurrences of plural expressions are also higher. From 3;4, the primary linguistic means that Rina frequently uses to describe more-than-one objects is iteration. Numerous other strategies also develop during this time. In the elicitation session at 4;8, Rina does not use iteration but she has acquired the grammatical Malay reduplication (e.g. *kucing kucing* 'cat cat') to mark plurals.

For English plural development, the marking of suffix *-s* (e.g. *cats, dogs, books*) on nouns is Rina's main linguistic expression to express plural in English from age 3;6 to 3;8. From 3;9 to 3;10, Rina develops the English phrasal constructions. When she starts using the English NP quantifiers (e.g. *two cat, many cat*), she drops

the use of noun + suffix *-s*. At 4;8, Rina uses reduplication (e.g. *cat cat*) to express plurality in English.

Rina's morphological development in English and Malay develop accordingly based on PT sequence; which is lemma/word > category/procedure > phrasal. However, in each of the PT stage, there are also 'intrastage' sequences. Rina takes these steps before finally reaching each of the designated PT level. In the study, Rina distinguishes her two languages, Malay and English. However, this does not mean the linguistic systems develop autonomously. The findings show cross-linguistic influence (CLI) from Malay to English and English to Malay in both the longitudinal study and at 4;8.

I have summarised the results for the lexical and morphological development of Rina's expression of plurality in Malay and English. The following chapter adds another dimension to the investigation; that is, the prosodic analyses in Rina's expression of plurality.

CHAPTER 6

PROSODIC ANALYSES

In the preceding chapter, I discussed several issues pertaining to Rina's language development; firstly, I discussed the interrelation between Rina's MLU development and her vocabulary size. The findings strongly indicate that Rina's grammatical development is dependent on her lexical acquisition; the MLU spurt at certain developmental points coincided with the increase of her word types and tokens. Secondly, I analysed Rina's plural development in Malay and English. In distinguishing between one and more-than-one objects, Rina has used various linguistic devices; in the corpus, I found that some of the plural-marking strategies she used originated from the target adult grammar of each language but interestingly, some were also emergent categories. Clark (2004) and Clark and Nikitina (2009) define emergent categories as categories that are not given any conventional expressions in any specific language. On Rina's plural acquisition, one of the most predominant plural marking strategies she used from age 3;4 to 3;10 was iteration. Readers may recall that when Rina used iteration, she repeated the noun based on the number of the items. For instance, if there were six cats, Rina iterated the noun cat six times, hence *cat cat cat cat cat cat*. Iteration is an emergent category as it does not belong to any grammatical system of Malay or English.

Based on the findings in Chapter 5, iteration is primarily used by Rina in Malay context. However, there were also some occurrences of iteration in English context, though with lower frequencies. Iteration continued to be her preferred plural marking strategy in Malay until age 3;8, when reduplication first emerged. In chapter 5, reduplication (or what I termed as *incipient reduplication*) in the corpus was only considered as a plural category if Rina produced reduplication to refer to more than two items. In Malay, reduplication is a grammatical device to mark plurals. Malay count nouns reduplicate to designate a plural referent. Although there are varieties of reduplication construction in Malay, Sew (2007) found that a simple noun-noun (N-N) duplicate is the plural-marking system frequently used by L1 Malay speakers.

This chapter took a different turn in the analyses of Rina's plural development; while in chapter 5, I discussed the lexical and morphological development of plural acquisition; here the purpose is to examine the formal property of iteration and reduplication. Morphologically, between iteration and reduplication, there is a joint in the system when iteration and reduplication display no difference i.e. the repetition of

two lexical items versus the grammatical marking of reduplication. So how do we distinguish iteration and reduplication? The answers may lie in terms of the prosodic differences between these two linguistic structures. Essentially, reduplication may have one prosodic contour as it is considered one word while iteration may have two contours, as it is a repetition of separate words. Thus, in the chapter, the main interest is to investigate the acoustic patterns of prosody in Malay reduplication. Before I proceed with the chapter, I will first define the term prosody and the acoustic correlates of prosody examined in this chapter.

6.1 Definition and acoustic correlates of prosody

Providing a universally acceptable definition of prosody is not easy as it involves many components and dimensions (Margaret Kehoe, 2013). Prosody has been defined as “phonetic and phonological features of spoken language that involve more than a single consonant or vowel. It may also refer to linguistic phenomena that apply across several segments, a word or an entire utterance” (Kehoe, 2013, p.1). Another term often used interchangeably with prosody is suprasegmental.

I found this definition too broad. So, I will discuss the acoustic correlates of prosody first before presenting a more specific definition of prosody. Three often-studied phonetic aspects of prosody are the fundamental frequency (F0), intensity and duration. These three correlates combine in various ways to express different prosodic structures in spoken language (Margaret Kehoe, 2013). Fundamental frequency is measured in Hertz (Hz) and relates perceptually to the pitch of the sound; the higher the F0, the higher the perceived pitch. In the analyses, I use the term F0 instead of “pitch” as it is a more objective measure than pitch, which is determined by human auditory perception and is, therefore, open to greater subjectivity (Davenport & Hannahs, 2010). One aspect of timing is the duration of segments, syllables and pauses in a sentence (Kehoe, 2013). Usually, a syllable is longer at the end of a phrase than at the beginning or in the middle; this is referred to as *phrase-final lengthening* (Kehoe, 2013, p.54). Intensity relates to the intensity or loudness of a sound; as intensity decreases, sounds become less audible (Davenport & Hannahs, 2010). Intensity is measured in decibels (dB). Similar to F0, intensity is a more objective measure than loudness. Accordingly, I have used the term intensity in the analyses.

Having reviewed key acoustic correlates of prosody, let us go back to the definition; Margaret Kehoe (2013) and Shattuck-Hufnagel and Turk (1996) merged the phonetic and phonological aspects of prosody and they came up with the following

definitions: “Prosody refers to the acoustic patterns of F0, duration and amplitude that can best be accounted for by reference to the higher-level structures of the prosodic hierarchy” (Margaret Kehoe, 2013, p. 9). Similarly, Shattuck-Hufnagel and Turk (1996, p. 196) state that prosody is “(1) acoustic patterns of F0, duration, amplitude, spectral tilt, and segmental reduction, and their articulatory correlates, that can be best accounted for by reference to higher-level structures, and (2) the higher-level structures that best account for these patterns”. The following analyses in the chapter represent preliminary investigation into the phonetic aspects of prosody in Malay reduplication. The research questions that will guide the prosodic analyses are shown in the following:

- 1) What are the prosodic patterns of disyllabic nominal reduplication in L1 adult Malay speakers?
- 2) How does the production of disyllabic nominal reduplication in Malay develop prosodically in the child?

Based on these research questions, the aim is twofold: firstly, I want to examine the prosodic property of iteration and reduplication in the production of L1 adult Malay speakers. Secondly, after describing the acoustic patterns of iterative and reduplicative utterances from the L1 Malay speakers, I will compare them with Rina’s iteration and reduplication utterances in the corpus of the longitudinal study from Chapter 5. I also included some recent reduplication utterances that I obtained from Rina when she was 4;8, which will be compared to the L1 Malay speakers.

Therefore, to achieve this goal, this chapter is divided into three studies: Study 1, the prosodic analyses of iteration and reduplication in L1 Malay speakers, Study 2, Rina’s prosodic analyses of iteration and reduplication from age 3;5 to 3;10 and finally Study 3, Rina’s prosodic analysis of iteration and reduplication at age 4;8. This chapter will begin with the review of related research in prosody and reduplication.

6.2 Literature review

6.2.1 The development of prosody in monolingual children. Prosody is crucial in children’s early language development; before they are able to acquire grammatical structure and understand the sounds around them; they have to find a way to detect the relevant linguistic unit in the speech stream. It was reported that children relied on prosodic mechanisms such as pausing, syllable lengthening, and the setting

of the pitch to segment adults' speech (Fisher & Tokura, 1996; Gleitman & Wanner, 1982; Peters, 1996, 2001). Generally speaking, it has also been argued that prosody and its acoustic correlates may help contribute to bootstrapping children into acquiring grammatical structures of the language (Echols & Newport, 1992; Fernald & McRoberts, 1996; Selkirk, 1996).

In the acquisition of a language, all children must learn not only the segmental features but also the suprasegmental properties of a language. Recent studies have shown that prosody develops very early in children; in fact, in the pre-linguistic period, particularly the babbling stage, it was found that one syllable in children's vocalisation tends to be more prominent than the others (Davis, MacNeilage, Matyear, & Powell, 2000). Davis et al. conclude that since infants have already controlled the acoustic correlates of stress in the pre-linguistic period, the task for children later in their development is to learn where to place stress in words.

In studies investigating children early word productions, many studies have found that despite considerable variability, children do develop adult-like use of the phonetics correlates of prosody at the beginning of the development (Kehoe, Stoel-Gammon & Buder, 1995; Linfert, 2010; Pollock, Brammer & Hageman, 1993; Schwartz, Petinou, Goffman, Lazowski & Cartusciello, 1996). Due to the global properties of F0 and duration, many research has found that the earliest acoustic parameters acquired by children are these two parameters (Levitt, 1993). For example, Kehoe et al.'s findings indicate that children used F0 earlier than duration and intensity in the acoustic marking of stress in English. Similarly, Astruc, Prieto, Payne, Post, and Vanrell (2009) found that Catalan, Spanish, and English monolingual children as young as two years old managed to use F0 and duration in placing the stress in their speech. In German-speaking children (age 0;5 to 3;0), Linfert's finding (2010) also support the early use of F0, but the children were found to use intensity before the duration.

On the other hand, Correia (2009) reports that her two children, age 1;0-2;0, did not use F0 to mark stressed syllables in European Portuguese, which is consistent with the absent of stress in adults speech in European Portuguese. So far, the studies mentioned above have been conducted, apparently, on monolingual children. What about children who are exposed to two languages? The following section describes research in the development of prosody in dual language acquirers.

6.2.2 The development of prosody in bilingual children. We have seen that in the studies of prosodic development in monolingual children, children have begun placing perceptual stress in their vocalisation early at the babbling stage. For bilingual children, the three longitudinal case studies (Cruz-Ferreira, 2006; Werner F. Leopold, 1947; Ronjat, 1913) reported that at the babbling stage, the children did produce early vocalisation, but it is not clear whether the children produced language-specific babbling. Cruz-Ferreira (2006) did mention that in her three Swedish-Portuguese subjects' early vocalisations, they used the intonation pattern that generally sounded like Swedish when talking to Swedish interlocutors and used the intonation pattern that sounded like Portuguese when addressing Portuguese speakers.

In another detailed longitudinal acoustic study of the acquisition of intonation in German-English bilingual children age 2;1 to 5;5 by Gut (2000), the findings suggest that the three bilingual children show language-specific developmental pattern; the children developed German intonational contour first before English, and there seems to be no evidence of transfer from the German intonational contours that the children acquired to the English intonation system.

Unfortunately, there are not many studies on prosodic development in bilingual acquisition (De Houwer, 2009). Thus, it was difficult to make a generalisation about the order of acquisition of acoustic patterns like we have seen for monolingual children. What we can be sure here is that in language acquisition, all children, monolingual and bilingual, have to learn to coordinate the prosodic properties of the language (s) that they are exposed to. This is indeed a drawn-out process (Behrens & Gut, 2005; De Houwer, 2009; Gut, 2000). Based on the case studies reviewed, we may assume that bilingual children can already use language-specific intonation contours from early on (Cruz-Ferreira, 2006) and the prosodic development appears to be language-specific as well (Gut, 2000). As we know, Rina is a bilingual Malay-English child. The following section illustrates studies on Malay prosody.

6.2.3 Studies on Malay prosody. Similar to studies of prosodic development in bilingual children, studies on prosodic characteristics of Malay are also very limited. Most of the early research reported in the literature are only based on human auditory and perceptual judgment such as by Mohd Onn (1980), Sulong (1994) and Teoh (1994). These studies claim that Malay is a syllable-timed language. Clearly, instrumental analyses must be conducted to verify this claim. The first acoustic study

on syllable duration and lexical stress in Malay is by Mohd Don, Knowles, and Yong (2008). This study examined syllable duration and fundamental frequency (F0) in the final two syllables of 111 Malay words by two female native speakers; in individual words and in connected speech. Their rationale to examine the last two syllables came from the observation that prosodic changes in Malay is more pronounced in these two syllables.

The result in the examination of individual words revealed that in terms of F0, 92 of the 111 words showed a peak at the penultimate syllable, followed by a significant drop on the last syllable. However, when the words are put together in continuous speech, they found high variability in terms of the F0 peak. Duration-wise, in individual words, Mohd Don et al. found that final syllable is the longest with the mean of 411.41 ms. However, in continuous speech, final lengthening was only found at phrase final position; words in non-final position in a phrase did not indicate lengthening of final syllable as they had been observed when spoken in isolation.

Because of the discrepancies between the results in words produced individually and in connected speech, Mohd Don et al. concluded that ‘there are no phenomena in spoken Malay corresponding to what phonologists call stress’ (2008, p.10). One major limitation in Mohd Don et al.’s study is that they disregard the morphological types of the 111 words chosen. There was no description of syllable structure of the words and thus, it was unsurprising that they found high variability of syllable duration across the data as different types of syllable structures, such as the CVC and CV structures yielded different durational values, which would make their suggestion of Malay as a language with non-isochrony syllables highly questionable (Wan Ahmad, 2012). Therefore, there is a need to carry out further work in order to verify what Zuraidah et al. (2008) claim in a comprehensive manner.

I have discussed studies on prosody on adults in Malay. Based on an intensive search in the literature, unfortunately, there are yet to be studies on L1 Malay children’s acquisition of prosody in Malay language. This research will contribute filling this gap, as I will discuss Rina’s acquisition of the phonetic patterns of prosody in her reduplication utterances. This brings us to the issue of reduplication. Reduplication is an important linguistic phenomenon and has been investigated in a number of studies. In the subsequent section, previous research investigating reduplication will be reviewed.

6.2.4 Studies in reduplication. Reduplication is defined as the systematic repetition of phonological units within a word for semantic or grammatical purposes (Rubino, 2005). Currently, reduplication has become an important phenomenon in language studies, as it is a widely used morphological device in a considerable number of languages around the world. Reduplication has been investigated in various approaches; in descriptive terms (Maas, 2005) as well as from the theoretical perspectives, such as in morphology (Ahmad, 2001; Inkelas, 2005), phonology (Downing, 2005), prosodic morphology (Hyman & Mtenje, 1999; McCarthy & Prince, 1999) and phonology-morphology interfaces (Ahmad, 2005; Raimy, 2000). However, scholars in reduplication so far have focused mainly on the phonological and morphological aspect of reduplication. This might be attributed to the fact that the issue of whether reduplication can be described in morphological and phonological terms is the “*vexata quaestio*” (Hurch, 2005, p. 1) in the field of reduplication; reduplication is a morphologically productive process, but it is also describable with phonological structures, as stated by Wilbur (1973, p. 5) in his seminal dissertation, “reduplication is a morphological procedure resembling a phonological rule”.

Due to the focus on morphology and phonology, studies investigating reduplication in terms of its acoustic-phonetics details are limited. An intensive search into the literature shows only a few researches that investigate the acoustic-phonetic aspect of reduplication using instrumental analyses. Gooden (2003) investigated the phonetics of Jamaican creole reduplication among seven L1 Jamaican Creole speakers. In this thesis, he presented the phonetic analysis of word-level prosody between distributive and intensive reduplications. He found that distributive reduplication has only one accentable syllable because there is one syllable which is “metrically stronger” (p.222) than other syllables while intensive reduplication, has two strong syllables. Gooden concludes that distributive reduplication in Jamaican creole behaves like a single prosodic word while intensive patterns behave like two prosodic words. Similarly, Nguyen and Ingram (2006) investigated the prosodic pattern in Vietnamese reduplication. Acoustic parameters, which include syllable duration, fundamental frequency and intensity were analysed and the finding showed that in Vietnamese reduplication, the second syllable is more acoustically prominent.

Finally, Niebuhr, Jarzabkowska, Lorenz, Schulz, and Sodigov (2012) investigated the acoustic form of emphatic reduplication in German. Emphatic reduplications are used to draw readers’ attention to relevant information and in German; this strategy is likely to occur in the conversations between parents/teachers

and children. So, in their study, Niebuhr et al recorded the interactions between nursery school teachers with the children during storytelling sessions. Results showed that the first and the second part of reduplication produced by the teachers were consistently accented. No significant prosodic differences were found in both elements as they showed similar F0 peaks and duration.

Given that reduplication plays an important grammatical role in Malay, we would expect there would be a substantial number of studies investigating this phenomenon. Therefore, the next section will describe some prominent studies in Malay reduplication.

6.2.5 Studies in Malay reduplication. Reduplication is a morphologically productive process in Malay (Sew, 2007). Therefore, many linguistic investigators have studied Malay reduplication; most of the research is from the morphological perspective. Their descriptions are primarily focused on form classifications, grammatical functions and the semantics of reduplication. The work of Omar (1975, 1987) is the first corpus-based study on reduplication in written Malay. Earlier important publications include those by Hassan (1974), Onn (1980), Ahmad (1991) and Mohamad Amin (1992). Recently, there is also a renewed interest in the study of reduplication as an important Malay lexical derivation; studies include those by Hassan (2006), Hassan, Rohani, Osman and Ayob (2006), Ahmad (2007), Sew (2007, 2011) and Ismail (2008).

Other than these morphological studies of Malay reduplication, there are also important works on the phonology and morphology of Malay dialects; such as those by Hendon (1966) and Ahmad (2005,2007). Works by Ahmad (2005, 2007) is crucial in Malay reduplication literature as it informs scholars about the formal linguistic observation of the phonological interplay in Malay reduplication.

I mentioned previously that studies in reduplication have mainly centred on the morphological and phonological perspectives. The same thing can be said about studies of Malay reduplication; to date, it seems that there are no studies yet about the acoustic patterns of reduplication in L1 Malay speakers. I also could not find any empirical studies about children acquiring reduplication in Malay (except for a conference paper by Soriente, 2014). Since this chapter will focus mainly on Rina's reduplication utterances, the following section will elaborate related studies investigating reduplication phenomenon in children.

6.2.6 Reduplication in child language. Reduplication is a widespread phenomenon acquired by children early in their speech development. In fact, it was found that reduplication plays an important role in children's language development. Reduplication as a physiological mechanism has often been linked to phonological, morphological and lexical awareness; Moskowitz (1973) and Conxita Lleo (1990) states that reduplication is an important process for word-formation in children since it is a first step for them to recognise syllables and segments as units in phonological acquisition.

Studies in reduplication by children have found that children acquiring Indo-European languages produced the construction at the onset of language development, usually observed from age 12 months up to 24 months (Fee & Ingram, 1982; C.A. Ferguson, 1983). Studies also show that the function of syllable reduplication in these children is due to their strategy to compensate their "... inability to appropriately represent or produce the second syllable of the word" (Ingram, 1974,p.54). In order words, reduplication is used by children as it is simpler for them to articulate, and it also enables the child to produce polysyllabic utterances without articulating complex structures (Lleó, 1990; Schwartz, Leonard, Wilcox, & Folger, 1980). The following examples from the literature evidently shows the children's attempt to substitute adult polysyllabic words with bi-syllabic utterances such as [wawa] for English word *water* (Ingram, 1979,p.140), [nana] for English word *another* (Waterson, 1971, p. 186), [nana] for German word *nase* , [bebe] for German word *bär* and [ne'ne] for French word *donner* (Dressler et al, 2005, pp.462-463).

As we can see, a substantial number of studies have been done on phonological reduplication in children; we have yet to see the acquisition of phonological and grammatical reduplication in languages that expresses reduplication as a formal linguistic device. Except for a conference paper by Soriente (2014) and some notes in Dardjowidjono (2000), it seems that studies of the acquisition of Malay/Indonesian reduplication are non-existent.

Therefore, this study on Rina's reduplication utterances would fill the gap as Malay (the Malaysian variety) uses reduplication as part of its grammatical system. I will observe the emergence of reduplication as a grammatical feature drawing from Rina's longitudinal data from 2;10 to 3;10 and also at 4;8. The case study allows for discussion and observation of reduplication in an understudied language (Malay) in children. However, before I proceed to discussing Rina's iteration and reduplication

utterances, I will first discuss Study 1, the investigation of prosody of reduplication on L1 Malay speakers.

6.3 Study 1

6.3.1 Participants. The participants were four adult L1 speakers of Malay (two males, two females) from monolingual homes in the northern region of Malaysia, Perak. The variety of Malay spoken by these speakers is the standard Johor variety which is the standard variety in Malaysia (Sew, 2007, p. 3). Although the Perak region boasts its own Malay dialect variety, these speakers were based in the city and their speech style/dialect more closely resembles standard Johor rather than the Perak regional variety. Their age range was 22 to 38 years old.

6.3.2 Materials. The materials used in the procedure were 12 picture prompts (see Appendix III). These prompts were selected based on the highly frequent nouns used by the child participant, Rina, during the period of our longitudinal investigation (from age 2;10 to 3;10). There were 12 target Malay nouns used as prompts, all of which were disyllabic monomorphemic words. Monomorphemic is defined as words consisted of a single morpheme (Denham & Lobeck, 2010, p. 142).

Regarding the Malay syllable structure, Musa, Kadir, Azman, and Abdullah (2011) found that 45% of syllable patterns in their corpora (Malay language dictionary and Berita, an online Malaysian news agency) are disyllabic. Thus, based on this finding, we can safely say that the disyllabic syllable structure is common for Malay words. The following table shows the list of nouns used in the procedures with the participants:

Table 6.1

Nouns used as prompts in the study

| Nouns | English translations |
|---------------|----------------------|
| <i>burung</i> | 'bird' |
| <i>bola</i> | 'ball' |
| <i>kucing</i> | 'cat' |
| <i>anjing</i> | 'dog' |
| <i>buku</i> | 'book' |
| <i>ikan</i> | 'fish' |
| <i>arnab</i> | 'rabbit' |

| Nouns | English translations |
|---------------|----------------------|
| <i>itik</i> | 'duck' |
| <i>bunga</i> | 'flower' |
| <i>ayam</i> | 'chicken' |
| <i>lembu</i> | 'cow' |
| <i>monyet</i> | 'monkey' |

Each prompt was printed on A4 paper in singular and plural form. Thus, a picture of *burung* (bird) had two separate prompts; a picture of a bird and a picture of many birds. I used these prompts to elicit singular, iterative and reduplicative utterances from the participants in the elicitation procedures, which is described in the following section.

6.3.3 Procedure. The equipment used to record the procedures included an Olympus linear PCM audio recorder and Rode microphones. The elicitation sessions were conducted in a quiet room and the participants were audio recorded individually. There were two sessions for each participant. Thus, there were eight elicitation sessions altogether. In the first session, the participants were asked to describe the singular and plural objects in the pictures shown to them. However, before they described the visual prompts, they were required to use the carrier phrase *saya nampak* (I see). In the first session, there were 24 prompts; 12 singular prompts and 12 plural prompts. The prompts were shuffled and put in randomised sequences to minimise possible order effects.

In the second session, the participants were asked to describe the prompts without using the carrier phrase *saya nampak* (I see). In this session, the pictures were organised differently; two pictures of single objects were arranged consecutively before the pictures of plural objects. The pictures of single objects were arranged in this way so that the participants would produce the default form (or the singular word) twice, hence emulating the iteration utterances produced by our child participant, Rina. Earlier, I discussed that in Rina's plural development at 2;10 to 3;10, iteration is one of her predominant strategies in marking plural items. In this second session, the iterative utterances were directly elicited from the adults in order to compare the adults' iterative utterances with that of Rina's. A total of 36 prompts were used; 24 were singular prompts and 12 were plural prompts. Each participant took approximately 10 to 15 minutes for both sessions.

6.3.4 Hypotheses. The elicitation sessions were designed to directly elicit utterances in which the participants described singular and plural objects in Malay. I am also interested in discovering the differences between repetitive/iterative utterances and reduplicative utterances, hence the design of the second elicitation session. Based on singular-plural marking in Malay, I form several hypotheses about the outcome of the procedure. I predicted that in the first session, the participants would describe the single objects with Malay default form and describe plural objects with reduplicated form. The predicted outcome is illustrated in the following table:

Table 6.2

The prompts used and the predicted outcome for singular and plural prompts.

| Prompts | Singular prompt | Plural prompt |
|------------------------|-----------------|----------------------|
| <i>burung</i> 'bird' | <i>burung</i> | <i>burung-burung</i> |
| <i>bola</i> 'ball' | <i>bola</i> | <i>bola-bola</i> |
| <i>kucing</i> 'cat' | <i>kucing</i> | <i>kucing-kucing</i> |
| <i>anjing</i> 'dog' | <i>anjing</i> | <i>anjing-anjing</i> |
| <i>buku</i> 'book' | <i>buku</i> | <i>buku-buku</i> |
| <i>ikan</i> 'fish' | <i>ikan</i> | <i>ikan-ikan</i> |
| <i>arnab</i> 'rabbit' | <i>arnab</i> | <i>arnab-arnab</i> |
| <i>itik</i> 'duck' | <i>itik</i> | <i>itik-itik</i> |
| <i>bunga</i> 'flower' | <i>bunga</i> | <i>bunga-bunga</i> |
| <i>ayam</i> 'chicken' | <i>ayam</i> | <i>ayam-ayam</i> |
| <i>lembu</i> 'cow' | <i>lembu</i> | <i>lembu-lembu</i> |
| <i>monyet</i> 'monkey' | <i>monyet</i> | <i>monyet-monyet</i> |

For the second session, I also hypothesised that the participants would produce the default form to describe singular objects and produce reduplication when indicating more-than-one objects. I postulate that the duration of iterative utterances will be longer than reduplication.

These hypotheses are based on the diagnostic criteria to differentiate repetition/iteration from reduplication as outlined by Gil (2005). Gil sets forth several criteria to distinguish between repetition and reduplication in Riau Indonesian. The following table illustrates the diagnostic criteria between repetition and reduplication as outlined by Gil.

Table 6.3

Criteria for repetition and reduplication as proposed by Gil (2005, p. 37)

| Criterion | Repetition | Reduplication |
|----------------------------------|--------------------------------------|---------------------------------|
| 1) unit of output | greater than a word | equal to or smaller than a word |
| 2) Communicative reinforcement | present or absent | absent |
| 3) interpretation | iconic or absent | arbitrary or iconic |
| 4) intonational domain of output | within one or more intonation groups | within one intonation group |
| 5) contiguity of copies | contiguous or disjoint | contiguous |
| 6) number of copies | two or more | usually two |

In fact, these characteristics are very relevant to the study as the Malay language spoken by the L1 Malay participants as well as the Malay variety exposed to Rina is similar to Riau dialect of Indonesian in term of its morphosyntactic structure. Firstly, regarding the unit of output, Gil contends that repetition yields output greater than a word, which is contrary to reduplication. Reduplication only produces total and partial reduplication; both structures produce equal or smaller units than a word. Secondly, repetition may be used by speakers for communicative emphasis while reduplication is not. Repetition may also be devoid of meaning; however, if there is meaning, it might be iconic-related such as intensity, plurality, and iterativity.

In contrast, reduplication as a grammatical structure is always associated with meanings; some of the meanings might overlap with repetition as it can be iconic as well. In terms of the intonational contours of repetition and reduplication, repetition as a multi-word construction might involve one or more intonation groups while reduplication only consists of one intonation. Repetition/iteration may or may not be separated by a pause, but reduplication is never separated by a pause (p.36). This criterion is crucial in this study as I will evaluate the length of iteration and reduplication utterances based on the pauses involved. Related to the intonational domain is the contiguity of repetition and reduplication. The iterated element might also be adjacent or disjoint to each other in repetitive structures while generally for reduplication, the copies are usually contiguous. The final criterion relates to the number of copies; the number of iterated elements is unbounded in repetition while reduplicative structure typically contains only two copies. Now that I have explained the hypotheses, I will proceed with the acoustic analysis of the study.

6.3.5 Acoustic analysis. In speech production, acoustic signals are formed when the vocal organs move and create measurable effects on the molecules of the airstream, which is spread outwards and eventually reaches the listeners' ears (Davenport & Hannahs, 2010; Harrington, 2012). Acoustic phonetics is a specific field that sets out to measure these effects. Thus, while acoustic phonetics constitutes a broad field of inquiry, what I am interested in discovering in this study is the duration, the fundamental frequency (F0) and the intensity of reduplication as produced by the L1 Malay speakers in the study.

The analysis of acoustic signals in this study is carried out using Praat software version 6.0.19 (Boersma & Weenink, 2016). Praat is a computer software available free of charge, used for the phonetic analysis of speech. Acoustic analysis was used as it provides greater accuracy than simple transcription methods; the latter might not be able to detect certain contrasts made by the speakers (Scobbie et al., 2000; Theodore et al., 2012). A study by Munson, Edwards, Schellinger, Beckman, and Meyer (2010) showed that listeners' perception of children's production of /s/ and /θ/ could be influenced by the age the listeners believe the children to be. It appears that adults report more tokens of /θ/ if they think that the children are older and more tokens of /s/ if they believe the children to be younger. This suggests that simply listening to and transcribing the speech sounds is inadequate in evaluating the accuracy of a sound. Hence, the acoustic analysis allows for a more objective judgment.

I first coded the singular, iterative and reduplicative tokens in the recordings based on the elicitation prompts. Singular tokens refer to the nouns the participants produced when describing a single object. Iterative tokens refer to the tokens the participants produced when describing single objects consecutively, and reduplicative tokens refer to the reduplicated form produced by the participants when describing the plural prompts. Altogether, there were 203 tokens produced by the participants; 56 single tokens, 48 iterative tokens and 99 reduplicative tokens.

The acoustic signals of the duration, the F0 and the intensity were examined through visual inspection of the waveform and spectrogram, together with the researchers own auditory perception. All the tokens are measured in terms of their duration. For iterative tokens, the duration is measured in terms of the length of the whole token, the duration of part 1 (the first word in the token) and duration of part 2 (the second word in the token) as well as the pause between the first and the second words. For reduplicative tokens, I also measured the duration of the whole token, as well as the first word (termed as *the base*) and the second word (*the reduplicant*). In

line with the terminology, Ahmad (2005) in his study of phonology-morphology interface in Malay uses the term *base* to refer to the first part of reduplicated item and *reduplicant* to refer to the second part.

In terms of F0, the analyses include the mean and maximum F0 of the single, iterative and reduplicative tokens. As I only used disyllabic Malay nouns in this study, single tokens then consisted of two syllables while iterative and reduplicative tokens consisted of four syllables. In counting the syllables in the tokens, we are in fact counting the vowels; a vowel is said to be the nucleus of a syllable (Dobrovolsky & Katamba, 1997). Hence, there are two vowels in single tokens, represented as vowel 1 (v1) and vowel 2 (v2) and four vowels in iterative and reduplicative tokens, represented as vowel 1 (v1), vowel 2 (v2), vowel 3 (v3) and vowel 4 (v4). The following figure illustrates the vowels in the tokens.

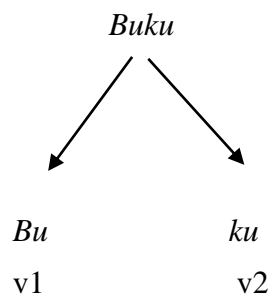


Figure 6.1. Vowels in single tokens.

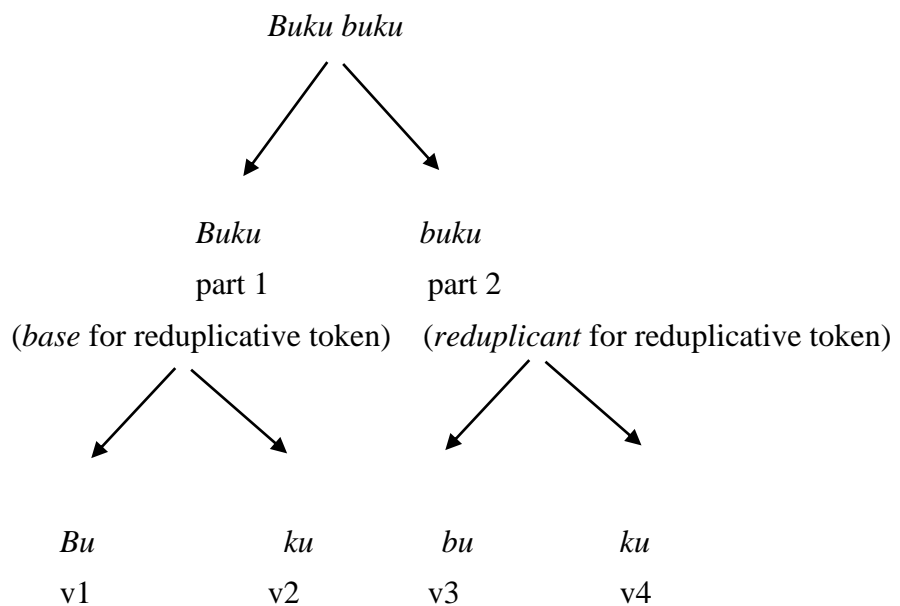


Figure 6.2. Vowels in iterative and reduplicative tokens.

The intensity of each syllable in single and reduplicative tokens is also analysed. Once I measured all the relevant acoustic signals, the information was kept in an Excel worksheet. To improve the reliability of the acoustic measurements, another trained coder rechecked 10% of the tokens.

6.3.6 Data analysis. Following the Praat analysis, the data for the duration, the F0 and the intensity of the tokens were converted into descriptive graphs in Excel. The graphs will assist us in understanding the acoustic patterns of iteration and reduplication as produced by L1 Malay speakers. The following section discusses the findings from the elicitation sessions.

6.3.7 Results. In the first elicitation session, the participants were shown 12 singular prompts and 12 plural prompts. Readers might recall that I hypothesised that the participants would use Malay default form to refer to singular items and resort to the reduplicated noun form to express plurals. I found that the participants did use Malay default form when describing one object and used reduplication for plural prompts. However, what I did not expect was the presence of Malay classifiers that some of the participants used when expressing singularity.

Out of 56 single tokens in the corpus, 35 were accompanied by Malay classifiers. Interestingly, all the classifiers were only found in the first session, where the participants had to begin the description of the prompts with the phrase *saya nampak* ‘I see’. Here are the classifiers that the participants used in the study:

- a) *se-ekor* *ayam*
one-tail(CL) chicken
- b) *se-biji* *bola*
one-seed(CL) ball
- c) *se-buah* *buku*
one-fruit(CL) book
- d) *se-kuntum* *bunga*
one-blossom(CL) flower

In the second session, as in the first session, the participants produced the default form to express singularity and used reduplication to mark plurals. I also hypothesised that iteration would have a greater duration than reduplication. This

hypothesis was borne out in the results as evidenced in Figure 6.3. Error bars in the figure are used to indicate the variability of data and to display uncertainty in the reported measurement (Shitan & Vazifedan, 2011).

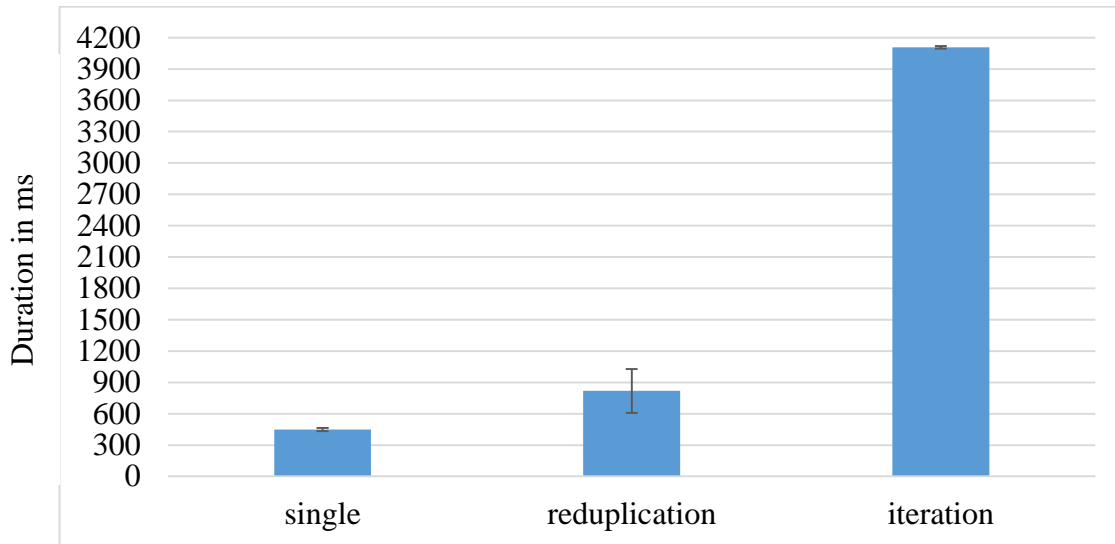


Figure 6.3. Average duration of single, iterative and reduplicative tokens (error bars represent standard error of the mean).

The findings indicate that the average duration for single tokens was 449 milliseconds (henceforth ms), 819 ms for reduplicative tokens and 4,107 ms for iterative tokens. Generally, the duration of reduplicative tokens was a bit longer than single tokens, while the duration of iterative tokens was four times longer than reduplication. In addition, based on the visual inspection of the waveform and spectrogram in Praat, when iterating, there seemed to be a protracted pause between participants' description of the first and the second single object. On the other hand, when the participants were reduplicating, the pause appeared to be shorter. Figure 6.4 and 6.5 illustrate the waveform and spectrogram of iterative token *ikan ikan* and reduplicative token *ikan-ikan*.

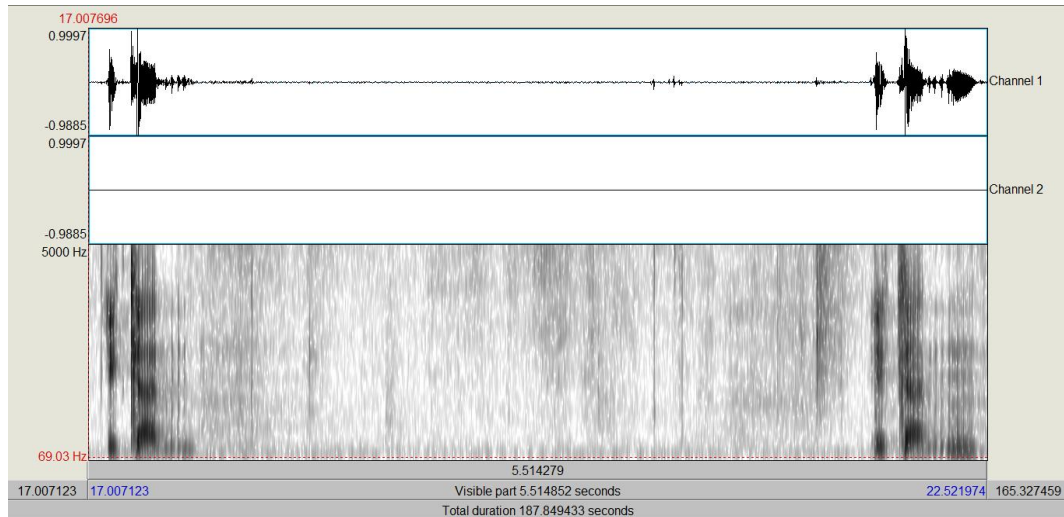


Figure 6.4. Iterative token *ikan ikan*.

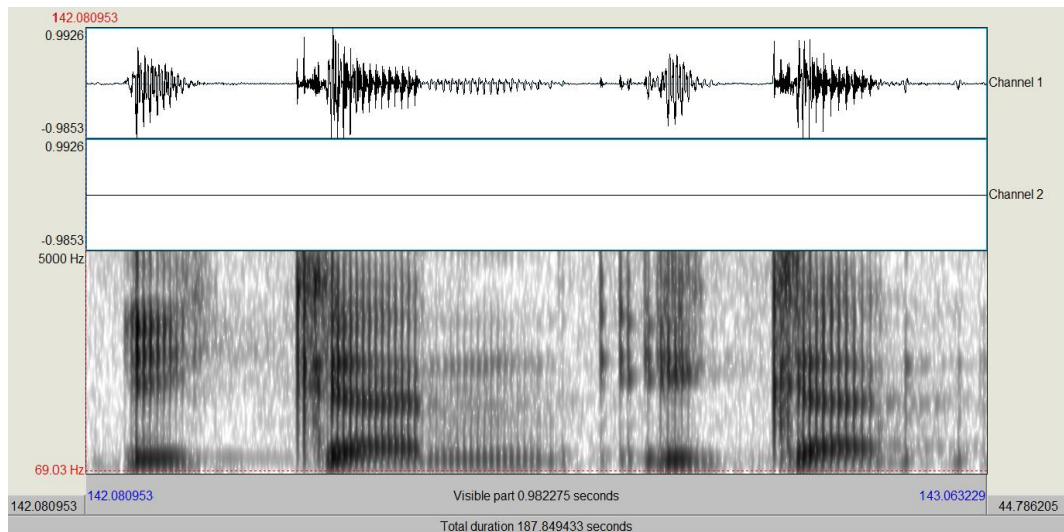


Figure 6.5. Reduplicative token *ikan ikan*.

I measured the duration of the first part, the second part and the pause in iterative tokens. The finding indicates that the average length of first and the second part in iterative tokens are similar (459 ms for the first part and 452 for the second part) while the average duration of the pause is found to be a staggering 3247 ms. Figure 6.6 shows this result.

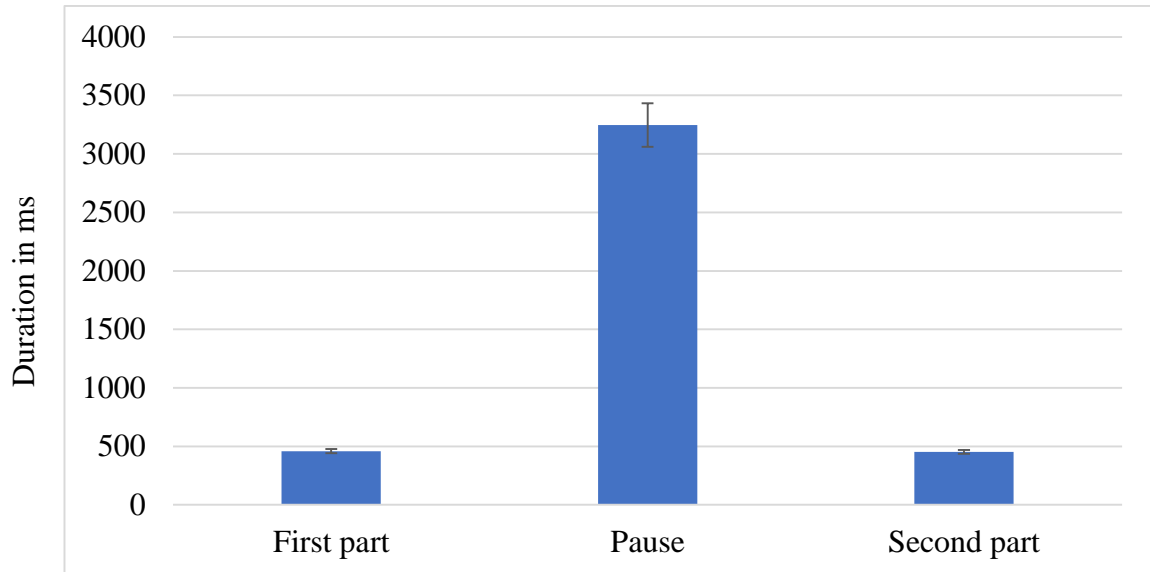


Figure 6.6. Average duration of the first word, second word and the pause in iterative tokens.

This finding supports Gil's (2005) diagnostic criteria cited earlier. To recapitulate, Gil states that reduplication is never separated by a pause as this may cause speakers to interpret this as two separate utterances. Iteration on the other hand is construed as multi-words. Therefore, they may include a pause. For the duration of reduplicative tokens, the results show that the average duration of the base in reduplicative tokens is 378 ms while the average duration of the reduplicant is 443 ms (Figure 6.7). Thus, the average duration of the base is slightly shorter than the reduplicant. The reduplicant is 1.17 times longer than the base. This suggests that Malay L1 speakers tend to assign prominence (albeit slightly) to the second part of the reduplicated words.

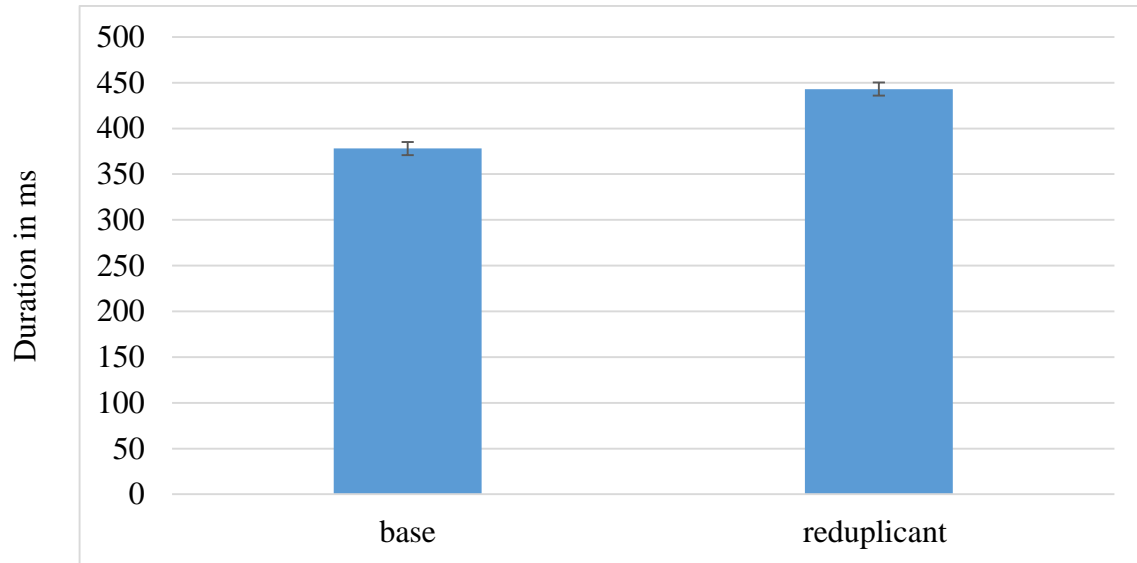


Figure 6.7. Average duration of base and reduplicant in reduplicative tokens.

Having analysed the duration of the tokens in iterative and reduplicative tokens, I compared the duration of the first part and the second part of the iterative tokens with the duration of the base and reduplicant in reduplicative tokens. Figure 6.9 indicates the comparison.

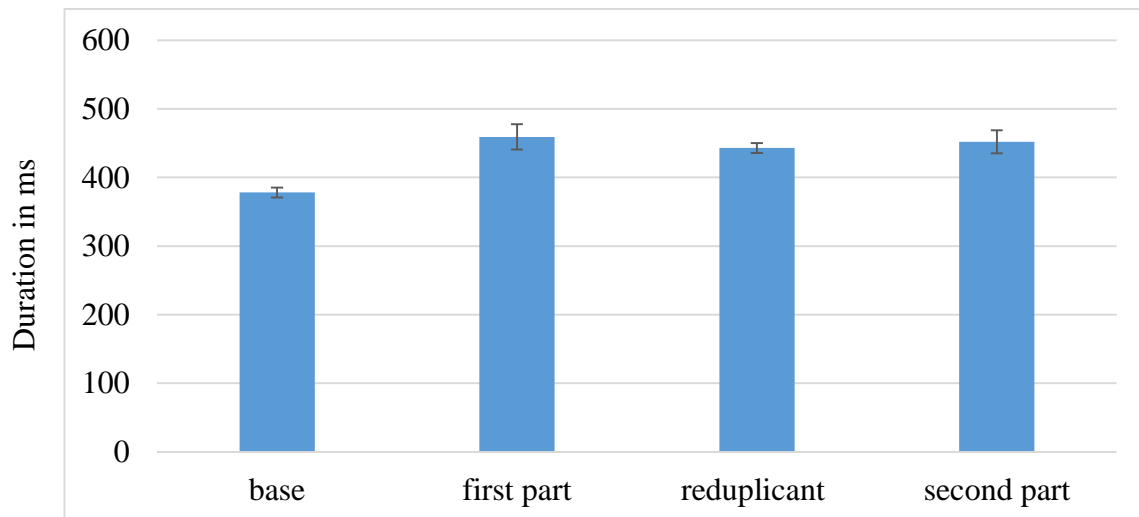


Figure 6.8. Average duration of the first part, the second part, the base and the reduplicant.

Thus, Figure 6.8 shows that for reduplicative tokens, the reduplicant tend to be slightly longer in duration than the base, while for iterative tokens, the duration is

similar. Now, let us shift to the result of the analyses of the mean and maximum F0 for the tokens. Firstly, the mean and maximum F0 for the single tokens (Figure 6.9 and 6.10). Davenport and Hannahs (2010) state that given the size difference of the vocal apparatus, men and women tend to have different fundamental frequencies; adult males produce approximately 80-200 Hz while adult females produce 150-300 Hz. As we can see from the figures (Figure 6.9 and 6.10), the male participants produced lower F0 compared to the female participants.

In terms of the mean F0 of the single tokens, the mean F0 decreased from 249 Hz in the first syllable (v1) to 198 Hz in the second syllable (v2) in female speakers. Similarly, the mean F0 also decreased in male speakers, from 108 Hz in v1 to 96 Hz in v2. For the maximum F0 of the single tokens, similar patterns can be observed; the maximum F0 of the first syllable is higher than the maximum F0 in the second syllable. For female speakers, the maximum F0 decreased from 269 Hz (v1) to 228 Hz (v2) while for male speakers, it decreased from 112 Hz (v1) to 104 Hz (v2). Thus, a discernible pattern is evident here: the prosodic pattern for single tokens for L1 Malay speakers is the F0 of the first syllable (v1) is more prominent than the second syllable (v2).

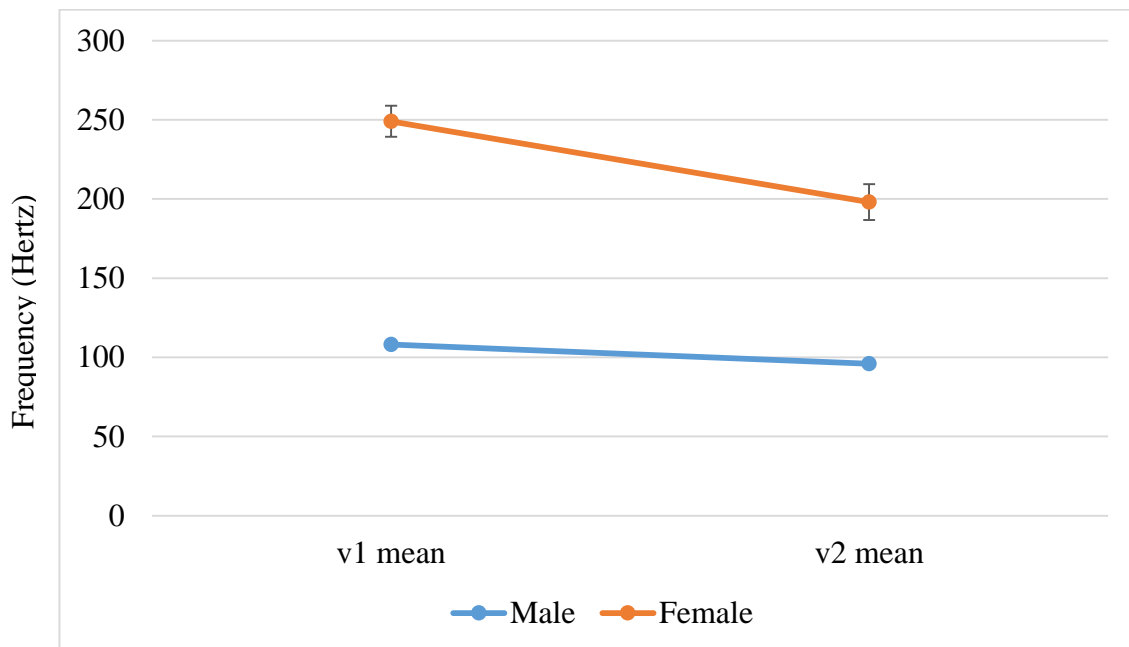


Figure 6.9. Mean F0 for single tokens.

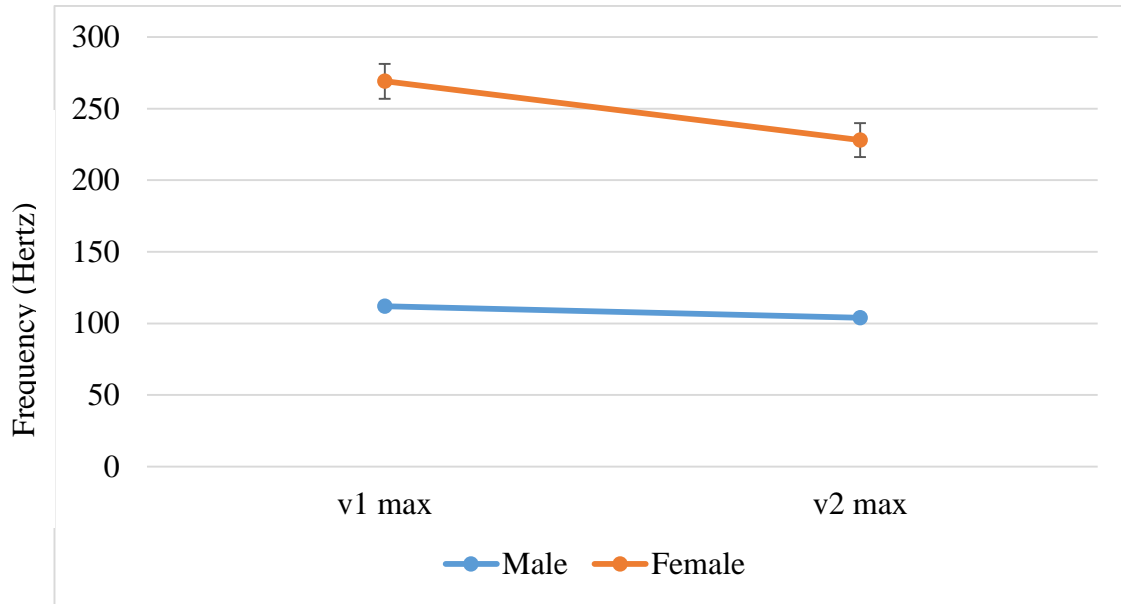


Figure 6.10 . Maximum F0 for single tokens.

For iterative tokens, the results show that they are two F0 peaks; at v1 and v3. Figure 6.11 and 6.12 show the mean and maximum F0 of the iterative tokens as produced by L1 Malay speakers.

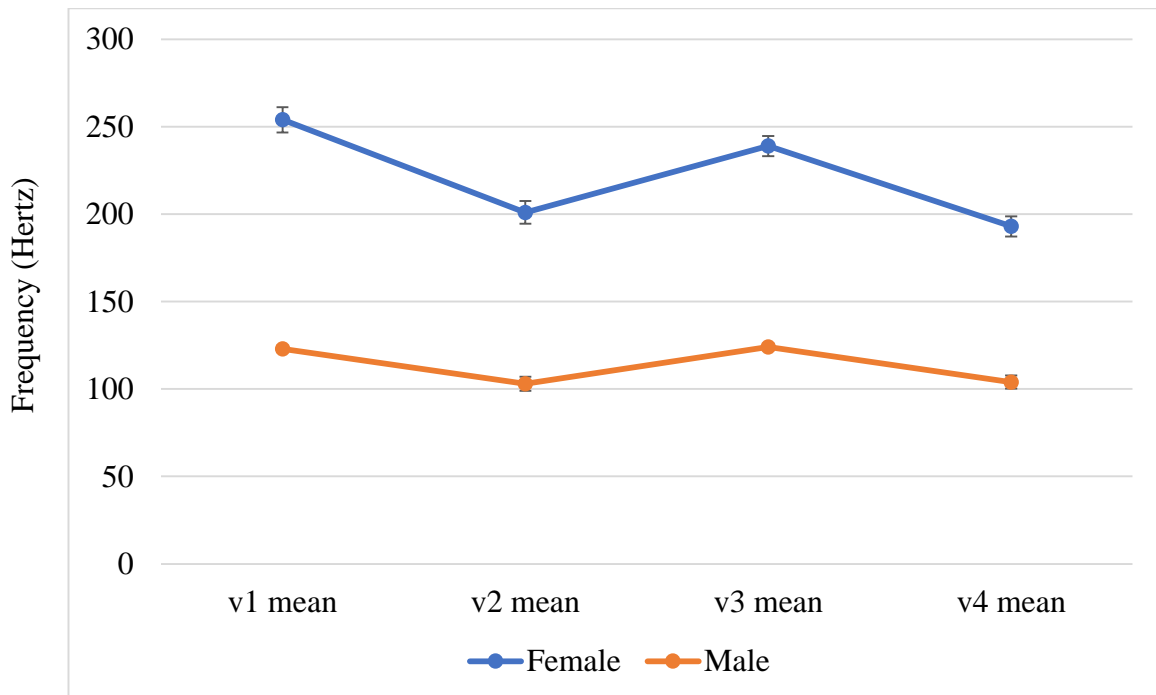


Figure 6.11. Mean F0 for iterative tokens.

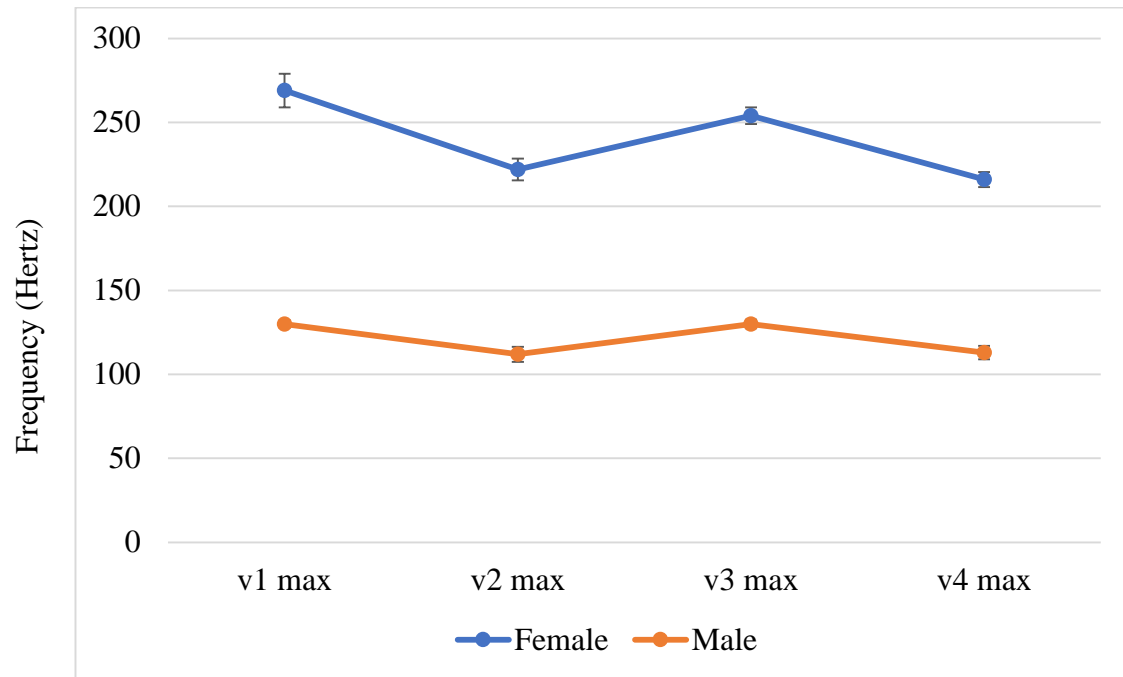


Figure 6.12. Maximum F0 for iterative tokens.

Based on the figures, the mean and maximum F0 for iterative tokens demonstrated similar patterns, albeit it is subtler for males than females. In both the mean and maximum F0, the peak goes down from v1 to v2 and increases again at v3 before dropping at v4. What about reduplicative tokens? Figure 6.13 and 6.14 illustrate the mean and maximum F0 for reduplicative tokens. For female speakers, the mean F0 increased from vowel 1 at 228 Hz to 255 Hz for vowel 3. At vowel 4, the F0 showed a drastic drop to 206 Hz. Similarly, the maximum F0 produced by females showed a rise from vowel 1 at 240 Hz, which then peaked at vowel 3 with 269 Hz. The maximum F0 then dropped to 238 Hz at vowel 4. For male speakers, the mean F0 showed a slight increase from vowel 1 (120 Hz) to 121 Hz at vowel 3. The F0 dropped to 98 Hz at vowel 4. For the maximum F0, it appears that there was no change from vowel 1 (126 Hz) to vowel 3 (also 126 Hz). The maximum F0 at vowel 4 then reduced to 110 Hz.

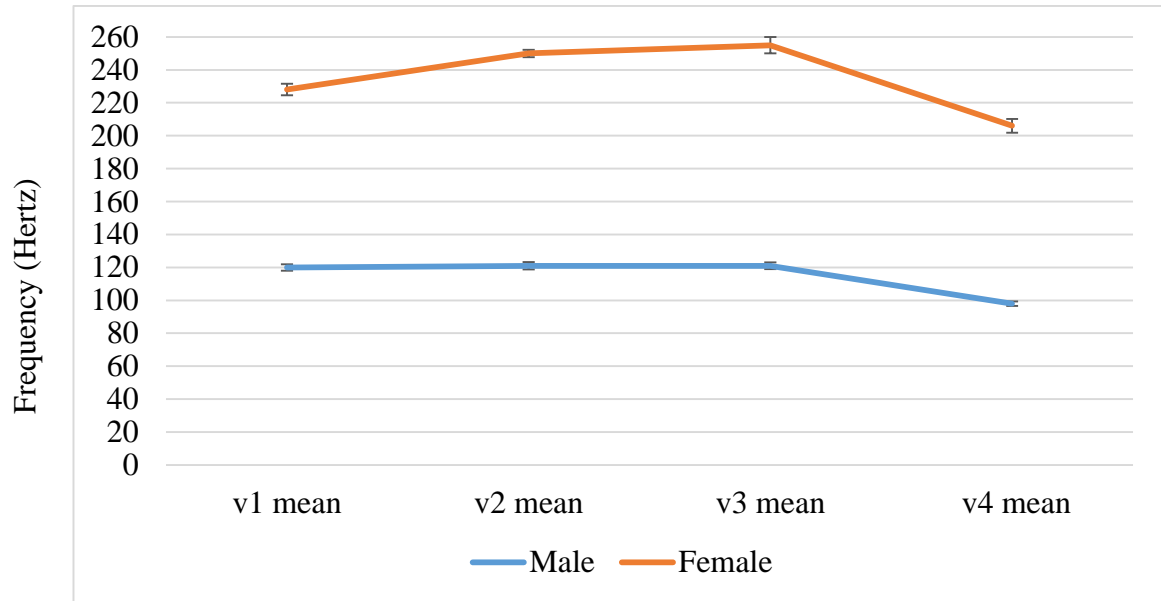


Figure 6.13. Mean F0 for reduplicative tokens.

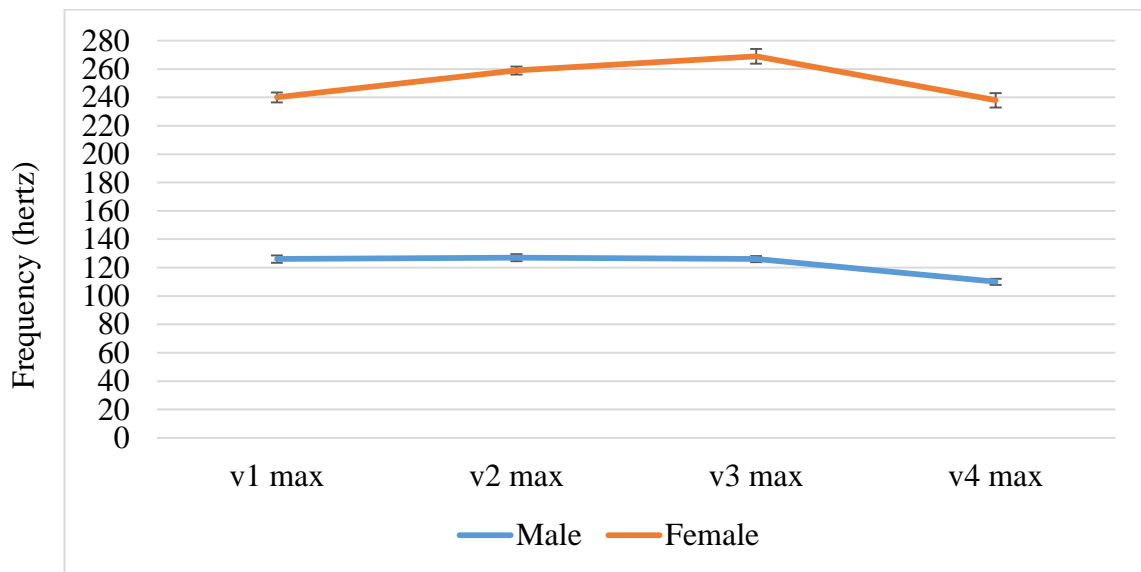


Figure 6.14. Maximum F0 for reduplicative tokens.

Therefore, the difference between iterative and reduplicative tokens in terms of the F0 patterning is that iteration has two peaks (at the first syllable and the third syllable), while reduplication only has one peak, which is at the third syllable. These findings suggest that L1 Malay speakers consider iteration as two separate words as there are two F0 contours while reduplication is considered as one word, reflected in the single F0 contour. So, for reduplication, Malay speakers tend to assign prominence to the third syllable, which creates a peak in F0 on the third vowel. Finally, we come

to the analysis of intensity in the single and reduplicative tokens. The results of our analysis of the mean and maximum intensity of the single and reduplicative tokens are shown in Figure 6.15 and 6.16.

The data show that male and female speakers have a similar range of intensity. Based on the figures (6.15 and 6.16), it is exhibited that there were similar prosodic contours between the mean and maximum intensity for single tokens in both female and male participants.

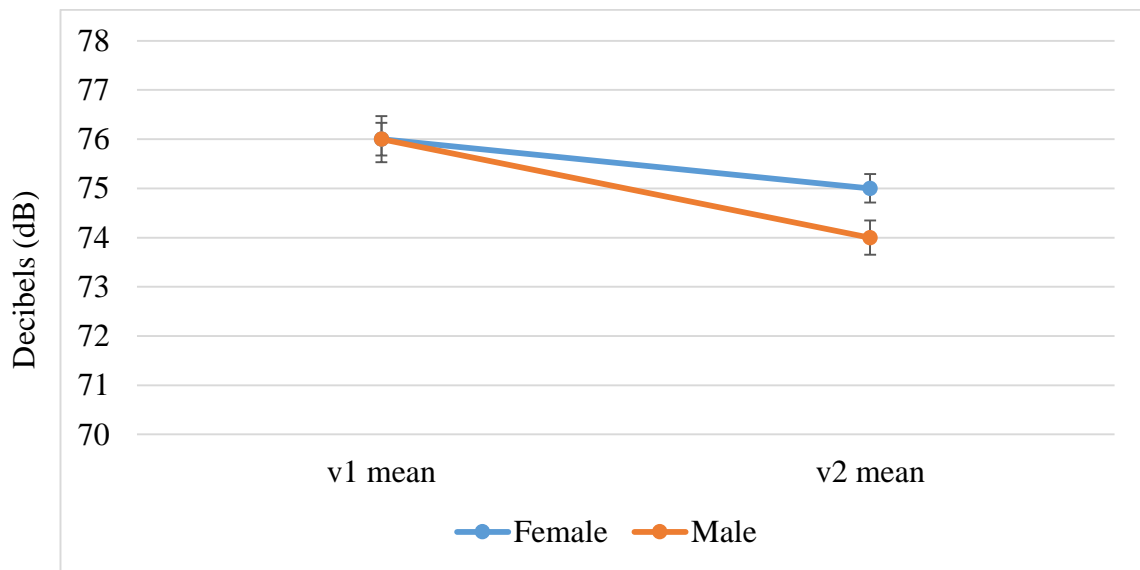


Figure 6.15. Mean intensity for single tokens.

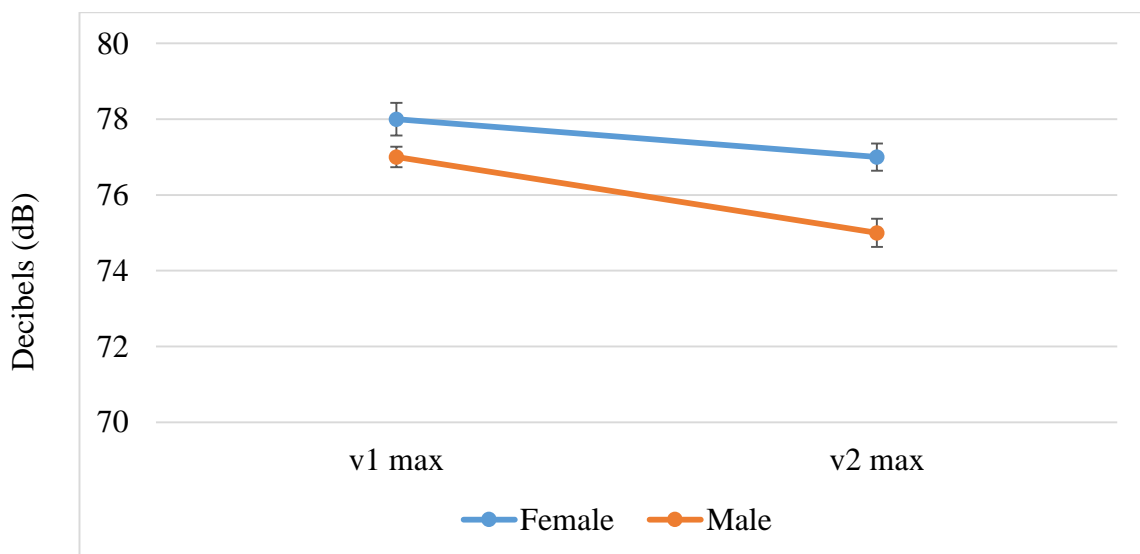


Figure 6.16. Maximum intensity for single tokens.

The mean and maximum intensity decreases from vowel 1 to vowel 2. For female speakers, there is a slight decline in the mean intensity, from 76 dB at vowel 1 to 75 dB at vowel 2. Similarly, the maximum intensity also slightly decreases for the females, from 78 dB in the first syllable to 77 dB in the second syllable. For the males, the mean intensity goes from 76 dB at vowel 1 to 74 dB at vowel 2. The maximum intensity is 77 dB in the first syllable, and it goes down to 75 dB in the second syllable. Figure 6.17 and 6.18 illustrates the mean and maximum intensity for reduplicative tokens.

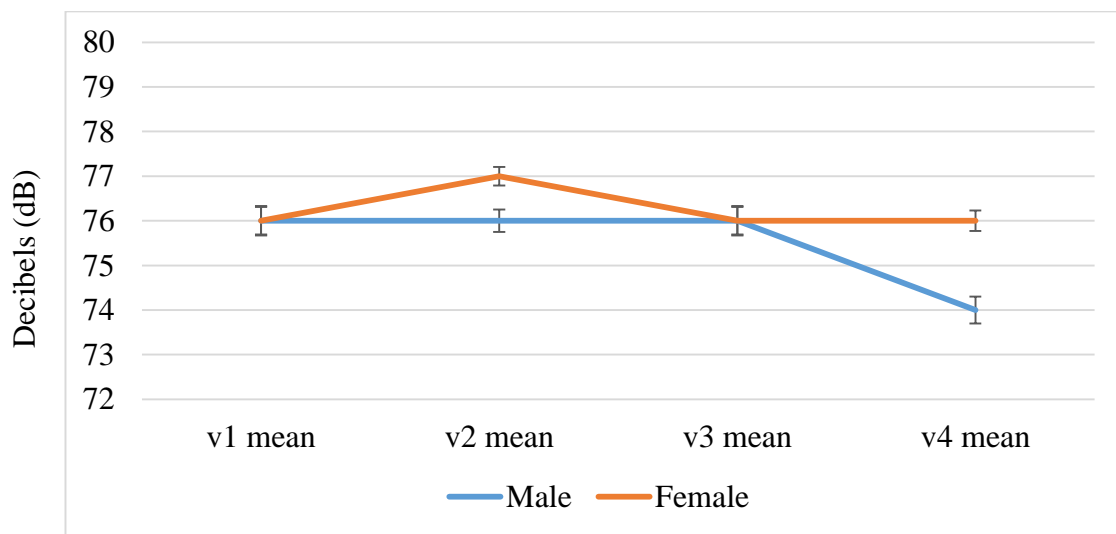


Figure 6.17. Mean intensity for reduplicative tokens.

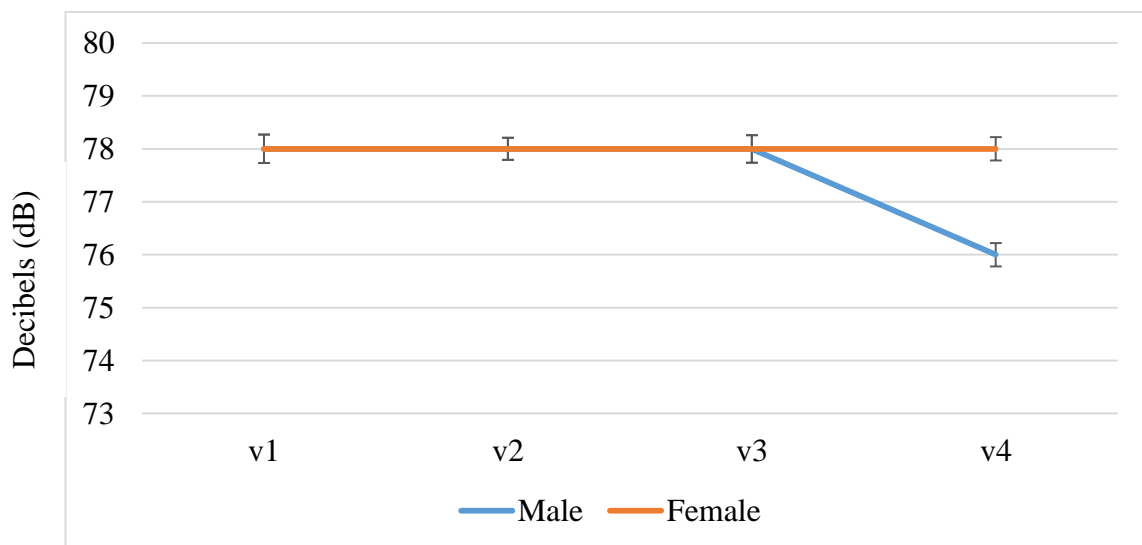


Figure 6.18. Maximum intensity for reduplicative tokens.

Unlike the single tokens where we can see a clear pattern of decrease from the first syllable to the second syllable, reduplicative tokens, on the other hand, show greater variability in terms of its mean and maximum intensity. For female speakers, the mean intensity exhibits a slight increase at vowel 2. From 76 dB at vowel 1, the intensity rises to 77 dB and then stabilises at 76 dB at vowel 3 and vowel 4. For males, the intensity is stable from vowel 1 to vowel 3 at 76 dB and then drops to 74 dB at vowel 4.

The maximum intensity for female speakers remains constant at 78 dB from vowel 1 to vowel 4. Similarly, for male participants, maximum intensity remained at 78 dB from vowel 1 to vowel 3. However, the intensity dropped to 76 dB at vowel 4. Due to this variability in the behaviour of the mean and maximum intensity between males and females, it is hard to generalise a pattern in reduplicative tokens conclusively.

6.3.8 Summary. Reduplication is a linguistic device used by Malay L1 speakers to mark “more-than-one” objects. This study investigates the suprasegmental properties of reduplication by L1 Malay speakers. Our findings indicate several prosodic features of reduplication as produced by L1 Malay participants in the study. Firstly, when reduplicating, there is only a slight pause between the base and the reduplicant, which contributes to the reduplicative tokens being shorter in duration compared to iteration. Also, the duration of the reduplicant is always longer than the base.

In terms of fundamental frequency, iteration shows two prominent peaks while for reduplicative utterances, the third syllable is the most prominent. This is consistent with the notion that iteration is two prosodic words with two F0 contours while reduplication is one prosodic word with a single F0 contour. For intensity, the single tokens show a similar pattern to the F0; the first syllable has the highest intensity effect. However, the variability found between mean and maximum intensity in female and male reduplicative tokens suggests that it has less effect acoustically on reduplication constructions. In fact, our findings corroborate what Roach (2009) posited, which is that prominence in stressed syllables is produced by four major factors: intensity, length, fundamental frequency and quality. However, all these factors are not equally important. Research has shown that fundamental frequency and length (duration) have the strongest prosodic effect compared to intensity and quality.

This research also clearly indicates that duration and fundamental frequency are the major prosodic parameters that Malay speakers employ when producing reduplications.

6.4 Study 2

In Study 1, I have obtained crucial information about the prosody of reduplication as produced by L1 Malay speakers. To recapitulate, the findings clearly indicate that duration and F0 play important roles in the production of reduplication; when reduplicating, the speakers tend to have a shorter pause between the first part and the second part while for iteration, there is a longer pause between the first and the second word. The second part of the reduplicated words (i.e. reduplicant) also tends to be slightly longer than the first part (i.e. the base). For fundamental frequency of disyllabic monomorphemic words, Malay speakers tend to assign prominence to the third syllable in the reduplicative utterances.

Turning now to study 2: in this study, I investigated the child participant's iterative utterances. As mentioned earlier, iteration is one of the predominant plural strategies that Rina used to mark plurals in Malay and English. Rina iterated the nouns based on the number of items; thus, five cats would be verbally produced as *cat cat cat cat cat*. In chapter 5, I found that reduplication emerged when Rina was 3;8. The main difference between iteration and reduplication, as contended in chapter 5, is that for iteration, Rina iterated the items based on the number of objects she encountered. For reduplication, I only consider Rina's output as reduplication if she reduplicated items more than two; for instance, if Rina produced *cat cat* when given a picture of five cats, I take this occurrence as evidence of reduplication. However, this distinction between iteration and reduplication was at times, ambiguous. What if Rina iterated two items? Would it be considered an instance of iteration or reduplication? Are there any other cues to distinguish between repetition and reduplication in Rina's plural output? These issues will be elaborated further in the following section.

6.4.1 Rina's double tokens from 3;5 to 3;10. Previously I have used terms such as iteration and reduplication. Iteration refers to the act of repeating the lexical items based on the number of objects. Reduplication, on the other hand, is generally limited to the iteration of two linguistic elements, and it is often regarded as a formal linguistic device (Maas, 2005). At age 3;5 to 3;10, I found that the distinction between iteration and reduplication in Rina's output is not clear-cut. Thus, in this study (Study

2), I opt to use a more general term, *double tokens*. I use the term double here to refer to all iterative tokens that Rina used when she iterated twice; this also includes what is considered as reduplication in the longitudinal study. Previously in Chapter 5, I consider Rina's token as reduplication if she doubled the nouns when referring to more than two items. However, there were also instances in which Rina iterated twice, especially when she encountered two objects.

Before I analyse the prosody of double tokens in her output, it is imperative to examine the contextual properties in which double tokens were produced in the corpus. I extracted all Rina's double outputs from the naturalistic study in chapter 5 (from age 2;10 to 3;10). When examining naturalistic data, it is not always clear whether the given form can be appropriately characterised as instances of iteration or reduplication. Thus, I include the contextual properties such as the prompts (items that Rina described), pointing gestures (whether Rina pointed to each item) and sentences (whether the utterances are part of a sentence) to distinguish between iteration and reduplication. The following table demonstrates Rina's double tokens from age 3;5 to 3;10;

In chapter 5, Rina's plural development was analysed from age 2;10 to 3;10. However, I found that instances of double nouns were limited in the corpus. This might be because of the limited contexts in the recording sessions; most of the prompts given to Rina during the longitudinal study were either a single item prompt or prompts with more-than-two items. Therefore, I found that most of Rina's iterative tokens in the corpus consisted of more than two copies, reflective of her one item-one noun strategy. Only beginning at age 3;5, did I find some double tokens. Altogether, from age 3;5 to 3;10, there were 18 double tokens in Rina's plural output. Rina produced these tokens when elicited by Mother or Father to describe certain plural entities/pictures. Thus, all these tokens were not part of a sentence; rather they were produced individually.

Table 6.4

Rina's double tokens from 3;5 to 3;10

| Age | Tokens | Prompts/Items | Pointing | Sentence |
|-----|----------------------------------|---------------|----------|----------|
| 3;5 | 1) <i>cow cow</i> | Two cows | Yes | No |
| | 2) <i>pig pig</i> | Two pigs | Yes | No |
| 3;6 | 1) <i>buku buku red</i> | >2 books | Yes | No |
| | 2) <i>kangaroo kangaroo jump</i> | >2 kangaroos | Yes | No |

| Age | Tokens | Prompts/Items | Pointing | Sentence |
|------|---|---------------------|----------|----------|
| 3;7 | 1) <i>bunny bunny</i> | Two rabbits | No | No |
| | 2) <i>rabbit rabbit</i> | >2 rabbits | Yes | No |
| | 3) <i>meow baby meow baby</i> | >2 kittens | Yes | No |
| 3;8 | 1) <i>toys toys</i> | Two toys | Yes | No |
| | 2) <i>Peppa-pig Peppa-pig</i> ⁵ | >2 Peppa pigs | No | No |
| | 3) <i>banana-banana</i> | >2 bananas | No | No |
| | *Tokens 2 and 3 were produced in the recording session with Father. | | | |
| 3;9 | 1) <i>burung burung</i> | >2 birds | No | No |
| | 2) <i>kucing kucing</i> | >2 cats | No | No |
| | 3) <i>kangaroo kangaroo</i> | >2 kangaroos | No | No |
| | 4) <i>Cinderella Cinderella</i> | >2 Cinderella dolls | No | No |
| | *All the tokens were produced in the recording session with Father. | | | |
| 3;10 | 1) <i>Elsa Elsa</i> ⁶ | Two Elsa dolls | Yes | No |
| | 2) <i>Cinderella Cinderella</i> | >2 Cinderella dolls | No | No |
| | 3) <i>Frozen backpack Frozen backpack</i> ⁷ | >2 backpacks | No | No |

One important contextual property that might assist us in distinguishing Rina's iteration and reduplication strategy is her pointing gesture. Pointing is a natural and pragmatic communication strategy to draw the visual attention of another person to an object or event (Meyer & Baldwin, 2013). Much research in child development has identified pointing gestures as a socio-pragmatic cue used by children to mark a certain particular reference (Gelman, 2003, 2004). Also, Tomasello, Carpenter and

⁵ Peppa Pig is a cartoon character based on a British animated series. The researcher had to use some prompts that the child found interesting in order to gauge the plural output.

⁶ Elsa is a fictional character based on a Disney animated movie entitled Frozen.

⁷ *Frozen* is a Disney animated movie. The child was very detailed in describing the backpacks she saw: she described the picture on the backpack first, hence the bag is described as *Frozen backpack*.

Liszkowski (2007) state, pointing is not just a gesture children make to draw attention to themselves, but also to the objects they found interesting to communicate about.

In Rina's case, pointing is indeed a very iconic gesture. As discussed in Chapter 5, when Rina iterated the lexical items, it was always followed by her pointing to each of the object. This is one important cue that distinguishes Rina's iteration and reduplication utterances. When pointing to a particular entity, Rina is drawing attention to that particular reference, hence individuating each object in the plural contexts. From Table 6.4, we can see some clear instances of iteration and reduplication. For example, at age 3;5, when describing two pigs and two cows, Rina pointed to the figurines and produced *cow cow* and *pig pig*. I interpreted these double outputs as iteration as Rina was evidently pointing to the items and iterated the noun each. However, there were also some instances in which the distinction was not obvious: for example, at age 3;6 and 3;7. At 3;6, when shown pictures of more than two items (*books* and *kangaroos*), Rina pointed to the pictures and doubled the noun. Hence *buku buku red* 'red books' and *kangaroo kangaroo jump*. Similarly, at 3;7, Rina described a picture of more than two rabbits as *rabbit rabbit* while pointing to the prompt. It seemed that she was reduplicating because the prompts given were more than two objects but the pointing might indicate that she was just iterating the first two objects she saw. At 3;7, when shown a picture of two rabbits, Rina produced *bunny bunny*, which might have seemed like double tokens but there was no pointing gesture involved.

At 3;8, the Malay recording sessions were conducted by the Father. In the sessions, Father taught Rina explicitly how to express plurals in Malay: that is through reduplication. There were two tokens in the recording that I consider as reduplication—when shown a picture of more than two Peppa Pigs and two bananas, Rina produced *Peppa Pig Peppa Pig* and *banana banana*, without the pointing gesture. Interestingly, all the tokens deemed as reduplication at age 3;8 and 3;9, occurred when Father was conducting the sessions. The following month, at 3;10, the recordings were carried out by Mother. I found that despite the absence of the Father, there were two occurrences in which Rina reduplicated to signify plurality. In both these occurrences, the prompts were more than two objects, and there was no pointing gesture involved.

From all these contextual properties, we can see that the demarcation between iteration and reduplication in Rina's utterances from age 3;5 to 3;10 was at times, ambiguous. In the beginning, I took the number of copies and pointing gesture as indications to distinguishing reduplication from iteration; if Rina double the nouns

when shown a picture of more than two items and do not point to the prompt, I interpret it as evidence of reduplication. However, as manifested in table 6.4, there are also instances in which Rina produces double tokens with the pointing gesture such as token 1 and 2 at age 3;6 (*buku buku* and *kangaroo kangaroo*) or token 1 at 3;7 (*bunny bunny*) in which she doubles the nouns when referring to two entities but no pointing gesture is involved.

The presence of the Father also affected the outcome of Rina's double form. It appears that Rina begins to reduplicate after the Father taught her how to express plurals correctly in Malay. Now I have discussed the contextual properties of iteration and reduplication in Rina's doubled output, I will proceed further with the prosodic analysis of Rina's double tokens.

6.4.2 Prosodic analysis of Rina's double tokens from age 3;5 to 3;10. In study 1, the findings indicate that duration and F0 play crucial roles in the prosody of L1 Malay speakers' production of reduplication. There is no pause between the base and the reduplicant in reduplicative tokens; the reduplicant is 1.17 times longer in terms of duration than the base and the peak F0 is at the third syllable. The results are significant, as they become a benchmark in which I compare Rina's double output in the naturalistic study. Based on these findings in Study 1, I analysed Rina's double tokens from 3;5 to 3;10 in terms of its durations and fundamental frequency. However, there were limited numbers of double nouns in Rina's corpus in the naturalistic study. I found only 18 tokens from age 3;5 to 3;10 (see Table 6.4). The acoustic analyses of the duration and F0 were performed in Praat software version 6 (Boersma & Weenink, 2016). For the duration, I analysed the whole eighteen tokens and measured the length of the first part and the second part of the tokens. In Study 1, following Ahmad (2005), I used the term *base* to refer to the first part of reduplication and *reduplicant* to refer to the second part of the construction. In this context, using the term base and reduplicant for Rina's double tokens would be misleading as it implies that she has acquired the reduplication construction. However, since the distinction between iteration and reduplication in Rina's output during the longitudinal study was still ambiguous, I use a more general term, *the first part* and *the second part*. The result for the duration of the first and the second part of Rina's double tokens is shown in Figure 6.19.

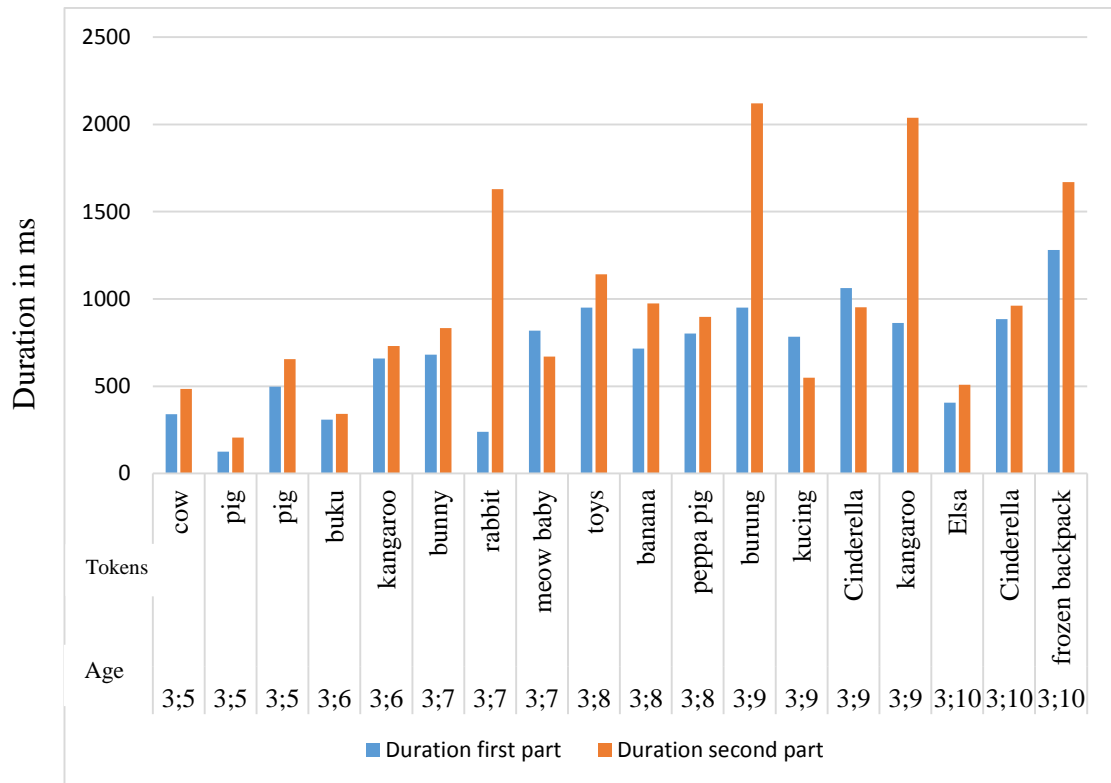


Figure 6.19. Duration of the first part and the second part in Rina’s double tokens from age 3;5 to 3;10.

The duration of most of Rina’s double tokens is longer in the second part than the first part, except for *meow baby* at 3;7, *kucing* ‘cat’ and *Cinderella* at 3;9. The general pattern evident here is that when producing double nouns, Rina tended to lengthen the duration of the second part of the construction. Among all these tokens, I did consider some of them as reduplication, due to some contextual factors. Thus, in Figure 6.20, I measured the duration of the first part and the second part of the reduplicative tokens from age 3;8 to 3;10.

Except for *kucing* and *Cinderella* at 3;9 (Figure 6.20), all the reduplicative tokens are longer in the second part. The difference in the first part and the second part in most of these tokens were not too distinct except for *burung* and *kangaroo*. I then refer to the Praat waveform and spectrogram of each of the token, shown in Figure 6.21 and 6.22.

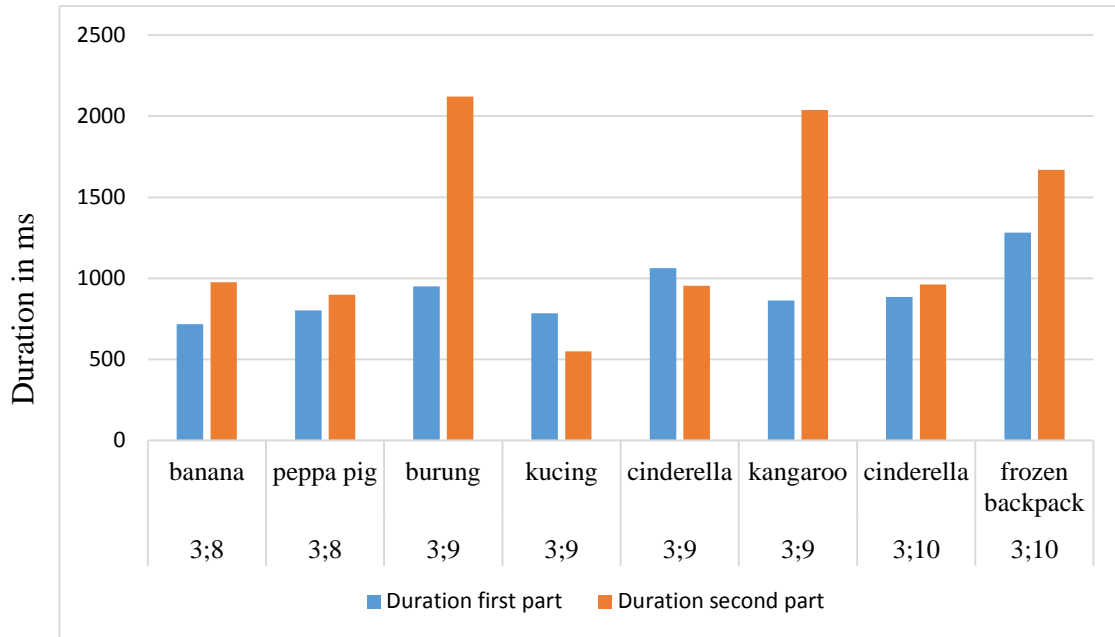


Figure 6.20. Duration of the first part and second part in Rina’s reduplicative tokens.

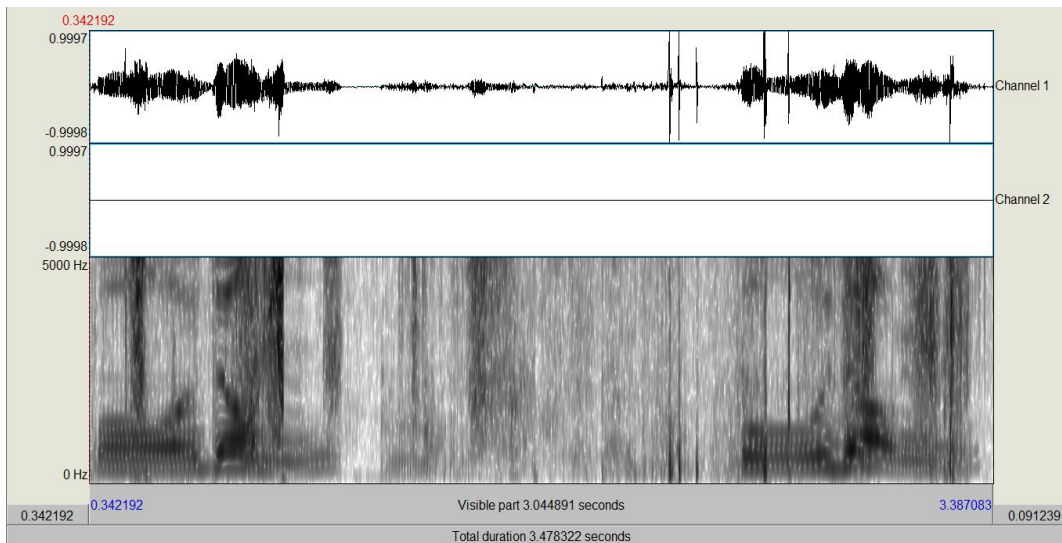


Figure 6.21. Reduplicative token *burung burung* at 3;9.

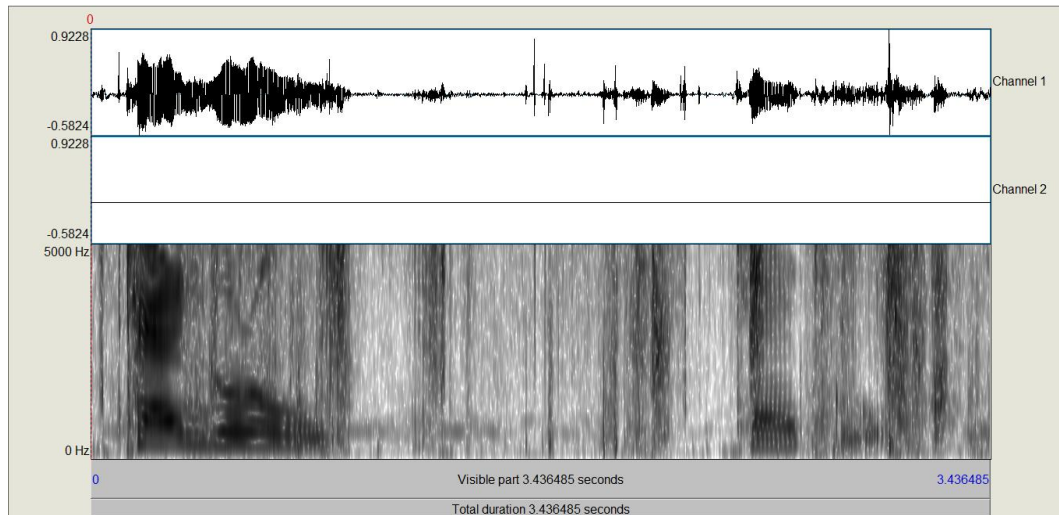


Figure 6.22. Reduplicative token *kangaroo kangaroo* at 3;9.

Figure 6.21 and 6.22 show that there was a prolonged pause between the first part and the second part in *burung and kangaroo*. Therefore, it is unsurprising that the duration is longer than the other reduplicative tokens. Interestingly, though I consider these tokens as reduplication, the extended pause might indicate otherwise. Previously Gil (2015) stated that for reduplication, the pause would be shorter because Malay speakers treat reduplicated noun form like a single-word construction. This criterion is supported in Study 1 where I found that L1 Malay speakers tend to have a shorter pause between the first and the second part when reduplicating entities. In Rina's case, although morphologically and contextually *burung* and *kangaroo* tokens are considered reduplication rather than iteration, the existence of the prolonged pause however, makes the tokens resemble iterative utterances in L1 Malay speakers. Possibly, this could be because at age 3;9, reduplication is a newly emerging form in Rina's expression of plurality. Rina is still learning to reduplicate plural entities, which might explain the longer pause in the tokens as well as some other inconsistencies, such as the longer duration in the first part rather than the second part (e.g., *kucing* and *cinderella* at 3;9). In terms of pauses, Table 6.5 summarises the existence of pause between the first part and the second part in all Rina's double tokens.

Table 6.5

The existence of pause in Rina's double tokens from 3;5 to 3;10

| Age | Tokens | Pause? (Yes/No) |
|------|---|--------------------|
| 3;5 | Cow cow | No |
| 3;5 | Pig pig | No |
| 3;5 | Pig pig | Yes |
| 3;6 | Buku buku | No |
| 3;6 | Kangaroo kangaroo | No |
| 3;7 | Bunny bunny | No |
| 3;7 | Rabbit rabbit | Yes |
| 3;7 | Meow baby meow baby | No |
| 3;8 | Toys toys | No |
| 3;8 | Banana banana (reduplicative token) | No |
| 3;8 | Peppa pig peppa pig (reduplicative token) | No |
| 3;9 | Burung burung (reduplicative token) | Yes |
| 3;9 | Kucing kucing (reduplicative token) | Yes |
| 3;9 | Cinderella Cinderella (reduplicative token) | Yes |
| 3;9 | Kangaroo kangaroo (reduplicative token) | Yes |
| 3;10 | Elsa Elsa | No |
| 3;10 | Cinderella Cinderella (reduplicative token) | No |
| 3;10 | Frozen backpack Frozen backpack (reduplicative token) | No |

Now, having discussed the duration of all double nouns in Rina's plural output, I then calculated the ratio of the average of the second part over the first part in Rina's double tokens from 3;5 to 3;10. I also compare Rina's ratio duration with that of the L1 Malay speakers'. This is shown in Figure 6.23.

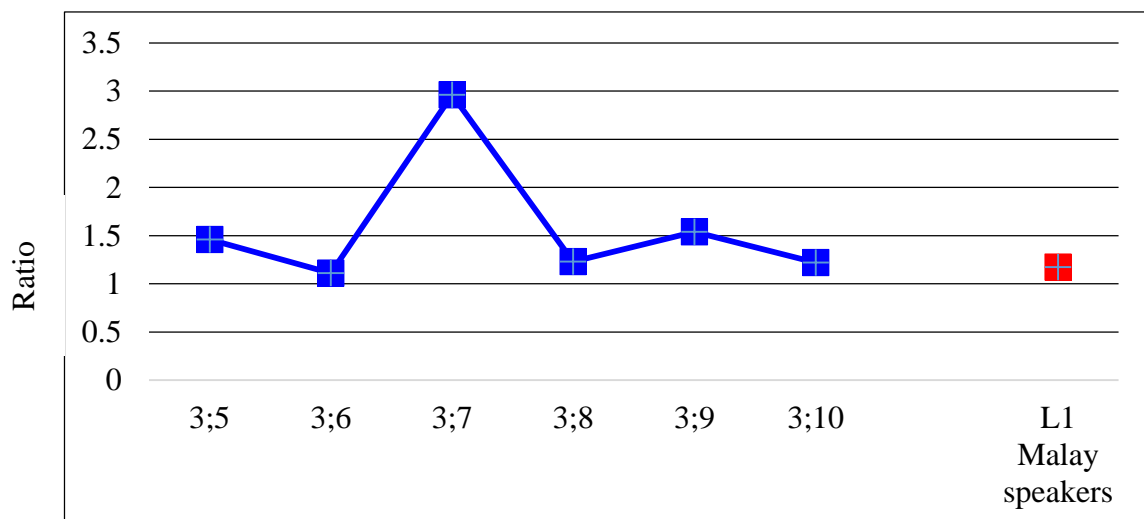


Figure 6.23. Ratio average duration of the second part over the first part in Rina's double tokens compared to L1 Malay speakers.

Based on the ratio, the average duration of Rina's double nouns indeed shows the lengthening on the second part. From 3;5 to 3;10, the ratio is consistently higher than one (which indicates that the second part is longer), and in fact, more pronounced at 3;7 when it shows the highest duration. When I examine the *rabbit* token at 3;7, Rina produces the token longer at the second part as she is emphasizing her utterance. Another discernible pattern that is obvious in this ratio is that though the average duration is variable, the development shows that Rina's duration is getting similar to that of L1 Malay speakers.

Turning now to the fundamental frequencies (F0) of Rina's double outputs at 3;5 to 3;10. In study 1, the result of the acoustic analyses of reduplicative tokens among L1 Malay speakers shows that the third syllable is the most prominent syllable. It needs to be pointed out that all the nouns elicited in study 1 were disyllabic nouns. In Rina's longitudinal corpus, all the double tokens varied with regard to their number of syllables; four tokens were monosyllabic (*cow, pig, pig, toys*), six tokens were disyllabic (*buku, bunny, rabbit, kucing, burung, Elsa*), four tokens were trisyllabic (*kangaroo, banana, Peppa Pig, kangaroo*) and four tokens were four-syllabic (*meow baby, Cinderella, Cinderella, Frozen backpack*).

Therefore, to make a comparable F0 comparison between the output by L1 Malay speakers and Rina's double tokens, I only analysed Rina's disyllabic tokens as I only have information on the reduplicated disyllabic nouns by L1 Malay speakers. The ensuing graphs (Figure 6.24 and 6.25) demonstrate the F0 of Rina's disyllabic tokens:

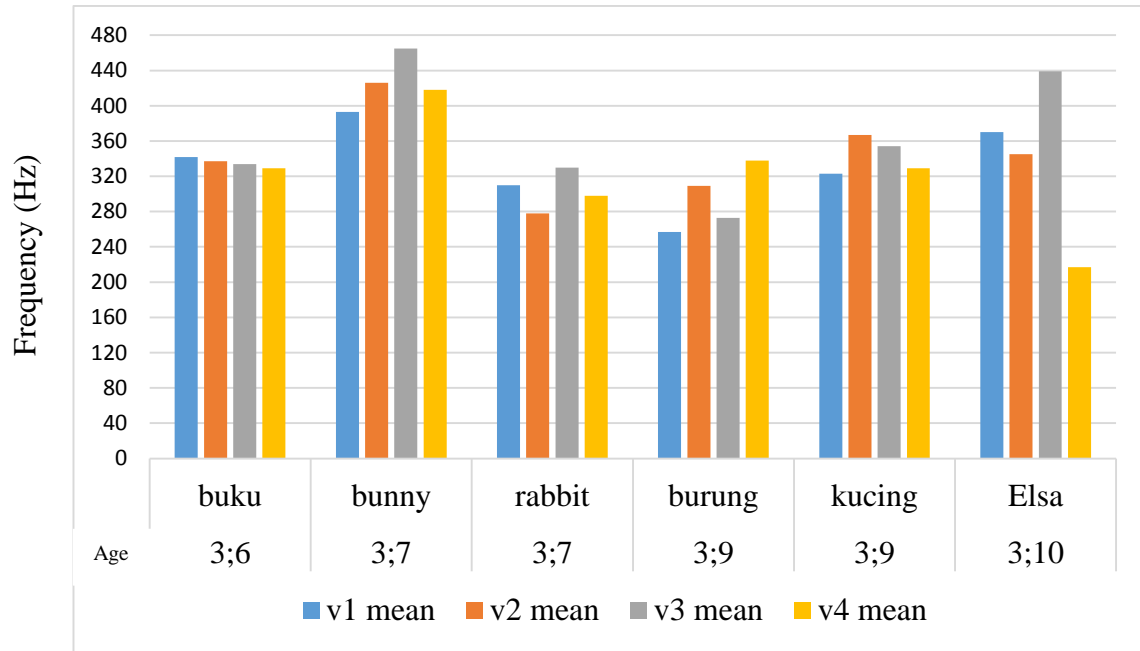


Figure 6.24. Rina's mean F0 for disyllabic tokens.

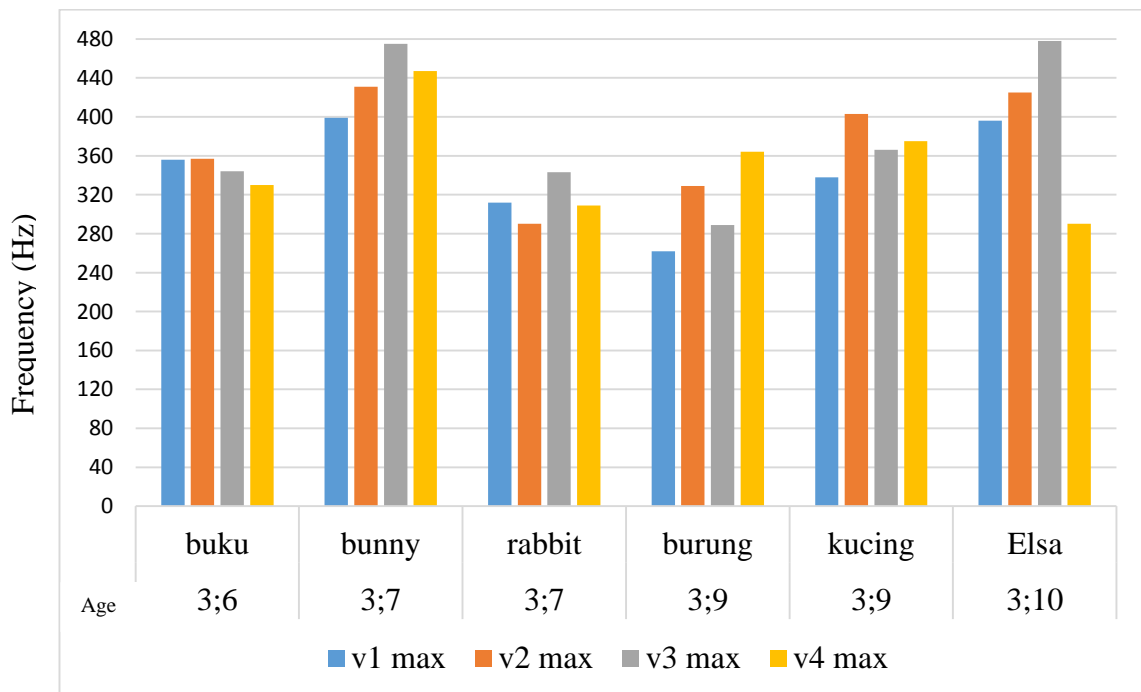


Figure 6.25. Rina's maximum F0 for disyllabic double tokens.

Since there are only six disyllabic tokens, in what follows, I present the Praat spectrogram of each of the token (Figure 6.26-Figure 6.31). The blue dotted lines in the figure is the F0. Each of the token in the figure is divided into its vowels (v1, v2, v3 and v4) and words (e.g. *buku* and *buku*).

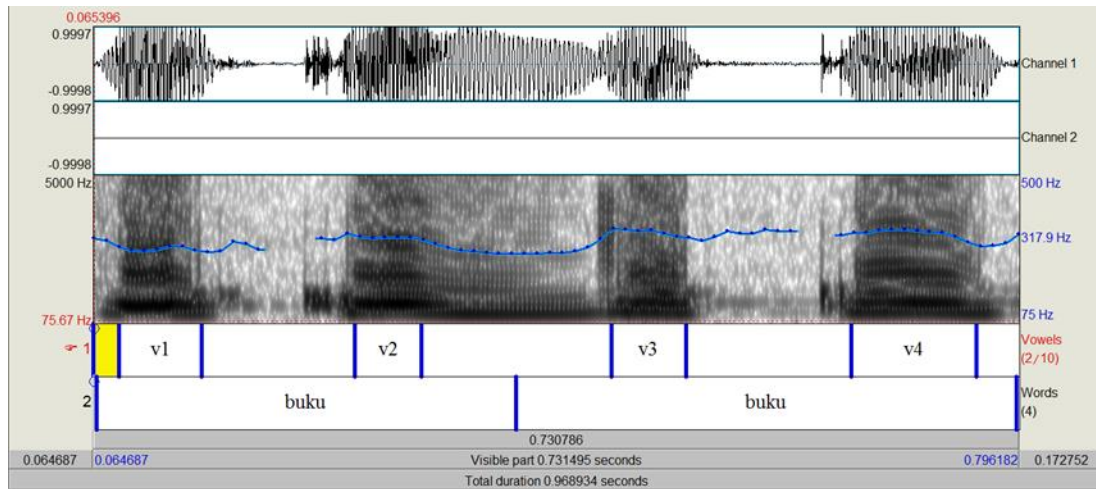


Figure 6.26 Rina's disyllabic token *buku buku* at 3;6

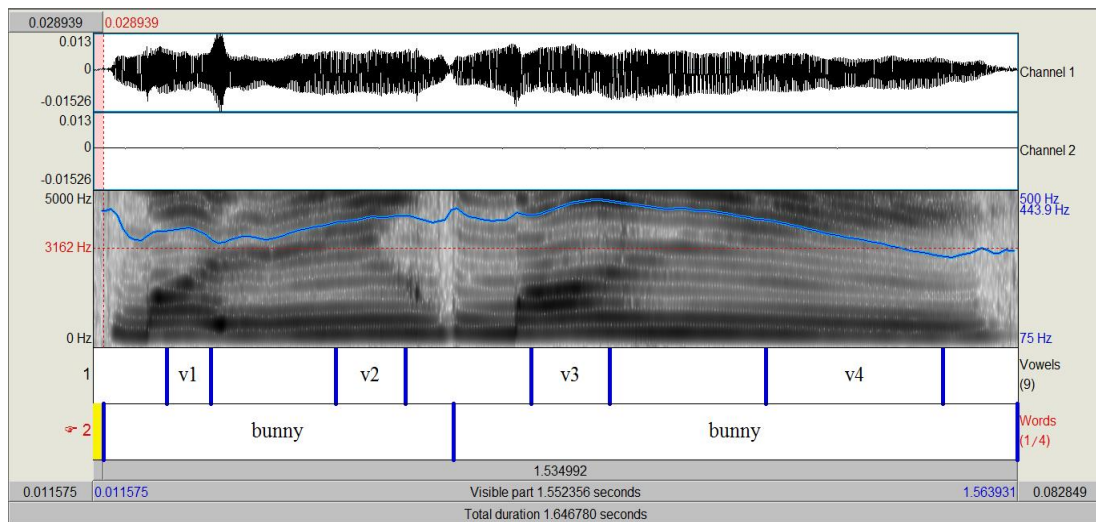


Figure 6.27 Rina's disyllabic token *bunny bunny* at 3;7

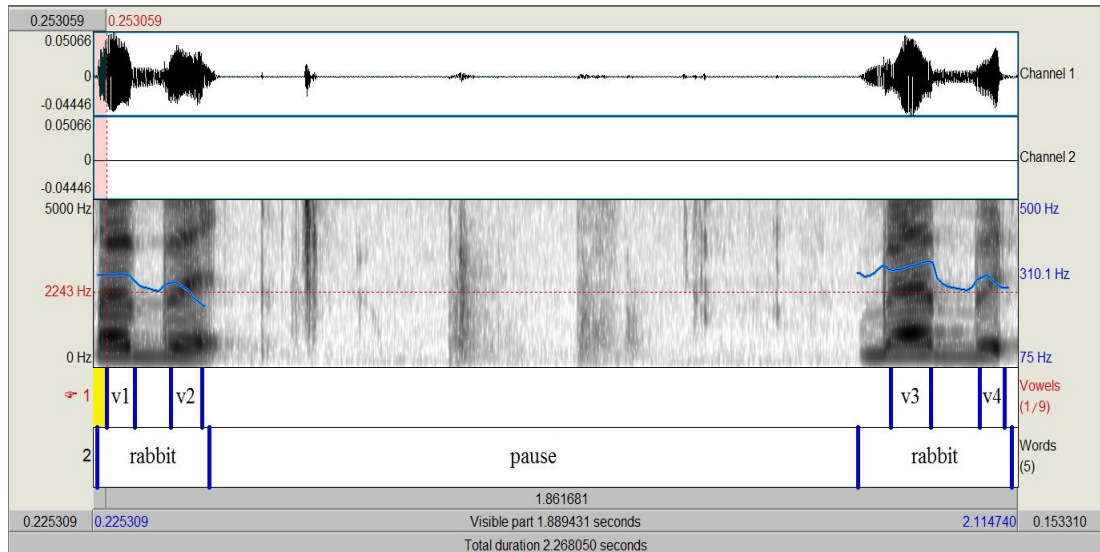


Figure 6.28 Rina's disyllabic token *rabbit rabbit* at 3;7

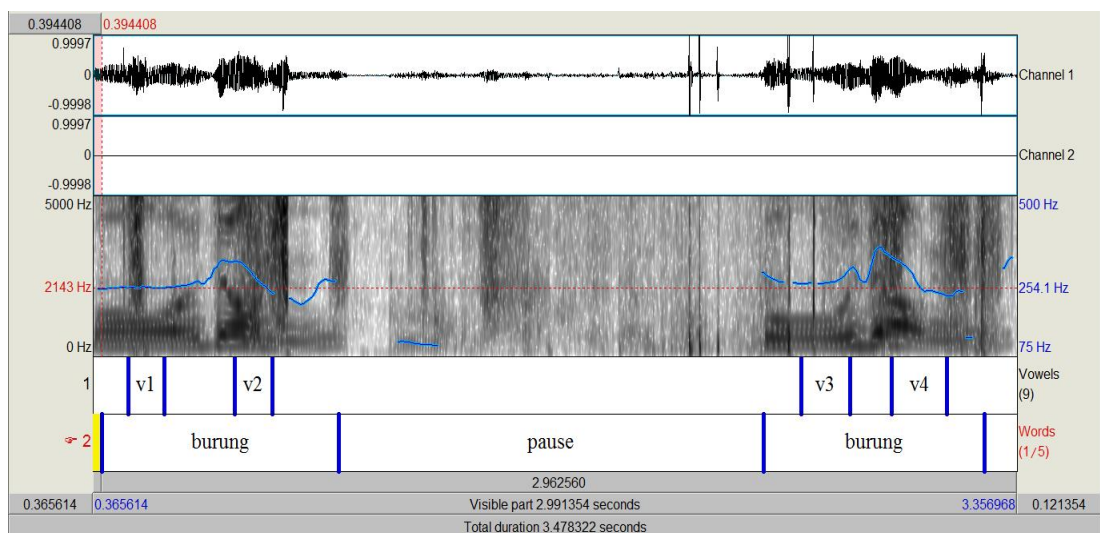


Figure 6.29 Rina's disyllabic token *burung burung* at 3;9

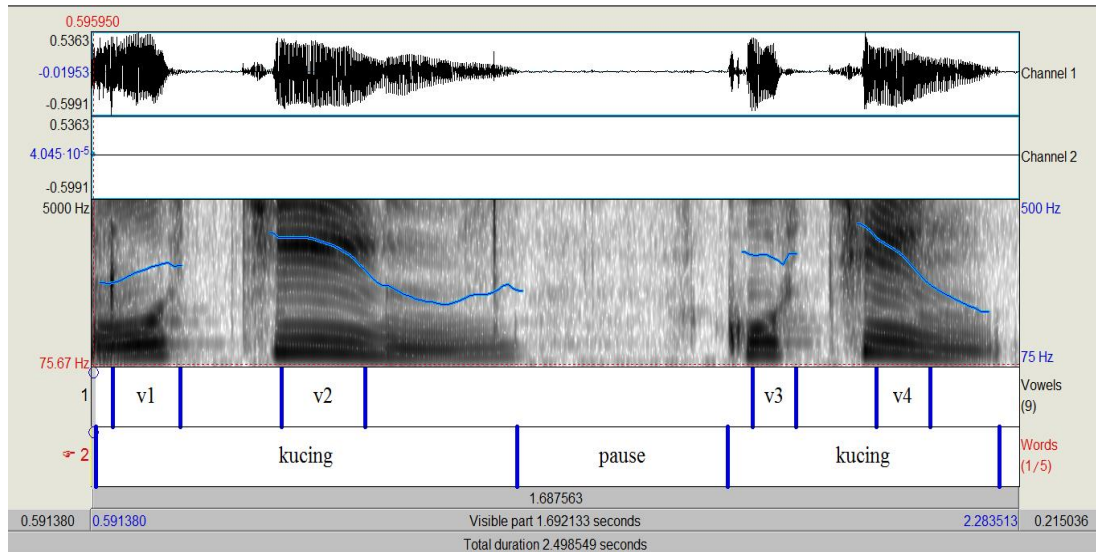


Figure 6.30 Rina’s disyllabic token *kucing kucing* at 3;9

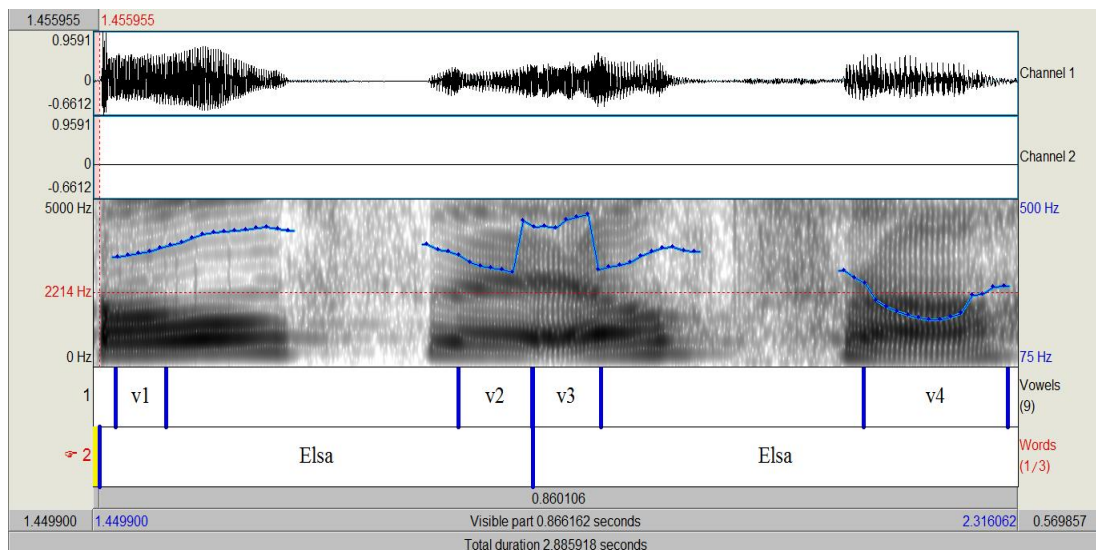


Figure 6.31 Rina’s disyllabic token *Elsa Elsa* at 3;10

The results shown in the figures are variable: in terms of F0, only three tokens (*bunny*, *rabbit* and *Elsa*) demonstrate prominence on the third syllable. Tokens of *burung* ‘bird’ and *kucing* ‘cat’ at 3;9 indicate higher F0 effect on the second syllable instead while *buku* ‘book’ at 3;6 show equal F0 on the first and second syllable. If we look closely at the spectrogram for the token *rabbit* (Figure 6.28), *burung* (Figure 6.29) and *kucing* (Figure 6.30), there are pauses between the first word and the second word. Because of the pause between the words, these tokens resemble the iterative tokens produced by the adults in Study 1. Based on the results, we can see that there is

variability in the production of fundamental frequency as well as the presence of pauses and the length in the above tokens. This is within norm for development. Previously, I calculated the ratio duration of the second part over the first part in Rina's double tokens. For F0, I calculate the ratio mean and maximum of the third syllable over the first syllable in Rina's disyllabic nouns. The ratios are shown in Figure 6.32 and 6.33.

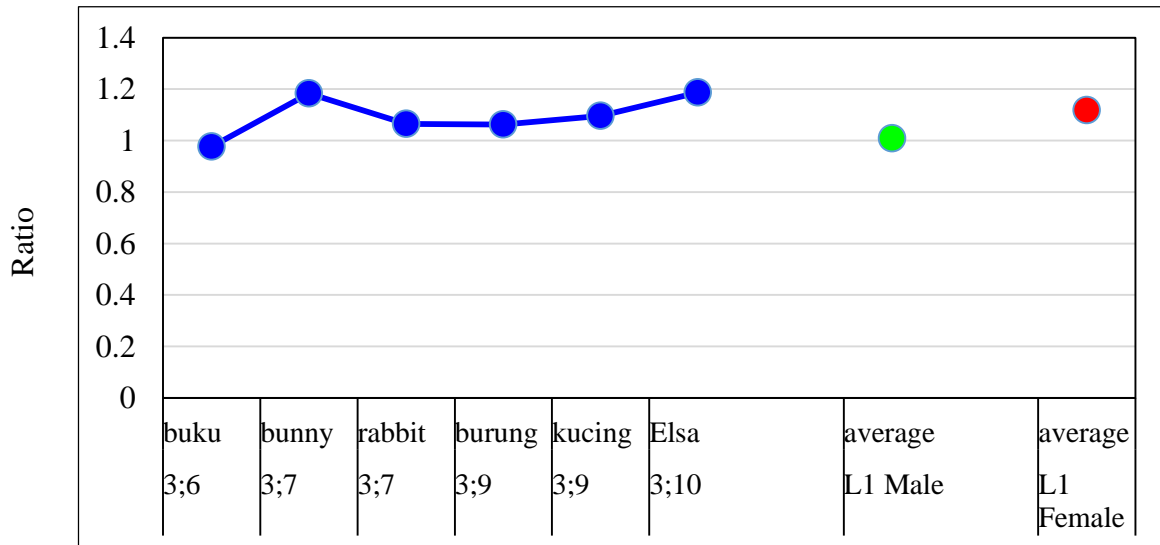


Figure 6.32. Ratio mean F0 of the third syllable over the first syllable in Rina's disyllabic double tokens compared to L1 Malay speakers.

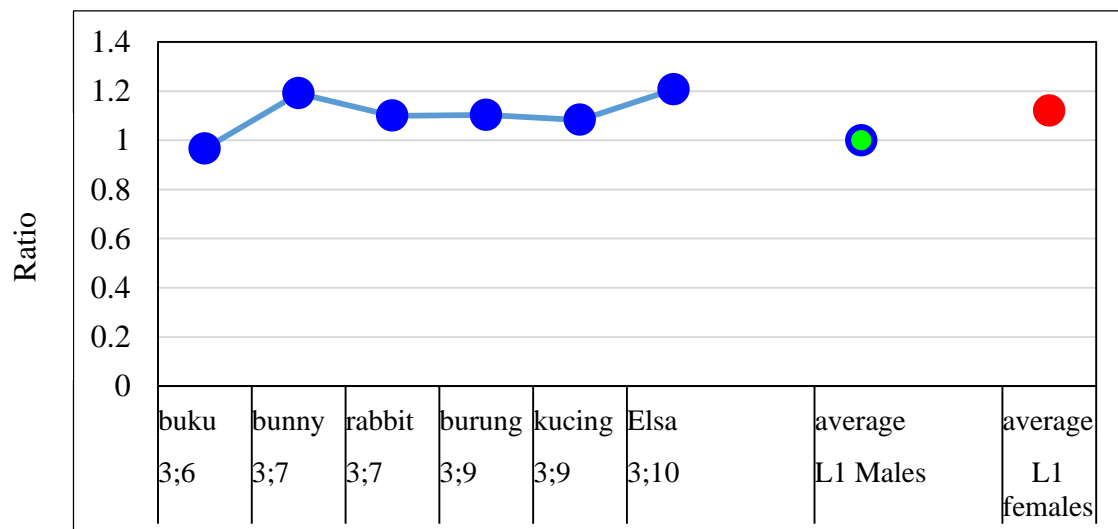


Figure 6.33. Ratio maximum F0 of the third syllable over the first syllable in Rina's disyllabic double tokens compared to L1 Malay speakers.

Based on the ratio, generally most of Rina's disyllabic tokens (except for *buku*) indicate prominence on the third syllable. The findings also show that Rina's ratio mean and maximum F0 of the disyllabic tokens resembles the L1 Malay female speakers than the males. However, there were only six tokens analysed; because of the limited tokens and the variability of the results, it is difficult to generalise and conclude the effect of F0 in Rina's double tokens.

6.4.3 Summary of Rina's prosodic analyses from 3;5 to 3;10. Up to now, I have discussed the prosody of Rina's double tokens from age 3;5 to 3;10. The finding from the acoustic analyses indicates that duration is the primary suprasegmental factor that Rina uses in assigning prominence in her double tokens. Most of the double tokens, both iterative and reduplicative tokens during this period, are produced with longer duration on the second part. With regard to pauses, some reduplicative tokens, (e.g., *burung* and *kangaroo* at age 3;9) are produced with a protracted pause between the first and the second parts; which make them resembles iterative tokens produced by L1 Malay speakers. I also calculated the ratio average duration of Rina's double tokens. The result shows two patterns; firstly, the second part tends to be longer than the first part and Rina's average duration over time (from 3;5 to 3;10), is growing similar to that of L1 Malay speakers.

For the analysis of F0, the limited disyllabic tokens in the corpus make it difficult to compare with L1 Malay speakers' reduplicative utterances. However, the ratio of Rina's disyllabic tokens show that the mean and maximum F0 resembles L1 Malay female speakers. Overall, it is hard to say whether F0 plays a role in the production of iterative and reduplicative utterances.

6.5 Study 3

6.5.1 Introduction. After the longitudinal study (from 2;10 to 3;10), I conducted elicitation sessions with Rina when she is older, at age 4;8. At this age, Rina has moved back to Malaysia for four months. In Malaysia, Rina goes to an English-medium school. At home, Mother speaks English to Rina (MaE), Father speaks Malay and the other family members also interact with Rina in Malay. Unlike in Australia where the dominant community language is English, in Malaysia, the dominant language is Malay. Thus, during the longitudinal study when Rina was living in Australia (from age 2;10 to 3;10), Rina's input exposure was estimated to be 60% in

Australian English and 40% in Malay whereas at age 4;8, her input is estimated to be 55% in Malay and 45% in Malaysian English (see Figure 4.2).

6.5.2 Materials and procedure. Similar to study 1, I designed two elicitation sessions with Rina. I used twelve picture prompts, representing twelve Malay nouns. I printed every prompt on A4 paper in singular and plural forms (see Appendix III). Thus, altogether there were 24 prompts: 12 singular and 12 plural prompts. The recording devices used were Olympus linear PCM audio recorder and Rode microphones. Rina was audio recorded individually in both sessions.

In the first session, Rina is asked to describe the singular and plural prompts, but she is required to use the carrier phrase *saya nampak* ‘I see’ before describing the objects. There are 12 singular and 12 plural prompts. The prompts are arranged in randomised order. In the second session, I ask Rina to describe the pictures without using the carrier phrase *saya nampak* ‘I see’. However, in this session, two single prompts are organised sequentially before the plural prompts. As stated earlier in Study 1, this is done to emulate Rina’s iterative utterances that she produced during the naturalistic study (when she was 2;10 to 3;10). I use 36 prompts in this session: 24 singular and 12 plural prompts. Rina took approximately 15 minutes to complete both sessions.

6.5.3 Acoustic and data analyses. The acoustic analyses of Rina’s utterances were performed using Praat software version 6.0.(Boersma & Weenink, 2016). Firstly, I identify Rina’s single, reduplicative and iterative tokens. Single tokens refer to utterances in which Rina describes a single prompt, reduplicative tokens refer to reduplicated forms Rina produces when describing plural prompts and iterative refers to tokens produced when she describes single objects consecutively.

In total, Rina produces 51 tokens; 12 single, 27 reduplicative, and 12 iterative tokens. The findings in Study 1 showed that duration and fundamental frequency (F0) are the most prominent in the production of reduplication in L1 Malay speakers. Thus, based on this result, I measured the duration of all the tokens, and for F0, I analysed the single, iterative and reduplicative tokens. The data for the duration and F0 was entered in Excel worksheets.

After the acoustic measurement, the data (duration and F0) are converted into descriptive graphs in Excel. I also compare the result of Rina’s tokens with the findings

in Study 1. The subsequent section discusses Rina's production of singular, reduplicative and iterative tokens from the elicitation sessions.

6.5.4 Results. In the elicitation sessions, I found that Rina produced single tokens when describing single prompts, iterative tokens when describing the two single prompts (that I arranged consecutively) and reduplicative tokens when describing plural prompts. However, there is one token in which Rina iterated thrice; instead of *buku buku*, Rina produced *buku buku buku*. Unlike Rina's double tokens in Study 2, all Rina's reduplicative tokens at 4;8 are produced without the pointing gesture. The following table exemplifies Rina's reduplicative tokens produced in the sessions:

Table 6.6

Rina's reduplicative tokens at age 4;8

| Tokens | Prompts | Pointing |
|--|-------------|----------|
| 1. <i>bola bola</i> 'ball ball' | >2 balls | No |
| 2. <i>ikan ikan</i> 'fish fish' | >2 fish | No |
| 3. <i>arnab arnab</i> 'rabbit rabbit' | >2 rabbits | No |
| 4. <i>itik itik</i> 'duck duck' | >2 ducks | No |
| 5. <i>burung burung</i> 'bird bird' | >2 birds | No |
| 6. <i>buku buku</i> 'book book' | >2 books | No |
| 7. <i>ayam ayam</i> 'chicken chicken' | >2 chickens | No |
| 8. <i>lembu lembu</i> 'cow cow' | >2 cows | No |
| 9. <i>anjing anjing</i> 'dog dog' | >2 dogs | No |
| 10. <i>kucing kucing</i> 'cat cat' | >2 cats | No |
| 11. <i>bunga bunga</i> 'flower flower' | >2 flowers | No |
| 12. <i>monyet monyet</i> 'monkey monkey' | >2 monkeys | No |

The result for Rina's average duration for single, reduplicative and iterative tokens are shown in Figure 6.34. In the figure, I also compare Rina's average length of the tokens with L1 Malay speakers. The results show that at 4;8, Rina's average length for single tokens was 803 ms, 1212 ms for reduplicative tokens and 4552 ms for iteration. In general, Rina's duration for all the tokens was longer than the adults; this is possibly because young children's speech rate is slower than adults (Wertzner & Silva, 2009). Nevertheless, it is evident that the child's duration pattern now resembles the L1 speakers.

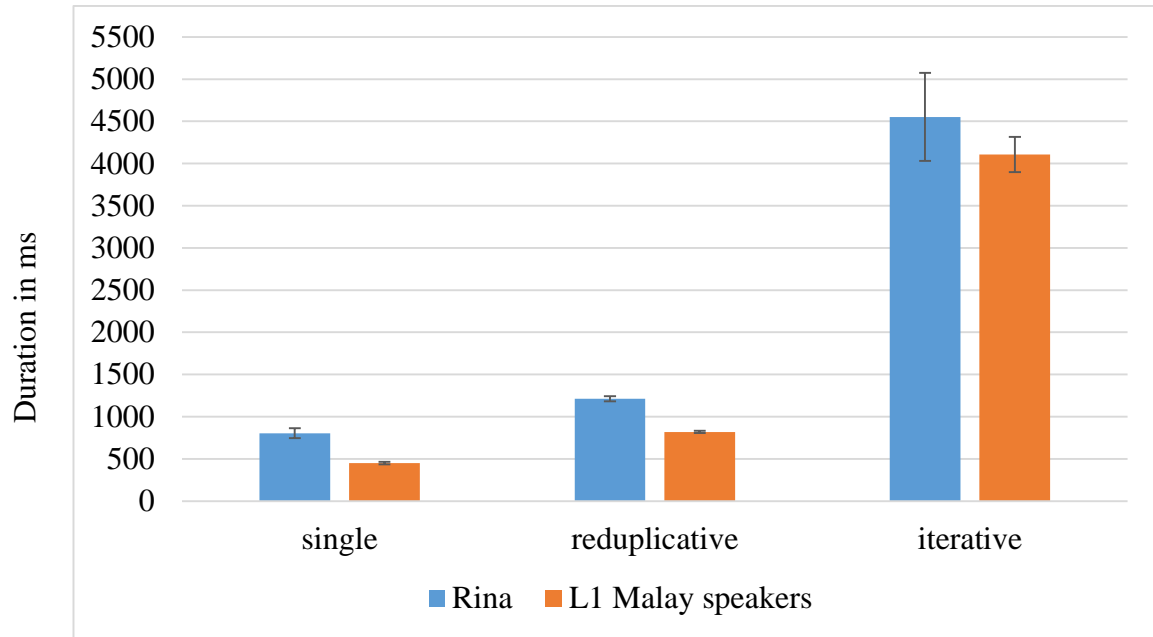


Figure 6.34. Rina’s average duration of single, reduplicative and iterative tokens compared to L1 Malay speakers.

In terms of pauses, based on the visual inspection of the Praat waveform and spectrogram, when producing reduplication, Rina tends to have shorter pause between the first part and the second part in reduplication utterances than iteration. Figure 6.35 and 6.36 illustrate the difference between Rina’s reduplicative token *burung burung* and her iterative utterance *burung burung* at 4;8.

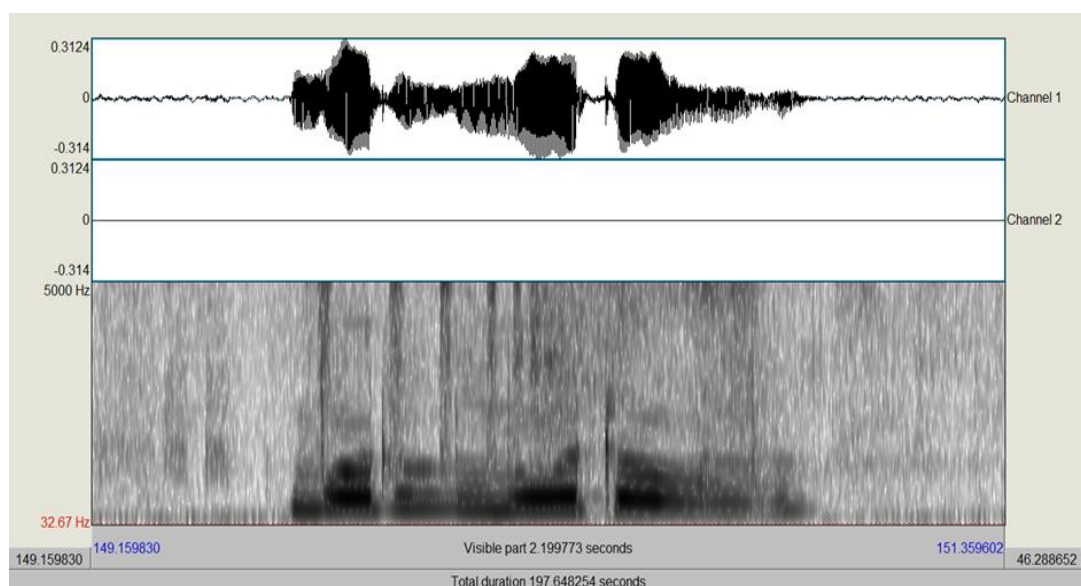


Figure 6.35. Rina’s reduplicative token *burung burung* at 4;8.

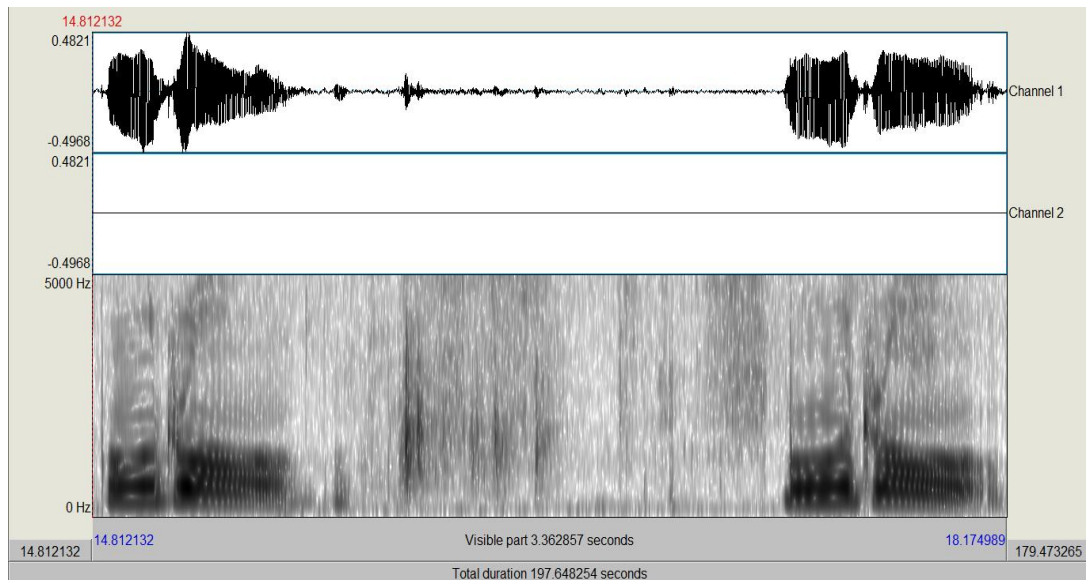


Figure 6.36. Rina’s iterative token *burung burung* at 4;8.

Rina’s average duration of the first part, second part and the pause in iterative tokens are summarised in Figure 6.37. I also compare the average duration with L1 Malay speakers. The findings in Figure 6.37 show that the duration of the first part and the second part of the iteration is longer in Rina’s speech, which support the possibility that Rina’s speech rate is slower than adults. The duration of the pause however, is shorter in Rina’s token than the adults.

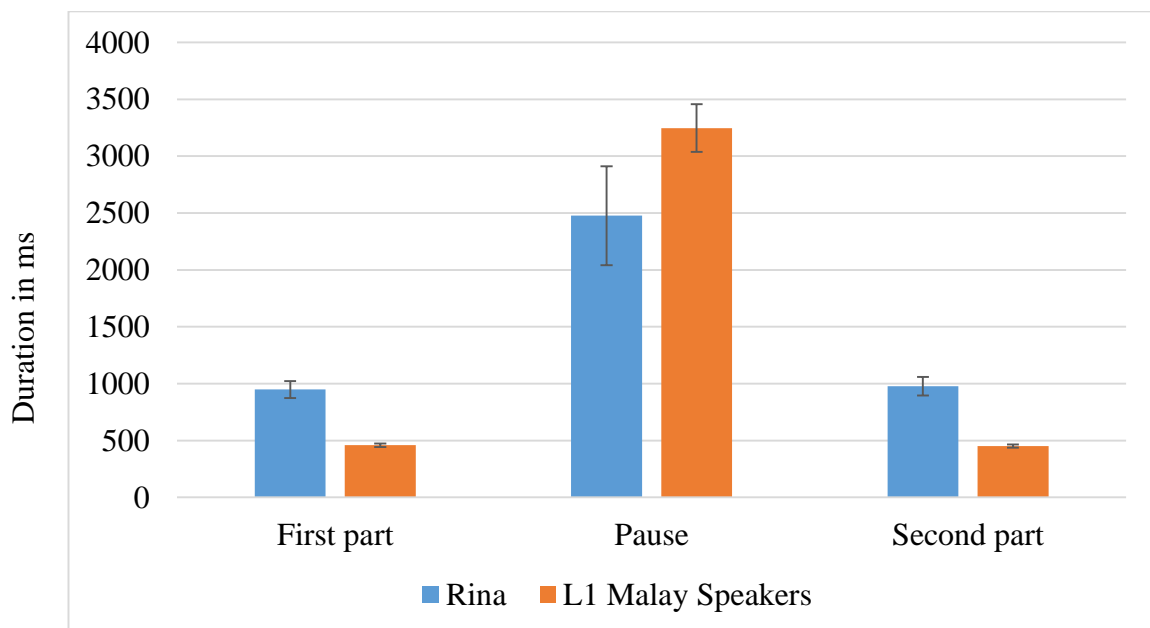


Figure 6.37. Rina’s average duration of the first part, second part and the pause compared to L1 Malay speakers.

Let us turn to the results of Rina's average duration between the first part of the reduplication, *the base* and the second part, *the reduplicant*. In Study 2, I used a more general term, *first part* and *second part* because I was not certain whether the tokens belong to reduplication or iteration. Using the term base and reduplicant would imply that Rina has acquired the reduplicative construction. At 4;8, due to the substantial number of reduplicative tokens that the child produces, I believe that she has acquired the reduplication structure. Figure 6.38 demonstrates Rina's average duration between the base and the reduplicant as well as the comparison with L1 Malay speakers.

The result shows that Rina's duration of the reduplicant is longer than the base. The average duration of the base was 503 ms while the reduplicant was 708 ms. It is interesting to note that the difference between the base and the reduplicant in L1 Malay speakers were subtle but for the child, the lengthening effect of the reduplicant is more evident.

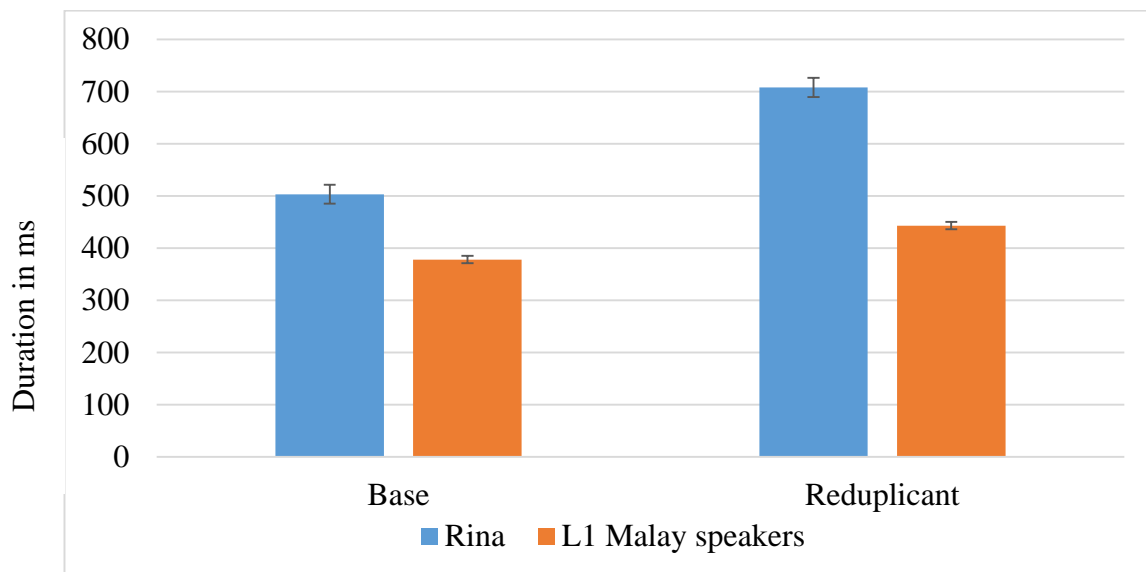


Figure 6.38. Rina's average duration between the base and the reduplicant compared to L1 Malay speakers.

Now, the discussion will shift to the analysis of F0 of the tokens. Figure 6.39 and 6.40 indicate Rina's mean and maximum F0 of single tokens evaluated against the L1 Malay speakers. Overall, Rina's mean and maximum F0 goes down from the first

syllable (v1) to the second syllable (v2), but the drop is more distinct in L1 Malay speakers, particularly the females.

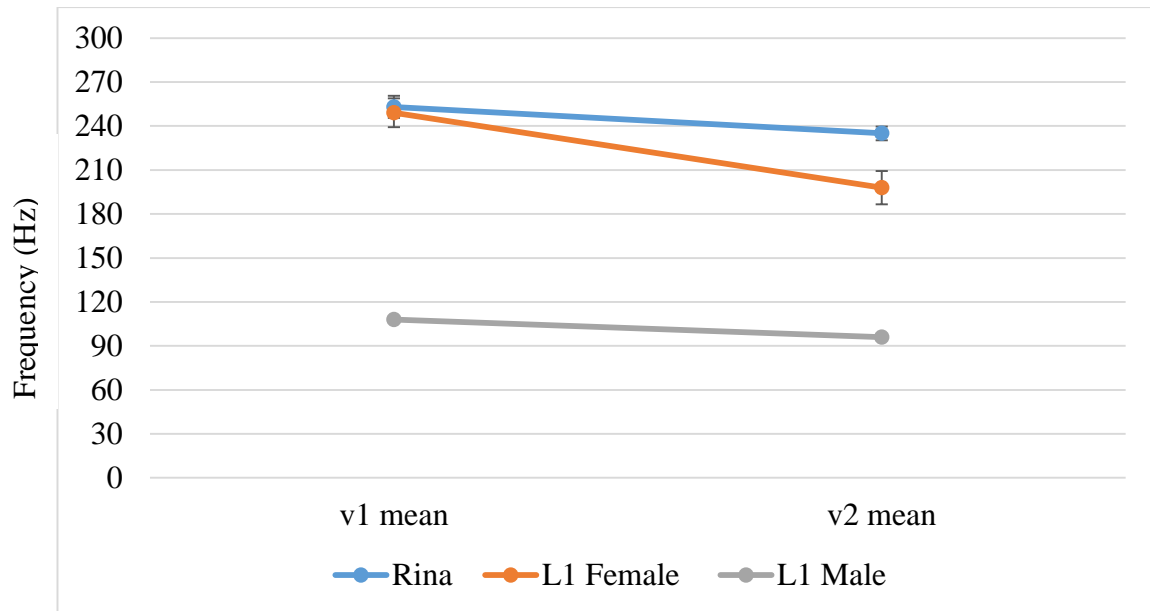


Figure 6.39. Comparison of Rina's mean F0 of single tokens with L1 Malay speakers.

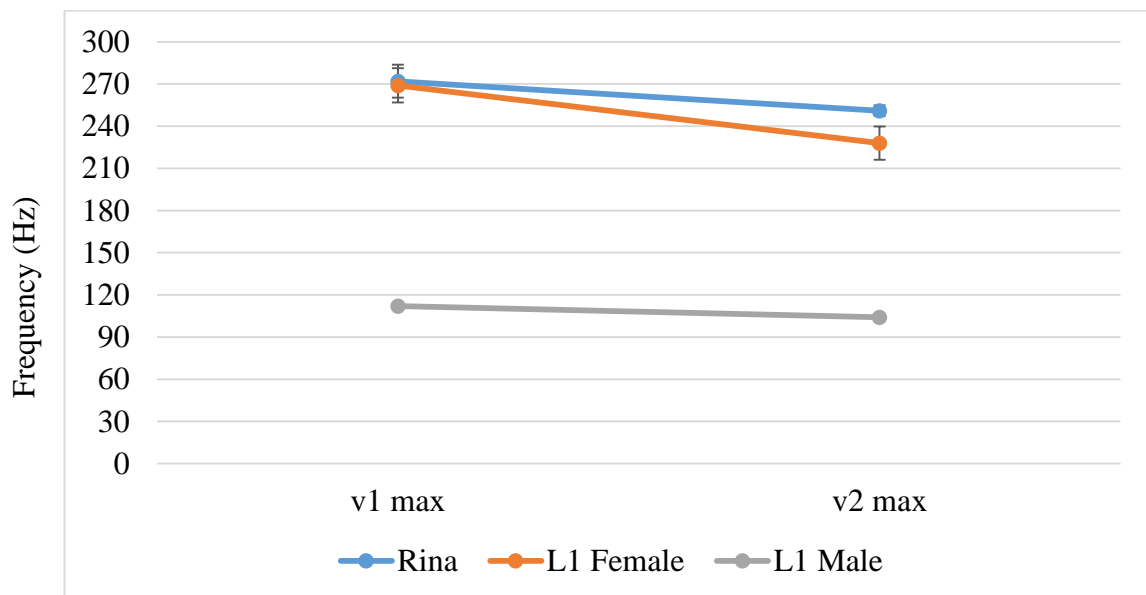


Figure 6.40. Comparison of Rina's maximum F0 for single tokens with L1 Malay speakers.

As mentioned earlier, for L1 Malay speakers, the F0 of disyllabic reduplicative tokens are most prominent in the third syllable. With respect to Rina's mean and

maximum F0 in reduplicative tokens at 4;8, we can see in Figure 6.40 and 6.41 that there is a subtle increase from vowel 1 to vowel 3. The F0 then drops at vowel 4. At 4;8, Rina’s F0 resembles the F0 contours of the L1 Malay speakers. However, similar to single tokens, the rising from vowel 1 to vowel 3 is more distinct in L1 females. Interestingly, Rina’s pattern of F0 is more similar to F0 displayed by L1 males.

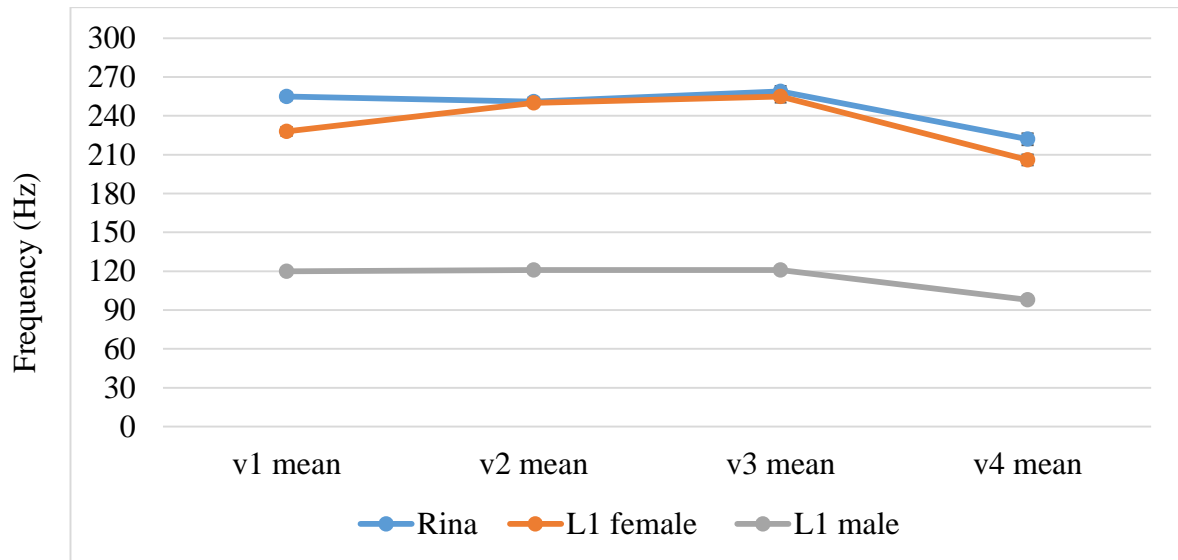


Figure 6.41. Comparison of Rina’s mean F0 for reduplicative tokens with L1 Malay speakers.

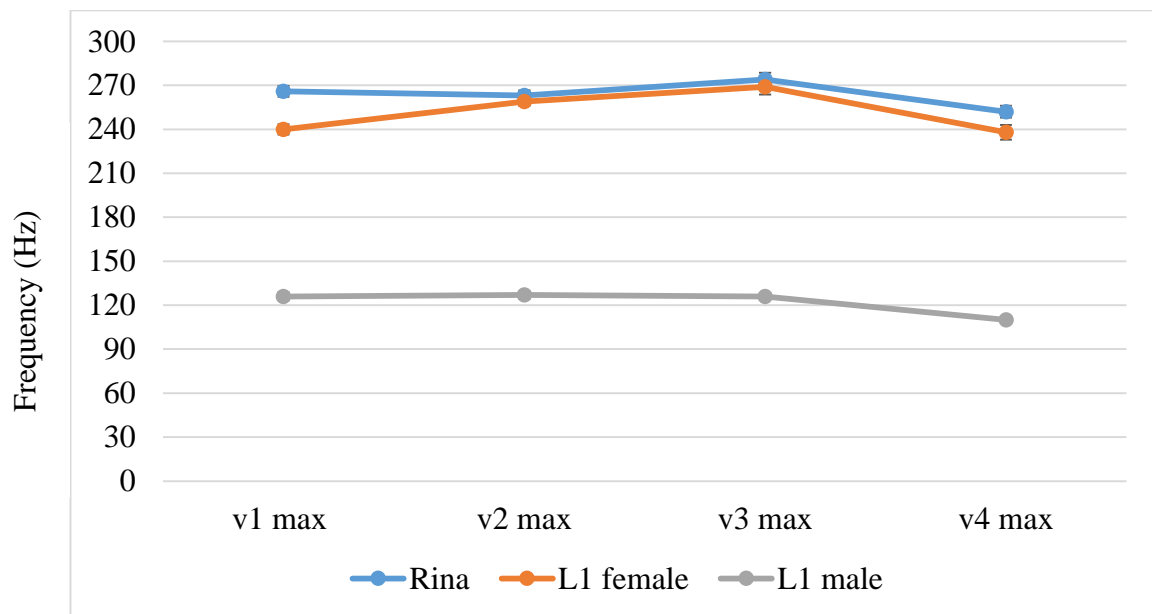


Figure 6.42. Comparison of Rina’s maximum F0 for reduplicative tokens with L1 Malay speakers.

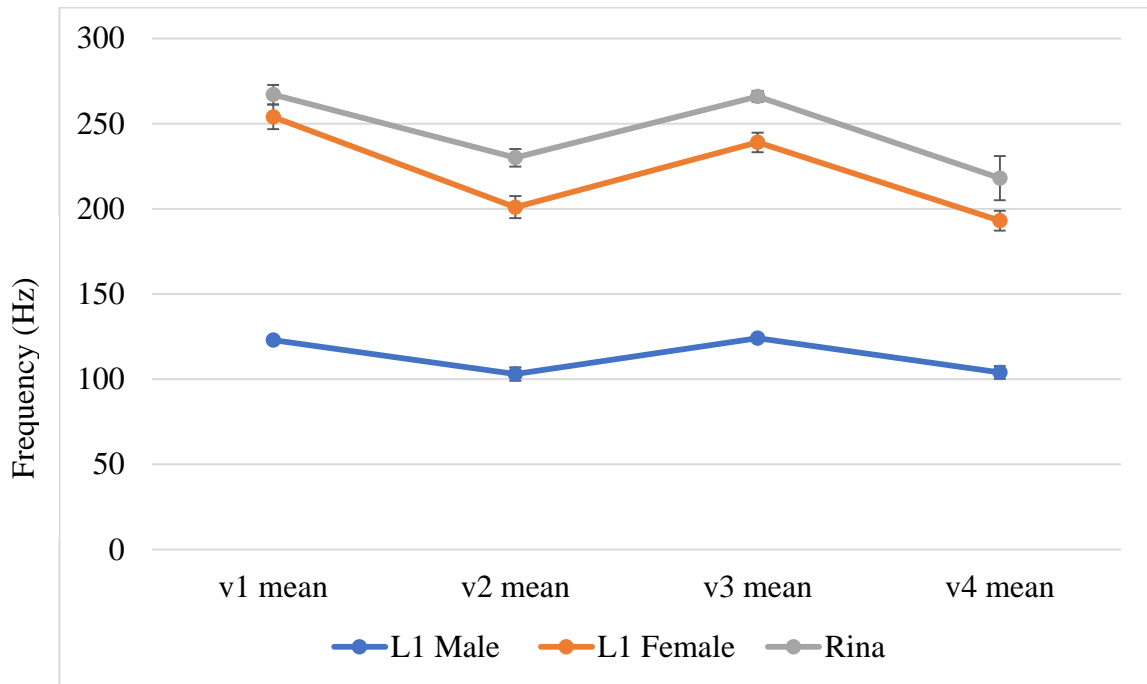


Figure 6.43. Comparison of Rina’s mean F0 for iterative tokens with L1 Malay speakers.

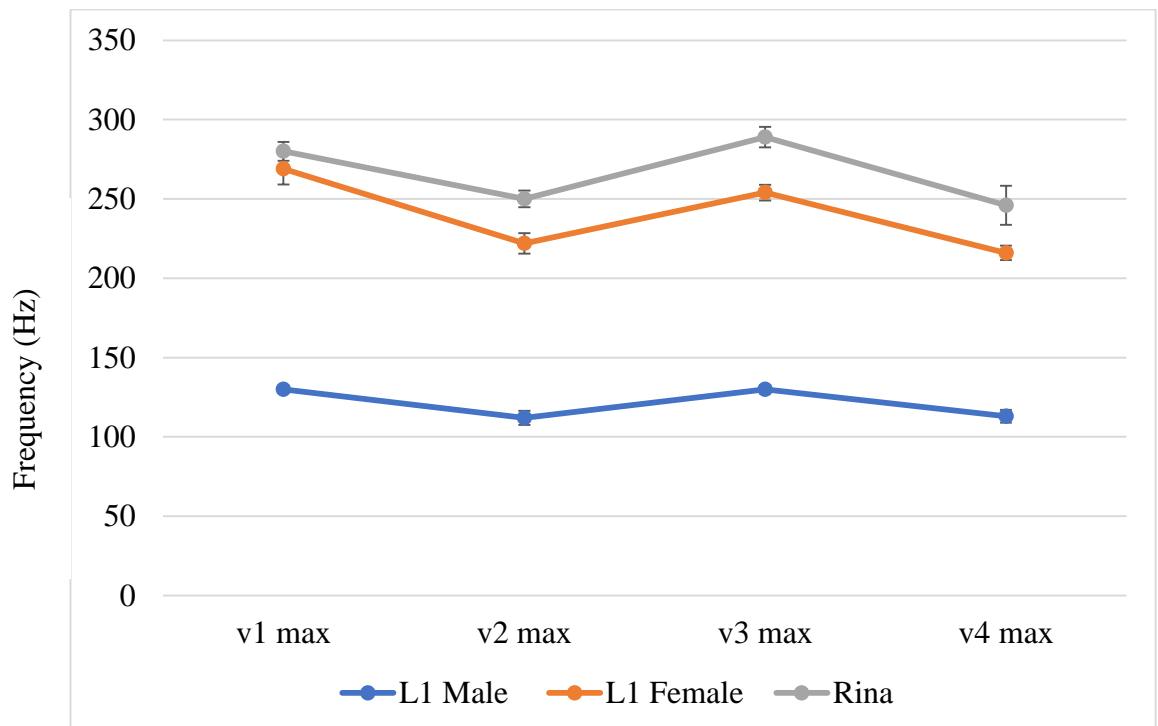


Figure 6.44. Comparison of Rina’s maximum F0 for iterative tokens with L1 Malay speakers.

In Study 1, the F0 of iterative tokens indicate that there are two peaks, consistent with the intonation contours of two prosodic words. In Figure 6.42 and 6.43, I compare Rina's mean and maximum F0 of iterative tokens with L1 adults. Generally, Rina's F0 is higher than the adults but she also shows the same F0 patterns; the prominence are given at the first and the third syllable. So, at 4;8, in terms of prosody, Rina produces similar characteristics of reduplication and iteration to L1 Malay speakers.

6.5.5 Summary. From the acoustic analyses of Rina's reduplicative and iterative tokens, we can see that at this age, at 4;8, Rina has acquired the reduplication construction. This is based on the number of reduplicative tokens she produced (27 tokens) when describing the plural prompts. The findings also suggest that lengthening the duration of the reduplicant is the main prosodic strategy that Rina employed to ascribe prominence. In terms of fundamental frequency, the results show that Rina's F0 in single, iterative and reduplicative tokens has resembled the F0 contours displayed by L1 Malay speakers.

6.6 Summary of the studies

In this chapter, I examined the prosodic production of reduplication and iteration in L1 adult Malay speakers and the child participant, Rina. Prosodic parameters of Malay reduplication are an unexplored area so I could not find any acoustic data to compare to Rina's reduplication utterances. This justifies why I elicited the reduplication utterances from L1 Malay speakers in Study 1. I will summarise the findings based on the research questions raised earlier:

- 1) What are the prosodic patterns of disyllabic nominal reduplication in L1 adult Malay speakers?

In Study 1, the results show that the prosodic characteristics that are important in the production of disyllabic nominal reduplication in Malay are the duration, pausing and the F0. L1 Malay speakers tend to lengthen the duration of the second part of reduplicated words. I also found that the pause between the first and the second word in reduplication utterances is shorter than in iteration. For F0 of reduplication in their speech, the perceptual stress seems to be magnified at the third syllable. While for

iteration, the F0 patterning shows two peaks, which is consistent with two prosodic words.

2) How does the production of disyllabic nominal reduplication in Malay develop prosodically in the child?

The answer to this question is in study 2 and study 3. In study 2, I analysed Rina's iteration and reduplication utterances from the longitudinal study (from 2;10 to 3;10) and compare it to the findings in study 1. In terms of prosody, I found that duration is the primary prosodic parameter that she deployed in assigning prominence in her iteration and reduplication utterances. In these utterances, Rina lengthened the second part of the construction. Over time, from 3;5 to 3;10, Rina's duration show closer resemblance to the L1 Malay speakers. For F0, Rina's disyllabic tokens did show prominence on the third syllable, but overall, because of the limited tokens, it is hard to say whether F0 plays a role in the production of her iterative and reduplicative utterances.

In the third study, I elicit plural utterances from Rina when she is older, at age 4;8. The preponderant production of reduplication to mark plurals at age 4;8 suggest that Rina has acquired the grammatical reduplication construction. When the tokens are analysed on the basis of prosodic features, the results revealed that Rina uses duration on the second part of the reduplicated word to assign prominence. Also, I found that her reduplication utterances at this age resembles the adults in terms of the absence of pause; whereas before (in the longitudinal study) Rina used a protracted pause in her reduplication output, at 4;8 she has clearly distinguished between the iteration and reduplication. Her iteration utterances are also longer in terms of the length of pause between the first and the second word. As for F0, the analysis shows that, similar to L1 Malay speakers, Rina assigns the F0 on the third syllable of the reduplicated noun form. For iterative tokens, two F0 peaks can be found, which is the same with the L1 adults' pattern. Overall findings from study 2 and study 3 indicate that in producing reduplicated tokens, Rina mainly controls the duration to derive perceptually identifiable stress.

CHAPTER 7

DISCUSSION AND CONCLUSION

In this chapter, the results and findings from Chapter 5 and Chapter 6 are discussed. The chapter is organised as follows; Section 7.1 describes the general findings with regard to the major theoretical approaches. 7.2 discusses the relationship between Rina's lexicon size and her grammatical development. The primary focus of this thesis is Rina's plural expressions in Malay and English; section 7.3 then discusses counting and early number concepts in Rina's language development. Following this, section 7.4 discusses the conceptual categories in Rina's plural acquisition. One of the central issues in BFLA is the language separation of the bilingual child; the issue will be discussed at section 7.5. Being a child exposed to two different typological languages, it is unsurprising that there are many cross-linguistic influences in Rina's speech from English to Malay and Malay to English. This is addressed in section 7.6. Throughout the study, we have also seen how the linguistic environment and contexts affect Rina's general language development as well as her plural expressions; this issue will be addressed in section 7.7. I also include the new approach to bilingualism, *translanguaging*, which will be elaborated in section 7.8. The framework used to analyse Rina's morphological development in Chapter 5 is Processability Theory (PT). Section 7.9 elaborates the implications of this study for the development of PT. Rina's plural expressions in Malay and English have been analysed in this thesis in term of its morphological development as well as the prosodic properties. What is the interplay between morphology and prosody in Rina's plural output? This is discussed in section 7.10. The limitations of this study as well as recommendations for future research will be presented in section 7.11. Finally, the overview and summary of the results of this thesis are presented at section 7.12 and 7.13.

7.1 The theoretical approaches

In section 3.1, I discussed the major theoretical approaches in language acquisition. Based on findings in this thesis, I can safely state that the results of Rina's language development in Malay and English are consistent with the emergentist theoretical approach. Rina acquired the linguistic structures in both languages gradually. It does not just appear instantaneously, and it is not definitely innate from birth, as proposed by the nativists. The linguistic structures that she gradually acquires

are cumulative in nature; she begins with the lexical items of each language, then develops the morphology and then at a certain stage, the grammar develops. The cumulative nature of Rina's language development will be further illustrated in her development of lexicon and grammar in each language. This is discussed in the following section.

7.2 Lexicon and grammar

In section 5.3, I analysed Rina's lexical development throughout the study. Based on Rina's MLU and lexical development throughout the longitudinal investigation (from 2;10 to 3;10), there are several important observations; firstly, the lexicon is the driving force of her grammatical development. This is evident especially in her English development. In the beginning, at age 2;10, when her total word tokens in English were less than 100 words, word combination and verb morphology were non-existent. However, when she acquired more words at 3;6, significant improvement can be seen; she combined words, produced inflections and the sentence complexity also markedly increased. Thus, the findings lend further support for the critical mass hypothesis that "grammar is an inherent part of the lexicon" (Bates and Goodman, 1999, p. 53). Also, Rina's lexical development also show that grammar is driven by her lexicon size, hence providing evidence for the lexicalist theories such as the Lexical Functional Grammar (Bresnan, 2001). So, grammar eventually develops when Rina acquires more words from each language. This indicates the cumulative nature of children's language development and further support the emergentists proposal.

Another important observation other than her lexical-grammatical development is the influence of the 'dominant' language throughout the development. Studies investigating the relationship of bilingual's lexicon and grammar show that the link only hold in each language; that is the lexicon affects the grammar of the language, rather than cross-linguistically. However, in Rina's data, what we can see is that when one of the language acquires more words and becomes more linguistically developed, she used the lexical items from this language to her less dominant language. Mixing in Malay contexts corresponds to the increase of English MLU and lexicon size; as she learns new words in English, she used these words when speaking in Malay. When I examined her utterances in Malay contexts after the MLU spurt, it appears that she tends to mix her Malay utterances with English and she also tends to code-switch to English.

At 4;8, a different pattern of development can be observed; Rina has distinguished the two languages and mixing were not found in the recording sessions. She spoke English and Malay in the respective contexts. Whereas in the longitudinal study, the lexical items from the more ‘dominant language’ (i.e. English) occurred in the less dominant language (i.e. Malay), at age 4;8, the lexical items from Malay, which is the environmentally dominant language in Malaysia, did not appear when she speaks English.

7.3 Counting and early number concepts

Studies investigating the acquisition of early number concepts among L1 English children have shown that it is a protracted process for children (see section 3.7.1). With respect to Rina’s early number concept in the longitudinal study, I observed a different developmental progression. The findings indicate that Rina’s counting strategy is commensurate with her overall lexical and grammatical development. At age 2;10 to 3;3, Rina expressed plurals in Malay context primarily by counting and pointing. Readers might recall that when Rina counted the objects, she would often point to the objects as well. Also, she tended to omit the noun referents of the objects. For example, when using counting and pointing, Rina described a picture of many cats as *one two three four five*. At this age, Rina seemed to associate the count-number sequence with plural entities. This strategy continues to be Rina’s highly preferred means to pluralise objects until age 3;4, when she started using iteration to mark plurals in both Malay and English contexts. Interestingly, when I examined her MLU at age 2;10 to 3;3, Rina’s language specific MLU at this age were below 3 (see Figure 5.1). When Rina’s MLU in Malay and English increased, she started using other linguistic strategies to pluralise nouns and counting gradually decreased. Thus, when Rina’s MLU and lexicon size were small, she resorted to counting to pluralise items but as she acquired more words and her grammatical abilities increasingly develop, her reliance on counting sequence to express plurals decreased. This is shown evidently in Figure 5.11.

Being a child raised in Malay and English, there were also instances in the longitudinal corpus in which Rina combined Malay and English counting sequences, for example at age 3;2, Rina produced *satu dua tiga one satu one* ‘one two three one one one’. However, throughout the study, I observed that Rina tended to use English counting sequences in Malay context. This might probably be due to the contexts in which Rina mainly learned the counting sequences; the childcare that she attended

daily. Studies in mathematical competence in bilinguals found very little evidence that there was transfer of number concepts across languages. Bilingual learners were found to have a strong preference for one language when performing arithmetic, preferably the language of the instruction in which they learn the concept (Dehaene, Spelke, Pinel, Stanescu, & Tsivkin, 1999; Spelke & Tsivkin, 2001). In Rina's case, she evidently preferred to use English counting sequence and numerals, as English was the language of instruction at school.

Rina's counting ability is also related to individuation in early word learning. In his article, Bloom (2001) proposed that prior to language acquisition, "infants do have a notion of individual that includes, but is not limited to, whole objects" (p.167). Bloom corroborated his argument with the findings from previous studies; for instance, pre-linguistic infants were found to be able to detect the numerosities of small arrays of linearly arranged dots (Antell & Keating, 1983), arranged household objects (Starkey et al., 1990) as well as computer-generated displays of moving patterns (Van Loosbroek & Smitsman, 1990). This capacity to determine numerosities of sets of small objects in fact, pre-supposes the ability to individuate the entities in a group into distinct objects.

In their article, Clark and Nikitina (2009) raised one important question "does counting and knowledge of numerical sequence play any role in children's acquisition of plural marking in language?" (p.108). Based on Rina's plural development, the findings suggest that her count sequences play a significant role in her initial attempts to mark plurality. Counting is the building block and foundation for Rina to distinguish one versus more than one in Malay and English. For Rina, the developmental progression of plural marking began with counting, followed by the emergent categories she created to mark plurals and then after some time, she began to use the conventional plural expressions in Malay and English. Emergent categories play a major role in highlighting the issue of conceptual development in child language acquisition. Thus, the following section will discuss the conceptual categories in Rina's plural acquisition.

7.4 Conceptual categories in Rina's plural acquisition

In their study, Clark and Nikitina (2009) predicted that prior to producing the conventional plural marking systems, children will attempt to express the notion with a transparent linguistic device such as a numeral plus default form (*two rabbit*), a quantifier plus default form (*more rabbit*) and also iteration of the same noun (*rabbit-*

rabbit). To recap, Clark and Nikitina (2009) termed these occurrences as emergent categories (See 3.7.3). Pertaining to Rina's plural expressions, there are several strategies in her plural expressions that belong to these emergent categories. Rina's use of these structures in expressing plurality support Clark and Nikitina's (2009) that children will look for semantically transparent and compatible forms to express a conceptual distinction. The following are the categories in Rina's plural development that belong to the emergent categories:

7.4.1 Iteration. Beginning at age 3;4, Rina started using iteration predominantly to mark plurals in Malay. Iteration also appeared in English context, though in lower frequencies. In Clark and Nikitina's study (2009) they found six L1 English children, five two-year-olds and one three-year-old, who iterated the default form of the noun as in *hat hat* (for two hats) and *lamp lamp lamp* (for three light bulbs). Interestingly, similar to Rina, their iteration utterances were accompanied by the pointing gesture. However, because the children tested in Clark and Nikitina's study only produced iteration in the cross-sectional study, the length of time the children continued using iteration strategy to identify sets of more-than-one to just one item is unknown. As for Rina, iteration is used from 2;10 up till the end of the longitudinal investigation, at 3;10. Iteration is indeed an iconic strategy in which the nouns are repeated based on the number of objects and in Rina's case, iteration is often paired with her pointing to each of the object in question.

Rina gradually grammaticised the marking of plurality in Malay and beginning at age 3;8, incipient reduplication emerged. When Rina started using reduplication, she also gradually stopped pointing to the object and when she has acquired reduplication at age 4;8, pointing is dropped altogether. This finding is evidence that as the child begins to grammaticise grammatical categories, the reliance on iconic gestures also become lower.

7.4.2 Prolonged vowel. Another iconic emergent category that Rina developed is the prolonged vowel. The prolonged vowel is a strategy in which Rina extended the duration of a vowel in a lexical item to differentiate it from a single item. Unlike iteration, prolonged vowel only occurred sporadically in Rina's corpus. I only found prolonged vowel at certain developmental points in Rina's acquisition; at age 3;0, 3;3, 3;8, 3;9 and 3;10. Nevertheless, prolonged vowel occurred in both Malay and English contexts. Prolonged vowel is also found in English L1 children; Camarata (1988,1990)

found that one normally developing English monolingual child lengthened the duration of a word and increased the F0 to signal plurals. Rina also used this strategy to signify plurals. Thus, Rina's prolonged vowel is a very iconic conceptual category as the longer duration corresponds to more-than-one items.

7.4.3 English quantifiers. Beginning at age 3;8, Rina began to use many English quantifiers when prompted to describe plurals in English context. However, Rina paired the quantifiers with the default form (e.g. *many cat, two cat*). Interestingly, Rina's usage of English quantifier + default form is similar to L1 English-speaking children in Clark and Nikitina's cross-sectional and longitudinal studies (2009). In the cross-sectional study, this strategy is reported to be used by 12 children, two two-year-olds and ten three-year-olds (e.g. *two goose, two cow, two rabbit*). In the longitudinal study, all three children that Clark and Nikitina analysed used two + "bare-stem form" to convey the plurality of the objects. For Rina, the numeral quantifier *dua* 'two' and *two* emerged quite late, which is at age 3;10. When Rina used *dua* and *two*, she used it to mark more-than-one objects. This is evidently indicated in the following conversation when Rina marked all the plural objects with the quantifier *two* in English context (R for Rina and M for Mother);

1. R that's two elephant and two chicken and two duck and two bus and two butterfly and two pencil and two crayon and two orange
M are you sure? that's not two there are many things there
R two two two (Age 3;10)

Similarly, in Malay context, Rina used *dua* to indicate more-than-one objects. There is only one occurrence of Malay numeral quantifier in the longitudinal corpus, and this is shown in the following conversation:

2. M Rina buat apa tu?
Rina do what that?
'What are you doing?'
R Rina nak buat kek
Rina want make cake
'Rina want to bake (a) cake'
M nak buat kek?
want make cake?
'(you) want to bake (a) cake?'
R Nak buat dua kek

want make two cake
 ‘(I) want to bake two cakes’
 (showing many muffin pans) (Age 3;10)

In this context, Rina is referring to a lot of muffins, as she was showing to Mother the many muffin pans. Evidently, at this age, Rina used the numeral *dua* and *two* as a marker of plurality. In a cross-sectional study, Barner, Lui, and Zapf (2012) also found that their participants used *two* 55% of the time when prompted to label sets of two or more objects. However, Barner, Lui, and Zapf stated that *two* is not a plural marker in child language, saying that *two* only occurred when the children were prompted to use numerals. They also interpreted this result by attributing *two* to the most frequent numeral the children heard in their caregivers’ speech (Dehaene & Mehler, 1992).

I found Barner, Lui and Zapf’s interpretation of their findings a bit contradictory as they state “this behaviour is overall very infrequent and is no more likely for two than for other numerals” (p.15). They found that *two* is the highest numerals used by their participants, but they contradict this result, stating that children only used it when asked to, rather than in the naturalistic speech. I assume this have to do with the methodological difference; Barner et al. study is a cross-sectional study, but this study is a longitudinal study and so is that of Clark and Nikitina (2009). On the basis of Rina’s data and Clark and Nikitina’s (2009), I believe that *two* is a form of conceptual category the children developed before they acquire the conventional marking of plurality in the language.

In section 3.7.3, I also discussed the issue of bootstrapping in children’s language acquisition. Among all the variants of bootstrapping theories proposed by linguists, I found the notion of typological bootstrapping, proposed by Slobin (2001), relates to Rina’s plural development. To recap, Slobin states that as children learns the typological characters of the language, the lexicalisation patterns as well as the grammar of the language is established. As a child exposed to two different typological linguistic systems, Rina formulates two different plural marking based on the language contexts; iteration is Rina’s identification of Malay nouns and she assigned iteration as her predominant strategy to express plural in Malay. While for English, her identification of the typological characters of the language is in the use of noun+ suffix *-s*. Throughout the longitudinal study, we can see that gradually, Rina distinguished the lexicalisation pattern and the grammatical structures of Malay and English, which is consistent with the notion of typological bootstrapping.

So far, I have discussed the emergent categories that Rina formulated in her development of the expression of plurality. The following discussion will elaborate on one of the crucial issues in BFLA; the language separation of the bilingual children. I will discuss this with regard to Rina's plural development in the longitudinal study as well as her plural output at 4;8.

7.5 One-versus-two languages in Rina's development

As discussed in section 3.3, a central debate in BFLA has been the issue of language separation. To repeat, do children raised in two languages start with one unitary linguistic feature or do they immediately separate the two different structures from the onset of development?

In the longitudinal study, Rina's morphosyntactic development, particularly in the expression of plurals, indicates that she developed two different plural marking systems in Malay and English. However, the development is not autonomous; in fact, there are bidirectional interactions from English to Malay and Malay to English. For instance, iteration, which the child used to mark plurals predominantly in the Malay context is also strongly used in the English setting (e.g. *cat cat cat, dog dog dog dog*) though in lower frequencies than in Malay given the simultaneous presence of competitors for plural marking in English. Likewise, the plural suffix *-s*, which the child frequently used in the English context, also appears occasionally in the Malay contexts (e.g. *mainans* 'toys,' *kucings* 'cats'). In the longitudinal corpus, there were also high occurrences of code switching, especially in Malay context. Rina tended to produce English lexical items when prompted to describe objects in the recording sessions in Malay.

However, at age 4;8, Rina has adequately distinguished the two languages, at least in terms of the lexical differentiation. In the recording sessions in Malay and English contexts, no occurrences of code switching and mixing can be found. However, when it comes to marking plurals, Rina applies reduplication to express plurality in English. If we look at the developmental progression as proposed by Volterra and Taeschner (1978) (see Table 3.1), it is interesting to note that Rina's plural output at age 4;8 resembles Volterra and Taeschner's second stage; the child developed two lexical systems and applied only one syntactic rule. Rina develops two lexical systems, but in terms of number marking properties, she appears to be using the structure from Malay.

So, returning to the main issue here, is it one or two systems? On the basis of our data, it could be both. The child does distinguish the two plural patterns in Malay and English, but there are also bidirectional interactions from both languages. In the study, the development of number marking in each language is also not instantaneously distinguished. For example, at 3;4 and 3;5, Rina used the same strategy to mark plurals in English and Malay contexts, that is through iteration and default form. She only begins using the suffix *-s* to mark plurals in English at age 3;6, which coincided with her increase in English word types and MLU spurt. Interestingly, when Rina acquires the suffix *-s* in English, she uses the marking not only to the open-class words but also to closed-class as well; hence I found words such as *yets* and *heres*. She also attaches the suffix *-s* to some Malay lexical items such as *mainans* ‘toys’, *kucings* ‘cats’ and *air bawahs* ‘water down’. The data suggests that when Rina acquires a grammatical property from one language, she uses it in both of her developing languages. At 3;8, when she starts using quantifiers in English, she also uses the same strategy (by code-switching to English) in the Malay context. So, we can say that she does not instantly distinguish the two plural systems immediately but rather gradually separate them. However, there are other variables that might have affected her language development. I posit that the use of grammatical properties from English to Malay and Malay to English is the outcome of cross-linguistic influence and the linguistic environment in which the child operates. The following sections will further discuss these issues.

7.6 Cross-linguistic influence in Rina’s plural acquisition

In Rina’s plural acquisition, the most evident CLI in the findings is her occasional use of grammatical number marking properties from English to Malay and Malay to English. During the longitudinal study (from 2;10 to 3;10), there were several CLI categories in Rina’s plural productions; firstly, her use of Malay noun + suffix *-s* in Malay contexts. The reader may recall that at age 3;6 there was an exponential increase of the noun + suffix *-s* constructions (e.g. *cats*, *dogs*) in the English contexts (see Figure 5.16). This strategy also spilled over to the Malay lexical items (e.g. *mainan* ‘a toy’, *kucing* ‘a cat’) with the *-s* plural (e.g. *mainans* ‘toys’, *kucings* ‘cats’) used in the Malay contexts. Some examples from Chapter 5 are presented here to illustrate the CLI phenomenon (M for Mother and R for Rina):

3. R Mommy I want mainans

- Mommy I want toy-S
(pointing to a bucket of toys)
- M Nak mainan-mainan?
want toy-toy?
'Do you want toys?'
- R No, mainans
No, toy-S
(pointing to a bucket of toys) (Age 3;6)

The second example of CLI in Rina's plural expression is the use of iteration in English. During the longitudinal study, iteration is Rina's preferred linguistic means to signify plurals in Malay contexts. However, iteration is also strongly used in the English contexts (e.g. *cat cat cat*, *dog dog dog dog*) though in lower frequencies than in Malay. Another evidence of CLI is at age 4;8. One striking finding at 4;8 is that Rina used Malay number marking category, reduplication, to pluralise nouns in English.

Cummins (2000) states that in BLFA and SLA, children can utilise language skills and knowledge of one language when working in another language. In the findings, we see this phenomenon several times in Rina's plural productions; whenever she acquires a strategy from one language, she would use it in the other language. For example, when she acquires the use of suffix *-s* in English, she applies the strategy to Malay. When she finally acquires Malay reduplication, she uses the same strategy to mark plurals in English. One would argue that Rina used the grammatical property of her dominant language to the less dominant one. However, CLI in Rina's case is exhibited from both directions; from the dominant language to the less dominant and vice versa. When English is more dominant (from age 3;6 onwards), she uses suffix *-s* in Malay contexts but iteration, which is her strategy to pluralise nouns in Malay (the less dominant language), also appears in English context.

Pertaining to Rina's CLI at age 4;8, I interpreted the occurrences (reduplication in English) as the effect of the more 'dominant' linguistic environment. Here, dominant refers to the majority language in the environment, which usually have higher presence and frequency of use compared to the less dominant language (Lanza, 2004; Meisel, 2007). At 4;8, Rina's linguistic environment was higher in Malay than in English, which might explain her use of reduplication in English contexts. The role of linguistic environment will be discussed further in the subsequent section.

7.7 The role of language mode, contexts, and linguistic environment

In Rina's plural acquisition during the longitudinal study, there are many code-switching utterances in Malay contexts. Rina tended to speak in English even when the adult speakers speak in Malay. Upon further examination of the recording contexts (see Table 4.2 and 4.3), Mother, who is a bilingual Malay-English speaker is always present in the recording sessions. Although Mother only speaks Malay to Rina during Malay sessions, the fact that Rina knows the bilingual identity of the Mother might have contributed to the production of code-switching utterances in the Malay contexts. Lanza (2000) states that though adult interlocutors may use one language with the bilingual child, "an indication of comprehension of the other language may contribute to bilingual context" (p.235). This could possibly be in Rina's circumstances; the sociolinguistic factor of the context might have activated the psycholinguistic aspect of the bilingual language mode (Lanza, 2004). Interestingly, although Mother was also present in the English contexts (and at times, she was the one conducting the sessions), Rina did not code-switch to Malay. In fact, in most of the examples presented in Chapter 5, her utterances in English contexts are consistently in English except for some lexicalised items from Malay, such as name of food (e.g. *susu* 'milk', *nasi* 'rice') and kinship terms (e.g. *ayah* 'father', *abang* 'elder brother'). It is possible that during the longitudinal study, Rina is more dominant in English and she has more lexical resources in the language. Thus, for better expressivity, she resorted to using English lexical items.

Let us shift to the role of contexts in Rina's language development. According to Oller (2005), bilingual children learn the lexical items in each language in a distributive nature. Certain words might be acquired in one language and another set in the other language. This notion of distributed characteristic is very evident in Rina's mixing utterances. Some of her mixed utterances in the corpus show the distributive nature of the contexts of the acquisition. For example, at 2;11, Rina produced *cikgu buat painting* 'teacher made (the) painting'. In this instance, Rina mixed the word *painting* in her Malay utterance. The word *painting* appears to be a school-related activity; which suggests that Rina might acquire the word *painting* in her school domain so when she communicates at home, she combines the word *painting* in her Malay-context utterances. Another example is at age 3;9; Rina produces *Rina nak bread and cheese* 'Rina wants bread and cheese'. In the corpus, it is observed that when it comes to requesting for 'Western-style' food items, Rina would simply code switch to English (e.g. *bread, cheese, spaghetti, toast* and so forth) and code switch to

Malay if she wants Malaysian staple food such as *more nasi* ‘more rice’ (age 2;10) and *more laksa* ‘more spicy-noodle-soup’ (age 3;6). Some of Rina’s favourite characters are also learnt in English contexts; for example, the word *princess*. There are many instances in which Rina code-switches to English when referring to specific lexicalised concepts, such as *Rina nak slime* ‘Rina want slime’ (age 3;6) and *Rina nak tengok princess* ‘Rina want (to) watch princess’ (age 3;7). Based on this finding, the contexts in which Rina learns the lexical items in Malay and English are also indicative of cultural specificity. As pointed out by Duranti and Goodwin (1992), language functions in context and as context.

Let us now discuss the influence of the linguistic environment on Rina’s general language development as well as her plural acquisition. While growing up, Rina is exposed to two different English varieties; namely the Malaysian English (MalE), which is spoken by Mother from birth to 1;11 and later on after the age of 1;11, the Australian English (AusE). Previously, when Rina was living in Malaysia, it was reported by the family that Rina did not produce any English utterances, but she understood Mother. This phenomenon is what De Houwer (2009) defines as “early passive bilingualism”; the state in which children raised in two languages understand both languages but produce only one. When Rina starts going to the childcare in Australia at age 2;0, she gradually acquires English, the predominant environmental language and her performance, based on her MLU profile, became higher in English than in Malay (see Figure 5.1). However, the progression for English to become her ‘dominant’ language is not instantaneous; it is not until 3;6 that she begins becoming more dominant in English than in Malay. Rina’s development in these two English varieties supports the pivotal role of the linguistic environment. Thus, the higher the input the child receives from the environment, the faster developing that language becomes. The findings show that in understanding Rina’s language acquisition more thoroughly, it is imperative that we take into account all her linguistic input from the environment and the development of all the languages she is exposed to.

With respect to Rina’s expression of plurality, I would like to focus on her development of reduplication in Malay and explain how the linguistic environment might have influenced her acquisition of reduplication. In the longitudinal study when Rina was living in Australia, reduplication emerged in piecemeal fashion; there were only five tokens of reduplication found in the corpus from 2;10 to 3;10. When Rina started using reduplication at age 3;8 to 3;10, her reduplicated noun forms appeared to resemble iteration in terms of its prosodic features. However, at age 4;8, when Rina

had been living in Malaysia for four months, her numerous production of reduplication in the elicitation sessions to mark plurality suggest that she has acquired the grammatical structure. What is more remarkable about Rina's plural acquisition at 4;8 is that she used reduplication to mark plurals in English context as well. Thus, I posit that because Malay is the dominant language exposed to Rina at 4;8, the daily input she received is higher in Malay so this possibly affects her plural acquisition. She uses the grammatical property of the dominant language to the less dominant one (Malay to English). This is in contrast to the findings in the longitudinal study; she used the plural suffix *-s* and paired it with Malay nouns (e.g. *mainans* 'toys', *kucings* 'cats', *bawahs* 'downs'). So, when residing in Australia, the results show that Rina uses the grammar from the dominant majority language (English) to her less dominant language (Malay) and when living in Malaysia, she uses the grammar from the dominant language (Malay) to the less dominant one (English). To repeat the point before, it is indeed crucial to investigate not just the individual's development of bilingualism but also the linguistic setting in which the bilingual individual lives in (Mohamed Salleh, Kawaguchi, Jones, & Biase, 2016). This finding further boosts the evidence that linguistic environment is one of the most influential variables in the bilingual child's language acquisition.

7.8 Translanguaging, bilingualism, and creativity

In the preceding sections, Rina's mixing and code-switching utterances were discussed from the psycholinguistics (i.e. CLI) and the sociolinguistic perspectives (i.e. language mode, contexts, and environment). The notion of mixing and code switching in these perspectives rest on the assumption that bilinguals manipulate two different linguistic systems. So, when we discuss Rina's linguistic behaviour, the explication has been on the perspectives of linguists or outsiders assessing her speech performance. If we put ourselves in Rina's shoes, the concept of languages in her linguistic repertoire or *mental grammar* is fuzzy; it is plausible to assume that Rina treats her languages as one single system and when she produces them, her speech output is selected based on the sociolinguistic factors of the interaction (interlocutors, subject, etc.). This is the new approach to bilingualism termed as *Translanguaging*.

In this study, the translanguaging phenomenon is evident in Malay context in the longitudinal study (from 2;10 to 3;10). In the Malay context, Rina freely switches to English and Malay as she speaks to Mother at home. Previously, this phenomenon is attributed to the bilingual language mode, but it is also possible that knowing the Mother shares the two languages with her, she deploys all her linguistic repertoire in

the expression of plurality. For example, iteration is Rina's most frequent linguistic strategy to show plurals in Malay. At 3;6, Rina develops another form of iteration; iteration with modifiers, in which she adds the modifiers to describe each of the objects. Hence, when Rina iterates at 3;6, her utterances are accompanied with modifiers to further describe the quality of the object. This strategy interestingly, only occurs in Malay context. I presented some instances from Chapter 5 in which Rina iterates with modifiers (M for mother and R for Rina):

4. M ni apa?
this what?
'what is this?'
R ni princess baby ni Rina baby
this princess baby this Rina baby
'this is a princess baby this is Rina baby' (Age 3;2)
5. M OK Rina yang ini apa?
OK Rina REL this what?
'OK Rina what is this?'
R green green bird green yellow em
M OK
R red red blue red bird orange bird yellow bird green bird blue bird and
green bird
(pointing to each bird in the picture) (Age 3;6)
6. M ni apa Rina?
this what Rina?
'what is this Rina?'
R monkey
M monkey? monyet-lah yang banyak ni apa?
monkey? Monkey-PART REL many this what?
'monkey? it's monyet what about these?'
R baby monkey ayah monkey mommy monkey
baby monkey father monkey mommy monkey
'baby monkey father monkey mommy monkey'
(pointing to each monkey) (Age 3;6)
7. R mommy tengok ni snow white Rina snow white Rina snow white ayah
snow white mommy snow white Rina
mommy look this snow white Rina snow white Rina snow white father
snow white mommy snow white Rina

‘mommy look these (are) snow white Rina snow white Rina snow white
father snow white mommy snow white Rina’ (Age 3;6)

What can be deduced from the examples is that when Rina uses code switching, she optimises all her lexical and structural features of both languages. Also, when mixing the languages, it is evident that her output becomes more creative; the monkeys in example (6) for instance, are assigned familial roles (*baby*, *ayah* ‘father’, *mommy*). The same goes in example (7) where each of the Snow-White picture is given the quality of being a member in Rina’s family. Since Rina more often code-switches in Malay context than in English, the findings also indicate that her plural marking categories are higher in Malay than in English. Some plural categories that I mentioned previously are also reflective of Rina’s greater innovative capacity in marking plurals, such as Malay noun + suffix *-s*, prolonged vowel and so forth. This finding corroborates Kharkhurin & Li Wei’s study (2015); in the study, the authors found that bilinguals who use code-switching often, show higher creative performance than bilinguals who do not use code switching daily. The code-switchers often combine elements from both of their languages effortlessly; hence their speech production is found to be more creative than the non-code switchers.

To summarise, translanguaging offers us a valuable perspective in Rina’s language development; instead of assessing Rina’s plural output from the linguists’ perspective, we now view Rina’s plural output as a creative performance of a child not bounded by the named social construct (the concept of Malay and English language). Now that I have discussed translanguaging, I will proceed with the implication of this study on Processability Theory (PT).

7.9 The implication of this study for Processability Theory (PT)

This is the first empirically tested PT study conducted on one language from the Austronesian family, Malay (of the Malaysian variety). The results for Malay PT sequence, as we have discussed, comply with the universal developmental sequence postulated in PT. These findings give further support on the applicability of PT across languages. The main tenet of PT as proposed by Pienemann (1998), is that language acquisition proceeds incrementally in an orderly manner, constrained by the second language learners’ processing resources. This tenet is also applicable for children acquiring two first languages that are typologically distant, as evidenced by Rina’s plural development in Malay and English.

Rina's acquisitional path in Malay and English, other than confirming the universal PT schedules as well as the specific ones for Malay and English, also contributes towards refining the general theoretical framework by providing evidence for the existence of intrastage sequences within each PT procedure, e.g. iteration in English and Malay plural development.

7.10 The interplay of prosody and morphology

Up until now, I have already addressed Rina's plural acquisition in Malay and English from multiple facets; from the morphosyntactic development, cross-linguistic influence, sociolinguistic factors, translanguaging as well as the applicability of Processability Theory (PT) in her plural acquisition. To gain a comprehensive picture of Rina's plural representation, I further analyse her development in terms of its prosodic characteristics; specifically, I examined her acoustic correlates of iteration and reduplication (see Chapter 6).

Pertaining to Rina's expression of plurality, the interplay of prosody and morphology can be seen in her development of reduplication. Reduplication involves more than a single word, but functionally, it is equivalent to one word plus a marker of plurality. The second added word is the grammatical number marker in Malay. So, in the results in Chapter 6, I found that there are suprasegmental characteristics that distinguish reduplication from simple iterations; namely the pausing, the final syllable duration and the fundamental frequency. Malay L1 speakers deploy all these prosodic properties when producing reduplication. As for Rina, her development of reduplication appears to be in piecemeal fashion during the longitudinal study. When she uses reduplication in the longitudinal study, the only consistent prosodic parameter she uses was the final syllable lengthening. She also uses final syllable lengthening when producing iteration. In discussing the link between prosody and morphological acquisition, Peters (1996) proposed the "Spotlight Hypothesis", in which she states that "Prosody may serve the learner, not only as an aid in segmentation, i.e., in finding boundaries, but also to highlight aspects of morphological structure on which to focus"(p.157). Peters explains that when learning a language, there are too many grammatical morphemes that children have to acquire all at once. So, to reduce this problem and make the acquisition easier, children will focus on those structures that are frequent and perceptually salient. Usually, this includes morphological structure that tends to appear at the end of the utterances or phrases (Slobin, 1973, p.185). With respect to Rina, the finding suggests that the final syllable in her iteration and

reduplication utterances is her ‘spotlight’ and the point in which Rina chooses to assign the prominence.

At age 4;8, Rina has acquired reduplication as a marker of plurality in Malay. When I examine her prosody of reduplication at 4;8, the results show that she has resembled L1 Malay speakers in producing the construction; she used shorter pauses, final-lengthening syllable as well as assigning the pitch stress at the third syllable in her reduplication utterance. The pitch stress is still very subtle, but the final lengthening syllable is longer and more pronounced in Rina’s utterances compared to L1 Malay speakers. The distinction between her iteration and reduplication is clearer at 4;8 when she has acquired all the prosodic properties of reduplication whereas before in the longitudinal study, the distinction between iteration and reduplication is ambiguous because she has yet to acquire the prosodic characteristics of reduplication. This suggests that in the acquisition of the prosodic structures of reduplication, the development is gradual; Rina creates partial and increasingly accurate analyses of the grammatical forms, gradually approaching the conventional adult form.

Previously in the discussion, I posit that Rina’s acquisition of reduplication when she is living in Malaysia at 4;8 is due to the effect of the linguistic environment. The predominant environmental language accelerates her acquisition because of the high frequency of reduplication in the input. Studies investigating children’s prosody also support this notion of frequency in input; in perception studies, infants were found to show sensitivity to the frequency of segments and prosodic mechanisms they hear (Anderson, Morgan, & White, 2003; Roark & Demuth, 2000). Similarly, it is also reported that three-to-five-year-olds’ representation of familiar and highly frequent words is more robust in both perception and production compared to low-frequent words (Edwards, Beckman, & Munson, 2004). Thus, the high frequency of reduplication in the input in Malaysia might contribute to Rina’s acquisition of reduplication as well as its prosodic features.

Prosodic analyses of Rina’s iteration and reduplication utterances also show us that to see the child’s development in a comprehensive way, it is necessary to examine the development from several perspectives. In Chapter 5, it is difficult to distinguish between Rina’s iteration and reduplication strategy as she has yet to acquire the prosodic mechanisms of grammatical reduplication. Contextual properties such as pointing and the items she describes need to be examined further to make the distinction between iteration and reduplication. However, when Rina has started acquiring the prosodic properties of reduplication, the demarcation between iteration

and reduplication is clearer. Thus, it is crucial to analyse the child's language development from several perspectives as it will give us a better understanding of the child's language acquisition strategy.

To summarise, I have discussed all the issues pertinent to Rina's plural development in this thesis. I contended that for a fuller understanding of the language acquisition process of the bilingual child, we should take into consideration the various linguistics and social perspectives. The following section will elaborate on the limitations of the study and some future recommendations for research.

7.11 Limitation of the study and recommendations

This study presented a longitudinal (from 2;10 to 3;10) as well as one complementary investigation (at 4;8) of the development of a single Malay-English bilingual child. Hence, the obvious drawback of this study is the lack of generalisability of the findings as it is based on the experiences of one bilingual subject. However, we have to take into account that research in general is cumulative and the increasing number of case studies provide the opportunity to compare and verify the findings with one another (Qi, 2011). Indeed, most classic studies that have advanced our understanding of bilingualism have been, first and foremost, case studies of individuals in increasingly different linguistic constellations (De Houwer, 1990; Leopold, 1939; Ronjat, 1913, among others). This in itself increases predictability and allows for a moderation of the claim of lack of generalisability.

Further limitations relate to the boundaries imposed by the study itself and its focus on the development of the concept of plurality and its linguistic marking in two languages. Of course, the child would have developed other systems in parallel, to which other studies will make a further contribution.

BFLA studies in Malay-English are still an area that needs further exploration. To generalise the findings obtained here on other Malay-English bilingual children, a large number of informants are needed. Future research investigating the development of these two languages is highly recommended. Malaysia is a multicultural country replete with bilingualism and multilingualism. Studies on bilingual or multilingual children would be beneficial to parents, teachers, and policy-makers so that concerns about these children's language development can be alleviated.

As we have seen, Rina developed iteration, which we interpret as an emergent category deriving from adults' usage of reduplication. However, it is unknown whether this is a form of Rina's individual difference. We need more studies to

investigate if other children raised in Malay environment also develop iteration to mark plurality in the language. For example, it would be beneficial to have a Malay equivalent of Clark and Nikitina's (2009) work on the antecedents of plural marking in English. This would be useful for developmental as well as cross-sectional studies investigating the morphological number marking in Malay.

7.12 Overview of the study

The goal of this study is to examine the development of plurality in a Malay-English bilingual child. Specifically, the goal is to examine the morphological and prosodic development of plural representations in a child exposed to two typologically distant languages, Malay, and English. To achieve this, I carried out a longitudinal as well elicitation sessions from the child participant, Rina. Rina's linguistic environment varied from birth up till age 4;8. The family stayed in Malaysia and moved to Australia and then returned to Malaysia. Thus, it is interesting to observe how Rina develops her language based on the differing contexts and environments. I examined her linguistic development from 2;10 to 3;10 as well at 4;8. In the following section, I summarise the main conclusions of this thesis into the research questions presented in Chapter 4.

7.13 Summary of the results of this thesis

In investigating Rina's acquisition, this thesis has focused on the morphological and prosodic development of Rina's plural expressions. The investigation was guided by three research questions presented in Chapter 4. The first two research questions relate to the area of morphological plural development while the third relate to the prosodic acquisition. In the following, the key findings for the research questions are summarised:

1. Plurality is a conceptual category in many languages, but it is expressed differently in Malay and English. How does a child acquiring these two languages simultaneously develop the lexical and morphological devices to mark plurality? In particular:

a) How does the child develop linguistic expressions of plurality in Malay?

The results indicate that at the beginning of the study (at 2;10), the child uses counting to pluralise nouns in Malay. As her lexical items in both languages continue

to develop, she begins to use numerous linguistic devices to express plurals in Malay. Beginning from 3;4, she uses iteration as her primary strategy to mark plurals in Malay. She continues using iteration predominantly until the end of the longitudinal investigation, at 3;10. The grammatical marking of plurality in Malay, reduplication, emerges at age 3;8. From 3;8 to 3;10, reduplication emerges in piecemeal fashion. There were only five occurrences of reduplication in the corpus of the longitudinal study. The child finally acquires reduplication at age 4;8.

b) How does the child develop linguistic expressions of plurality in English?

For English context, the data begin at age 3;4. From 3;4 to 3;5, the child begins with a low plural output. Further analysis shows that this low occurrence of plurals in English corresponds with her low MLU at that age. However, when her English MLU suddenly increases at age 3;6, the child produces exceptionally high numbers of plural expressions; the most frequent strategy that she adopts for marking plurals in English is the use of suffix-*s* on nouns. This strategy continues from 3;6 to 3;9 when it drops against an increase of the English phrasal quantifiers (e.g. *many cat, two cat*). So, from 3;9 to 3;10, Rina uses mainly the quantifiers to signify plurals in English. At 4;8, interestingly, she uses reduplication when prompted to describe plurals in English context.

c) To what extent does the morphological development of the plurals exhibited by the child in Malay and English followed the sequence of acquisition predicted by the Processability Theory (PT)?

The results of Rina's morphological plural development of both Malay and English follow the universal sequence as proposed by PT. In terms of processing procedures, it is found that Rina acquires the plural marking in each of the two languages in the following sequence; word level > lexical level > phrasal level. This finding lends support to PT's universal applicability to different types of language acquisition (in this case, BFLA) as well as across languages of different typologies (Pienemann, Keßler, & Itani-Adams, 2011).

The second research question is still within the purview of morphological development. Based on the findings in question 1, question 2 concerns the issue of CLI:

2. Based on the findings in question 1, do the plural structures in Malay and English develop independently or do they indicate any interaction? In particular:

a) If cross-linguistic influence occurs in the child's plural encoding development in English and Malay, what is its nature?

Rina developed two systematic differences in marking plurals in each language in the longitudinal study. Although the development is to some extent, separate, there are bidirectional cross-linguistic influences from Malay to English (e.g. use of iteration in English) as well as from English to Malay (the code-switching utterances). At 4;8, Rina does not deploy mixing in her speech; she speaks fully English and Malay based on the respective settings. However, one striking finding is that she uses reduplication, the grammatical Malay plural, to express plurality in both Malay and English.

The final research question relates to the prosodic development in Rina's plural expression. Specifically, acoustic analyses on Rina's iteration and reduplication utterances in the longitudinal study as well as at age 4;8 are performed:

3. a) What are the prosodic patterns of disyllabic nominal reduplication in L1 adult Malay speakers?

Research on the prosody of Malay reduplication is an unexplored area. Thus, to compare Rina's iteration and reduplication utterances, a benchmark is needed. I elicited reduplication from several L1 Malay speakers. The findings show that in producing reduplicated noun form, the prosodic parameters produced are the shorter pausing between the first and the second word in the reduplication construction, longer duration on the final syllable and the pitch stress is magnified at the third syllable.

b) How does the production of disyllabic nominal reduplication in Malay develop prosodically in the child?

Rina acquires the prosodic characteristics of reduplication in a gradual manner. In the longitudinal study, the only prosodic property she produces in her reduplication utterance is the longer duration i.e. the final syllable lengthening. Also, the distinction

between iteration and reduplication during the longitudinal period is ambiguous as Rina has yet to differentiate the prosodic features in her production of iteration and reduplication. However, at 4;8, Rina has resembled the L1 Malay speakers when producing reduplication. The acoustic analyses show that she uses shorter pauses, longer duration and slightly magnified pitch stress at the third syllable. Only when she employs all these prosodic parameters in her reduplication, can we distinguish clearly between her iteration utterance and the grammatical reduplication.

Thus, to conclude, this study investigated the development of plural marking in a bilingual child acquiring English and Malay simultaneously from birth. The child's speech productions in both languages were analysed in terms of the different strategies the child deploys in marking plurality from age 2;10 to 3;10 and 4;8. This study offers a new perspective on morphological development and its interplay with prosody in a bilingual child development. The specific features of plurality in Malay and English and how they develop in the bilingual child are crucial to extend the empirical database and address whether early development shows a unitary language system or separate development in each language within bilingual environments, as well as evaluating cross-linguistic influence in the child's developing languages.

Although this is a study of a single bilingual child, I believe that this research has contributed to the literature of Bilingual First Language Acquisition (BFLA) as well as Processability theory (PT). The findings obtained here have broadened our understanding of the acquisitional process of a child raised in two distinct typological languages and how different variables and different environments influence the child's language development. Hopefully, this study will lead to further research in Malay-English bilingual acquisition.

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APPENDIX I (MLU)

Appendix 1

Rina's MLU development in Malay, English and Mixed utterances from 2;10 to 3;10

| Age | MLU (English) | MLU (Malay) | MLU (mixed) |
|------|---------------|-------------|-------------|
| 2;10 | 1.47 | 1.66 | 2.2 |
| 2;11 | 1.58 | 1.78 | 2.36 |
| 3;0 | 1.65 | 2.01 | 2.38 |
| 3;1 | 1.64 | 2.33 | 1.8 |
| 3;2 | 1.71 | 2.45 | 3.3 |
| 3;3 | 2.14 | 2.76 | 3.58 |
| 3;4 | 2.44 | 3.14 | 3.2 |
| 3;5 | 2 | 3.33 | 3 |
| 3;6 | 3.74 | 3.56 | 3.62 |
| 3;7 | 3.5 | 3.83 | 2.86 |
| 3;8 | 3.62 | 3.81 | 3.2 |
| 3;9 | 3.8 | 3.42 | 3.13 |
| 3;10 | 4.85 | 3.33 | 4.8 |

APPENDIX II (LEXICAL DEVELOPMENT)

Table 10.1

Rina's composition of lexical items at 2;10 in Malay context

| Lexical categories | Type | Percentage | Token | Percentage |
|--------------------------|------|------------|-------|------------|
| Nouns | 10 | 25.6 | 23 | 25.6 |
| Verbs | 4 | 10.3 | 13 | 14.4 |
| Modifiers | 3 | 7.7 | 4 | 4.4 |
| Relational words | 7 | 18.1 | 11 | 12.3 |
| Interjections | 3 | 7.7 | 5 | 5.6 |
| English nouns | 2 | 5.1 | 4 | 4.4 |
| English verbs | 4 | 10.3 | 13 | 14.4 |
| English relational words | 4 | 10.3 | 8 | 8.9 |
| Self-reference | 1 | 2.6 | 8 | 9 |
| Mixed word | 1 | 2.6 | 1 | 1.1 |
| Total | 39 | 100 | 90 | 100 |

Table 10.2

Rina's utterances at 2;10 in Malay context

| Age | Utterances in Malay contexts (the first recorded session) | | |
|------|---|--------------------|---------------------------|
| 2;10 | <i>Kejap</i> | <i>ayah bangun</i> | <i>ayah busuk</i> |
| | <i>Rina makan</i> | <i>more</i> | <i>air</i> |
| | <i>Rina nak</i> | <i>tu air</i> | <i>nak air</i> |
| | <i>beg</i> | <i>lagi</i> | <i>jom</i> |
| | <i>nak agi</i> | <i>opah</i> | <i>tu ball</i> |
| | <i>Rina nak main</i> | <i>timun</i> | <i>ball Rina</i> |
| | <i>habish dah</i> | <i>nasi</i> | <i>teddy Rina</i> |
| | <i>panash</i> | <i>itu air</i> | <i>I touch tu</i> |
| | <i>atash tu</i> | <i>mainan Rina</i> | <i>I touch ni</i> |
| | <i>Rina nak susu</i> | <i>ini mainan</i> | <i>I want main</i> |
| | <i>nak nasi</i> | <i>jom main</i> | <i>my kashoes kashoes</i> |
| | <i>no cikgu</i> | <i>beg Rina</i> | <i>more nasi</i> |
| | <i>more timun</i> | <i>nak tu</i> | <i>Give me mainan</i> |
| | <i>more air</i> | <i>jom</i> | <i>Give me air</i> |
| | <i>ball main</i> | <i>no school</i> | <i>Give me susu</i> |
| | <i>it</i> | <i>jump</i> | <i>no</i> |
| | <i>go away</i> | <i>ball</i> | <i>more</i> |
| | <i>come mommy</i> | <i>bag</i> | <i>down</i> |
| | <i>please</i> | <i>more</i> | <i>gimme</i> |

Table 10.3

Rina's composition of lexical items at age 3;4 in Malay context

| Lexical categories | Type | Percentage | Token | Percentage |
|--------------------------|------|------------|-------|------------|
| Verbs | 38 | 23.6 | 201 | 26.3 |
| Nouns | 28 | 17.4 | 89 | 11.6 |
| Relational words | 23 | 14.1 | 183 | 23.8 |
| Interjections | 17 | 10.5 | 42 | 5.5 |
| Modifiers | 15 | 9.3 | 40 | 5.2 |
| English nouns | 13 | 8 | 73 | 9.6 |
| English numerals | 12 | 7.5 | 41 | 5.4 |
| Numerals | 5 | 3.1 | 31 | 4 |
| English relational words | 4 | 2.5 | 19 | 2.4 |
| English verbs | 3 | 1.9 | 7 | 1 |
| English modifiers | 2 | 1.2 | 14 | 1.8 |
| Self-reference | 1 | 0.6 | 23 | 3 |
| Total | 161 | 100 | 763 | 100 |

Table 10.4

Rina's utterances at 3;4 in Malay context

| Age | Utterances in Malay context | | |
|-----|---|---------------------------------------|--|
| 3;4 | <i>nak main game</i> | <i>nanti Rina tak tak nampak game</i> | <i>one two three four five six seven nine ten twelve thirteen nineteen</i> |
| | <i>olaf ayah</i> | <i>bukan</i> | |
| | <i>my god my god belon</i> | <i>jom main</i> | <i>satu dua dua tiga satu dua tiga</i> |
| | <i>nak nak nak bagi snow white</i> | <i>ni bag</i> | <i>bukan bukan ball lupa</i> |
| | <i>kenapa mommy pergi sana mommy lupa</i> | <i>bag bag</i> | <i>ayah tu apa tu</i> |
| | <i>buku I want buku</i> | <i>frozen</i> | <i>ni ball</i> |
| | <i>buku pula</i> | <i>no no no no main</i> | <i>ball ball ball ball ball ball</i> |
| | <i>ayah meow ayah meow ayah</i> | <i>tu main</i> | <i>bola</i> |
| | <i>tu Rina</i> | <i>bukan apa banyak apa banyak</i> | <i>dekat kerja mommy ada ada kat buku</i> |
| | <i>ni Rina meow</i> | <i>I want</i> | <i>ni snow white</i> |
| | <i>baby miao</i> | <i>banana</i> | <i>snow white snow white snow white snow white snow white snow white</i> |
| | | <i>pisang</i> | <i>snow white snow white</i> |

| Age | Utterances in Malay context | |
|-----|--|--|
| | <i>cat cat cat cat cat cat</i> | |
| | <i>cat</i> | <i>nak banana</i> |
| | | <i>snow white snow white snow white snow white</i> |
| | <i>mommy ni apa baby</i> | <i>bukan pisang banana</i> |
| | <i>baby dia ni nampak baby</i> | <i>apa mommy silap</i> |
| | | <i>kenapa takde kenapa mommy ni princess ana</i> |
| | <i>ni rabbit</i> | <i>ni banana</i> |
| | | <i>one two three four</i> |
| | <i>rabbit rabbit rabbit</i> | <i>ni kangaroo</i> |
| | | <i>one three four five</i> |
| | <i>taknak main rabbit</i> | <i>mommy jatuh</i> |
| | | <i>nak babap meow</i> |
| | <i>bukan ayah ayah sembahyang</i> | <i>tak nak Rina nak apple nak peach</i> |
| | | <i>ayah ayah ayah ni babap ayah</i> |
| | <i>rabbit rabbit rabbit rabbit</i> | <i>ada lagi bukan mommy habis</i> |
| | | <i>boleh babap</i> |
| | <i>ada lagi dah</i> | <i>mommy nak nak nak buka</i> |
| | | <i>I want air</i> |
| | <i>apa mommy buat?</i> | <i>mommy suka kacang?</i> |
| | | <i>mommy gigit Rina takut Rina sejuk</i> |
| | <i>tak tak tak nak kacang nak jilat</i> | <i>suka ni</i> |
| | | <i>Rina buat</i> |
| | <i>mommy jilatkan tak ada kacang manis</i> | <i>sikit je sedikit</i> |
| | | <i>OK ke tak? ada ada</i> |
| | <i>tak suka</i> | <i>no no no buat that</i> |
| | | <i>tu tu buku princess</i> |
| | <i>tu apa tu?</i> | <i>nice I like</i> |
| | | <i>boleh? ala tumpah</i> |
| | <i>tu tu mommy mommy ke?</i> | <i>tu aiskrim coklat</i> |
| | | <i>apa?</i> |
| | <i>Rina tau</i> | <i>aiskrim aiskrim</i> |
| | | <i>Rina habiskan mommy tak tau habis</i> |
| | <i>Rina tak tau kan</i> | <i>mommy tak boleh gigit nanti habis</i> |
| | | <i>habis coklat tu habis</i> |
| | <i>mommy suka gigit</i> | <i>napa buka? tengok tengok</i> |
| | | <i>sini nah</i> |
| | <i>tak ada aiskrim dah</i> | <i>tak boleh buka dah</i> |
| | <i>ada rasa?</i> | <i>taknak? mommy mommy suka?</i> |
| | | <i>kaki ni</i> |
| | <i>nampak ada ada dekat dalam</i> | <i>mana pergi?</i> |
| | | <i>nak tengok</i> |
| | <i>nak buka</i> | <i>ada ke?</i> |
| | | <i>bukan bukan mommy mommy tekan sini</i> |
| | <i>ni Rina buangkan</i> | <i>boleh Rina gigit?</i> |
| | | <i>jatuh takut</i> |

| Age | Utterances in Malay context | | |
|-----|---|---|--|
| | <i>nak telur</i> | <i>bagi Rina nak lagi sikit</i> | <i>napa mommy cakap aiskrim aiskrim aiskrim?</i> |
| | <i>takut habis</i> | <i>Rina nak ambil lagi</i> | <i>duduk dekat dekat kaki ayah</i> |
| | <i>Rina tengok mommy bawakan</i> | <i>ayah dekat rumah tak boleh tengok camne nak tengok</i> | <i>kucing</i> |
| | <i>mommy nak tengok</i> | | <i>apa mommy?</i> |
| | <i>nak tengok kawan</i> | <i>one three four five seven nine ten twelve</i> | <i>Rina tak habis</i> |
| | <i>one three four five</i> | <i>mommy angkat me</i> | <i>dua dua tiga satu dua</i> |
| | <i>one three four five seven nugget nugget nugget nugget nugget nugget nugget nugget nugget</i> | <i>banyaknya satu dua tiga satu tiga tiga nugget nugget nugget nugget</i> | <i>one two three four satu dua tiga empat lima</i> |

Table 10.5

Rina's composition of lexical items at age 3;4 in English context

| Lexical categories | Type | Percentage | Token | Percentage |
|--------------------|------|------------|-------|------------|
| Nouns | 11 | 42.3 | 31 | 60 |
| Relational words | 6 | 23 | 9 | 21 |
| Numerals | 4 | 15.4 | 4 | 7.8 |
| Verbs | 3 | 11.5 | 4 | 7.8 |
| Modifiers | 1 | 3.8 | 1 | 1 |
| Interjections | 1 | 3.8 | 2 | 3 |
| Total | 26 | 100 | 51 | 100 |

Table 10.6

Rina's utterances at 3;4 in English context

| Age | Utterances | |
|-----|---------------------------------|----------------------|
| 3;4 | <i>bag</i> | <i>that's banana</i> |
| | <i>ball ball ball ball ball</i> | <i>wait wait</i> |
| | <i>snow white</i> | <i>banana</i> |
| | <i>princess Ana</i> | <i>more banana</i> |
| | <i>one three four five</i> | <i>more water</i> |
| | | <i>I want apple</i> |

| Age | Utterances |
|-----|---|
| | <i>Rina's wearing my dress princess its not beautiful</i> |
| | <i>I like love heart this one beautiful</i> |
| | <i>Rina wants love heart chocolate cinderella</i> |
| | <i>yes is it over here elephants</i> |
| | <i>one blue one pink one orange one purple one pink heart one red elephant</i> |
| | <i>red is yellow and pink nose elephant</i> |
| | <i>yellow is this is it blues it is showers</i> |
| | <i>blue is it purple too big</i> |
| | <i>pink is it is it purple heart cannot sit in the car</i> |
| | <i>yes is this is it orange red orange red little girls</i> |
| | <i>is it right there whats this</i> |
| | <i>red doh tie red tie is my hey I want story</i> |
| | <i>purple green barbie want story</i> |
| | <i>boats fish fish fish fish fish fish fish fish fish oh yes this is abang Rina plays my princess</i> |
| | <i>I want cookies I cant I cant hear</i> |
| | <i>no is it is it train I cant hear dad</i> |
| | <i>ayah ayah daddy dads go aeroplane lemon</i> |
| | <i>one seven eight nine ten eleven yes its too sour</i> |
| | <i>twelve fifteen seventeen eighteen</i> |
| | <i>orange orange orange orange orange yes the crayon is my</i> |
| | <i>orange orange orange crayon this is crayon pinkie pie</i> |
| | <i>orange orange orange orange pinkie pie book sit I colours</i> |
| | <i>not yet dad yeah it this is pens</i> |
| | <i>no not yet daddys butterfly</i> |
| | <i>one elephant one elephant one one alligator alligator two duck is eat my</i> |
| | <i>bath shower air bawahs my doll eats</i> |
| | <i>look shower air bawah eight chicken</i> |

| Age | Utterances |
|-----|---|
| | <i>yes I do happy birthday</i> |
| | <i>I want I want open it</i> |
| | <i>is it flower</i> |
| | <i>open it</i> |
| | <i>spider up here</i> |
| | <i>ant is it dads</i> |
| | <i>no is it small ones dads</i> |
| | <i>I barbie</i> |
| | <i>is it my cars</i> |
| | <i>I go my sleep now</i> |
| | <i>yes I know</i> |
| | <i>nice water is my heads</i> |
| | <i>six my car dads</i> |
| | <i>no is it is it cars dads</i> |
| | <i>look like daddy heres</i> |
| | <i>yes this one mommy cars</i> |
| | <i>one and two and four and five six seven seven eight and nine</i> |
| | <i>I want jumping</i> |
| | <i>no no no jump here</i> |
| | <i>yes this is my boy</i> |
| | <i>I will go sleep now</i> |
| | <i>hello what your name?</i> |

Table 10.9

Rina's composition of lexical items at 3;6 in Malay context

| Lexical categories | Type | Percentage | Token | Percentage |
|--------------------------|------|------------|-------|------------|
| Verbs | 43 | 19.1 | 187 | 16.4 |
| English nouns | 34 | 15 | 147 | 12.8 |
| Nouns | 29 | 12.8 | 128 | 11.2 |
| English verbs | 24 | 10.6 | 59 | 5.1 |
| Relational words | 25 | 13.6 | 217 | 18.8 |
| English relational words | 16 | 7 | 89 | 7.8 |
| Interjections | 14 | 6.2 | 63 | 5.5 |
| English modifiers | 11 | 4.9 | 47 | 4.1 |
| Modifiers | 10 | 4.4 | 30 | 2.6 |
| English numerals | 9 | 4 | 28 | 2.45 |
| Numerals | 5 | 2.2 | 56 | 4.9 |
| Onomatopoeic | 2 | 0.8 | 43 | 3.8 |
| Self-reference | 1 | 0.4 | 47 | 4.1 |
| Creative words | 1 | 0.4 | 2 | 0.2 |
| Total | 224 | 100 | 1143 | 100 |

Table 10.10

Rina's utterances at 3;6 in Malay context

| Age | Utterances | |
|-----|--|---|
| 3;6 | warna | <i>mommy macam slime mommy</i> |
| | <i>ni crayon ada ada ni ada pen</i> | <i>slime slime</i> |
| | <i>mommy ikut Rina ok</i> | <i>besar</i> |
| | <i>tak nak</i> | <i>belum</i> |
| | <i>ambil colour</i> | <i>warna merah pink</i> |
| | <i>ambil yang besar yang big</i> | <i>Rina nak keluar</i> |
| | <i>Rina nak nak red</i> | <i>nak keluar pensil</i> |
| | <i>jadi apa?</i> | <i>ini crayons</i> |
| | <i>Rina nak nak macam slime air</i> | <i>em this one</i> |
| | <i>mommy mommy hold my hand</i> | <i>apa tu? sama</i> |
| | <i>mommy cepat cepat cepat tepi</i> | <i>Rina nak pink</i> |
| | <i>jatuh</i> | <i>warna blue jatuh</i> |
| | <i>blue ni macam slime air</i> | <i>Rina nak slime nampak tu</i> |
| | <i>mommy mommy mana pergi?</i> | <i>Rina nak playdoh</i> |
| | <i>jom colour</i> | <i>warna blue</i> |
| | <i>Rina nak head kepala dia blue</i> | <i>mommy yes yes yes slime</i> |
| | <i>shower dululah</i> | <i>no slime bukan</i> |
| | <i>fish</i> | <i>slime Rina nak warna blue</i> |
| | <i>spider</i> | <i>love heart and buku</i> |
| | <i>spider spider satu dua</i> | <i>kad kad kad love heart</i> |
| | <i>snake</i> | <i>satu dua tiga empat lima satu dua tiga empat</i> |
| | <i>satu dua empat lima one and two and three</i> | <i>not is it square?</i> |
| | <i>moo</i> | <i>dalam kad ada square</i> |
| | <i>moo pig</i> | <i>Rina dah tulis</i> |

| Age | Utterances | |
|-----|--|--|
| | <i>pig pig pig pig</i> | <i>kejap bagi Rina kemas</i> |
| | <i>cow</i> | <i>ni black colour</i> |
| | <i>cow cow</i> | <i>here is mommy frog</i> |
| | <i>mommy mommy anjing suka moo?</i> | <i>buku buku buku Rina nak satu dua tiga empat</i> |
| | <i>woof woof woof woof</i> | <i>lima satu dua tiga empat lima satu dua tiga empat lima satu dua tiga empat lima</i> |
| | <i>belle belle belle belle belle</i> | <i>dah tak cantik dah</i> |
| | <i>doctors butterfly hello kitty and air hello kitty</i> | <i>pink?</i> |
| | <i>air air hello kitty butterfly hello kitty doctor</i> | <i>nampak kasut</i> |
| | <i>hello kitty air air hello kitty</i> | <i>pecah?</i> |
| | <i>hello kitty tidur hello kitty air hello kitty</i> | <i>no no this nak</i> |
| | <i>hello kitty doctors hello kitty hello kitty</i> | <i>mommy mommy kenapa ambil gambar</i> |
| | <i>butterfly hello kitty air hello kitty air dah</i> | <i>one and three and four and five six seven eight nine</i> |
| | <i>peppa pig</i> | <i>I see ribbon</i> |
| | <i>peppa pig peppa pig peppa pig peppa pig peppa pig peppa pig peppa pig</i> | <i>it is toing toing toing</i> |
| | <i>quack quack</i> | <i>this is one and three and four</i> |
| | <i>macam yellow</i> | <i>mommy mommy mana mana ulat ambil</i> |
| | <i>satu satu dua tiga empat lima satu dua tiga empat lima</i> | <i>bau bau bau mainan</i> |
| | <i>quack quack quack quack quack quack quack quack quack quack quack quack quack quack quack</i> | <i>pasal apa mata white?</i> |
| | <i>buku buku red</i> | <i>macam macam whites</i> |
| | <i>woof woof</i> | <i>napa napa macam whites</i> |
| | <i>em book green book purple book blue</i> | <i>belum kejap kejap Rina ambil cars</i> |
| | <i>book brown</i> | <i>cars</i> |
| | <i>book</i> | <i>cars cars cars cars cars cars</i> |
| | <i>book blue book green book</i> | <i>nak nak nak ambil ni?</i> |
| | <i>orange book yellow book</i> | <i>em black and and car</i> |
| | | <i>ni black</i> |

| Age | Utterances |
|-----|---|
| | <i>book orange book and red</i> |
| | <i>woof woof</i> |
| | <i>dog baby dog woof woof</i> |
| | <i>kangaroo kangaroo jump jump</i> |
| | <i>anjing anjing anjing anjing anjing anjing anjing anjing</i> |
| | <i>woof woof anjing anjing eii</i> |
| | <i>standup</i> |
| | <i>kuda tak nak standup</i> |
| | <i>ini ini tak nak apa tu?</i> |
| | <i>Itu itu jatuh</i> |
| | <i>kuda mommy kuda ayah kuda Rina</i> |
| | <i>mommy tu tu apa tu?</i> |
| | <i>penguin penguin penguin</i> |
| | <i>monkey</i> |
| | <i>baby monkey ayah monkey mommy monkey</i> |
| | <i>OK it's gone</i> |
| | <i>is it belle</i> |
| | <i>is it cow moo</i> |
| | <i>cow cow cow cow</i> |
| | <i>I wanna play cars</i> |
| | <i>nak main cars</i> |
| | <i>mommy I want this one I want I want this one</i> |
| | <i>Rina punya hello kitty</i> |
| | <i>mommy mommy pergi ambil monsters</i> |
| | <i>satu dua tiga</i> |
| | <i>ariel mermaid ariel mermaid ariel mermaid ariel mermaid ariel mermaid</i> |
| | <i>bird colour</i> |
| | <i>bird bird and colour</i> |
| | <i>cinderella pula</i> |
| | <i>cinderella</i> |
| | <i>green green bird green yellow em</i> |
| | <i>green</i> |
| | <i>red red blue red bird orange bird yellow bird green bird blue bird and green bird</i> |
| | <i>buku red</i> |
| | <i>meow</i> |
| | <i>meow meow meow meow meow meow ayah meow mommy meow meow meow baby meow mommy meow ayah meow mommy meow baby meow ayah meow baby meow meow and baby</i> |
| | <i>Rina nak susun kereta</i> |
| | <i>Mommy Rina nak black mommy nak apa?</i> |
| | <i>mommy nak warna warna mommy nak warna sand?</i> |
| | <i>Rina nak cari car</i> |
| | <i>nak cari cars</i> |
| | <i>mermaid tak cantik tak pakai baju</i> |
| | <i>jumping</i> |
| | <i>give me hi five</i> |
| | <i>monsters monsters</i> |
| | <i>satu dua</i> |
| | <i>mana mana pergi oh ni lah</i> |

Table 10.11

Rina's composition of lexical items at 3;10 in English context

| Lexical categories | Type | Percentage | Token | Percentage |
|---------------------|------|------------|-------|------------|
| Nouns | 59 | 38 | 130 | 24.6 |
| Relational words | 42 | 28.5 | 222 | 41.9 |
| Verbs | 22 | 14 | 50 | 9.4 |
| Modifiers | 12 | 7.6 | 24 | 4.5 |
| Numerals | 11 | 7 | 84 | 16 |
| Interjections | 6 | 3.8 | 15 | 2.8 |
| Malay kinship terms | 1 | 0.6 | 2 | 0.4 |
| Malay nouns | 1 | 0.6 | 1 | 0.2 |
| Total | 157 | 100 | 528 | 100 |

Table 10.12

Rina's utterances at 3;10 in English context

| Age | Utterances |
|------|---|
| 3;10 | <i>I I not clean yet</i> <i>wait I not be clean yet</i> |
| | <i>I put this one this one this one now I put this one</i> <i>its its too messy</i> |
| | <i>be careful</i> <i>I I not yet not yet frog</i> |
| | <i>I got I got the the sun</i> <i>two</i> |
| | <i>wait Im still clean all gone</i> <i>one two three four five six seven eight nine ten eleven</i> |
| | <i>look it</i> <i>eleven frog</i> |
| | <i>star</i> <i>a buzz</i> |
| | <i>one more</i> <i>bees</i> |
| | <i>voila</i> <i>strawberry</i> |
| | <i>I cannot</i> <i>all strawberry</i> |
| | <i>why ayah</i> <i>last night</i> |
| | <i>dont give two card</i> <i>one one snail</i> |
| | <i>umbwella</i> <i>all snail</i> |
| | <i>many umbwella</i> <i>I like I like it</i> |
| | <i>crayon</i> <i>fishy</i> |

| Age | Utterances | |
|-----|--|--|
| | <i>crayons cards</i> | <i>All the fish all the fish</i> |
| | <i>a crayon</i> | <i>you dont see the sun</i> |
| | <i>many crayon</i> | <i>all the car</i> |
| | <i>balloon balloon</i> | <i>all the cars</i> |
| | <i>many balloon</i> | <i>one teddy bear</i> |
| | <i>fifteen</i> | <i>one two three teddy bear</i> |
| | <i>one flower</i> | <i>all the teddy bear</i> |
| | <i>give back</i> | <i>star</i> |
| | <i>look it doggy</i> | <i>all the star</i> |
| | <i>tree</i> | <i>I want this one</i> |
| | <i>tree tree tree look it</i> | <i>my my my doll this one is so broken</i> |
| | <i>thats my daddy thats not Khalid daddy</i> | <i>you not broken my doll</i> |
| | <i>I love you</i> | <i>a glove</i> |
| | <i>I said I love you</i> | <i>glove</i> |
| | <i>because I love daddy</i> | <i>two woolly glove</i> |
| | <i>you get this one</i> | <i>is that me</i> |
| | <i>you like what?</i> | <i>wheres wheres you?</i> |
| | <i>buttons</i> | <i>thats me</i> |
| | <i>mommy tickle</i> | <i>shiny shoes</i> |
| | <i>ayah keep quiet</i> | <i>horsie</i> |
| | <i>pig</i> | <i>this is my one</i> |
| | <i>many pigs</i> | <i>shiny shoes</i> |
| | <i>many pig</i> | <i>two button</i> |
| | <i>look it Im flying</i> | <i>two ball</i> |
| | <i>a sheep</i> | <i>two sheep</i> |
| | <i>yes Im a smart girl</i> | <i>many ball</i> |
| | <i>one two three four five six seven</i> | <i>many fish</i> |
| | <i>one two three four five six seven</i> | <i>and many sheep</i> |

| Lexical categories | Type | Percentage | Token | Percentage |
|--------------------|------|------------|-------|------------|
| English numerals | 6 | 2.69 | 22 | 2.45 |
| Self- reference | 1 | 0.44 | 47 | 5.25 |
| Total | 222 | 100 | 894 | 100 |

Table 10.14

Rina's utterances at 3;10 in Malay context

| Age | Utterances |
|------|--|
| 3;10 | <i>Rina nak tengok</i> |
| | <i>be careful</i> |
| | <i>mommy takut ayah tengok tu</i> |
| | <i>ayah cakap tu ayah cakap quiet</i> |
| | <i>nanti lampu cakap</i> |
| | <i>keep off this here</i> |
| | <i>stop ball go</i> |
| | <i>mommy mana the ball?</i> |
| | <i>ball sini</i> |
| | <i>bola ada ke?</i> |
| | <i>sebab I dont go inside here</i> |
| | <i>no I small mommy silap ke?</i> |
| | <i>new stroller baru</i> |
| | <i>I got I got</i> |
| | <i>sebab dia macam monster sikit je</i> |
| | <i>mommy tak nak monster?</i> |
| | <i>sorry Im scared this off</i> |
| | <i>this is this is last night Im cleaning</i> |
| | <i>last night I cleaning this one</i> |
| | <i>you want play playdoh now?</i> |
| | <i>wait this one this one it has</i> |
| | <i>Ana broken his leg</i> |
| | <i>mommy Rina nak wheres the ball?</i> |
| | <i>steady right go</i> |
| | <i>is look it is is working</i> |
| | <i>and your turn</i> |
| | <i>is like this</i> |
| | <i>like thats</i> |
| | <i>all like that OK mommy?</i> |
| | <i>mommy semua toy letak sini</i> |
| | <i>letak sini all of em toys</i> |
| | <i>hurry hurry hurry pastu pergi sekolah</i> |
| | <i>mommy Im coming</i> |
| | <i>because Im scared</i> |
| | <i>you sit over here I sit over here</i> |
| | <i>ada ke tak?</i> |
| | <i>again again</i> |
| | <i>toys</i> |
| | <i>last night I made cupcake with skype ayah</i> |
| | <i>dua kek</i> |
| | <i>you going to make what in my playdoh?</i> |
| | <i>mommy nak buat apa kat playdoh Rina?</i> |
| | <i>mommy nak buat apa?</i> |

| Age | Utterances |
|-----|---|
| | <i>Im a cupcake</i> |
| | <i>and kawan boleh?</i> |
| | <i>inside out is so best</i> |
| | <i>and dia macam takde monster</i> |
| | <i>kek aiskrim</i> |
| | <i>I want buka lampu</i> |
| | <i>Rina kena letak inside in the middle</i> |
| | <i>kalau Rina letak takde letak kat milk</i> |
| | <i>chocolate chips Rina nak</i> |
| | <i>bagi chocolate chips kat atas</i> |
| | <i>Rina nak dekat bilik</i> |
| | <i>wheres wheres this is I hold this friend</i> |
| | <i>come with me</i> |
| | <i>ayah tengok Rina draw</i> |
| | <i>Rina tak tau draw Rina draw scribble</i> |
| | <i>Rinaa nak mommy tolong main</i> |
| | <i>fish</i> |
| | <i>banyak fish</i> |
| | <i>you wanna play with me I want pink</i> |
| | <i>I dont got it</i> |
| | <i>Rina tak nak main dah</i> |
| | <i>lots of toys want to play?</i> |
| | <i>want to play lots of toys?</i> |
| | <i>you want play no?</i> |
| | <i>you want play this one?</i> |
| | <i>you want play all the toys?</i> |
| | <i>you get a big playdoh</i> |
| | <i>because I got this</i> |
| | <i>not on the floor</i> |
| | <i>I make a snail and you make a cake</i> |
| | <i>kek cawan put on playdoh</i> |
| | <i>Rina nak keep it</i> |
| | <i>I found this one this play for playdoh</i> |
| | <i>mommy mommy tak main dengan Rina pun</i> |
| | <i>mommy tak boleh beli mainan and gula and jelly later</i> |
| | <i>tunggu ayah datang ayah beli gula and jelly and toys</i> |
| | <i>this number one two</i> |
| | <i>jangan gelak</i> |
| | <i>no lipat this main</i> |
| | <i>I dont like this one</i> |
| | <i>Rina tak suka binatang</i> |
| | <i>mommy mana yang all</i> |
| | <i>bawah meh Rina cari</i> |
| | <i>I want cari all princess</i> |
| | <i>Im sorry</i> |
| | <i>tak cakap ini ini tak cakap yet</i> |
| | <i>kalau Rina tak suka boy one</i> |
| | <i>Rina nak tengok present</i> |
| | <i>nak pink</i> |
| | <i>tengok apa tu?</i> |
| | <i>Rina nak tengok</i> |
| | <i>nak yang toy</i> |

| Age | Utterances |
|-----|---|
| | <i>this is snow white mother snow white snow white snow white</i> |
| | <i>toy dalam present box</i> |
| | <i>Rina suka princess one</i> |
| | <i>Rina suka budak</i> |
| | <i>meh I hold the princess one</i> |
| | <i>ayah lambatlah</i> |
| | <i>one cinderella one cinderella one cinderella</i> |
| | <i>semua cantik dia dress</i> |
| | <i>silap ke</i> |
| | <i>Rina suka ini ini ini</i> |
| | <i>yang ini Rina tak nak main</i> |
| | <i>Rina suka ini ini ini ini ini ini ini ini</i> |
| | <i>Rina nak hold the princess one</i> |
| | <i>mana lagi satu?</i> |
| | <i>Rina tak nampak lagi satu</i> |
| | <i>frozen backpack frozen backpack</i> |
| | <i>Rina nak tengok dua selipar</i> |
| | <i>ada one two three four six seven</i> |
| | <i>ada bag bag bag bag</i> |

Table 10.15

Rina's composition of lexical items in English context at age 4;8

| Lexical categories | Type | Percentage | Token | Percentage |
|--------------------|------|------------|-------|------------|
| Nouns | 32 | 29.6 | 144 | 33.2 |
| Relational words | 30 | 27.7 | 153 | 35.3 |
| Numerals | 18 | 16.6 | 55 | 12.7 |
| Verbs | 18 | 16.6 | 50 | 11.5 |
| Interjections | 7 | 6.4 | 23 | 5.3 |
| Modifiers | 3 | 2.7 | 8 | 1.8 |
| Total | 108 | 100 | 433 | 100 |

Table 10.16

Rina's utterances in English context at age 4;8

| Age | Utterances in English context in Malaysian setting |
|-----|--|
| 4;8 | <i>English</i> |
| | <i>duck</i> |
| | <i>this one no yeah?</i> |
| | <i>duck duck</i> |
| | <i>why?</i> |
| | <i>its alright</i> |
| | <i>adult?</i> |
| | <i>I can say duck-duck yeah</i> |
| | <i>this one?</i> |
| | <i>two two yeah?</i> |
| | <i>because when last time you this</i> |
| | <i>chicken</i> |

| Age | Utterances in English context in Malaysian setting | |
|-----|---|--|
| | <i>so? that one for adults</i> | <i>chicken chicken</i> |
| | <i>or something like adults I just looking only</i> | <i>can you can you see because it's many chicken</i> |
| | <i>a dog</i> | <i>later we see something yeah</i> |
| | <i>book</i> | <i>later later we did</i> |
| | <i>book book</i> | <i>a dog dog</i> |
| | <i>I gonna take the dog I just kidding</i> | <i>dog dog yeah look it</i> |
| | <i>a cow</i> | |
| | <i>a cow pees</i> | <i>dog</i> |
| | <i>and now I want to pee here</i> | <i>yeah I want to say chicken chicken</i> |
| | <i>cow cow</i> | <i>two I said two are you just kidding I said three</i> |
| | <i>why you said cows only cow?</i> | <i>I just said two</i> |
| | <i>why this only cows?</i> | <i>two and one are you just kidding</i> |
| | <i>you said cows and now not two why?</i> | <i>ball</i> |
| | <i>cows s?</i> | <i>this time this time I gonna say two because theres many ball see ball see?</i> |
| | <i>s like this?</i> | <i>can I please said ball ball?</i> |
| | <i>monkey</i> | <i>ball and ball</i> |
| | <i>monkey monkey</i> | <i>see because its all the ball</i> |
| | <i>this is for adult</i> | <i>its all the ball</i> |
| | <i>oh yeah I can take I want</i> | <i>I want toy</i> |
| | <i>rabbit</i> | <i>a toy I want I want I want</i> |
| | <i>rabbit rabbit</i> | <i>fish fish</i> |
| | <i>rabbit rabbit</i> | <i>two fish</i> |
| | <i>a rabbit</i> | <i>I gonna count first how many fish</i> |
| | <i>bird</i> | <i>one two three four five six seven eight nine ten eleven twelve thirty forty sixty seventy eighty twenty-one twenty-two twenty-seven</i> |
| | <i>bird bird</i> | |
| | <i>no I just kidding</i> | |
| | <i>hi I love you too</i> | |

| Age | Utterances in English context in Malaysian setting | |
|-----|--|--|
| | <i>flower flower</i> | <i>one two three four five six seven eight nine ten eleven twelve thirty forty sixty</i> |
| | <i>a flower a flower</i> | <i>and thirty forty I just kidding</i> |
| | <i>two flower</i> | <i>I want to look inside is it fits?</i> |
| | <i>I like flower flower</i> | <i>fit my hair?</i> |
| | <i>fish fish</i> | <i>OK it fit</i> |
| | <i>oh yeah oh yeah I want to put on me</i> | <i>a cat</i> |
| | <i>cat cat</i> | <i>cat so soft the cat</i> |
| | <i>I now I now I suck my thumb</i> | <i>so soft the cat I want it</i> |

Table 10.17

Rina's composition of lexical items in Malay context at age 4;8

| Lexical categories | Type | Percentage | Tokens | Percentage |
|--------------------|------|------------|--------|------------|
| Verbs | 32 | 37 | 94 | 24.3 |
| Relational words | 23 | 27 | 144 | 37.1 |
| Modifiers | 10 | 11.7 | 48 | 12.4 |
| Interjections | 7 | 8.2 | 31 | 8 |
| Numerals | 5 | 5.8 | 17 | 4.4 |
| Nouns | 5 | 5.8 | 8 | 2 |
| Self-reference | 2 | 2.3 | 42 | 11 |
| Quantifiers | 1 | 1.1 | 2 | 0.5 |
| Total | 85 | 100 | 386 | 100 |

Table 10.18

Rina's utterances in Malay context at age 4.8

| Age | Utterances | |
|-----|--|----------------------------------|
| 4;8 | <i>bukan macam itu macam ini</i> | <i>Rina cari dua</i> |
| | <i>Rina tengok dulu</i> | <i>sama</i> |
| | <i>ayah tunggu jap tunggu jap Rina ambil bantal lain</i> | <i>kalau macam lain tak ape</i> |
| | <i>bantal yang biasa tunggu jap tau</i> | <i>kalau nombor lain tak ape</i> |
| | <i>ini tak suka</i> | <i>OK letak sini ayah</i> |
| | <i>OK ayah boleh letak yang mana sama sama</i> | <i>letak satu satu je</i> |
| | | <i>Rina tengok dulu</i> |

| Age | Utterances |
|-----|--|
| | <i>kalau nak lain kalau kalau nombor lain takpe</i> <i>ayah tunggu jap tunggu jap Rina ambil bantal lain</i> |
| | <i>letak letak ataslah</i> <i>bantal yang biasa tunggu jap tau</i> |
| | <i>Rina cari Rina ada ni</i> <i>ini tak suka</i> |
| | <i>ayah tak payah sama sebab dah habis sama</i> <i>OK ayah boleh letak yang mana sama sama</i> |
| | <i>Rina nampak dua dua</i> <i>Kalau nak lain kalau kalau nombor lain takpe</i> |
| | <i>ayah ini ayah punya atas tau</i> <i>sikit je ayah</i> |
| | <i>Rina punya bawah Rina ambil ni</i> <i>sekejap tengok dulu ada banyak ke tak</i> |
| | <i>nah ayah ambil ini</i> <i>sebab belakang Rina ada ni</i> |
| | <i>nah bukak ni jap sebab Rina nak sebab sebab Rina punya sikit</i> <i>oh ya silap silap</i> |
| | <i>tengok dulu yang macam sama tau</i> <i>Ayah tengok dulu ke?</i> |
| | <i>ayah ayah kena tengok</i> <i>satu je</i> |
| | <i>kalau Rina punya silap tak ape</i> <i>OK ayah dah datang</i> |
| | <i>OK apa ni silaplah</i> <i>banyak sama</i> |
| | <i>OK lepas lepas ni lain tau</i> <i>eh bukan tujuh puluh enam</i> |
| | <i>bukan macam tu tadi tu tadi</i> <i>masa ayah buat ayah boleh</i> |
| | <i>apa? tak mau ada lagi ayah</i> <i>OK Rina ambil satu macam ini tau</i> |
| | <i>OK takde jangan tengok dulu Rina punya</i> <i>Rina rasa nak ambil dua tau</i> |
| | <i>ayah kalau tak sama jangan bagi kat orang tau</i> <i>rasa macam ayah boleh ambil ini je?</i> |
| | <i>bagi kat Rina je</i> <i>ayah kalau kalau lepas tu lepas tu kira nombor tau</i> |
| | <i>mana?</i> <i>ayah dua dua ni ayah punya ke?</i> |
| | <i>OK ni Rina punya dah</i> <i>Tunggu jap Rina tengok jap</i> |
| | <i>ni sama dengan ni</i> |
| | <i>tengok dulu sama je</i> |
| | <i>bukan sama</i> |

APPENDIX III (PROSODIC ANALYSES)

Prompts used to elicit the singular and plural outputs from L1 Malay speakers and Rina in Chapter 6.

Singular prompts

Burung 'a bird'



Plural prompts

Burung-burung 'birds'



Bola 'a ball'



Bola-bola 'balls'



Kucing 'a cat'



Kucing-kucing 'cats'



Anjing 'a dog'



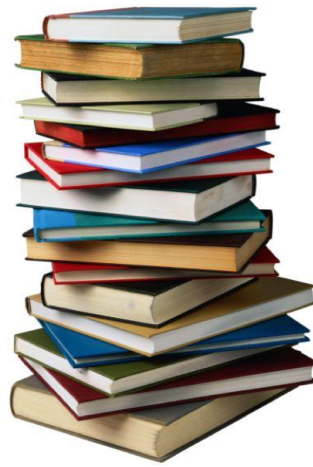
Anjing-anjing 'dogs'



Buku 'a book'



Buku-buku 'books'



Ikan 'a fish'



Ikan-ikan 'many fish'



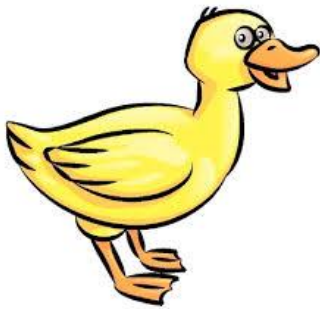
Arnab 'a rabbit'



Rabbit-rabbit 'rabbits'



Itik 'a duck'



Itik-itik 'ducks'



Bunga 'a flower'



Bunga-bunga 'flowers'



Ayam 'a chicken'



Ayam-ayam 'many chickens'



Lembu 'a cow'



Lembu-lembu 'cows'



Monyet 'a monkey'



Monyet-monyet 'monkeys'

