The Acquisition of the Syntax and Morphology of the English Spoken in Singapore: Evidence from preschool speakers of Singapore Colloquial English

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Abstract

The language environment in Singapore is complex. Consequently, assessment of children's language skills is challenging. Singapore has four official languages (English, Mandarin, Malay, Tamil) and many unofficial languages (e.g. Chinese/Indian dialects). There are two distinct forms of English: Singapore Standard English (SStdE) and Singapore Colloquial English (SCE). SStdE is the medium of education, but SCE is most likely to be spoken with young children. Despite this complexity, in Singapore there is little information on acquisition of the local languages and few locally standardised assessments. This study seeks to address this lack of information because such information is needed to enable differential diagnosis between language impairment (LI) and language difference in multilingual children.

The initial component of this study investigated whether modifying the Renfrew Action Picture Test (RAPT) to make it more culturally and linguistically appropriate for assessing the language of Chinese Singaporean preschoolers would allow them to produce better samples of their English expressive language abilities.

One hundred and six English-Mandarin bilingual children aged 4-5 years were tested using the modified assessment (Singapore English Action Picture Test, SEAPT), the original RAPT and, as there was a change from colour pictures to line drawings, a line-drawn version of the RAPT (LRAPT). The results showed that the SEAPT elicited more representative samples of expressive vocabulary and grammar in English than the original RAPT and LRAPT.

Interesting differences were observed between the English spoken by children who spoke mainly English in the home (EL1) and mainly Mandarin in the home (ML1). The second component of this study investigated the emergence of morphosyntax characteristic of SCE and SStdE in the expressive language samples of English-Mandarin bilingual Chinese Singaporean preschoolers. The study considered specific characteristics of language that are clinically useful for Speech Pathologists in the assessment and diagnosis of LI, rather than a comprehensive linguistic description of the English spoken in Singapore by these children.

Expressive language samples in English were collected from 481 children aged between 3;9 years and 6;8 years (236 EL1, 245 ML1) using the SEAPT. The data were analysed to determine differences between main language groups across ages in patterns of use and errors in use of morphosyntax.

The results showed differences in order and acquisition of many aspects of syntax and morphology between the two language groups. The EL1 group acquire both SCE and SStdE, but with differences in rate of acquisition of morphosyntax in comparison with Standard English (StdE) spoken around the world. The ML1 participants' development of English differs significantly to the patterns of development shown by the EL1 children, as well as to monolingual StdE speaking children, with these children acquiring only SCE in their preschool years.

The results from each language group are discussed with reference to the diagnosis of LI in bilingual/multilingual children, including implications for education.

Declaration

I certify that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text

Signed C M Brebner

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Dedication

To my boys Phil, Alec and Cullen.

Chapter 1 Introduction

This thesis describes the acquisition of the syntax and morphology of the English spoken by English-Mandarin bilingual preschool children in Singapore. As an Australian Speech Pathologist working with the local population in Singapore for many years, personal experience of the challenges facing local clinicians in the accurate assessment and diagnosis of language impairment in a complex multilingual environment formed the basis of this project. The research examines an assessment tool and the impact of cultural and linguistic difference on the valid and reliable assessment of expressive language ability with this population. It also addresses a need to understand how children acquire the syntax and morphology of the two forms of English spoken in Singapore in order to facilitate differential diagnosis between language difference and language impairment.

A comprehensive literature review was conducted to better understand the complex issues in assessment of children's language skills in a multilingual environment. The importance of culture and language was explored, examining the issue of cultural and linguistic bias in language assessment. The literature on the forms of English spoken in Singapore was also examined, leading to an exploration of the issues in modifying assessment tools for multilingual populations. This information is described in Chapter 2.

The understanding gained from the literature review led to the development of the research over two phases. The first phase, Part A, involved modification of an existing assessment tool to determine whether cultural and linguistic modification to an assessment would elicit more representative samples of children's expressive language abilities in English. This involved careful consideration of the potential cultural and linguistic bias inherent in the existing test items, and the design of replacement items encompassing pictorial, semantic and linguistic changes. The changes were made based on knowledge acquired from research, theory, clinical experience and the expert opinions of local clinicians. Both the modified and original tests were then used to collect language samples in order to explore the above hypothesis. This process, including a discussion of the results obtained, is presented in Chapters 3-6.

The samples of the children's expressive language abilities in English yielded interesting information additional to the issue of modification of language tests. There were clear differences in the syntax and morphology used by the children from the different language backgrounds. Thus the second phase, Part B, involved the analysis of a large number of children's language samples to examine the syntax and morphology of the English spoken by English-Mandarin bilingual preschool children in Singapore. It was not the intention of the project to provide a comprehensive linguistic description of the forms of English, rather to consider some of the specific characteristics of language that are clinically useful for Speech Pathologists in the assessment and diagnosis of language impairment.

The method used for this phase is outlined in Chapter 7. An extensive analysis of the results follows in Chapter 8. Chapter 9 contains a detailed discussion of the results for each of the main language backgrounds. In Chapter 10, an overall discussion is presented, outlining implications for clinical and educational practice, the limitations of this project and potential future research. This thesis outlines the factors to be considered when assessing language skills in such a complex multilingual environment. Most importantly, this thesis presents the key findings of the research that will further the understanding of the development of children's English in Singapore.

Chapter 2 Literature Review

Singapore is a multi-cultural, multilingual nation. There is a population of four million people comprised of approximately 77 percent Chinese, 14 percent Malay, eight percent Indian and one percent "other" (e.g. Eurasians, expatriates) (Leow, 2000). There are four official languages (English, Mandarin, Malay, Tamil) and a variety of unofficial languages (including Chinese and Indian dialects). There are two distinct forms of English spoken: Singapore Standard English (SStdE) and Singapore Colloquial English (SCE). The language environment is complex, which makes the assessment of children's language skills challenging.

In such a multilingual, multicultural setting it can be difficult to perform a valid and reliable assessment of a child's language skills. The most obvious factor may be that the child and examiner do not share the same language. Another factor may be that bilingual language development differs from monolingual language development. However, significant cultural factors could impact on the assessment and assessment procedure, resulting in cultural bias that may invalidate the results.

For example, external to the tests used there is potential for cultural bias due to the differences in the environment the child comes from, the child-rearing practices of their society, the schooling system the child attends and the social status of the child within their cultural group (Isaac, 2002; Miller, 1984; Westby, 2000; Wyatt, 2002).

There may also be a different emphasis placed on the importance of communication and language skills (Cheng, 2002; Isaac, 2002; Penn, 1998; Taylor & Clarke, 1994; Westby, 2000). For example, Maori people in New Zealand have a strong oral tradition and value good oral communication skills (Marshall & Peters, 1989). Furthermore, cultural differences may occur in the way the child communicates. For example, Cheng (1995) describes how some cultures (such as Asian Pacific Americans) give less information in a verbal message, relying more on the information contained in the physical context and cues, such as non-verbal behaviours like facial expression and body language. In Singapore, too, one of the forms of English (SCE) has been described as being pragmatically rich but morphologically simple (Gupta, 1994), with a lot of information carried within the context of the interaction. American Caucasian children, however, are more often

reinforced for being highly verbal (Miller, 1984; Owens, 2004; Paul, 2007; Westby, 2000). These cultural differences and expectations are important when considering a child's language abilities, especially as the child may have a different expectation of a communication event.

As well as this general cultural variation, there can be cultural differences in the tests and test procedures used to assess language skills; differences that may also invalidate the results (Carter, Lees, Murira, Gona, Neville & Newton, 2005; Isaac, 2002; Westby, 2000; Wyatt, 2002). For example, in using the Peabody Picture Vocabulary Test with North Sotho speakers in South Africa, Pakendorf and Alant (1997) reported on cultural differences in the vocabulary used, which made the test inappropriate to use in its original form. They gave the example of how North Sotho speakers were not familiar with the picture of the helicopter and therefore did not know this test item.

In order to further consider the importance of cultural differences and how they may impact on the assessment of language skills, it is necessary to examine the idea of culture and how it affects the skills and abilities of the people within that society; particularly language and communication skills.

Interaction of culture and skills

Culture is a framework of meanings and relationships that give a group an identity and way of life that is their own, and language is a vital part of culture as it is the means of communicating ideas, meanings and relationships (Battle, 2002; Carter et al., 2005; Isaac, 2002; Owens, 2004; Westby, 2000). Different dialects / languages are spoken in different cultures, and the ability to speak the particular language / dialect defines a person as a member of that society. Language and culture have a complex relationship. It is not possible to separate culture and communication. This complex link has been well documented in the international literature (Battle, 2002; Carter et al., 2005; Cheng, 1995, 2002; Isaac, 2002; Kayser, 1995; Martin, 2000; Owens, 2004; Penn, 1998; Taylor & Clarke, 1994; Westby, 2000; Wyatt, 2002).

Taylor and Clarke (1994) discuss how culture and communication are closely linked, and how language is necessary for defining the culture, unifying its members and excluding others. This can be seen in Singapore where members of a multilingual

society have a common language in SCE. Using SCE identifies people as Singaporean and works to unite this multilingual, multicultural community.

The social structure of a cultural group is defined by linguistic features, and culture shapes the way in which we behave, speak, think and learn (Battle, 2002; Taylor & Clarke, 1994). Therefore, people from different cultural groups will have different views on what defines communicative competence within their community and this cultural context will define and form all communication. Consequently, in assessing a child's language skills, knowledge of the cultural, linguistic, socio-linguistic rules and knowledge base of that culture is of extreme importance, as the view of communicative competence will vary between cultures (Battle, 2002; Carter et al., 2005; Cheng, 2002; Taylor & Clarke, 1994; Wyatt, 2002).

People develop language and speech patterns that are characteristic of their culture. Different cultural groups will place different emphasis on communication skills. Therefore certain skills will become more developed in different societies (Carter et al., 2005; Cheng, 2002; Isaac, 2002; Penn, 1998; Reed, 1986; Westby, 2000). These differences may be in any aspect of communication, such as non-verbal behaviours, pragmatics, semantics, phonology, grammar / syntax and vocabulary (Cheng, 1995). For example, some Hispanic cultures do not usually ask children to explain and describe something that an adult understands (Kayser, 1995). Asking a child from such a culture to do so may not elicit a response, possibly leading to underestimation of the child's abilities. Another example from Gupta (1994) is how, in SCE, use of subordinate clauses develops relatively early (by approximately 36 months) in comparison with British children (by 42-48 months), as this is a structure often used and modeled. If this difference in developmental sequence is not understood, a child's language abilities may be overestimated. Therefore, how culture affects language is an important consideration.

Clearly, language and culture are inter-linked. We all come from our own culture, which shapes our attitudes, beliefs and communicative style. Poor understanding of a culture may result in a breakdown in communication or a misunderstanding. Therefore, it is essential to account for culture when assessing the language skills of a culturally and linguistically diverse child to obtain a valid and reliable picture of the child's skills.

Likewise, it has been well documented that culture impacts on the acquisition of other skills and this may have implications for the tasks utilised in the assessment process (Carter et al., 2005; Ferguson, 1956; Miller, 1984; Irvine & Berry, 1988; Poortinga & van der Flier, 1988; Wyatt, 2002). Researchers agree that different skills will become more developed in some cultures because of the importance placed on those abilities within that environment. Therefore, environment and background should be accounted for in assessing abilities in a way that is meaningful to the specific population (Miller, 1984; Wyatt, 2002).

Reuning (1988) used culturally appropriate tasks in his study when he designed and performed culture-fair intelligence tests on the Bushmen of the Central Kalahari. He designed an intelligence test that accounted for cultural differences, including the use of sand drawings rather than pictures on paper and the recasting of pen and paper and pictorial tasks into a three-dimensional format that the participants could manipulate. These changes in materials elicited valuable data on the participants' information processing. Reuning also noted significant cultural differences in participants' task performance. In their sand drawings, for example, the Bushmen chose different pictures and would orient them in different ways. Reuning concluded that this was due to cultural differences in the importance of development of certain skills and his study shows that assessing these people's abilities in a culturally appropriate way elicited more valid and reliable information about their skills.

Similarly, a study of the performance of indigenous Australians on intelligence tests found that different skills, important to their culture, were better developed (Klich, 1988). In Klich's study, the participants performed better on many visual and spatial tasks as these skills are of importance in their culture, for example in searching the environment for tracks. The participants performed less well on tasks requiring skills considered to be less important, such as the language and verbal tasks.

These studies demonstrate how people from different cultures will develop the skills important within their culture. They clearly indicate that in assessing skills, the assessment process should be meaningful to the participant, utilising tasks familiar to them. Tasks considered relatively simple and routine in some cultures may be difficult for children from other cultures. Gupta, Brebner and Chandler Yeo (1998) highlight this issue of using culturally appropriate tasks to elicit information on

culturally appropriate targets and activities. In a paper outlining two studies, Gupta and Chandler's project aimed to establish normative data for Singaporean children on the Renfrew Bus Story, an assessment of expressive language abilities (Gupta et al., 1998). They found that Singaporean children were not familiar with the task of retelling a story. They noted that the children were not commonly exposed to this type of activity and therefore were often unable to perform on this test, rendering use of the Renfrew Bus Story inappropriate for Singaporean preschool children. Singaporeans do not highly value narrative abilities in young children, and this difference can greatly affect perception of a child's language abilities if no allowance is made for these variations.

The importance of considering the influence of culture and cultural differences on skills, and therefore tasks, when assessing the skills of culturally and linguistically diverse people is clearly indicated. As evidenced in the studies and literature discussed, it may not be appropriate to use commercially available materials designed in other countries to assess the abilities of children from different cultures. The relevance of the skills targeted and tasks used may be questionable, and there may be variations in any number of aspects of communication (Battle, 2002; Carter et al., 2005; Cheng, 1995; Gupta et al., 1998; Isaac, 2002; Klich, 1988; Martin, 2000; Owens, 2004; Penn, 1998; Reed, 1986; Reuning, 1988; Taylor & Clarke, 1994; Westby, 2000; Wyatt, 2002). This may result in bias in the test and / or test procedure. Therefore, the assessment process needs to be planned carefully to overcome potential bias.

Assessment of language skills

Assessing the language skills of a multilingual child can be a challenging process. It is generally acknowledged that bilingual and monolingual language development differ, and that it is necessary to assess multilingual children in all of their languages in order to make an accurate differential diagnosis (Abudarham, 1987; Adler, 1990; Carter et al., 2005; Holm & Dodd, 2001; Isaac, 2002; Jordaan, Shaw-Ridley, Serfontien, Orelowitz, & Monoghan, 2001; Langdon, 1989; Martin, 2000; Owens, 2004; Paul, 2007; Penn, 1998; Westby, 2000; Wyatt, 2002). Currently, however, it is extremely difficult to assess a child in all of their languages in many multilingual societies. This is due to the absence of information on the acquisition of many

languages other than English, the lack of locally standardised assessments in the local languages / dialects and the difficulty in finding Speech Pathologists and / or interpreters qualified to perform assessments in all of the local languages (Cheng, 2002; Gupta, 1994; Isaac, 2002; Penn, 1998; Martin, 2000; Pert & Stow, 2001; Wyatt, 2002). There is also a paucity of information on the development of English in bilingual children (Paradis, 2005).

Making the diagnosis of Specific Language Impairment (SLI) in bilingual and multilingual children can be particularly complex. SLI is defined as a developmental language disorder in the absence of an easily identifiable cause such as hearing impairment, intellectual disability or a social-emotional problem such as an autistic spectrum disorder (Leonard, 1995; Paradis, 2005, 2007). Monolingual speakers of English with SLI have been found to have more difficulty in acquiring verb morphology than children with typically developing language skills (Conti-Ramsden & Hesketh, 2003; Paradis, 2005, 2007; Restrepo & Kruth, 2000). Inflectional morphology (e.g. past tense marking, third person singular '-s') has been shown to be particularly troublesome for children with SLI, with these structures tending to be omitted rather than substituted (Klee, Gavin & Stokes, 2006; Montgomery & Leonard, 2006; Paradis, 2005, 2007; Restrepo & Kruth, 2000; Scuele & Dykes, 2005). There is increasing evidence that there may be clinical markers of SLI specific to certain languages (Klee, Stokes, Wong, Fletcher & Gavin, 2004; Klee et al., 2006). Gupta's (1994) observations about the richness of the pragmatics of SCE may be of critical importance in the diagnosis of SLI for this multilingual population. Therefore, we need information on the normal development of language in order to identify these markers of SLI. It is vital that clinicians have information about the acquisition of all aspects of language, including verb morphology, for this population in order to make an accurate differential diagnosis.

The assessment and diagnosis of language impairment in children in Singapore has been complicated by the lack of information on the development of the main languages spoken in Singapore (English, Mandarin, Malay and Tamil, with formal education in English). Additionally, there are very few standardised assessments for the local population (Brebner, Rickard Liow & McCormack, 2000). Making an accurate differential diagnosis between language difference or language impairment

is challenging without this information on language development, with clinicians relying on their understanding of normal language development for StdE speakers as well as their instinctive, "gut feeling" about a child's language abilities (Brebner et al., 2000; Gupta et al., 1998). Thus, there is a need for more information on children's development of the main languages in Singapore.

When considering language impairment, the basic principle of accurate differential diagnosis is that if performance in both / all the languages is weak the child has a language learning difficulty (Isaac, 2002; Owens, 2004; Paul, 2007). If one language is within normal range, this indicates second language learning difficulties. Making an accurate differential diagnosis is essential for setting appropriate therapeutic and educational goals. Assessing in both / all of the child's languages can also help in the identification of the area of specific deficit in each language, which assists in determining which areas are weak across all languages and which may allow for generalisation of abilities across languages with intervention (Jordaan et al., 2001). Additionally, accurately identifying the type / nature of the language impairment can assist in determining which language (one or all) should be used in intervention.

Holm and Dodd (2001) outline the importance of making an accurate differential diagnosis in all the child's languages when they discuss the assessment and treatment of phonological impairment in two bilingual children. They, too, highlight the importance of assessment in all the child's languages in order to identify the specific area of breakdown, and to determine whether skills targeted in intervention would generalise across languages or whether therapy would be required in all of the child's languages.

In her discussion of the assessment of children's language skills in South Africa, Penn (1998) agrees on the need to assess the child's language abilities in all languages in order to make an accurate differential diagnosis. However, as there is limited availability of suitable materials for use in many multilingual societies, as well as limited information on the development of many languages other than English (Isaac, 2002; Martin, 2000), it is necessary to consider the assessment process in order to maximise the reliability and validity of the information obtained when assessing multilingual children.

Therefore, in order to perform a thorough assessment of both monolingual and multilingual children's language skills, it is necessary to perform more than just a standardised assessment to gain a clear picture of the child's abilities across a range of situations. Additionally, standardised assessments alone are not sufficient to provide the information required for setting appropriate goals for intervention. In Singapore, however, there is a heavy reliance on the use of standardised assessments.

Speech and language therapy in Singapore

Speech and language therapy is a relatively new profession in Singapore, with the first qualified therapist being employed in the country in the early 1980s. Since then, the number of Speech Pathologists employed has grown enormously to the current number of approximately 100 therapists (Speech-Language and Hearing Association [Singapore], 2006). However, there is a significant shortage of qualified clinicians, particularly therapists with the ability to speak one or more of the local languages.

In a survey of how Speech Pathologists were assessing children's language skills in Singapore, it was reported that many clinicians were using descriptive assessments based on their knowledge of the languages spoken in Singapore, or using standardised assessment tools and interpreting the scores loosely (Gupta & Chandler, 1994). In many settings, with the low number of therapists and the steadily increasing number of referrals, case load numbers are high and significant restrictions have been placed on the assessment process. Clinicians have reported the impact of these restrictions on the assessment process they adopt, in which they use less descriptive assessment and rely more on standardised assessment, often without supporting the results through other informal measures such as language sampling (personal communication, December 2004; personal communication, February 2009). In 2004, one major paediatric centre allowed only 30-45 minutes for an assessment. Clinicians were expected to assess and diagnose within that time. In order to perform a quick assessment of skills, goal setting and therapy planning, therapists in such situations are often forced to rely heavily on standardised assessment tools that may not yield valid and reliable results for the particular population of children being serviced.

The potential for cultural bias in commercially available standardised language assessments is an important issue to consider when using them with culturally and linguistically diverse children. The heavy reliance on such tools in Singapore demands an evaluation of the degree of cultural bias, as the likelihood of bias in these tests is high, which may result in invalid, unreliable assessments of children's language abilities. Therefore, the initial component of this study focuses on standardised assessments and their appropriateness in the assessment of children's language skills in Singapore. It also considers the existence and nature of the cultural bias.

Cultural bias in assessments

Goldstein (1996) defines test bias as occurring when two people of the same ability but different cultural groups do not have the same probability of success on a test. This bias occurs because of cultural bias within the test and assessment procedure.

The potential for bias against children from culturally and linguistically diverse communities is clear in some types of assessments of communicative competence, such as pragmatic language skills, as there will be obvious cultural differences in interaction style. However, with standardised assessments that assess specific morpho-syntactic features of language, the possibility of cultural bias remains additional to specific linguistic bias in the test's target structures.

Many researchers have reported on cultural bias, particularly linguistic bias, in language assessment (Abudarham, 1987; Carter et al., 2005; Cheng, 1995; Isaac, 2002; Kayser, 1995; Martin, 2000; Miller, 1984; Pakendorf & Alant, 1997; Penn, 1998; Taylor & Clarke, 1994; Vaughn-Cooke, 1983; Westby, 2000; Wyatt, 2002). Fagundes, Haynes, Haak and Moran (1998), Penn (1998), Taylor and Clarke (1994) and Wyatt (2002) all discuss the different forms of cultural bias that can occur in language assessment. They note the potential for bias in the:

- interpreter (i.e. the clinician's analysis of the test situation and child's responses);
- understanding of the child's language (i.e. acknowledging that there may be a language difference);
- values (i.e. the appropriateness of the procedure and tasks given);

- directions (i.e. the potential for misinterpretation of the instructions);
- format (i.e. the test format may be inconsistent with the child's cognitive style);
- situation (i.e. in the format of the test itself);
- interpretation of behaviour (e.g. not understanding that certain behaviour may be culturally appropriate for the participant);
- stimuli (e.g. a picture oriented test when a student is socially oriented);
- linguistic targets (e.g. forms of Standard English versus a dialect).

The potential for bias in the assessment process can be analysed using this combined model.

Interpreter bias may occur if the tester does not understand the child's culture and language (Carter et al., 2005; Isaac, 2002; Owens, 2004; Paul, 2007; Westby, 2000). For example, Singaporean children are not used to narrative type tasks that require the retelling of a story (Gupta et al., 1998). If the tester is unaware of this cultural difference on such a task, they may underestimate the child's language abilities.

Understanding the child's language and having an awareness of the potential for **language difference** is important in assessing the language skills of culturally and linguistically diverse children (Gupta et al., 1998; Isaac, 2002; Owens, 2004; Paul, 2007; Westby, 2000; Wyatt, 2002). For example, in SCE the subject may be omitted from the sentence (PRO-drop) (Gupta, 1994). Therefore, the use of sentences without subjects may not be indicative of language impairment; it may instead be indicative of language difference. This needs to be understood in order to perform a valid and reliable assessment.

The **values** targeted by the test may be unfamiliar. For example, some cultures do not place emphasis on sitting down and answering direct questions about pictures when the answer is clear to the examiner (Isaac, 2002; Kayser, 1995; Westby, 2000; Wyatt, 2002), but this is the standard test procedure with most commercially available standardised assessments.

Socio-linguistic differences may mean that the **directions** are not clear to the child (Carter et al., 2005; Cheng, 1987; Owens, 2004; Paul, 2007; Westby, 2000). Cheng

(1987) highlights this issue with her description of assessing the language abilities of an Asian child in the United States of America (USA). The child was shown pictures of pencils and food and was asked "which one do you eat?" Cheng explains how, unable to understand the socio-linguistic meaning of the question, the child referenced the question to his own experiences and pointed to the pencils, considering them to be chopsticks. This illustrates how children may give incorrect responses due to different interpretations of the tasks and instructions.

The test situation and the **test format** may not be culturally appropriate for the child's style (Carter et al., 2005; Fagundes et al., 1998; Isaac, 2002; Owens, 2004; Paul, 2007; Westby, 2000; Wyatt, 2002). Fagundes et al. (1998) studied the effects of stimulus variability on African American and Caucasian children using the Preschool Language Assessment Instrument (PLAI). They modified the PLAI to become more culturally appropriate for African American children by changing the questions about picture stimuli to fast paced, interactive, "hands on" activities designed to elicit the same information about their language abilities. They found that the African American children responded much better and therefore achieved more highly on language tasks where there was more interaction and a rapid change of the stimulus and activity, whilst the change in format made no difference to the scores achieved by the Caucasian children. Most commercially available assessments do not utilise such interactive, fast paced activities in standardised assessments and may therefore be inappropriate for children from some cultures.

The way in which the clinician **interprets** behaviours is also important (Carter et al., 2005; Huynh, 1995; Isaac, 2002; Owens, 2004; Paul, 2007; Westby, 2000). Huynh (1995) highlights the example of how Vietnamese children expect a lot of prompting to elicit a response. If unaware of this cultural norm, examiners may not prompt sufficiently and therefore may not elicit a valid sample of the child's expressive language abilities.

Stimuli are important in standardised assessments, and there is potential for cultural bias in the pictures and objects used (Carter et al., 2005; Gupta et al., 1998; Isaac, 2002; Miller and Abudarham, 1984; Owens, 2004; Paul, 2007; Westby, 2000; Wyatt, 2002). Cheng (2002), and Miller and Abudarham (1984) state that many toys and pictures used in assessments are "culture bound" and unfamiliar in some societies.

They highlight the example of tea sets and teddy bears, which are widely used in assessments devised in the United Kingdom (UK) and USA but are not familiar and common toys in some cultures. This was also an issue in Gupta and Chandler's study using the Renfrew Bus Story in Singapore (Gupta et al., 1998) as many of the children were unable to recognise the pictures, for example the picture of a cow in the field. Singapore, as a city-state, no longer has room on the island for farms and livestock, so many children were unfamiliar with this picture.

The toys children are exposed to in Singapore also differ from those commonly used by American children. Gupta et al. (1998) identified and documented differences in the age of acquisition of certain play skills in Singapore, with preschool children receiving more encouragement to develop manipulative play skills and academic skills such as number and letter recognition. Toy shops and toy catalogues have a large number of toys for manipulative play, such as puzzles, blocks and particularly alphabet and number oriented toys, but considerably less toys for imaginative play (such as tea sets) (Nurture Craft, 2001). These differences in toys may impact on the children's ability to recognise some objects, pictures and scenes found in traditional language assessments.

The **linguistic targets** may not be appropriate (Carter et al., 2005; Isaac, 2002; Owens, 2004; Paul, 2007; Westby, 2000; Wyatt, 2002). Culture and language are inter-linked and cultures will have differences in the language they use. This may be minor variations in a form of Standard English, it may be a dialectal form of English or it may be a completely different language.

Linguistic bias is an important consideration and has been widely discussed in the international literature (Carter et al., 2005; Isaac, 2002; Owens, 2004; Pakendorf & Alant, 1997; Paul, 2007; Westby, 2000; Wyatt, 2002). Abudarham (1987), Cheng (2002) and Miller (1984) discuss how the vocabulary used in assessments may not reflect familiar words and situations appropriate to the culture. The linguistic structures targeted may not be relevant to the local language. Most importantly, the basic assumptions of language development on which the test has been designed will most likely be those relating to monolingual children from another culture. There is a significant shortage of information on the developmental acquisition of languages and dialects other than Standard English (Isaac, 2002; Martin, 2000; Owens, 2004;

Paul, 2007; Westby, 2000). Therefore, it is not always possible to know whether the test is assessing appropriate structures in an appropriate sequence.

There may be differences in areas such as vocabulary, semantics, phonology, grammar / syntax and vocabulary (Carter et al., 2005; Cheng, 1995; Westby, 2000). For example, "nappies" are called "diapers" in the USA. In Singapore "stay" means "live" (as in "reside"). Word order in interrogatives differs in SCE, so "stay where?" is asked rather than "where do you live?" (Gupta, 1994). Therefore, the target structures of assessments may not be culturally and linguistically appropriate for assessing the language skills of children from different societies.

Many researchers stress the importance of test items being relevant to both the child's language and their culture in order to be valid and reliable measures of their language skills (Abudarham, 1987; Carter et al., 2005; Cheng, 1995, 2002; Isaac, 2002; Kayser, 1995; Martin, 2000; Miller, 1984; Penn, 1998; Taylor & Clarke, 1994; Westby, 2000). This is an important point. The issue of linguistic bias related specifically to children's English in Singapore is discussed in more detail later.

Test bias is clearly a potential problem in all test procedures and can occur when assessing specific morpho-syntactic aspects of language with standardised assessment tools. This cultural bias needs to be surmounted in order to achieve a valid and reliable assessment of a child's language abilities.

Overcoming test bias for different cultural groups presents a challenging problem for the clinician and researcher. Different methods of eliminating cultural bias in assessment have been attempted. These methods are the production of "culture fair" tests, the translation of existing tests into the local language / dialect of the group to be assessed, psychometric compensation techniques and the modification of test materials for specific cultural groups.

Attempts to overcome test bias

The debate over the existence of bias in tests arose in the US A in the mid twentieth century. There had been reports of a disproportionate number of minority children being placed in special educational facilities, suggesting inaccurate diagnosis (Cummins, 1984; Erickson & Iglesias, 1986; Williams, 1970). Debate ensued in the

literature about the definition of "intelligence", and whether it was fair and unbiased to assess intelligence using materials developed for white, middle-class American or British populations (Miller, 1984; Williams, 1970). However, despite controversy, there was eventual acknowledgement of the potential for bias in testing, and it then became the educational goal in the USA that all children should function linguistically in both Standard English and their home language / "mother tongue" (Erickson & Iglesias, 1986; Williams, 1970). Thus, the need for assessments that allowed for differences in culture and language was recognised as being crucial in the differential diagnoses between learning problems, language disabilities and English as a second language difficulties, leading to the call for "culture fair / culture free" assessment materials. Although the literature is controversial, it was agreed that tests should not be culturally biased in order to conduct a valid and reliable assessment of skills. Many attempts were made to devise culture fair assessments. This commenced initially with attempts to devise culture fair assessments of intelligence, with the requirement to devise such tools for the assessment of language skills soon becoming apparent (Miller, 1984).

Culture fair tests

Culture fair tests are those assessments designed for use with all cultural groups worldwide, but which do not bias for or against a person from a specific culture (Carter et al., 2005; Taylor & Payne, 1983). The aim was to see beyond the culture of the person to the intelligence and abilities of the individual (Miller, 1984). These acultural tools were devised by attempting to eliminate test items and test procedures that could discriminate against certain cultural groups (Miller, 1984). This was done by making changes to the format and content of existing assessments, by strategies such as reducing pen and paper tasks, giving oral rather than written instructions, and assessing abstract reasoning rather than factual knowledge (Fagundes et al., 1998; Jensen, 1980). Some suggested methods were the complete removal of language-based items in the assessment of intelligence, which therefore could not give a holistic picture of a person's abilities and resulted in potentially restricted, incomplete assessment tools (Miller, 1984).

It is difficult to know whether it is in fact possible for people to create a culture fair assessment tool because our thoughts and behaviours are closely linked to our culture

and the society in which we live. However, some researchers still purport to have devised culture fair assessment tools of non-verbal abilities, such as the Kaufman Assessment Battery for Children (Lichtenberger, Kaufman & Kaufman, 1998). Lichtenberger et al. report that this test was designed as a culture fair assessment of non-verbal abilities, and all test items were carefully controlled for bias in the materials used, test format, the children selected for the standardisation sample and the language of instruction. They state that the only items used in the test were those shown by research to be culture fair.

However, culturally appropriate tests of language skills are also required and acultural tests cannot allow for all possible cultural differences in the acquisition of language and skills (Carter et al., 2005; Lewis, 1998; Martin, 2000). Strategies such as omitting language-based items obviously do not allow for the assessment of language abilities. Therefore, the measures to devise holistic culture fair tests were largely unsuccessful and the attempt to produce one acultural assessment tool has not been sufficient in eliminating cultural bias from tests of language abilities.

Translation of tests

Another method employed in the attempt to make assessment tools more suitable for use with people from different cultures was the translation of tests into other languages and / or dialects. This has been achieved with varying degrees of success depending on factors such as the nature of the society (e.g. it is easier to adapt a number of tests for a large Spanish-speaking population in the USA as opposed to a multilingual society where there are a large number of languages spoken, such as African countries). Although of questionable value in some countries, this method is still relatively common today with the translation of tests to assess children's language abilities, particularly in developing nations in Africa and Asia. This has been due mainly to lack of funding and / or expertise for the production of appropriate assessment tools for the local languages. Some examples of such projects are the translation of a number of tests for the Hispanic population in the USA (Paul, 2007); the Reynell Developmental Language Scales into many languages including Cantonese for use in Hong Kong (Hong Kong Society for Child Health and Development, 1987); the translation of a number of tests into Mandarin for use in

Singapore (Chong, Rickard Liow & Lee, 1998); and the translation of a number of formal language assessments for use in South Africa (Penn, 1998).

However, translation of tests has been reported to result in many confounding variables that affect the validity of the instrument (Abudarham, 1987; Carter et al., 2005; Cheng, 2002; Isaac, 2002; Kayser, 1995; Martin, 2000; Miller, 1984; Penn, 1998; Vaughn-Cooke, 1983; Westby, 2000). Translation alters the language but does not allow for difference in the complexity and structure of its semantic, syntactic and phonological components, as illustrated by difficulties faced in translating the British Picture Vocabulary Test (BPVT) into Mandarin, Malay and Singapore Standard English for use in Singapore. Rickard Liow, Hong and Tng (1992) found that the complexity of items was altered in translation, for example "marsupial" became "animal with pouch" in Mandarin, significantly reducing the complexity and therefore difficulty of that test item. Item length may also be affected in translation, once again altering the complexity of the stimulus (for example, the change from the single word "marsupial" to the three words "animal with pouch" introduces a memory component).

Additionally, translation does not account for variation in the developmental sequence of acquisition of vocabulary, syntax and morphology (Abudarham, 1987; Carter et al., 2005; Kayser, 1995; Martin, 2000; Miller, 1984; Penn, 1998; Vaughn-Cooke, 1983; Westby, 2000). In Singapore, children acquire conditional clauses at a relatively early age in comparison with British children (Gupta, 1994), which would render test items looking at this structure invalid. Another example of the difference in age of acquisition of certain structures is the re-ranking of test items that was required in a project which looked at the suitability of the Expressive Vocabulary subtest of the Clinical Evaluation of Language Fundamentals Preschool 2 UK version (CELF-P2 UK) (Teoh, Brebner & McCormack, 2009) for preschool children in Singapore. This study found that different ranking of items was required for Mandarin dominant and English-dominant bilingual children. Similar difficulties were encountered in the study that established normative data for the BPVT (Rickard Liow et al., 1992). Here too, different ranking of items was required for each of the three different language groups to reflect the different age of acquisition and relative complexity of the test item (Rickard Liow et al., 1992). These examples indicate that

merely translating a test into a local language or dialect would not account for these differences in age of acquisition, and that doing so would provide invalid results.

Translation does not allow for differences in culture and life experiences (Cheng, 2002; Kayser, 1995; Penn, 1998; Westby, 2000) and may not overcome the problems with recognising the scenes and situations depicted (Cheng, 1995, 2002). Furthermore, translation may alter the complexity of the target (Owens, 2004), as in the example above from Rickard Liow et al. (1992). Translation has also been found to invalidate tests as children examined often achieve well below the expected age level despite the translation (Owens, 2004; Paul, 2007; Westby, 2000). Gupta et al. (1998) report on clinicians in Singapore using standardised language assessments, then assuming a delay of six months in language abilities in children whose first language is not English. In some reports, when new normative data for assessments were established, the levels were significantly lower for that cultural group than the original norms, suggesting that translation was not adequately solving the issue of eliminating cultural bias from the test (Adler, 1990; Vaughn-Cooke, 1983).

Thus, as demonstrated in the literature, translation of language alone is not an appropriate option in the quest to overcome cultural bias in assessments, as cultural bias will remain in the original intention of the test, the stimuli used and the procedure. All these issues need consideration when performing "culture fair" assessments.

Statistical issues

The statistical relevance of using the normative data for standardised tests from a different culture has also been widely questioned (Abudarham, 1987; Anastasi, 1990; Kayser, 1995; Miller, 1984; Omark, 1981; Paul, 2007; Westby, 2000). Omark (1981: 251) argues strongly against using the original normative data from tests developed in different cultures, stating "When tests are normed on populations and cultures different from those to which the child has been exposed, then the tests should be rejected as valid assessment instruments". It is now generally agreed that normative data for one cultural group will be almost meaningless for another and these norms should not be used in comparing a child's performance with his/her peers from another culture in order to determine whether a problem exists.

Psychometric compensation techniques have been attempted in order to overcome some aspects of test bias in the normative data of standardised assessments. This is based on achieving score equivalence across cultures. People of different cultures do not achieve the same scores on tests, and psychometric compensation techniques can be employed to try to gain equivalence in the scores by overcoming bias related to the test items and subject selection (van de Vijver & Poortinga, 1991). Strategies include removing biased test items and use of statistical models such as regression and conditional probability (Baker, 1988; Fagundes et al., 1998; Miller, 1984; Peña et al., 1992).

These techniques are statistically fair methods of scoring and selecting individuals across groups, but they do not alter the test itself. Therefore, they cannot overcome cultural bias related to the test and test procedure as the item stimuli, tasks, administration and interpretation of performance are not changed (Fagundes et al., 1998). Using statistical methods to achieve score equivalence will give limited diagnostic information on a child's performance and it is not appropriate to attempt to overcome cultural bias in tests by statistical methods alone.

Other studies by psychometricians have found that using commercially available tests devised for monolingual cultures on different cultural groups significantly affects the validity of those instruments (Samuda, 1998). He cites a study that found some tests were able to retain their predictive validity (i.e. the scores achieved predict future academic performance) but other forms of validity (e.g. content and construct validity) were no longer adequate due to cultural bias within the test items themselves. Therefore, it would not be valid to use these instruments in their original form to identify language impairment in children from different cultural backgrounds. Thus, tests must be examined carefully for cultural bias in all aspects of the test. Merely translating a test then scoring it using the original normative data or psychometric compensation techniques is insufficient (Lewis, 1998). Problems identified in Singapore with using commercially available tests include low scores in comparison with the original normative sample related to baseline effects on the distribution of scores (Brebner, Rickard Liow & McCormack, 2000, 2001; Chong, Rickard Liow & Lee, 1998; Gupta et al., 1998); poor recognition of scenes and situations (Gupta et al., 1998); differences in vocabulary (Brebner et al. 2000, 2001;

Rickard Liow et al., 1992); and tests not always targeting appropriate linguistic structures (Brebner et al., 2000, 2001). This indicates a need for culturally appropriate assessment tools that can provide a valid and reliable picture of skills for children in Singapore.

Modification of assessment tools

The great deal of evidence indicating that using standardised assessments devised for monolingual populations may result in an unreliable picture of a bilingual person's abilities has led to current recommendations in the international literature that the way to overcome problems of cultural bias in assessment is to use assessments in a culturally appropriate way (Lewis, 1998). If possible, tests need to be devised for specific populations. If this is not possible, it is recommended that existing assessments should be carefully modified for use with specific populations (Huynh, 1995; Leeman, 1981; Lewis, 1998; Martin, 2000; Miller, 1984; Penn, 1998; Schiff-Myers, Djukic, McGovern-Lawler, & Perez, 1993; Vaughn-Cooke, 1983; Westby, 2000).

Where modification has not been successfully achieved, different strategies for minimising cultural bias in tests can be utilised (Carter et al., 2005; Lewis, 1998; Martin, 2000; Pakendorf & Alant, 1997; Penn, 1998; Westby, 2000; Wyatt, 2002). Lewis (1998) suggests that rather than attempting to devise a culture fair test, it is more appropriate to adopt a culturally fair assessment process, including a culturally appropriate interpretation of the results. He suggests that the clinician needs to develop heightened awareness of the influences of culture on performance in language assessment and adopt procedures that maximise the validity of the test whilst being sensitive to the client's background and experience. Lewis also suggests changing traditional models of assessment to be more culturally appropriate. This may incorporate modifying existing assessments for the cultural group where possible.

Many other authors state that new assessments should be designed for a specific population or, if this is not possible, assessments should be modified for the specific group (Carter et al., 2005; Huynh, 1995; Leeman, 1981; Martin, 2000; Miller, 1984; Penn, 1998; Schiff-Myers et al. 1993; Vaughn-Cooke, 1983; Westby, 2000). It is

widely agreed that test design / modification should not focus on producing an acultural test for all culturally and linguistically diverse populations. Rather, test design / modification should be developed for specific populations, being sensitive to culture and language and basing the test on the cultural framework of those people, thus maximising their potential performance on the test (Erickson & Iglesias, 1986; Martin, 2000). It has also been argued that normative data on the development of different languages are required to expand our knowledge on the development of different languages and dialects, which can inform our assessment procedures (Westby, 2000).

Sensitivity to differences in the local language is critical in modifying an assessment. Tests need to reflect normal bilingual/multilingual language development for the population. As already stated, Singapore is a multilingual society where English is the educational language but there are two distinct forms of English spoken. Therefore, when modifying a test for assessment of children's language abilities in Singapore, it is essential to consider and understand the forms of English used.

English in Singapore

There has been a large amount of literature published on the significant differences between Standard English spoken in countries such as Britain and Australia, and the English spoken in Singapore (Alsagoff & Ho, 1998; Brown, 1992; Deterding, 2007; Deterding & Poedjosoedarmo, 2001; Gupta, 1994; Gupta et al., 1998; Ho & Platt, 1993; Lim & Foley, 2004). Two forms of English are used: Singapore Standard English (SStdE), which is the educational and business language; and Singapore Colloquial English (SCE), which is more informal and used for everyday communication, including interaction with young children (Gupta, 1994).

English became more widely used in Singapore in the mid-nineteenth century, with Chinese dialects and Malay being the languages of the population prior to British colonisation of the island (Gupta, 1998a). English became the language of education and also the common language, or lingua franca, of children from different language backgrounds. Over time, the language has developed and split into the two distinct varieties (Gupta, 1998b). SStdE is comparable with other Standard Englishes world-wide, using similar syntax and grammar but with variations in accent and

vocabulary. However, SCE differs significantly from many other forms of English used in the region (for example, Hong Kong English), although there are many similarities with Malaysian English (Gupta, 1994).

Not all adult Singaporeans will speak SStdE, as this is related directly to education and socio-economic status. However, most Singapore residents speak SCE with a wide range in ability across the community. At last census in 2000 it was found that 71 percent of Singapore residents are literate in English (Gupta, 1994; Khoo, 1981; Leow, 2000). Gupta (1994) believes that the English spoken in Singapore is diglossic. Ferguson (1959) defined "diglossia" as being where there were "high" and "low" forms of a language spoken. Gupta (1994) writes that diglossia is a characteristic feature of the English spoken in Singapore, with speakers switching between the "high" form of English (SStdE) and the "low" form (SCE) depending on the context and the formality required by the situation. For example, with professionals in education and in business, people will speak SStdE or attempt to speak it if they are not proficient. In everyday situations, general conversation or in interaction with small children, people will choose to speak SCE. Switches within conversations will occur if the topic changes, if a point is to be emphasised or if the SStdE has not been understood.

Whilst more recent publications have suggested that the diglossia model is too simplistic to account for the complexities of use of English in Singapore, a polyglossic model has been put forward (Ansaldo, 2004; Wee, 2004). This places the forms of English spoken in Singapore on a continuum with "acrolectal" or "low" form Singapore English (i.e. SCE) at the "low" end of the continuum, increasing to SStdE at the "high" end (Wee, 2004). In general, however, Singaporeans are tolerant of people who speak SCE at different levels of competency and believe that it is a symbol of their Singaporean identity. For example, there are a number of very popular television shows with the theme of the characters' proficiency in SCE whilst struggling to learn SStdE.

The use of SStdE has been maintained and encouraged through the Singapore government's language development. Over the years, there have been government planned "Speak English" and "Speak Mandarin" campaigns (Xu & Li, 2002). This has been an attempt to eliminate the use of Chinese dialects and poor quality English

(commonly known as “Singlish”) in order to promote and encourage use of standard, “good” Mandarin and English. In 2000, the Singapore government launched the “Speak Good English Movement”, which, through speeches in parliament and extensive media coverage, aimed to encourage Singaporeans to “speak good English” (Speak Good English Movement, 2000). In general, the view presented is that SCE is a deficient language that cannot be understood internationally. The government aims to promote usage of SStdE in order to sustain high levels of proficiency that will facilitate international business activities. Consequently, there can be stigma attached to speaking local dialects in the absence of standard forms (e.g. Hokkien not Mandarin, SCE not SStdE). So, whilst there is general tolerance and pride in speaking SCE as a symbol of national identity, there can be shame and embarrassment for some families if they speak only SCE and no SStdE.

SCE is significantly different from Standard Englishes. Gupta (1994) describes SCE as a nativised, contact variety of English. That is, SCE has evolved originally from English and has developed through the medium of education and contact with other languages. Ansaldo (2004) also describes SCE as a nativised, contact variety of English but believes that the form developed from colonial English in contact with Bazaar Malay, Hokkien and possibly Cantonese.

With SStdE being the language of education, SCE is now the first language of an increasing number of people in Singapore. In the Singapore Census of 2000 it was found that the use of English was increasing, with it being widely used by people of all racial groups and the major home language for approximately 25 percent of the population (Leow, 2000). However, multilingualism is usual in Singapore and SCE is highly likely to be only one of the languages spoken in the home (Ansaldo, 2004; Gupta, 1994).

In their book “Dynamics of a Contact Continuum: Singapore English”, Ho and Platt (1993) illustrate how SCE has developed through years of direct contact with other languages. They highlight the significance and impact of these contact languages, as most people were fluent in English and one or more of the influencing languages. Ho and Platt describe the dominant underlying influence on SCE as being Chinese, with other influences being Bazaar Malay (a pidginised form of Malay) and Baba Malay

(a combination language of Malay and the Chinese Hokkien dialect). These languages have influenced the grammar / syntax and vocabulary of SCE.

Ho and Platt (1993) also describe the intonation (i.e. rhythm and stress patterns) as being similar to Indian English and relate this to the employment of Indians as English teachers earlier this century. More recent research utilising instrumental measures suggests that the characteristic features of the pronunciation of SCE include:

- neutralization of the vowels /ae/ and /ɛ/ (therefore "mat" and "met" sound the same);
- long-short vowel neutralization (e.g. "sheep" and "ship" sound the same);
- dental fricatives /Ɵ/ and /ð/ replaced with /t/ and /d/ respectively (e.g. "three" becomes "tree");
- different phrasal and lexical stress;
- syllable-timed rhythm due to reduced distinction between full and reduced vowels (Low, Deterding & Brown, 2002).

Whilst these are the general features of the English spoken by Singaporeans, there is also evidence of some degree of ethnic variation in the accent and pronunciation of Singaporeans from the different ethnic groups of Chinese, Malay and Tamil (Deterding & Poedjosoedarmo, 2000). Deterding and Poedjosoedarmo found that the less formal the style of English spoken (i.e. SCE rather than SStdE), the more features of the ethnic group were evident.

As stated previously, Ansaldo (2004: 146) suggests that SCE developed from colonial English in contact with Bazaar Malay, Hokkien and possibly Cantonese. He describes a complex matrix of constantly interacting languages for modern SCE:

"1. Standard English – Standard / Colloquial Singapore English – Sinitic languages (Cantonese)
2. Standard Mandarin – Singapore Mandarin – Sinitic languages (Cantonese)
3. Standard Malay – Colloquial Malay – Bazaar Malay".

This illustrates the extreme complexity of the nation's language environment.

The majority of the literature on Singapore English to date has been based on language samples from adult speakers, including the Grammar of Spoken Singapore English Corpus (GSSEC) based on data from adults collected in 1998-1999 by students from National University of Singapore and the National Institute of Education Corpus of Spoken Singapore English. From the studies of the English spoken by adults, there have been many publications on the morphology and syntax of SStdE and SCE (Alsagoff & Ho, 1998; Bao, 1995; Deterding, 2007; Deterding & Poedjosoedarmo, 2001; Fong, 2004; Ho & Platt, 1993; Platt & Ho, 1988; Wee, 2004; Wee & Ansaldo, 2004). There have been published articles and books on the use of English in education (D'Souza, 1996; Foley, 1998; Low & Teng, 2002; Pakir, 1994; Pakir & Low, 1995) that have concentrated on the use of SStdE in educational institutions. There have also been studies on specific, characteristic features of SStdE and SCE in adults (Bao, 1995; Deterding, 2007; Gupta, 1992), and more general texts on the specific vocabulary and use of SCE (Brown, 1992; 2003; Shelley, 1995).

Studies on the development of children's colloquial English in Singapore have not been totally ignored, as evidenced by the work of Gupta (1994) and Kwan-Terry (1986, 1992). In her case studies of four children speaking English in Singapore, Gupta (1994) found SCE to be their main home language, used in informal situations and therefore the form of English most commonly used with children during their preschool years. She found that it is only at approximately age 4, when most children commence schooling, that SStdE is introduced. As children grow older, diglossia / polyglossia develops and children start to use SStdE and SCE in different situations, depending upon the circumstances and the context.

Characteristics of SCE

In order to understand the differences between StdE and SCE and how they impact on the assessment of children's language abilities in Singapore, an understanding of the characteristics of SCE, in particular the morphosyntax of verbs, is critical.

Gupta (1994) describes SCE as a pragmatically rich language that is characterised by simple grammar and less inflectional morphology than Standard Englishes. She defines the four main features of SCE that differentiate it from SStdE and other Standard Englishes as being:

- the **use of 11 pragmatic particles** which are added into a sentence / phrase in order to indicate the speaker's level of commitment to what they have said (e.g. the particle "la" which is used to indicate assertion or strong feelings about a subject. An example is where people may say "cannot la!" in SCE compared with the Standard English "I can't do that!");
- **verbs used without subjects** if not required by the context (i.e. using the verb without a subject. For example, the SCE "go Orchard" as compared with the Standard English "I am going to Orchard");
- the **use of conditional clauses without a subordinating clause** if not required by the context (i.e. "if / when" deleted. For example, the SCE "take sweet, Mummy angry" as compared with the Standard English "if you take that sweet then Mummy will be angry");
- **BE deletion** (sometimes called **-**ing as a finite verb or verbless complements) where the verb "to be" may be deleted if not required by the context (e.g. the SCE "He happy" as compared with the Standard English "He is happy" or "He's happy"). This only occurs with the verb "to be" and not other verbs.

Gupta (1994) also indicates differences in the phonology of SCE:

- **neutralising voiced / voiceless contrasts in word final position** (e.g. "bed" and "bet" will sound the same);
- **cluster reduction in word final clusters** (e.g. "lef" for "left"; "as" for "ask");
- **major differences in pronunciation of vowels** (e.g. "sheep" for "ship").

Deterding (2007) summarises a range of phonological differences that also occur in SStdE, including:

- **absence of length distinction between vowels** (e.g. "sheep" for "ship" will sound the same);
- **additional final /t/** (e.g. occasional addition of /t/ in word final position, possibly articulatory in nature or an surplus "-ed" suffix);
- **glottal stop,** which occurs only in word final position of singleton consonants (e.g. "put" becomes "pu-");

- **final consonant cluster simplification** (e.g. "lef" for "left"; "as" for "ask").

Gupta (1994) argues that cluster reduction in word final clusters is closely related to some of the morphological variations of SCE. That is, if word final consonant clusters are reduced, this will result in:

- **variable noun-plural marking** (e.g. "many apple" as compared with the Standard English "many apples");
- **variable past tense marking** (e.g. "skip" for "skipped").

Lim (2004) describes consonant cluster reduction in SCE as complex, with a number of different patterns affecting the use of different morphological markers:

- **deletion of final plosives** (particularly alveolar plosives) when preceded by nasals, |s| or |l| (e.g. "ting" for "think"), which therefore impacts on the use of the past tense "-ed" morpheme (e.g. "kiss" for "kissed");
- **deletion of voiceless alveolars, voiceless dental fricatives and voiceless palato-alveolar affricates when preceded by |n|, |t|, |k|** (e.g. "clown" for "clowns"). This may also affect the penultimate consonant and therefore cluster reduction before the suffix is added (e.g. "jumt" for "jumped").

Lim concludes that while it is not yet clear whether the process is phonetic reduction or syntactic simplification, cluster reduction does impact on the marking of noun plurals and past tense marking of regular verbs.

Deterding (2007) also discusses the difficulty in determining whether some features of both SCE and SStdE are morphological or phonological in their basis. He reports on final consonant cluster simplification with the omission of /t/ and /d/ in word final consonant clusters, which impacts on past tense marking of verbs. He outlines how context has an impact on past tense marking; once context is established, past tense marking becomes variable. However, Deterding suggests that for word final /s/ in consonant clusters (i.e. important in third person singular tense marking, possessives and regular noun plural marking), this feature is morphological rather than phonological in basis as there is no phonological process to account for deletion in SStdE (i.e. the /s/ should be preserved in consonant cluster simplification) .

Ho and Platt (1993) conducted some early studies of SStdE and SCE and identified features of SCE that include:

- **mixing of verbs of movement** (e.g. "I will fetch you to the airport" as compared with the Standard English "I will take you to the airport");
- **repetition of verbs for emphasis** (e.g. "don't play play" as compared with the Standard English "don't play / fool around").

However, Ho and Platt identify variable past tense marking as being a morphological variation of SCE as it also occurs with irregular verbs (e.g. "go market" as compared with the Standard English "I went to the market"). In their 1993 study, Ho and Platt examined the percentage of usage of correctly marked past tense verbs in adult speakers of SCE. Although they were not able to differentiate clearly between SCE and features of SStdE, Ho and Platt obtained data from a range of adult participants of different educational levels in a formal interview situation, which was seen as more likely to elicit features of SStdE. They noted that verbs are more likely to be marked for past tense if they refer to one specific event in the past. For example, "walk walk then suddenly one tree fell" (rather than Standard English "I was walking and then suddenly the tree fell down").

Their research also found that the verbs "do, go, buy, come, get, take" were more commonly marked correctly for past tense. However, Ho and Platt (1993) noted that verbs were more often marked correctly for tense if the pronunciation of the verb ending was consistent with the phonology of SCE. They summarised the frequency of occurrence for the following ways of marking a verb for past tense in SCE as:

- containing a vowel change (e.g. "fall" to "fell") marked 57.3 percent of the time;
- using an "-ed" allomorph (i.e. pronounced as an entire syllable, such as "started", "patted") marked 40.6 percent of the time;
- ending with vowel plus "d" (e.g. "paid") marked 36.2 percent of the time;
- ending with a consonant cluster (e.g. "stopped", which is pronounced "stopt") marked 3.9 percent of the time.

These results support Gupta's (1994) theory that the phonological features of SCE are related to the past tense marking. The relatively low percentage of use of the markers also seems to suggest that context may be a critical factor in past tense

marking, as discussed in Deterding (2007). That is, once the context in which the event has occurred in the past has been established, past tense marking is no longer required.

Fong (2004), from her research using the data from the GSSEC, found that in SCE it is optional to mark the verb for tense, number and person. She states that the option of marking is not dependent on whether the verb uses regular or irregular inflections, and suggests that rather than marking at random there is a clear pattern of use of the non-finite or correct irregular past tense form, not a random, variable pattern. For example, if there is an adverbial such as "yesterday" then the tense is marked correctly on the following verb, or the verb can be used in non-finite form. For example:

- yesterday go market (non-finite form);
- yesterday went market (correct irregular past tense verb).

Once again, context is possibly the factor that may be important in how the verb is marked.

Ho and Platt (1993) note that verbs are often marked for past tense by the use of "already" or "just" (e.g. "just do" for "did", "finish already" for "finished). Bao (1995) also reports on the use of "already" as a marker for the past tense in SCE. The "already" is likely to be due to contact with Chinese languages because it translates directly from the "le" marker in Mandarin to indicate the past tense (Yip & Rimmington, 1997). For example, "fall down" is "die dao" in Mandarin and "fell down" is "die dao le", translating as "fall down already". Similarly, Ansaldo (2004) reports that this is a feature of past tense marking in Hokkien, which was one of the primary contact languages as SCE evolved prior to Mandarin being spoken in Singapore. Therefore, this is possibly the most consistent way in which the past tense is marked in SCE.

In their study of SCE in 1993, Ho and Platt also investigated the occurrence of morphological marking of noun plurals. They found that the "-s" marker for plurality often was not used. In Chinese and Chinese dialects, plurality is not marked morphologically but is assumed by context or, if required, specified by the use of a quantifier (e.g. "many dog", "two girl"), (Yip & Rimmington, 1997). A similar

pattern can be seen in SCE, with plurality often marked by a quantifier rather than the "-s" marker. From the GSSEC data, Wee and Ansaldo (2004) found plural marking to be optional among their native English, SStdE-speaking Singaporean university students. They believe this demonstrates that noun plural marking in SCE and SStdE does not yet have a clear pattern. However, Ho and Platt (1993) reported a correlation between morphological marking of noun plural and higher educational level, indicating that the marker is more likely to emerge as children learn SStdE.

Gupta (1994), like Ho and Platt (1993), commented on the increased use of morphological marking of structures as children learn SStdE, noting the emergence of:

- the **use of an auxiliary + subject in interrogatives** (e.g. "what do you want?" as compared with SCE "want what?");
- **past tense marking** (e.g. "he wanted that yesterday");
- **marking of nouns for possession** (e.g. "teacher's") and **plurality** (e.g. "many apples");
- **complex verb groups with modal auxiliaries** (e.g. "she has been...").

However, she stated that these features of SStdE would be used only in contexts that require the more formal variety of English. SCE is more likely to be the language of choice in less formal situations. As stated earlier, this ability to switch between varieties of the language is termed "diglossia" (Ferguson, 1959) or, when it occurs more as a shift along a continuum, "polyglossia" (Ansaldo, 2004). It is a significant feature of language use in Singapore, which children with normally developing language skills will acquire after SStdE develops.

Linguistic tolerance in Singapore

Singaporeans tend to be tolerant of language problems, often assuming poor proficiency in a certain language rather than globally poor language skills (Gupta, 1994). Singaporeans will switch between forms of English as well as other languages to maximise the exchange of information. Therefore, if a child does not develop SStdE, many parents and professionals will be tolerant of the child's pattern of language use and not seek further assessment to rule out potential language learning problems, even though the child may be struggling to cope with the school

curriculum. This attitude is indicated by low referral rates to Speech Pathologists in Singapore (0.11%) in comparison with rates in the UK (1.68% in the northern region of the UK) (Gupta & Chandler 1994). Other indicators include the way in which Singaporeans will switch languages to find the best common language and the predominance of code switching (i.e. inserting words from another language into a sentence) when they do not have the vocabulary in the language they are using.

Thus it is not uncommon for parents to be unconcerned if their children are not speaking by preschool age (Chandler, Rickard Liow & Gupta, 1994; Gupta et al., 1998). In fact, many professionals and parents believe that it is normal for children to start to speak at age 3-4 years, and parents should only become concerned if the child is not speaking by the age of six. This appears to be based on "myth" rather than fact, as there have been no studies that suggest there is a delay in the early language development of Singaporean children in comparison with other English speaking children around the world.

Further complicating the situation in Singapore, the educational system is very fast paced, with children expected to be reading and writing competently when they start primary school (aged 6-7 years). Preschool programmes focus on developing early reading and writing skills, with less focus on oral language abilities. Class sizes are very large and many preschool teachers have minimal training. Therefore, oral language impairment often goes undetected until the child starts primary school and experiences difficulties learning SStdE, or when they start to have difficulty with the increase in language complexity in the school curriculum at approximately Primary 3 level. It is of extreme importance, therefore, to understand normal development in SCE in order to be able to promote awareness of these difficulties and make early identification of disorders in language development. It is also vital to take note of the literature, which clearly shows that SCE differs significantly from other forms of English in both linguistic structure and language use.

The general tolerance of language problems in the community emphasizes the importance of good assessment of language skills. The purpose of an assessment is to identify the developmental language level, the child's strengths and weaknesses, and to plan intervention accordingly. In the Singaporean context, the child's ability to have flexibility in use of both SCE and SStdE must also be considered. SStdE is

usually elicited in a formal assessment situation where children are more likely to use standard forms to respond, defaulting to SCE if they do not have the SStdE structures (Brebner, in press). Therefore, there is a need for reliable and valid language assessment tools that can be used to assess the development of children's English in Singapore.

Ideally, assessment materials are required for both SCE and SStdE, but with the availability of assessment materials for Standard English from countries such as the USA and UK, there is a more urgent need for appropriate assessment materials for SCE, the earlier developing language. However, currently there is no suitable assessment tool available for examining a child's expressive language abilities in SCE, and, as culture and language are inextricably linked, there will be cultural and linguistic bias in commercially available assessment tools.

Linguistic bias in language assessment in Singapore

As well as being culturally biased in terms of stimuli and tasks, assessments designed for monolingual children who speak Standard English will be biased to reflect the normal development of Standard English in that society. As discussed previously, there may be linguistic bias in language assessments in that vocabulary and syntax, and the developmental sequence of acquisition of the language, may differ (Abudarham, 1987; Cheng, 2002; Fagundes et al., 1998; Huynh, 1995; Miller, 1984; Pakendorf & Alant, 1997; Penn, 1998; Wyatt, 2002). The literature indicates significant differences in the forms of English spoken in Singapore (Alsagoff & Ho, 1998; Ansaldo, 2004; Deterding & Poedjosoedarmo, 2001; Fong, 2004; Gupta, 1994; Ho & Platt, 1993; Lim & Foley, 2004; Wee & Ansaldo, 2004). There are significant differences in the structure and morphology of SCE, for example it does not follow the same developmental sequence as Standard Englishes and the sociolinguistic code switching patterns are not clearly understood (Gupta, 1994). Therefore, there is likely to be linguistic bias in the assessment if a commercially available test is used to assess the expressive language abilities of SCE-speaking children.

Given the identified differences between SCE and StdE, and evidence that language assessments may contain linguistic bias, an analysis of a screening assessment was conducted to explore the potential bias. In Singapore, many clinicians use the widely

available Renfrew Action Picture Test (RAPT) (Renfrew, 1988) as a screening assessment of children's expressive language skills. The RAPT assesses expressive language skills by eliciting a sample of information (i.e. vocabulary) and grammar. The RAPT scoring system awards points for the presence of target grammatical structures. However, as can be seen in Table 2.1, many of the structures are not used in SCE. The existence of the RAPT target structures in SCE and SStdE (based on characteristics of SCE and SStdE outlined earlier) has been indicated by a ✓if present or a × if not present. Once again, it is important to note that although mature SStdE does not vary greatly from other Standard Englishes, not all Singaporeans will speak the standard form. Therefore, the existence of the structures in SStdE does not mean this standard form of English will occur frequently in Singapore.

Table 2.1 shows clearly that many of the structures the RAPT aims to elicit are not always used in SCE, indicating that the assessment is not linguistically appropriate for assessment of expressive language skills in children speaking SCE because it disadvantages SCE-speaking children by targeting forms that are not part of the local dialect. Although many structures may be acquired as children learn SStdE, it is important to have an assessment of normal development of skills in SCE in order to make early identification of language learning difficulties. Most children do not start to learn SStdE until the age of 4 years and many children may never acquire full proficiency depending upon their socio-economic status and education.

Table 2.1: Grammatical targets in Renfrew Action Picture Test

RAPT TARGET GRAMMATICAL STRUCTURE	FEATURE OF SCE	FEATURE OF SStdE
present tense participle "-ing" (e.g. "riding")	× verb endings may be omitted	✓
indication of future aspect (e.g. "put")	× variable marking of future aspect, morphological features often results in verb being used in finite form regardless of tense	✓ indicated by "going to" or "wants to".
possessive nouns (e.g. "girl's")	× nouns not consistently marked for possession	✓
pronouns (e.g. "he / she / it / them / one / they")	✓ "it/them/one/they" × "he/she" often mixed	✓
relative pronouns (e.g. "that / who")	✓ "that"	✓
possessive pronouns (e.g. "his / her")	× "his / her" often mixed	✓
auxiliary "is / has / was"	× auxiliaries may be deleted	✓
passive (e.g. "got")	× variable marking of past tense	✓/× variable marking of past tense
regular past tense participle "-ed" (e.g. "lifted)	× variable marking of past tense	✓/× variable marking of past tense

RAPT TARGET GRAMMATICAL STRUCTURE	FEATURE OF SCE	FEATURE OF SStdE
irregular past tense verbs "caught / fell / broke / took / bit"	× variable marking of past tense	✓/× variable marking of past tense
plural noun, regular ending "-s" (e.g. "mouses")	× variable marking of plurals or marked by quantifier (e.g. two dog)	✓/× variable marking of plurality
plural noun, irregular ending (e.g. "mice")	× variable marking of plurals or marked by quantifier (e.g. two dog)	✓/× variable marking of
co-ordinating conjunction "and"	✓	✓
subordinating conjunction "to / so (that) / because"	✓*note – conjunctions optional depending on context	✓
use of noun phrase with main clause subject	× subject may be deleted	✓
use of main clause verb (e.g. "There is a hole in the bag and the apple is falling out")	✓ (e.g. "drop already")	✓

Based on her case studies of four children, Gupta (1993) formulated a basic developmental sequence for the acquisition of SCE (see Table 2.2). Whilst Gupta is clear that proposing such a developmental sequence based on such a small population of children is not reliable, she reports that in her data she found major differences in the order of acquisition of many aspects of language, in particular with morphology and syntax. Some skills are acquired earlier than in Standard English (e.g. clauses with "because" are acquired by only 3 years in SCE) and others are acquired later, if at all (e.g. gender specific pronouns "he / she"). These differences in developmental acquisition, structure and use of English are of crucial importance in the assessment of English language development in Singapore, as many commercially available formal assessments are based on the patterns of language acquisition of monolingual children in societies such as the USA and will target specific grammatical features that may not be characteristic of SCE.

Table 2.2: Gupta's developmental sequence for English in Singapore

2 – 3 years negatives – don't, no "to be" conjugated correctly for 3rd person singular "is" conditional and subordinate clauses
3 – 4 years "to be" conjugated correctly for 1st person "am" and plural "are"
4 years + Emergence of SStdE Diglossia develops ↓ ↓

SCE used in informal situations	SStdE used in formal situations

Gupta (1993) also highlighted the importance of the acquisition of the verb "to be", noting that agreement between the subject and the verb (i.e. use of "I <u>am</u>", "the girl <u>is</u>", "the children <u>are</u>") is accurate in children with normally developing SCE. However, it must be noted that absence of the verb "to be" is a feature of SCE (e.g. in SCE "Jie Jie so clever" is appropriate, rather than Standard English "older sister <u>is</u> so clever"). Therefore, agreement, not absence, would be an important diagnostic feature.

Although Gupta (1993) notes the emergence of the subordinating conjunction "because" (which is possibly an artefact of her data from the language samples of four children), she emphasises that conjunctions are not always used. Instead, they are used only if required by the context, for example saying "you do that I beat you" in SCE instead of the Standard English "if you do that, then I will smack you". Once again, the ability to use conjunctions, rather than their absence, would be an important diagnostic feature.

From all the literature on SCE, it can be seen that there are significant differences between the forms of English spoken in Singapore. SCE is an informal language but is also the language of interaction with young children and the form of English children are most likely to be exposed to first (Gupta, 1994). Accurate evaluation of a child's expressive language abilities in SCE is important, particularly if early detection of language impairment is to occur. Of particular note is the importance of focusing on the child's competence in the language rather than performance, as many features of SCE occur only variably. Therefore, assessment procedures should include naturalistic language sampling as well as formal assessment tasks, and formal assessment tasks should highlight the features of SCE and SStdE that are expected in the language of typically developing Singaporean children. Existing assessments are not sensitive to the characteristic features of SCE and therefore have limited value in diagnosis of language impairment. The ability to assess language skills in SCE, before acquisition of SStdE when many language learning difficulties become evident, is of great importance for early identification and remediation of language learning problems, as well as being important in the assessment of those children who have had minimal exposure to SStdE.

In performing a linguistically fair assessment of expressive language skills, therefore, characteristic features of SCE should be examined to determine whether expressive language skills are developing normally. In Singapore, for all the reasons outlined in this literature review, the validity of currently available developmental scales and formal assessments is under threat. There are no tests designed specifically for the local population. Tests may not reflect relevant skills, utilise familiar objects / pictures or tasks, or reflect appropriate linguistic structures and vocabulary. Also, tests will have been based on language samples from monolingual children exposed

to Standard English in countries other than Singapore (Gupta, 1993). In order to try to overcome this cultural and linguistic bias and inform clinical practice, some research projects have been conducted to attempt to gain knowledge about the languages and forms of English spoken in Singapore. These projects have been vital in helping clinicians begin to understand differences in the developmental sequence of SCE and have established some normative data with which it is possible to compare a child's performance with that of his / her peers.

Projects to overcome test bias in Singapore

In Singapore to date, projects have focused on describing features of SCE, developing means of determining language dominance and developing normative data for existing assessments. Gupta and Chandler's project (Gupta et al., 1998) aimed to establish local norms for the Renfrew Bus Story, but found that the children were unfamiliar with the task of retelling a story, seemed to have difficulty in understanding the story and were unable to describe many of the key pictures. This affected the language elicited and the local norms were significantly lower than those for British children, making the assessment inappropriate for use in Singapore.

Another project (Chong, Rickard Liow & Lee, 1998) determined local normative data for both Mandarin and English on a number of language assessments in order to facilitate differential diagnosis of Specific Language Impairment (SLI) and English as a Second Language (ESL) difficulties. Normative data for The British Picture Vocabulary Scale, Derbyshire Language Scheme assessment, Essex Picture Naming and Renfrew Action Picture Test (RAPT) were obtained for Singaporean children aged 4½ - 6½ years, separating the data for children with English as a first language from data for children with Mandarin as a first language. Chong et al. (1998) focused on obtaining the new normative data for Singaporean children by using data resulting from the RAPT to compare the raw scores achieved by the Singaporean children with the raw scores from the original British data. They noted that Singaporean children achieved much lower scores than British children (see Table 2.3). Chong et al. noted considerable floor effects in the data (i.e. there was a disproportionate number of zero or low scores), particularly for the Mandarin-speaking children. They felt this was because the children were often unable to recognise the scene depicted or did not have the vocabulary necessary to be able to describe the scene. Such floor effects

have a significant impact on test sensitivity, as the test was clearly not eliciting any data from which to make a judgment about these children's abilities to express themselves in relation to familiar ideas and concepts.

Table 2.3: Comparison between original RAPT norms and Singaporean norms (from Chong et al. 1998)

	British children's mean raw scores (total)	***Singaporean children's mean raw scores (total)***	
Age	**Monolingual English speakers only**	**Bilingual English dominant English speakers**	**Bilingual Mandarin dominant English speakers**
5;0–5;05	53	39	20
5;06-5;11	55	41.5	26
6;0-6;05	59	43	28

It seems appropriate to establish local normative data for tests to make their utilisation more appropriate in a Singapore context. This would provide data with which to compare a child's performance with that of their peers. However, it is evident that the test materials are not appropriate in their linguistic targets or format and therefore affect the validity of the instrument (Brebner et al., 2000). The significant differences in the forms of English spoken in Singapore and the high likelihood of cultural bias (including linguistic bias) in the available assessment tools for multilingual populations reported in the international literature make it important to investigate whether there is cultural bias in an assessment tool before using the original form of the assessment with the Singaporean population. Despite this situation, there has been no exploration of whether the assessments used in Singapore are culturally biased and whether children would score better on these assessments if the materials had been adapted to become more culturally appropriate.

Many authors have stated that new assessments specific to the population should be devised, or that existing assessments should be modified to be culturally and linguistically appropriate for use in assessing culturally and linguistically diverse children (Abudarham, 1987; Brebner et al., 2000, 2001; Brebner, McCormack & Rickard Liow, 2004; Gupta & Chandler, 1994; Gupta et al., 1998; Lam, & Rao, 1993; Martin, 2000; Owens, 2004; Pakendorf, & Alant, 1997; Paul, 2007; Vaughn-

Cooke, 1983; Westby, 2000; Wyatt, 2002). Additionally, the test and test procedure need to be reviewed and adapted to make them as culturally appropriate as possible. If such changes are made, significant modification to existing assessment materials may be required to make them appropriate for use in assessing the language abilities of culturally and linguistically diverse children.

Modification of existing assessments

An increasing number of researchers support the relevance and importance of adapting and modifying existing assessment materials, and then establishing normative data for the target population (Abudarham, 1987; Brebner et al., 2000, 2001; Brebner et al., 2004; Gupta & Chandler, 1994; Gupta et al., 1998; Lam, & Rao, 1993; Martin, 2000; Pakendorf, & Alant, 1997; Vaughn-Cooke, 1983; Westby, 2000). Modification provides a cheaper, less time consuming and therefore more viable alternative to devising new assessments, particularly for developing nations (Pakendorf, & Alant, 1997).

Currently, most Speech Pathologists in Singapore use commercially available assessments, either interpreting the scores with caution or not scoring the results and using the information only for informal assessment (Gupta & Chandler, 1994; Gupta et al. 1998). Lewis (1998), however, believes little literature has been published on how to use traditional assessments in a culturally appropriate way. Lewis suggests adapting these assessments is more appropriate than merely administering the test as it is and not scoring it. He highlights some important steps in selecting a traditional assessment for modification for a new cultural group, stressing the importance of starting with an assessment that was initially well designed and as culturally appropriate as possible. His recommendations include deciding whether the content of the test is suitable for the cultural group, adapting the test and then determining the validity for the target group. However, Lewis (1998) and Cheng (2002) also state the importance of examining existing data to see if lower performance on a test is due to culturally-based test characteristics. This stance supports the importance of first examining whether culturally and linguistically appropriate materials result in better scores on existing assessments. This had not been explored previously in Singapore.

Both Vaughn-Cooke (1983) and Martin (2000) state that modifying tests for a specific cultural group is one way of overcoming potential bias in tests and of developing a suitable assessment tool. However, both state that modification must be carried out carefully. Issues to consider in modification / adaptation include:

- researcher / examiner bias;
- the process of modification:
  - identification of the assessment tasks requiring modification;
  - identification of the assessment content requiring modification;
  - identification of culturally appropriate stimuli;
  - if modification is successful, statistical analysis and production of normative data from a representative sample of the population.

Researcher / examiner bias

Researcher / examiner bias is an important issue in Singapore that parents and some professionals often raise when research by non-Asian clinicians is presented. However, the most crucial factor is that the researcher be culturally and linguistically competent, rather than necessarily being a member of the culture for which an assessment is being adapted.

Carter et al. (2005) outline a series of considerations in developing cross-cultural assessments, including involving speakers of the language for whom the test will be used. They highlight the importance of piloting all aspects of the test and testing process, and using this as a necessary iterative process, ensuring that the test is well designed for the population. Other strategies include ensuring that picture stimuli recognised with less than 80 percent accuracy in the pilot be removed or redrawn, and that practice items and prompts be used as appropriate to the target group.

Kayser (1995) cites a paper by Taylor (1992) in which he states that it is not necessary for a researcher modifying an assessment for a specific population to be a member of that group, but that the researcher must be culturally aware. This includes having an understanding that the clinician's own culture will affect what they consider to be correct or normal. Furthermore, it is vital that the clinician understands that what a test measures may not be culturally appropriate. Cultural sensitivity and knowledge is mandatory when working with culturally and linguistically diverse

clients (Carter et al., 2005; Cheng, 2002; Isaac, 2002; Kayser, 1995; Owens, 2004; Paul, 2007; Westby, 2000; Wyatt, 2002).

Taylor (1992) also states that with regard to research, projects should allow for cultural differences and diversity, and should only investigate a culturally appropriate issue, formulating suitable research questions and adopting culturally appropriate methodology and analyses. Results should never be generalised across cultures and any comparison across cultures should be controlled for other variables such as educational level and socio-economic status. This allows for unbiased research. Following Taylor's guidelines when modifying an assessment should allow for the production of a culturally appropriate tool.

In developing nations that have a relatively undeveloped infrastructure and limited availability of appropriately qualified researchers, it is not always possible to find a suitably qualified local researcher to work on modification of assessments. This can be addressed by finding a culturally competent researcher from a different cultural group who can work to produce a culturally appropriate assessment tool suitable for that population (Penn, 1998). Culturally competent researchers have been involved in such projects to modify assessments in developing nations like South Africa.

World-wide projects to modify language assessments

Adaptation / modification of language assessments for other cultural groups has been undertaken widely in South Africa, a developing, multilingual nation. In her summary of the translated and adapted assessment tools in South Africa, Penn (1998) states that many of the projects to translate assessments have been largely unsuccessful because the assessment tools were not suitable for the local population. Ideally, the materials should have been modified to make them more culturally appropriate. Some of the projects Penn describes, which modified existing assessments, were successful in providing appropriate assessment tools for specific cultural groups. For example, the Reynell Developmental Language Scales were modified for the dialectal form of English spoken in South Africa. That project found a high correlation between scores obtained by the original British children and white South African children.

Similarly, the Peabody Picture Vocabulary Test (PPVT) was used and found to be suitable for English-speaking children in South Africa. From Penn's analysis of the validity and reliability of the modified tools, it appears that those tools adapted to suit assessment of a dialectal form of English were more suitable for use, but adaptations for totally different languages required extensive modification and even then were not always suitable. For example, adaptation of the PPVT for Xhosa children was unsuccessful as the test format and linguistic targets were inappropriate for this population. The test was found to be suitable for use with English-speaking children only, as the test format and targets were appropriate for this population. Socio-cultural and socio-economic factors may have impacted on these results. It appears from this study that valid and reliable modification of materials across forms of English is easier to achieve than for completely different languages. This is likely to be because there will be more similarities in the structures tested and any problems with the test can be overcome more easily with modification. These results suggest that careful modification of an assessment tool for use with English-speaking children in Singapore would have a high likelihood of success.

If a culturally competent researcher undertakes modification of an assessment for a cultural group, it is necessary for them to understand the assessment procedure and its purpose. Ideally, modification should be done by a team (Kayser, 1995) but if consultation occurs with other professionals and members of the cultural group, a careful, appropriate modification can be made by an individual researcher. Nevertheless, liaison is important in ensuring that any changes / new tasks or stimuli are culturally appropriate and each step of the modification process must be carefully analysed.

Process of modification

Many areas need to be considered in adapting / modifying a test. It is important that tasks, content and stimuli are culturally appropriate (Carter et al., 2005; Kayser, 1995), and that the validity and reliability of the modification is checked using statistical analysis (Bishop, 1998; Goldstein & Lewis, 1996).

Test tasks

There is wide agreement in the literature that test tasks need to be culture and language sensitive to help the child create meaning, and therefore understand and interpret the task (Carter et al., 2005; Cheng, 2002; Deyhie, 1987; Fagundes et al., 1998; Owens, 2004; Paul, 2007; Martin, 2000; Taylor & Clarke, 1994; Westby, 2000; Wyatt, 2002). Therefore, in modifying an assessment instrument, the tasks need to be reviewed to ensure a culturally appropriate task and format is used, with instructions worded so that the children can understand what is required of them. For example, as described earlier, in adapting the PLAI for use with African American children, Fagundes et al. (1998) modified the tasks to elicit the same target information but through play and interaction-based activities, therefore making the assessment task more culturally appropriate for that population. In contrast, the task required in the Bus Story, that is retelling a story, was unfamiliar to children in Singapore, and therefore reduced their ability to achieve scores representative of their language abilities on this test (Gupta et al., 1998). A more culturally appropriate task needs to be utilised for the assessment of expressive language abilities for Singaporean children. Simple written picture descriptions are expected at an early age in Singapore. Children are also used to being asked to describe what is happening in a picture. In primary school, the English oral tests and examinations (starting from age 6-7 in Primary 1) are based on picture description tasks. Many parents introduce such tasks early with their children in order to prepare them for the future test situation. Thus, it can be assumed that an oral picture description task will be more culturally appropriate than a narrative task, and will be a culturally appropriate way of eliciting information on the child's expressive vocabulary, morphology, syntax and sentence formulation abilities.

Content of tests

The content of the test needs to be critically reviewed. Items known to be biased need to be removed, and targeted vocabulary as well as scenes depicted and topics / themes used need to be reviewed. Much of the vocabulary used and scenes depicted in the RAPT are culturally inappropriate for Singaporean children. For example, in a country with very few horses and little open land to ride them, RAPT item 4 with the picture of the man fox hunting is confusing for many Singaporean children. Test

content therefore requires careful scrutiny, with inappropriate scenes and vocabulary being substituted with more culturally appropriate alternatives.

Stimuli

The stimuli also need reviewing so that they are culturally appropriate and within the children's experience. Carter et al. (2005) and Erickson and Iglesias (1986) identified possible bias in picture stimuli in that lack of familiarity with the picture format (e.g. line drawings, coloured pictures etc.) could result in inappropriate responses and therefore bias in the test results. Pictures and objects used in assessment are culture-loaded. Any modification needs to adapt the pictures and objects to increase their suitability for the cultural group to be assessed (Carter et al., 2005; Cheng, 2002; Jensen, 1980; Miller & Abudarham, 1984).

Pictures need to depict familiar scenes in a format familiar to the child and the pictorial materials in assessment need to be chosen carefully (Carter et al., 2005; Cheng, 2002; Kayser, 1995; Leeman, 1981). It is difficult to separate culture from linguistic factors, so the use of culturally appropriate scenes and situations is important in eliciting the language representative of that cultural group. Penn (1998) described how culturally appropriate stimuli were used in the development of the Zulu Expressive Receptive Language Assessment, and how local craftsmen were involved in their production to maximise their appropriateness.

In a South East Asian project to form a Chinese version of the Psychoeducational Profile (CPEP) to assess children with autistic spectrum disorders, Lam and Rao (1993) identified potential stimulus bias with the pictures. Lam and Rao addressed this bias by utilising pictures from local kindergarten workbooks in the modified assessment. They considered these pictures to be more culturally appropriate stimulus materials for this population. Some additional minor changes were also made to make the scenes more culturally appropriate (for example, the cowboy was changed to a fisherman and his horse to a junk / boat).

With so much support for the notion of potential stimulus bias, the selection of an appropriate pictorial format in adapting an assessment for use in Singapore is vital. Any such adaptation needs to take note of the emphasis placed on the use of workbooks and worksheets in Singapore schools, most often using simple black and

white line drawn pictures. Similar materials are reportedly used in Hong Kong (Cheung et al., 1997), and this format was chosen as the most suitable in designing the Cantonese Receptive Vocabulary Test because it would be familiar and recognisable to the majority of children.

One of the primary problems with using picture stimuli to assess language skills is knowing whether it is the children's ability to perceive and recognise the pictures accurately or cultural differences in the scenes / familiarity with the topic, or whether the child truly has a language learning problem that results in depressed scores. It is difficult to determine whether it is an issue of poor recognition of unfamiliar scenes and situations depicted, whether word recognition and exposure means that the children have difficulty understanding the picture and therefore responding as expected, or whether the pictures themselves are perceived differently.

Cultural differences in picture perception and picture recognition have been discussed comprehensively in the international literature. There have been extensive studies of picture perception in tribal people in countries such as Africa and New Guinea, and it has been shown that many cultures do not perceive pictures in the same way as people from "Western" cultures (Segall, Campbell & Herskovits, 1966). Hudson (1960) found that the Bantu tribe could not easily recognise simple pictures, but their ability to recognise pictures increased dramatically as they were exposed to more pictures over time and as the culture started to incorporate the use of pictorial materials.

Carter et al. (2005) found that the rural Kenyan children in their study, particularly those not attending school, found interpreting picture stimuli difficult. Errors noted included confusing objects of similar shape or an unfamiliarity with what a named object actually looked like (e.g. they found many children knew what a crocodile was, but had never seen a real one or a picture). Similarly, a study by Herskovits described in Segall et al. (1966) found that "Bush Negroes" of Africa were unable to recognise photographs the first time they saw one, but this ability increased as the pictures were explained and people were given clues to help them perceive the picture. Segall et al.'s study (1996) also found differences in picture perception based on the participants' experience of pictures and the environment, but, similar to

Hudson's (1960) research, they found that as people were exposed to more pictorial materials, their ability to recognise the pictures increased.

Whilst it is difficult to determine whether stimulus bias is due to cultural differences or differences in picture perception, the potential for bias in the stimulus pictures is clear. Further evidence for bias in stimulus pictures can be found in Segall et al. (1966), who cite a study by Bagby in 1957 that compared the language of Mexican children with the language of American children on a picture description task. Results indicated that the Mexican children used poorer quality language to describe the pictures. Although this study aimed to demonstrate differences in picture perception, the results were inconclusive in this respect. However, they were important in identifying the crucial importance of using easily recognisable pictures of familiar scenes in eliciting the best possible language output.

A more recent study by Barrow, Holbert and Rastatter (2000) looked at colour versus black and white pictures for picture naming tasks. They found that colour pictures allowed young, middle to upper class Caucasian children in North Carolina correctly to name more pictures than when presented with black and white pictures. Therefore, whilst this study does not consider cultural factors, it indicates that not only picture perception but the influence of colour is an important factor to consider when designing tests.

There have been no published studies on picture perception in Singaporean or Asian children. The available literature on picture perception and its relationship to testing the language skills of children from diverse cultural backgrounds is inconclusive. Therefore, it is not appropriate to assume that the cultural differences in picture perception of "primitive" people in some of the studies cited will be the same for the technologically and educationally sophisticated society in Singapore. However, the overall view is that cultural differences affect the way in which pictures are perceived and authors (Abudarham, 1987; Carter et al., 2005; Cheng, 2002; Erickson & Iglesias, 1986; Fagundes et al., 1998; Isaac, 2002; Kayser, 1995; Lam & Rao, 1993; Miller, 1984; Westby, 2000; Wyatt, 2002) state that there is potential for cultural bias in stimulus materials. Thus, in order to maximise the language elicited from pictorial materials, it would appear beneficial to select the most familiar pictorial format. In Singapore, as in Hong Kong, it would seem that a culturally

appropriate format for a language assessment would be simple black and white line drawn pictures that all schoolgoing children could recognise easily. Additionally, the strategy of using a local artist for the production of materials would be a useful measure in ensuring production of culturally appropriate materials.

Statistical analysis

Once the task, content and stimuli have been examined and modified, a pool of test items can be established and their suitability determined. Statistical analysis is important in ensuring validity of test items (Bishop, 1998; Goldstein & Lewis, 1996). A pool of items needs to be established, based on the examination of task, content and stimuli. By necessity, this process will be subjective and difficult to control, but liaison with other professionals / members of the cultural group on the appropriateness of the items will help reduce cultural bias (Goldstein & Lewis, 1996). These items should then be piloted with a representative group of children, and statistical analysis used to eliminate unsuitable items and irregular features (that is, those items which all children always get correct or wrong). The final pool of items can form the modified assessment, enabling normative data for the cultural group to be obtained. Teoh et al. (2009) used this process in the adaptation of the Expressive Vocabulary subtest of the CELF-P2 UK. In this study the item analysis showed that both re-ranking of the test items and modification to some picture stimuli (e.g. changing the colour of a fireman's clothes to match those of Singaporean firemen) was required to form the final pool of subtest items to make it suitable for use with children in Singapore.

Pakendorf and Alant (1997) followed a similar procedure in modifying the Peabody Picture Vocabulary Test (PPVT) for the North Sotho population in South Africa. Dissatisfaction with an existing translated version of the PPVT led to the project, which aimed to develop a culturally and linguistically appropriate version of the assessment that considered cultural and socio-linguistic factors in the adapted test items. This included the applicability of stimulus pictures and correction of several previously inaccurately translated vocabulary items. A team of professional and non-professional native North Sotho speakers met to translate the original PPVT and determine which pictures were not appropriate to their culture. They worked to devise culturally appropriate substitutions for the inappropriate pictures without

changing the structure of the original test. The resulting adapted test was then standardised for North Sotho speakers but Pakendorf and Alant reported that, whilst the adaptation was successful, the test no longer bore much resemblance to the original form. However, in modifying an assessment, it is sometimes necessary to make significant changes to the stimuli used in order to make the tool more culturally appropriate.

Summary

In summary, the literature indicates that in assessing children from a culture other than that in which a test has been devised, the test should be culturally appropriate in the tasks set and materials used (including vocabulary and pictures). It should be linguistically sensitive to the child's language in the structures it assesses and should be standardised on a representative sample of the cultural group for which it will be used. Tests should be examined closely to determine whether the tasks and items of the test accurately reflect the skills and experiences of the culture, and whether adapting these tests to make them more culturally and linguistically appropriate would increase performance on these tests for children from that society.

The strong evidence in the literature of the importance of culturally and linguistically appropriate instruments for valid language testing suggests that researchers should be urged to develop such assessments for the Singapore population. Although the international literature supports such an approach, modification has not yet been attempted with any standardised assessments in Singapore. Assessments need to be examined in closer detail to determine whether cultural bias exists for the Singapore population and whether the materials require adaptation to increase their suitability for use in this society.

The initial component of this study (Part A) aims to investigate this issue by modifying the Renfrew Action Picture Test (RAPT) to determine whether cultural and linguistic modification makes the test more culturally and linguistically appropriate for preschool Chinese Singaporean children and allows them to achieve higher language scores. This type of modification can be done appropriately by a culturally competent researcher who carefully modifies the existing assessment to make it more appropriate in terms of task, stimuli (and therefore vocabulary) and

linguistic structures to be assessed. Comparing language samples on the modified and original forms of the test will indicate whether the adapted test is more culturally appropriate. Analysis of these samples will determine whether the modified form elicits higher information and grammar scores and a better sample of the children's expressive language abilities in SCE. If it does, it can be claimed to be more culturally and linguistically appropriate for assessing the expressive language abilities of this population. Chapters 3, 4, 5 and 6 now describe Part A of the research, which includes the modification of the Renfrew Action Picture Test, the researcher's methodology, results and discussion.

RESEARCH PART A

Chapter 3 Renfrew Action Picture Test Modification

Chapter 4 Methodology for Hypothesis Testing

Chapter 5 Results Part A

Chapter 6 Discussion of Results Part A

Chapter 3 Renfrew Action Picture Test Modification

This chapter describes the modification process undertaken by the researcher in relation to the Renfrew Action Picture Test.

Method

In order to determine whether culturally and linguistically appropriate materials elicited a better sample of children's expressive language abilities in Singapore, the Renfrew Action Picture Test (RAPT) (Renfrew, 1988) was modified to make it more culturally and linguistically appropriate for preschool Chinese Singaporean children. The RAPT was selected as a culturally appropriate format for children in Singapore because it uses picture description of 10 pictures to obtain a sample of expressive language. Picture description tasks are familiar to children in Singapore and form the basis of many kindergarten activities. Responses to questions on the RAPT are scored for information (i.e. vocabulary used) and grammar. The test was also selected for adaptation as it is easy to administer and score, and was already widely used by clinicians in Singapore as a screening tool of children's expressive language skills.

It was expected that modifying the assessment pictures and targets to make them more culturally and linguistically appropriate for Singaporean children would result in the children giving responses to the target questions that were more reflective of their true language abilities, and therefore achieving higher scores for information and grammar.

Ethical clearance

Before commencing the adaptation process, ethical clearance for the project was obtained from Flinders University of South Australia and the National University of Singapore (see Appendix 2).

Test modification

The modification process design was based on the work of Vaughn-Cooke (1983) and Martin (2000), as discussed previously, ensuring that culturally appropriate stimuli and tasks were used.

In adapting the RAPT to be more culturally and linguistically appropriate, several types of modifications were made to the pictures: semantic; linguistic; and pictorial. The modifications are summarised in Tables 3.1 - 3.10. The scoring system was also modified to reflect these alterations. All changes were based on the researcher's understanding of SCE and SStdE from the literature, clinical experience, and general exposure to and experience of Singaporean culture (after six years living and working as a Speech Pathologist in the country). Changes were planned in consultation with experienced Singaporean Speech Pathologists to ensure they would be culturally, linguistically and age appropriate substitutions.

Pictorial

Two types of pictorial changes were made. Firstly, the original RAPT coloured picture format was changed to simple black and white line drawings that can be considered more culturally appropriate in some Asian cultures (Cheung, Lee and Lee, 1997; Lam & Rao, 1993). This is the format common to the "workbooks" widely used in kindergartens and homes in Singapore.

Whilst the change from colour to black and white is not supported by the literature on picture recognition for picture naming tasks (Barrow & Rastatter, 2000), the change is well supported for cultural reasons. As discussed previously, there is extensive evidence that materials used for assessment of language skills need to be culturally appropriate (Gupta et al., 1998; Isaac, 2002; Miller and Abudarham, 1984; Owens, 2004; Paul, 2001; Westby, 2000; Wyatt, 2002). Furthermore, from personal clinical experience in using the RAPT with Singaporean preschool children, it was obvious that the colours in the RAPT pictures often emphasised features of the picture which influenced the children's recognition of the object / scene. For example, RAPT picture 9 (see Table 3.9) depicts a boy crying because the dog has taken his shoe. The shoe is coloured red and many children misidentify the shoe as a red "pau" (Chinese bun). This misidentification was compounded by the cultural

inappropriateness of the scene depicted, as generally dogs would not be permitted to get near enough to food in Singapore to take it. Therefore, other pictorial changes were made in that some pictures were altered to make scenes look more Singaporean (e.g. velcro straps on shoes rather than laces; Singapore style post-box etc.).

Semantic

Semantic changes were made by altering scenes and situations to those more familiar to Singaporean children, therefore changing the target vocabulary to be more appropriate for the population. These changes were made as the content of a test needs to be critically reviewed, removing items known to be biased, and reviewing vocabulary targeted as well as scenes depicted and topics / themes used (Martin 2000; Vaughn-Cooke 1983). Much of the vocabulary used and many scenes depicted in the RAPT are culturally inappropriate for Singaporean children. For example, in a country with no mice and where the large rats are often bigger than the small feral cats commonly seen, RAPT item 5 with the picture of a cat catching two mice is confusing for many Singaporean children. As such, it does not elicit the target vocabulary or grammar.

As previously discussed, this type of change has been widely recommended in the literature to aid in making a test instrument more culturally and linguistically appropriate for a different cultural group (Abudarham, 1987; Cheng, 1995, 2002; Isaac, 2002; Kayser, 1995; Martin, 2000; Miller, 1984; Penn, 1998; Taylor & Clarke, 1994; Westby, 2000). Therefore, for modification, the test content was carefully scrutinised, and more culturally appropriate alternatives were substituted for inappropriate scenes and vocabulary. Care was taken to keep the new targets as similar to the old as possible, for example substituting a high frequency noun (e.g. bear) for a high frequency noun (e.g. doll). More common scenes (such as a boy getting stars on his worksheet) replaced unfamiliar situations (such as the cat catching two mice). As far as possible, the modifications did not alter the complexity of the target.

Linguistic

Linguistic changes were made by changing the pictures to elicit target vocabulary and syntax that were thought to better represent normal language development for

SCE. Targets were also changed to words more likely to elicit the target syntax (e.g. targeting verbs more likely to elicit past tense marking in Singapore Colloquial English). This type of change, as with the other changes made, is well supported in the international literature on test modification (Abudarham, 1987; Cheng, 1995, 2002; Isaac, 2002; Kayser, 1995; Martin, 2000; Miller, 1984; Penn, 1998; Taylor & Clarke, 1994; Westby, 2000).

Control of researcher bias

Although the majority of the research was conducted by a culturally competent researcher, the team approach suggested by Kayser (1995) was adopted in the production of the modified test materials. This procedure has been used successfully in modification of test materials for other cultural groups, as evidenced by the results of Pakendorf and Alant's (1997) research using the Peabody Picture Vocabulary Test (PPVT) for speakers of Northern Sotho. Goldstein (1996) also suggests a similar process of forming a main pool of assessment items based on individual knowledge and experience, but limiting the bias of these items by consulting experts if possible, then piloting the items and using statistical analysis to select the final items.

A similar process was adopted for this study and a list of suggested alternative pictures was drawn up and discussed with several Singaporean Speech Pathologists, related professionals and another expatriate professional who had worked in Singapore for more than ten years. Based on the feedback received, modifications were made and a Singaporean artist was employed to draw the pictures in a simple format similar to the style used in preschool workbooks. Three or four alternative scenes were chosen for each of the original RAPT pictures, resulting in 34 alternative pictures. The changes for each picture are discussed in Tables 3.1 - 3.10.

Table 3.1: Original RAPT picture 1 and alternative pictures

			
A	**B**	**C**	**D**

A Original RAPT Picture 1 – "the girl is holding a teddy bear"

Cultural/linguistic differences identified: unfamiliar object "bear", children often comment that girl "crying"

B Modified version alternative a – "The girl is holding a doll"

Change of object to "doll"

C Modified version alternative b – "The mother is holding a baby"

Change of subject to "mother" and object to "baby"

D Modified version alternative c – "The girl is holding a rabbit"

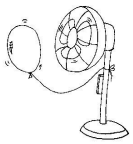
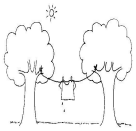
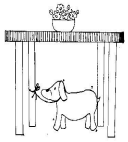
Change of object to "rabbit"

Table 3.2: Original RAPT picture 2 and alternative pictures

			
A	**B**	**C**	**D**

A	Original RAPT Picture 2 – "the mother is going to put the girl's boot on"
	Cultural/linguistic differences identified: unfamiliar object "boot"
B	Modified version alternative a – "the mother is going to put the girl's shoe on"
	Change of object to "shoe"
C	Modified version alternative b – "The mother is going to put the girl's book away"
	Change of object to "book", change of preposition from "on" to "in/away"
D	Modified version alternative c – "The mother is going to put the girl's umbrella up"
	Change of object to "umbrella", change of preposition from "on" to "up"

Table 3.3: Original RAPT picture 3 and alternative pictures

				
A	**B**	**C**	**D**	**E**

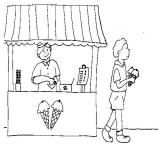
A	Original RAPT Picture 3 – "the dog has been tied to the post"
	Cultural/linguistic differences identified: unfamiliar scene of dog tied to a post, unfamiliar object "post", children often comment that dog "naughty"
B	Modified version alternative a – "the monkey has been tied to the tree"
	Change of subject to "monkey", change of object to "tree"
C	Modified version alternative b – "the balloon has been tied to the fan"
	Change of subject to "balloon", change of object to "fan"
D	Modified version alternative c – "the washing (line) has been tied to the tree"
	Change of subject to "washing (line)", change of object to "tree"
E	Modified version alternative d – "the dog has been tied under the table"
	Change of object to "table", change of preposition from "to" to "under"

Table 3.4: Original RAPT picture 4 and alternative pictures

				
A	**B**	**C**	**D**	**E**

A	Original RAPT Picture 4 – "the man is riding the horse and jumping over the gate"
	Cultural/linguistic differences identified: unfamiliar scene of hunting, unfamiliar objects "horse" and "gate/fence", children often comment that horse is a "dog"
B	Modified version alternative a – "the man is riding the bicycle over the bridge"
	Change of objects to "bicycle" and "bridge"
C	Modified version alternative b – "the man is riding the bicycle over the (overhead) bridge"
	Change of objects to "bicycle" and "(overhead) bridge"
D	Modified version alternative c – "the amah/grandmother is pushing the trolley up the hill"
	Change of subject to "amah/grandmother", change of objects to "trolley" and "hill", change of preposition to "up"
E	Modified version alternative d – "the man/father is carrying the boy up the stairs"
	Change of subject to "man / father", change of objects to "boy" and "stairs", change of preposition to "up"

Table 3.5: Original RAPT picture 5 and alternative pictures

				
A	**B**	**C**	**D**	**E**

A Original RAPT Picture 5 – "the cat has caught the mice"

Cultural/linguistic differences identified: unfamiliar scene of a cat catching its prey, unfamiliar object "mice", children often comment that is a "rat" and refer to "putting foot on" rather than "catching", irregular plurals not commonly used by children in Singapore until school age, use of regular plural marker "-s" occurs later than for StdE

B Modified version alternative a – "the boy has got two stars"

Change of subject to "boy", change of verb to "got", change of object to "stars/chops" ("chop" is the word used for "stamp" in Singapore)

C Modified version alternative b – "the boy threw the balls"

Change of subject to "boy", change of verb to "threw", change of object to "balls"

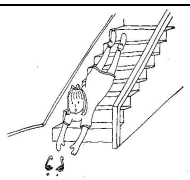
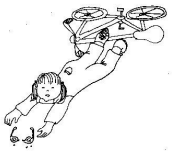
D Modified version alternative c – "the boy got two ice creams"

Change of subject to "boy", change of verb to "got", change of object to "ice creams"

E Modified version alternative d – "the boy got two ice creams"

Change of subject to "boy", change of verb to "got", change of object to "ice creams"

Table 3.6: Original RAPT picture 6 and alternative pictures

			
A	**B**	**C**	**D**

A Original RAPT Picture 6 – "the girl has fallen down the stairs and broken her glasses"

Cultural/linguistic differences identified: children highly protected and unlikely to fall down often, especially on stairs

B Modified version alternative a – "the girl has fallen down the stairs and broken her glasses"

Change of picture format/colour

C Modified version alternative b – "the girl has fallen off her bicycle and broken her glasses"

Change of object to "bicycle", change of preposition from "down" to "off"

D Modified version alternative c – "the girl has fallen off the seesaw and broken her glasses"

Change of object to "seesaw", change of preposition from "down" to "off"

Table 3.7: Original RAPT picture 7 and alternative pictures

			
A	**B**	**C**	**D**

A Original RAPT Picture 7 – "the girl is lifting the baby up to post the letter"

Cultural/linguistic differences identified: post box the wrong colour and size

B Modified version alternative a – "the girl is lifting the baby up to post the letter"

Change of picture format to make post box more Singaporean

C Modified version alternative b – "the mother is lifting the baby up to blow the candles (out)"

Change of object to "candles", change of verb to "blow"

D Modified version alternative c – "The mother is lifting the baby up to see the clowns"

Change of object to "clowns", change of verb to "see"

Table 3.8: Original RAPT picture 8 and alternative pictures

			
A	**B**	**C**	**D**

A Original RAPT Picture 8 – "the man is climbing up the ladder to get the cat off the roof"

Cultural/linguistic differences identified: most people live in high rise apartments and do not climb on the roof, cats not usually kept as pets, ladders not commonly seen in this context

B Modified version alternative a – "the man is climbing up the ladder to pick the fruit off the tree"

Change of picture to make the scene more Singaporean, change of object to more familiar "fruit"

C Modified version alternative b – "the boy is climbing on the chair to get the boat off/from the cupboard"

Change of subject to "boy", change of object to "chair", change of preposition from "up" to "on", change of object to "boat"

D Modified version alternative c – "the boy is climbing up the ladder to go down the slide"

Change of object to "slide", change of preposition from "off" to "down", change of verb to "go". Flaw in replacement of noun with verb (i.e. to get the cat off the roof →to go down the slide)

Table 3.9: Original RAPT picture 9 and alternative pictures

			
A	**B**	**C**	**D**

A Original RAPT Picture 9 – "the boy is crying because the dog took his shoe"

Cultural/linguistic differences identified: children highly protected and unlikely to be unsupervised with a dog, dogs not commonly kept as pets, shoe looks like a "pau" (Chinese bun)

B Modified version alternative a – "the boy is crying because the dog took his shoe"

Change of picture format to make the scene look more Singaporean

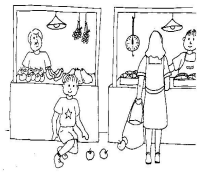
C Modified version alternative b – "the boy is crying because he fell off his bicycle"

Change of object to "bicycle", change of verb to "fell". Flaw in addition of preposition (i.e. the dog took his shoe → he fell off his bicycle)

D Modified version alternative c – "the girl is crying because the boy took her baby (doll)"

Change of subject to "girl", change of objects to "boy" and "baby (doll)"

Table 3.10: Original RAPT picture 10 and alternative pictures

			
A	**B**	**C**	**D**

A	Original RAPT Picture 10 – "the lady's bag has a hole in it and the apples are falling out. The boy is picking up the apples" Cultural/linguistic differences identified: shopping goods "over-packed" in plastic and bags unlikely to break, children often comment that the boy is stealing
B	Modified version alternative a – "the lady's bag has a hole in it and the apples are falling out. The boy is picking up the apples" Change of scene to represent Singapore market, boy to look more like he is with the woman
C	Modified version alternative b – "the boy's bag has a hole in it and the books/pencils/things are falling out. The girl is picking up the books" Change of objects to "books/pencils/things", change of subject to "boy", change of object to "girl"
D	Modified version alternative c – "the boy has dropped his ice cream and the lady is picking it up" Change of object to "ice cream", change of subject to "boy", change of object to "girl". Flaw in loss of cause (i.e. hole in bag) for dropping the ice cream

Modification of the scoring system

Once the above modifications had been made, both the target questions and the scoring system were modified to reflect the changes made to the targets. The RAPT target questions were adapted to reflect the scenes depicted. The new scoring system was based on Renfrew's original scoring, with points given for the correct vocabulary and grammar used, based on the new target pictures (e.g. points for the noun "doll / baby" rather than "bear" for picture 1). In order to facilitate comparison across tests, the new system was based as closely as possible on the original scoring system (see Appendix 1).

Selection of pictures

The best alternative picture for each RAPT item needed to be selected to decide the 10 pictures to make up the Singapore version of the RAPT. In order to select the 10 pictures, a pilot study was conducted to analyse Chinese preschool Singaporean children's responses to each of the pictures.

Participant sample

A local government preschool was approached and the Principal / Director gave approval for conducting the pilot study. The Principal, acting in "loco parentis", which is the usual procedure in Singapore, gave permission to test each of the children. Ten Chinese Singaporean children in kindergarten 1 (aged 4-5 years) participated in the pilot study. The class teacher identified the participants as having age appropriate language skills and a home language of English or Mandarin. Participation was voluntary and children were able to discontinue testing at any stage.

Procedure

The 33 pictures were presented to the children following the procedure outlined in the RAPT manual. All participants were tested individually in a quiet area of the kindergarten. Their responses were tape recorded and later transcribed for scoring. The results were scored for information and grammar using the new modified scoring system. The scores were then compared using a Friedman non-parametric data analysis in order to determine which pictures elicited statistically better scores.

Where there was a statistically significant result, the picture achieving the higher score (for either or both information and grammar) was selected for the test. Where there was no statistically better score, the scores obtained for each picture were considered and a selection was made based on comparative scores. Decisions for each picture are explained in more detail in Table 3.11.

These ten "best" pictures were then used to form the modified assessment called the "Singapore English Action Picture Test" (SEAPT). Table 3.11 shows the results of data analysis and final test picture selection.

Table 3.11: Friedman analysis results and picture selection

<table>
<tr><th></th><th>Information</th><th>Grammar</th></tr>
<tr><td>Pic. 1</td><td>Mean scores a = 1.95 b = 2.35 c = 1.70
$Chi_{(2,9)}$=3.440, not significant (ns)</td><td>Mean scores a = 2.10 b = 1.80 c = 2.10
Chi(2,9)=4.0, ns</td></tr>
<tr><td></td><td colspan="2">Picture a selected as best option:
equal highest score grammar
second highest score information
Picture b not selected:
lowest grammar score
highest information score
Picture c not selected:
lowest information score
equal highest grammar score  </td></tr>
</table>

Table 3.11 continued

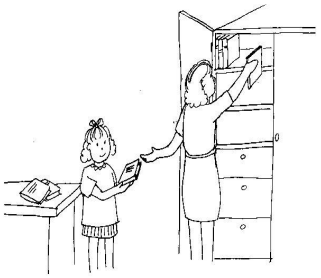
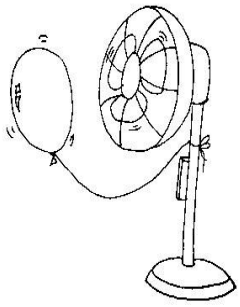
<table>
<tr><td rowspan="2">Pic.
2</td><td>Mean scores a= 2.25 b = 2.35 c = 1.40
$Chi_{(2,9)}$=7.267, p<0.05</td><td>Mean scores a = 2.25 b = 2.45 c = 1.30
$Chi_{(2,9)}$=10.786, p<0.01</td></tr>
<tr><td colspan="2">Picture b selected as best option:
• highest score grammar
• highest score information
Picture c not selected:
• significantly lowest information score
• significantly lowest grammar score
Picture a not selected:
• second highest information score
• second highest grammar score
  </td></tr>
<tr><td rowspan="2">Pic.
3</td><td>Mean scores
a = 2.35 b = 2.75 c = 2.40 d = 2.5
$Chi_{(2,9)}$=1.075, ns</td><td>Mean scores
a = 2.35 b = 2.55 c = 2.35 d =2.75
$Chi_{(2,9)}$=1.571, ns</td></tr>
<tr><td colspan="2">Picture b selected as best option:
• highest score information
• second highest score grammar
Picture a not selected:
• lowest information score
• lowest grammar score
Picture c not selected:
• second lowest information score
• equal lowest grammar score
Picture d not selected despite equal scores for picture b and d as test considered likely to be more sensitive for information than grammar. Results were:
• second highest information score
• highest grammar score
  </td></tr>
</table>

Table 3.11 continued

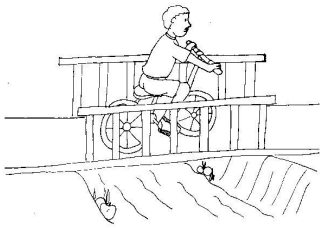
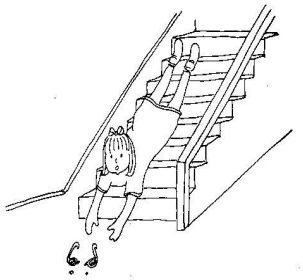
Pic. 4	Mean scores a = 2.35 b = 2.20 c = 2.55 d =2.90 $Chi_{(2,9)}$=2.946, *ns*	Mean scores a = 3.0 b = 2.8 c = 2.2 d =2.0 $Chi_{(2,9)}$=8.5, p<0.05
	Picture a selected as best option: • significantly highest score grammar • third highest score information	
Pic. 5	Mean scores a = 2.40 b = 2.20 c = 3.35 d = 2.05 $Chi_{(2,9)}$=7.5, *ns*	Mean scores a = 3.55 b = 1.75 c = 2.45 d = 2.25 $Chi_{(2,9)}$=14.620, p<0.01
	Picture a selected as best option: • significantly highest score grammar • third highest score information	
Pic. 6	Mean scores a = 2.15 b = 2.25 c = 1.60 $Chi_{(2,9)}$=2.97, *ns*	Mean scores a = 2.15 b = 1.85 c = 2.0 $Chi_{(2,9)}$=1.0, *ns*
	Picture a selected as best option: • second highest score information • highest score grammar Picture b not selected: • lowest grammar score • highest information score Picture c not selected: • lowest information score • second highest grammar score	

Table 3.11 continued

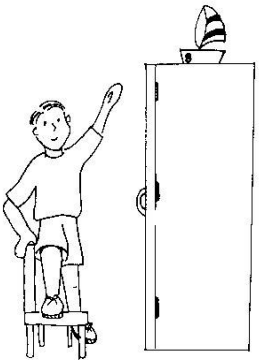
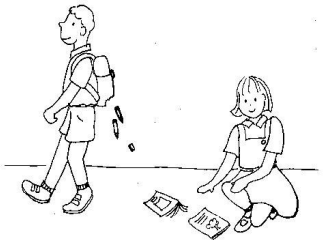
Pic. 7	Mean scores a = 2.10 b = 1.70 c = 2.20 $Chi_{(2,9)}$=1.647, *ns*	Mean scores a = 1.75 b = 2.05 c = 2.20 $Chi_{(2,9)}$=2.0, *ns*
	Picture c selected • highest score information • highest score grammar Picture a not selected: • second highest information score • lowest grammar score Picture b not selected: • lowest information score • second highest grammar score	
Pic. 8	Mean scores a = 2.10 b = 2.50 c = 1.40 $Chi_{(2,9)}$=7.515, p<0.05	Mean scores a = 1.85 b = 2.0 c = 2.15 $Chi_{(2,9)}$=1.5, *ns*
	Picture b selected as best option: • highest score information • second highest score grammar Picture a not selected: • second lowest information score • lowest grammar score Picture c not selected: • significantly lowest information score • highest grammar score	

Table 3.11 continued

<table>
<tr><td rowspan="2">Pic. 9</td><td>Mean scores a = 2.10 b = 1.70 c = 2.20
$Chi_{(2,9)}$=2.545, ns</td><td>Mean scores a = 2.20 b = 1.6 c = 2.15
$Chi_{(2,9)}$=2.643, ns</td></tr>
<tr><td colspan="2">Picture c selected as best option:
highest score information
second highest score grammar
as scores were very close between pictures c and a, c selected as marginally better scores comparatively for information
Picture a not selected:
second highest information score
highest grammar score
Picture b not selected:
lowest information score
lowest grammar score  </td></tr>
<tr><td rowspan="2">Pic. 10</td><td>Mean scores a = 1.55 b = 2.70 c = 1.75
$Chi_{(2,9)}$=10.067, p<0.01</td><td>Mean scores a = 1.60 b = 2.40 c = 2.0
$Chi_{(2,9)}$=5.818, ns</td></tr>
<tr><td colspan="2">Picture b selected as best option:
significantly highest score information
highest score grammar  </td></tr>
</table>

Once the Singapore version of the test was complete, it was possible to begin testing the hypothesis that adapting the RAPT to produce a more culturally and linguistically appropriate test for preschool Chinese Singaporean children would elicit better samples of their expressive language abilities in English. And would this enable them to achieve scores that better reflect their true information and grammar abilities in SCE and SStdE? This is discussed in the following chapter.

Chapter 4 Methodology for Hypothesis Testing

It was expected that modifying the assessment pictures and targets of the RAPT to make them more culturally and linguistically appropriate for Singaporean children would result in the children giving responses to the target questions that were more reflective of their true language abilities, and therefore better samples of their expressive language abilities in English. Use of the diglossia model outlined by Gupta (1994) to explain the emergence of English in Singapore led to the expectation that younger children would use English with more characteristics of SCE, with SStdE forms emerging with increasing exposure to formal education in SStdE (i.e. with increasing age). This chapter outlines the methodology used to test this hypothesis.

Methodology: Comparing the Renfrew Action Picture Test with the Singapore English Action Picture Test

The Renfrew Action Picture Test (RAPT) and Singapore English Action Picture Test (SEAPT) were presented to the participants to test the above hypothesis. A comparison was then made of the participants' performance on both tools.

Participant sample

One hundred and six Chinese Singaporean children were the participants for this section of the study, with equal distribution of boys (50%) and girls (50%). The participants were students in Kindergarten 1 classes (aged 4-5 years) in several local government kindergartens that were willing to participate in the study. The participants were grouped by age using the groupings made in the RAPT test manual. This was done to make comparison across the tests relatively easy.

Table 4.1 shows the number of participants per age group by dominant language. There were far fewer participants under the age of 4 years and 5 months due to the time of year the testing took place, which coincided with the intake of students into the preschools.

Table 4.1: Age groups

Age group	Age range (year;months)	*Number of participants*	
		EL1 (50%)	**ML1 (50%)**
1	4;0 – 4;5	5	6
2	4;6 – 4;11	23	26
3	5;0 – 5;5	25	21

The spread of preschools across Singapore that were willing to participate allowed sampling of a cross-section of the population and a mix of socio-economic levels. As stated earlier, permission for testing was obtained from the school principal, as is the procedure in Singapore. Ethical clearance for the project was obtained from both Flinders University and National University of Singapore (Appendix 2).

In an attempt to minimise the complexity of the multilingual language situation in Singapore, only children with English or Mandarin as their main language were asked to participate (EL1 and ML1 respectively), with an equal number of participants representing each main language (see Table 4.1). This was an attempt to minimise the influence of other languages on the samples of English obtained, although it was recognised that the amount and quality of exposure to English and Mandarin would vary among participants. Information on each student's dominant language was obtained from school records and discussion with the class teacher just prior to testing.

Additionally, following the RAPT standardisation process, children with any known speech and language difficulty were to be eliminated from the study to ensure we obtained samples of typically developing language. The participation process was voluntary, so any children who did not wish to participate or wished to discontinue participation were eliminated from the study. In the participating kindergartens, however, there were no children whom teachers identified as having speech and language difficulties, and all children participated willingly in testing.

The sample was reasonably equally distributed for socio-economic status. In Singapore, approximately 88 percent of the population live in Housing Development Board (HDB) flats (Leow, 2000), which vary in size from two-room flats to five

rooms or more. In Singapore, this is used as a measure of socio-economic status, as housing type and socio-economic status correlate for this population. As shown in Table 4.2, the sample is roughly equivalent for four- and five-room HDB flat and private apartments, but participants living in HDB flats of three rooms or less are under-represented. This most likely reflects the trend for lower income families to be less likely to send their children for preschool education, which is not compulsory in Singapore.

It can be seen that the sample is over-represented for participants residing in private houses. This, too, most likely reflects a socio-economic trend for higher income families to send their children for preschool education.

Table 4.2: Type of residence

Type of residence	% in sample	% in population (Chinese citizens)
HDB flat - 3 room or less	18	30.1
HDB flat - 4 room	32	32.3
HDB flat - 5 room or more	24	24.2
Private apartment	10	6.7
House	16	5.7

Procedure

The modified assessment was evaluated against the original version of the test by presenting both tests to the participants. As a change from colour picture to line drawings had been made, a line drawn version of the RAPT (LRAPT) was also presented to the participants in order to determine whether differences in scores were due to the cultural and linguistic modifications or the change in picture format. The principal researcher administered the three sets of pictures (RAPT, LRAPT and SEAPT) in one sitting of approximately 10 minutes per child, in alternating order to eliminate any potential order effect.

The samples obtained from the 106 children were tape recorded and later transcribed, scored and the results compared. The scoring system for the original RAPT was used to score the samples obtained on the LRAPT, and the modified scoring system was

used to score the SEAPT samples. The SEAPT scoring system had been modified to make the two scoring systems as similar as possible, with the same number of points possible for each test item but reflecting the changes made in the adapted test (e.g. change in vocabulary item).

Inter-rater reliability

Inter-rater reliability was measured by asking a Speech Pathologist with a similar number of years of clinical experience and years in Singapore to conduct some testing. She tested 20 participants, and also transcribed and scored 20 language samples (approximately 20%) collected by the principal researcher. Inter-rater reliability was high, with correlations between 0.93-0.98 obtained for all measures.

Data analysis

The data obtained were analysed statistically to determine differences in scores across tests and across languages, and to determine differences in frequency of use or omission of specific morphology or syntax, characteristic of the forms of English spoken in Singapore.

Comparisons were made between the three tests (SEAPT, RAPT and LRAPT) and between the main language groups (EL1 and ML1). Repeated measures analyses of variance were run for the total scores for information and for grammar. Where a difference between tests was indicated, paired sample t-tests were run to determine where the difference lay.

It was hypothesised that as the SEAPT had been modified to make it more culturally and linguistically appropriate for Chinese Singaporean preschool children, a better sample of their expressive language in English would be elicited. Therefore, the following aspects of the language sample were analysed:

- mean length of utterance (MLU) in words and morphemes;
- total number of word roots used;
- total number of words used and omitted;
- total number of inflectional morphemes used and omitted;
- total number of prepositional phrases used;
- total number of conjunctions used.

Each measure is discussed individually in relation to the results obtained in the following chapter. Some specific methodological issues are discussed below.

Mean length of utterance (MLU)

It was decided to compare MLU values from the language samples obtained in order to determine whether the SEAPT allowed children to produce longer utterances than on the RAPT and LRAPT. Although the language samples obtained were not collected in a manner that allowed for reliable calculation of MLU (i.e. there was not a minimum of 100 utterances using conversational sampling), as all of the language samples were from picture descriptions and of similar number of utterances, it was possible to make a comparison of MLU across the three tests. It was hypothesised that the EL1 children would achieve greater MLUs than the ML1 children because they were being tested in their dominant language.

A second hypothesis was that the children's MLUs would be consistent across tests. However, it was thought that the children would use more complex language on the SEAPT than on the other tests. Other features of the language samples were analysed to explore this further as omission of words and inflectional morphemes is characteristic of SCE.

Number of word roots used

The mean number of word roots (e.g. the word root "run" is common to the words "ran", "runs" and "running") was compared across tests to determine whether the children produced a larger number of word roots on the modified version of the test. It was hypothesised that the children would use a larger number of word roots on the SEAPT, but there would be no differences in the number of word roots used between the RAPT and LRAPT.

Total number of words used

The total number of words used was compared across tests to determine whether the children produced a larger number of words on the modified version of the test. It was hypothesised that the children would use a larger number of words on the SEAPT, but there would be no differences in the number of words used between the RAPT and LRAPT. It was also hypothesised that the EL1 children would use a

greater number of words than the ML1 children because they were being tested in their dominant language.

Total number of words omitted

One of the characteristics of Singapore Colloquial English (SCE) outlined in Chapter 2 is the omission of words usually required in a StdE context (Alsagoff & Ho, 1998; Deterding & Poedjosodarmo, 2001; Gupta, 1994). Therefore, the data collected on this feature were analysed.

It was hypothesised that on the SEAPT, the children would omit more words than on the RAPT and LRAPT because the modifications to the SEAPT would allow children to produce more complex utterances, giving more opportunities to omit words that are usually required in a StdE context. It was also hypothesised that the EL1 children would omit a greater number of words than the ML1 children because they were expected to give longer, more complex responses, thus increasing the number of opportunities for word omission.

Total number of inflectional morphemes omitted and used

Another characteristic of SCE discussed previously is the omission of inflectional morphemes (Alsagoff & Ho, 1998; Deterding & Poedjosodarmo, 2001; Gupta, 1994; Ho & Platt, 1993), with use of inflectional morphemes being indicative of development of SStdE forms.

Therefore, analysis was conducted of both use and omission of inflectional morphemes. It was anticipated there would be a higher rate of both use and omission of inflectional morphemes from the language samples using the SEAPT than on the RAPT and LRAPT because the modifications to the SEAPT would allow children to produce more complex utterances, thus giving more opportunities to use and to omit words usually required in a StdE context. It was hypothesised that the EL1 children would use more inflectional morphemes because they were more likely to use some SStdE forms, whereas the ML1 children would be more likely to use SCE. It was also hypothesised that the EL1 children would omit more inflectional morphemes because they were expected to give longer and more complex responses, thus increasing the number of opportunities for omission of inflectional morphemes.

Total number of prepositional phrases used

The use of prepositional phrases was analysed in order to analyse data for increased complexity in the participants' language output on the SEAPT. It was hypothesised there would be a higher number of prepositional phrases used on the SEAPT than on the RAPT and LRAPT as the modified test would allow the children to more easily recognise, and therefore use, prepositional phrases. It was also hypothesised that the EL1 children would use more prepositional phrases than the ML1 children because they were being tested in their dominant language.

Total number of conjunctions used

The use of conjunctions was analysed in order to analyse data for increased complexity in the participants' language output on the SEAPT. It was hypothesised that there would be a higher number of conjunctions used on the SEAPT than on the RAPT and LRAPT as the modified test would allow the children to produce more complex utterances and therefore more conjunctions. It was also hypothesised that the EL1 children would use more conjunctions than the ML1 children because they were being tested in their dominant language and would be more able to formulate more complex utterances in English.

Summary

In summary, overall it was hypothesised that the SEAPT would allow Chinese Singaporean preschool children to produce a better sample of their expressive language in English than on the RAPT or LRAPT. The results are presented in the following chapter.

Chapter 5 Results Part A

This chapter presents the results of the hypothesis testing described in Chapter 4.

The results obtained show that the Singapore English Action Picture Test (SEAPT) allowed Singaporean children to achieve significantly higher scores for both information and grammar than on both versions of the Renfrew Action Picture Test (RAPT) (i.e. the RAPT and the Line-drawn RAPT [LRAPT]).

It was possible to compare the raw scores achieved on the different tests by scoring the SEAPT using the modified scoring system, as the same number of points was possible on all three tests for each test item. The new scoring system reflected only the changes in what could be scored (e.g. allowing for changes in vocabulary items, such as "doll" or "baby" being worth a point for SEAPT picture 1 rather than "bear" as in RAPT and LRAPT picture 1). The scores obtained were analysed statistically to determine whether there were any differences in scores across tests and across languages.

Results of statistical analysis

The repeated measures analysis of variance for information showed main effects for test ($F_{[2,208]}$=181.88, p<0.001) and language ($F_{[1,104]}$=72.48, p<0.001). Children with English as their dominant language (EL1) achieved significantly higher scores than those with Mandarin as their dominant language (ML1), as would be expected (see Figure 5.1 for mean raw scores for each language group on each of the three tests).

Simple effects testing across tests showed that the SEAPT allowed the participants to perform significantly better than on both the RAPT ($t_{[1,105]}$=-15.46, p<0.001) and the LRAPT ($t_{[1,105]}$=-15.94, p<0.001). There was no difference in scores achieved on the two versions of the RAPT ($t_{[1,105]}$=2.81, not significant [n.s.]), indicating that changes in picture format were not the reason for the difference in performance on the tests.

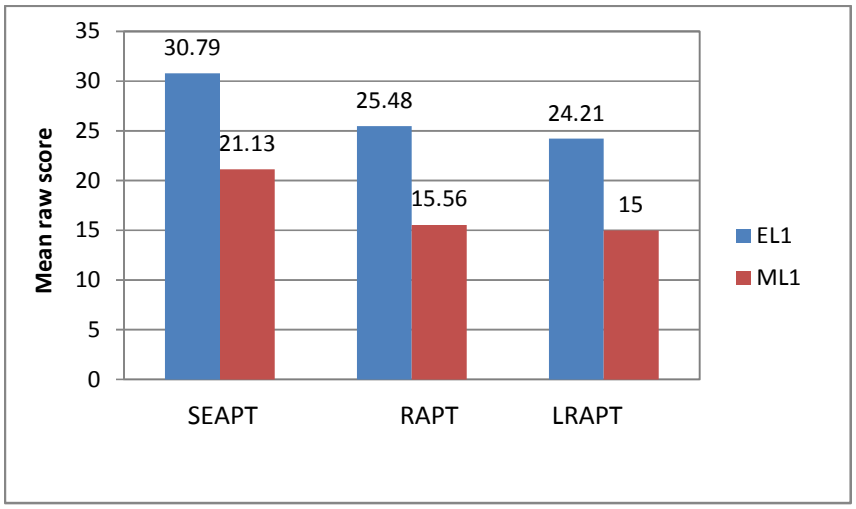


Figure 5.1: Information scores by main language group for each test

The SEAPT clearly allowed children to give a more representative sample of their expressive vocabulary than the RAPT. Table 5.1 shows the mean raw score and standard deviation for the original RAPT standardisation sample, and the equivalent mean raw scores and standard deviations achieved by the EL1 and ML1 participants on all three tests. For information, the EL1 children achieved scores on the SEAPT comparable to the scores achieved by the standardisation sample in the RAPT original, whilst their scores on the RAPT and LRAPT overlapped in range but were markedly lower. The ML1 children achieved markedly lower mean scores on the SEAPT, as would be expected for children being tested in their non-dominant language. On the RAPT and LRAPT, however, when the scores were compared with those of the RAPT original sample, there was often no overlap in the range of scores (see age groups 2 and 3), showing that, a fortiori, the ML1 children scored significantly more poorly on the RAPT and LRAPT than the population for which the test was designed.

Table 5.1: Mean scores, standard deviation and range for both language groups on the SEAPT, RAPT and LRAPT, and original RAPT standardisation sample

INFORMATION SCORES (maximum possible score 40)					
Age group	**Main language**	**Test**	**Mean**	**Standard deviation**	**Range**
1		RAPT original	27	5.33	21.6-32.33
	EL1	SEAPT	30.1	4.94	25.16-35.04
		RAPT adapted	28.1	4.08	24.02-32.18
		LRAPT	23.3	6.50	16.8-29.8
	ML1	SEAPT	22.67	7.70	14.97-30.37
		RAPT adapted	18.08	7.93	10.15-26.01
		LRAPT	16.42	4.98	11.44-21.40
2		RAPT original	29	5.32	23.68-34.32
	EL1	SEAPT	30.61	5.16	25.45-35.77
		RAPT adapted	24.91	5.17	19.74-30.08
		LRAPT	23.78	5.04	18.74-28.82
	ML1	SEAPT	20.61	8.87	11.74-29.48
		RAPT adapted	15.60	7.44	8.16-23.04
		LRAPT	14.54	8.20	6.34-22.74
3		RAPT original	30	5.02	24.98– 35.02
	EL1	SEAPT	31.10	6.27	24.83-37.37
		RAPT adapted	25.48	5.67	19.81-31.15
		LRAPT	24.80	5.59	19.21-30.39
	ML1	SEAPT	21.33	6.29	15.04-27.62
		RAPT adapted	14.79	4.54	10.25-19.33
		LRAPT	15.17	3.78	11.39-18.95

Table 5.1 continued

GRAMMAR SCORES (maximum possible score 37)					
Age group	**Main language**	**Test**	**Mean**	**Standard deviation**	**Range**
1		RAPT original	20	5.84	14.16-25.84
	EL1	SEAPT	12.80	2.77	10.03-15.57
		RAPT adapted	12.80	3.90	8.90-16.7
		LRAPT	11.0	3.0	8.0-14.0
	ML1	SEAPT	7.67	6.59	1.08-14.26
		RAPT adapted	7.50	6.32	1.18-13.82
		LRAPT	5.0	3.10	1.90-8.10
2		RAPT original	21	5.66	15.34-26.66
	EL1	SEAPT	12.09	5.16	6.93-17.25
		RAPT adapted	10.43	5.03	5.40-15.46
		LRAPT	10.74	5.12	5.62-15.86
	ML1	SEAPT	6.44	5.47	0.97-11.91
		RAPT adapted	4.52	4.45	0.07-8.97
		LRAPT	4.85	4.40	0.45-9.25
3		RAPT original	23	5.68	17.32-28.68
	EL1	SEAPT	14.52	6.13	8.39-20.65
		RAPT adapted	12.32	6.17	6.15-18.49
		LRAPT	12.40	6.77	5.63-19.17
	ML1	SEAPT	5.62	3.96	1.66-9.58
		RAPT adapted	4.52	2.52	2.0-7.04
		LRAPT	4.76	2.51	2.25-7.27

The repeated measures analysis of variance for grammar also showed main effects for test ($F_{[2,208]}$=19.12, p<0.001) and language ($F_{[1,104]}$=56.65, p<0.001). Children with English as their main language again achieved significantly higher scores, as would be expected (see Figure 5.2 for mean raw scores for grammar for each language group on each of the three tests).

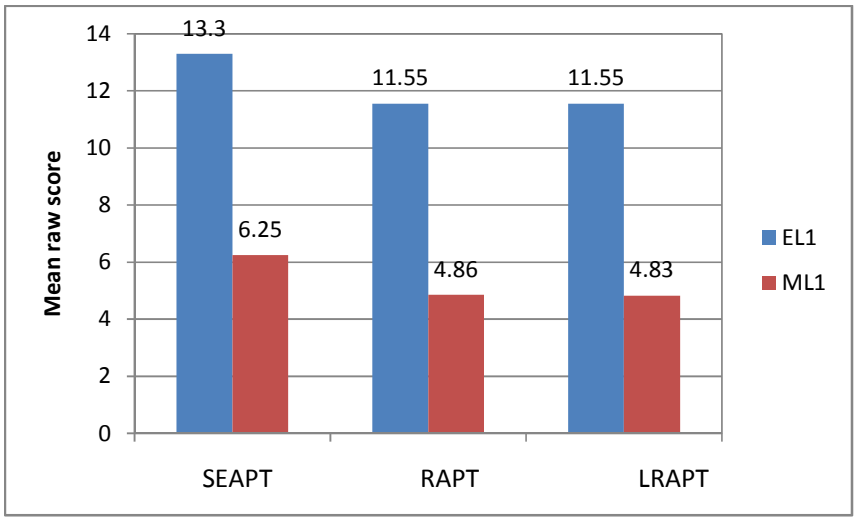


Figure 5.2: Grammar scores by main language group for each test

Simple effects testing across tests showed that the SEAPT allowed the participants to perform significantly better than both the RAPT ($t_{[1,105]}$=-5.62, p<0.001) and the LRAPT ($t_{[1,105]}$=-4.79, p<0.001), with no difference in scores achieved on the two versions of the RAPT ($t_{[1,105]}$=0.05, n.s.). Again this indicated that changes in picture format were not the reason for the difference in performance on the tests.

The SEAPT clearly allowed children to give a better sample of their expressive grammar than in the two versions of the RAPT. However, as illustrated in Table 5.1, for grammar the EL1 children were achieving scores on the SEAPT, RAPT and LRAPT that were markedly lower than the scores achieved in the RAPT original by the standardisation sample, although there was some overlap in the lower range of the original RAPT sample scores. This indicates that the acquisition of expressive grammar is markedly different for EL1 children in Singapore than for the StdE-speaking children in Britain who made up the RAPT standardisation sample.

The ML1 children also achieved lower mean scores on the SEAPT, LRAPT and RAPT, as would be expected for children being tested in their non-dominant language. When the scores were compared with those of the RAPT original sample, there was no overlap in the range of scores, showing that, a fortiori, the ML1 children scored significantly more poorly for expressive grammar on the SEAPT, RAPT and LRAPT than the population for which the test was designed.

Further analysis of the language samples was conducted in order to examine the quality of the children's output on the tests. The samples were transcribed and specific aspects of the syntax and morphology analysed using Systematic Analysis of Language Transcripts software (SALT) (Language Analysis Laboratory 1984). Analysis using SALT software required the comparison of features of Singapore Colloquial English (SCE) with Standard Singapore English (SStdE), allowing for analysis of the syntax and morphology elicited across the three tests for:

- mean length of utterance (MLU) in words and morphemes;
- total number of word roots used;
- total number of words used and omitted;
- total number of inflectional morphemes used and omitted;
- total number of prepositional phrases and conjunctions used.

MLU

For MLU, the repeated measures analysis of variance showed main effects for language for both MLU words ($F_{(1,104)}$=529.155, p<0.001) and morphemes ($F_{(1,104)}$=540.350, p<0.001). The children with English as their main language produced significantly longer utterances for both measures, as was hypothesised.

There was no significant difference in the mean length of utterance (MLU) for both words ($F_{(2,208)}$=0.665, n.s.) and morphemes ($F_{(2,208)}$=1.025, n.s.) across tests. This indicated that the children's utterances were of similar length across all tests, also as hypothesised (see Figure 5.3 for mean MLU in morphemes and Figure 5.4 for mean MLU in words for each of the three tests).

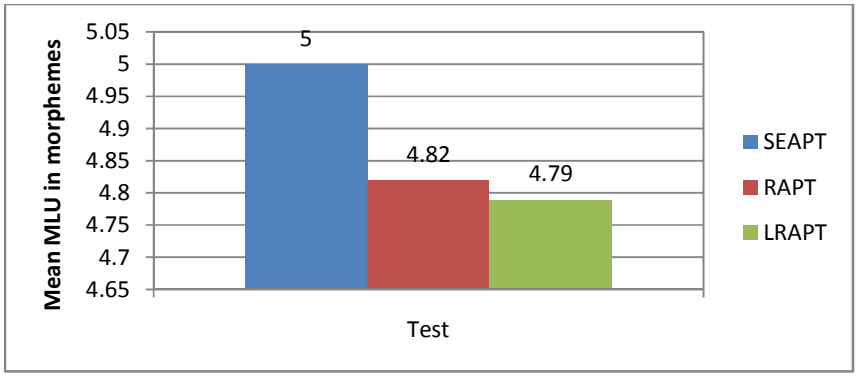


Figure 5.3: Mean MLU in morphemes

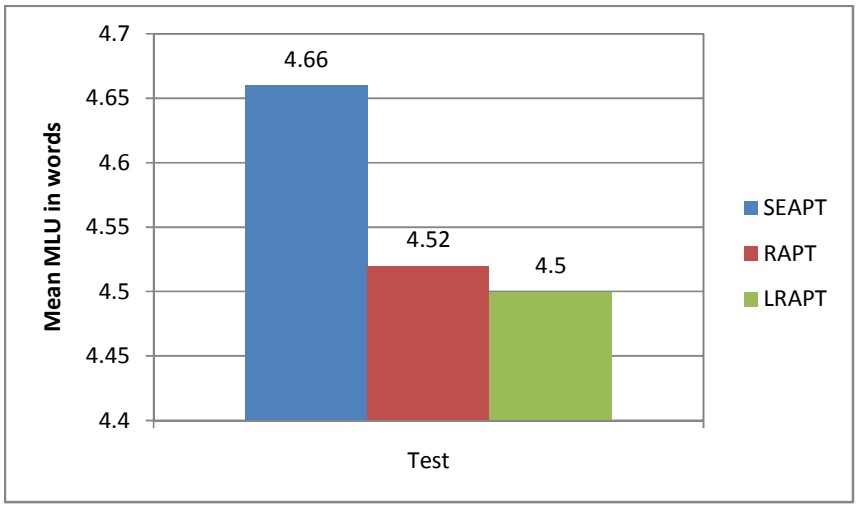


Figure 5.4: Mean MLU in words

Word roots

For word roots used, the repeated measures analysis of variance showed main effects for language for total number of word roots used ($F_{[2,208]}$=35.27, p<0.001). EL1 children used significantly more word roots than the ML1 children, as hypothesised. Simple effects testing across tests showed that the SEAPT allowed the participants to use more word roots than on the RAPT ($t_{[1,105]}$=-6.71, p<0.001). There was no difference between the number of word roots used on the RAPT and LRAPT ($t_{[1,105]}$=-.126, n.s.), also as hypothesised (see Figure 5.5).

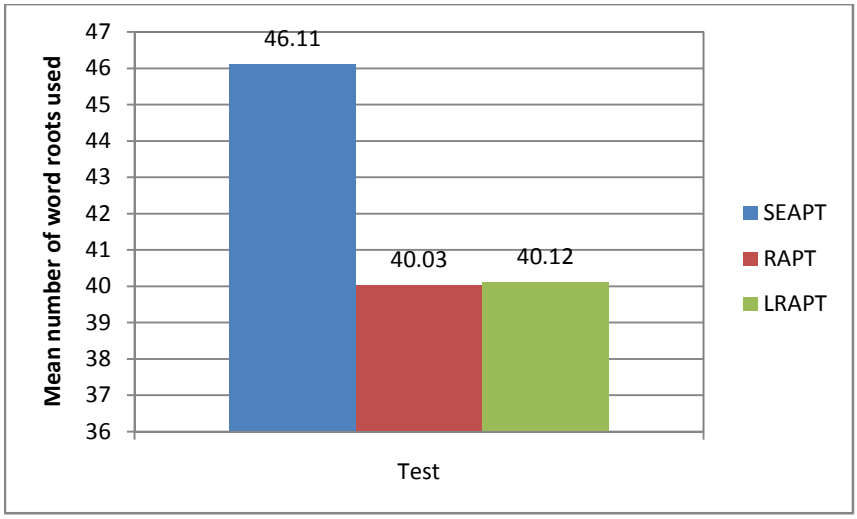


Figure 5 5: Number of word roots used

Number of words used

The repeated measures analysis of variance for words used showed main effects for language for total number of words used. The EL1 children used significantly more words than the ML1 children ($F_{(2,208)}$=29.783, p<0.001), as had been hypothesised. Simple effects testing across tests showed that the SEAPT allowed participants to use more words than the other versions of the test (RAPT vs. SEAPT [$t_{(1,105)}$=-5.769, p<0.001]). There was no difference between the number of words used between the RAPT and LRAPT ($t_{[1,105]}$=-.719, n.s.), also as hypothesised (see Figure 5.6).

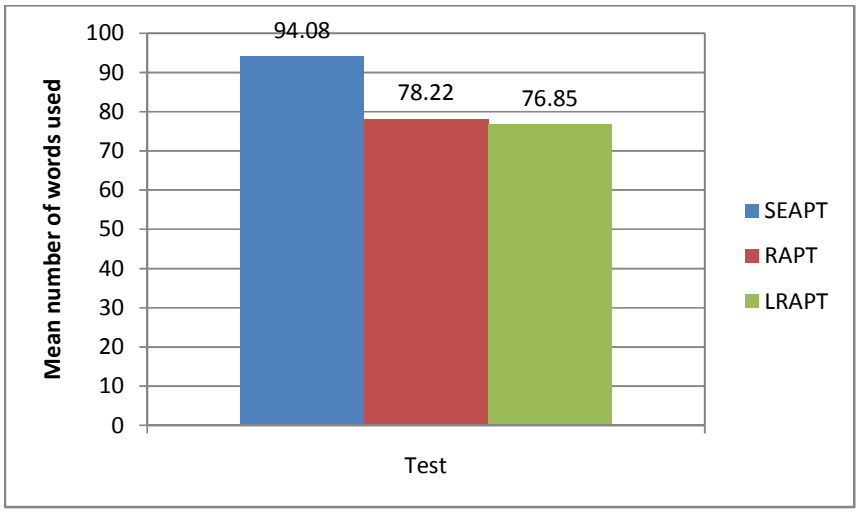


Figure 5.6: Total number of words used

Number of words omitted

The repeated measures analysis of variance for words omitted showed main effects for language for total number of words omitted. The EL1 children omitted significantly more words than the ML1 children ($F_{[2,208]}$=10.56, p<0.001), as had been hypothesised. Simple effects testing across tests showed that the SEAPT had more words omitted (RAPT vs. SEAPT [$t_{[1,105]}$=-3.03, p<0.01)). There was no difference in the number of words omitted on the RAPT and LRAPT ($t_{[1,105]}$=1.473, n.s.), also as hypothesised (see Figure 5.7).

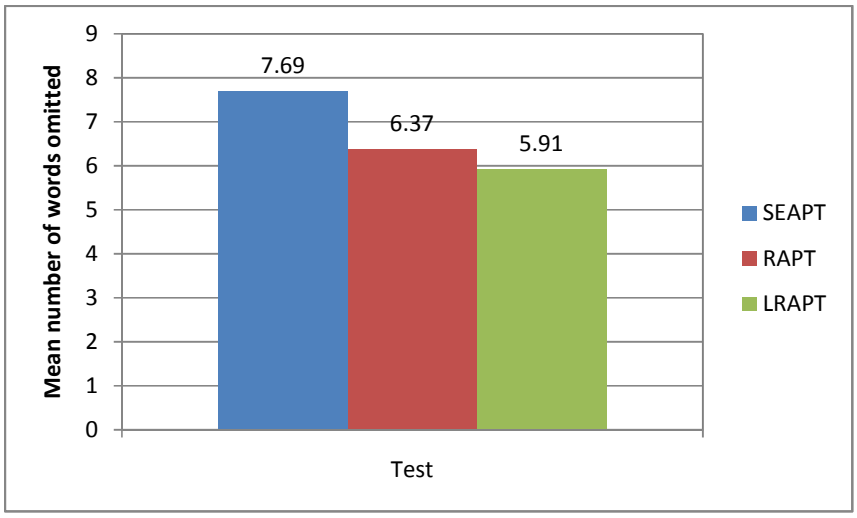


Figure 5 7: Total number of words omitted

Inflectional morphemes

The repeated measures analysis of variance for inflectional morphemes used showed no main effects for language for total number of inflectional morphemes used. The EL1 children were not using more inflectional morphemes than the ML1 children ($F_{(2,208)}$=2.569, n.s.), as hypothesised. A possible reason for this is that the children were responding using SCE rather than SStdE forms (i.e. not required by context to use inflectional morphemes), and warrants further investigation.

Simple effects testing across tests showed a difference in the number of inflectional morphemes used by the different tests. The SEAPT elicited significantly more inflectional morphemes than the LRAPT ($t_{[1,105]}$=-2.016, p<0.05), but there was no difference in the number of inflectional morphemes used between the other tests (RAPT vs SEAPT [$t_{[1,105]}$=--0.979, n.s.] and RAPT vs LRAPT [$t_{[1,105]}$=1.462, n.s.]) (see Figure 5.8). The reason for these results is not clear, but may be due to the relatively low number of inflectional morphemes used by this age group of children. This warrants further investigation.

Figure 5.8: Total number of inflectional morphemes used

There was a clearer pattern for inflectional morphemes omitted. The repeated measures analysis of variance showed significant main effects for language ($F_{(2,208)}$=29.45, p<0.001), with the EL1 participants omitting significantly more inflectional morphemes, as had been hypothesised (see Figure 5.9).

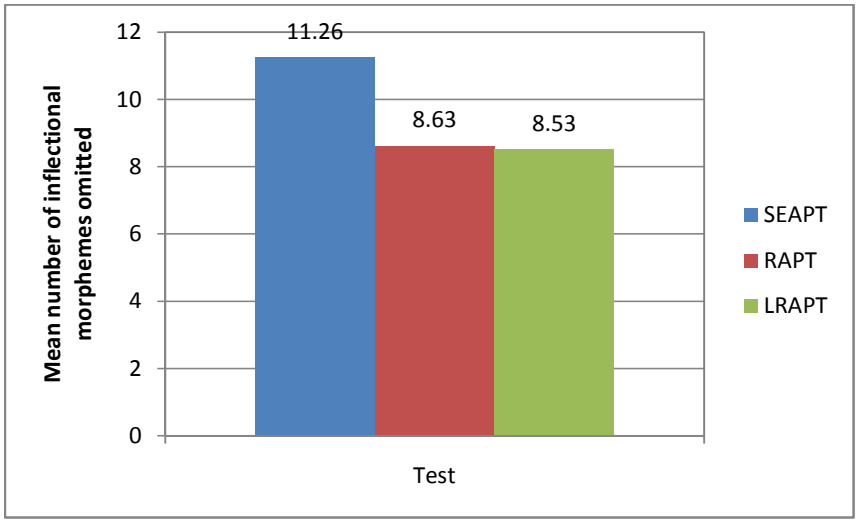


Figure 5 9: Total number of inflectional morphemes omitted

Simple effects testing across tests showed that there was a difference in the number of inflectional morphemes omitted on the different tests. Significantly more inflectional morphemes were omitted in the language samples from the SEAPT in comparison with the RAPT ($t_{[1,105]}$=-5.86, p<0.001) and the LRAPT ($t_{[1,105]}$=-1.863,

$p<0.001$), but there was no difference between the RAPT and the LRAPT ($t_{[1,105]}=0.339$, n.s.), as hypothesised.

Prepositional phrases used

There were few differences between the scores achieved on the RAPT and LRAPT, therefore only the SEAPT and RAPT samples were scored for use of prepositional phrases.

Simple effects testing across tests showed a difference in the number of prepositional phrases used, with the SEAPT eliciting significantly more prepositional phrases than the RAPT, as was hypothesised ($t_{[1,105]}=2.263$, $p<0.05$) (see Figure 5.10).

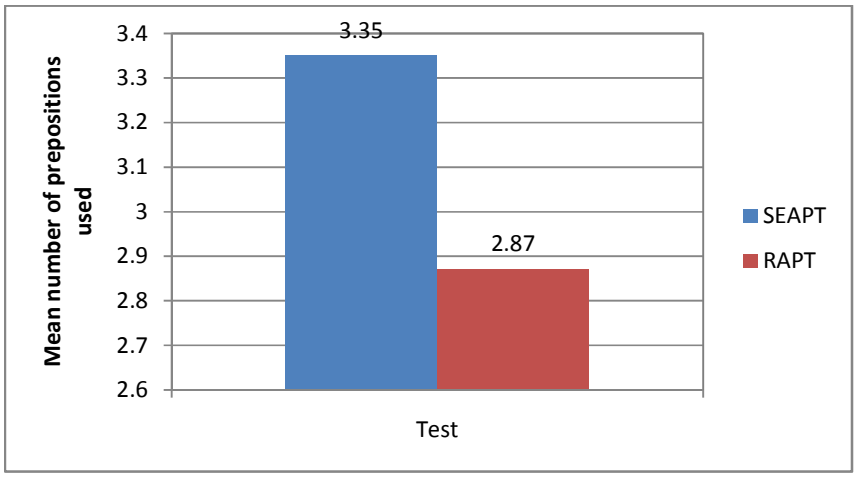


Figure 5.10: Mean number of prepositional phrases used

Conjunctions used

Only the SEAPT and RAPT samples were scored for use of conjunctions as there was little difference between the RAPT and LRAPT language samples. Simple effects testing across tests showed a difference in the number of conjunctions used, with the SEAPT eliciting significantly more conjunctions than the RAPT, as was hypothesised ($t_{[1,105]}=3.66$, $p<0.001$) (see Figure 5.11).

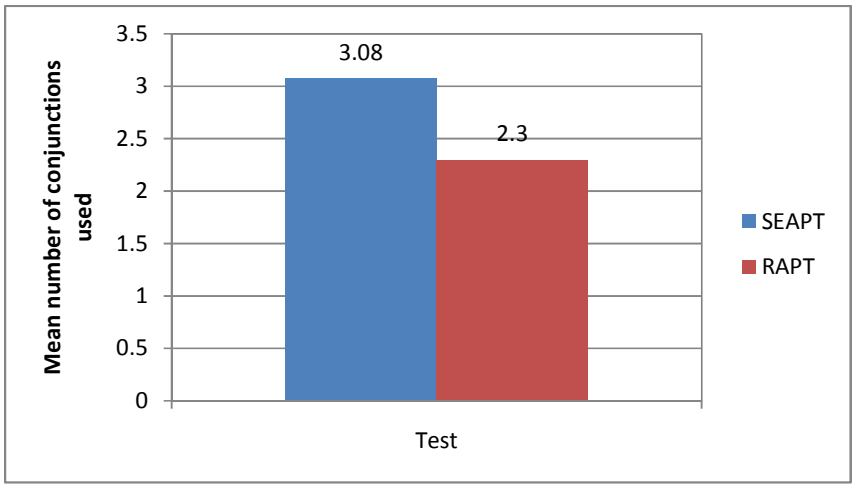


Figure 5.11: Mean number of conjunctions used

Summary

In summary, as was hypothesised, the SEAPT allowed Chinese Singaporean preschool children to produce a better sample of their expressive language in English than on the RAPT or LRAPT. The results are discussed in the following chapter.

Chapter 6 Discussion of Results Part A

This chapter discusses the results of testing to determine whether the Singapore English Action Picture Test (SEAPT) would allow Chinese Singaporean preschool children to produce a better sample of their expressive language in English than on the Renfrew Action Picture Test (RAPT) or the Line-drawn RAPT (LRAPT). The results obtained clearly show that modifying the RAPT to make it more culturally and linguistically appropriate for assessing the expressive language abilities of preschool Chinese Singaporean children bilingual in English and Mandarin (forming the SEAPT) did in fact elicit more representative samples of the children's expressive abilities in English.

Modifications to the RAPT

The adaptation of the test consisted of three types of modifications: pictorial; semantic; and linguistic. The results show that the change in picture format from colour to line-drawn pictures did not affect the results. There was no difference between information or grammar scores for the RAPT and the LRAPT.

As anticipated, however, the semantic and linguistic modifications resulted in a test that elicited better samples of the children's expressive language abilities in English for both main language groups. The results clearly show that the SEAPT allowed the participants to perform significantly better than on both the RAPT and the LRAPT for information and grammar. This indicates that modifying the test to make it more culturally and linguistically appropriate enabled the children to more easily recognise and describe the pictures, therefore eliciting an improved sample of their expressive language abilities in English.

The results show that the modifications to the test allowed both language groups better to demonstrate their expressive abilities in English. However, for both information and grammar, children with English as their dominant language (EL1) achieved significantly higher scores than those with Mandarin as their dominant language (ML1), as would be expected for children being tested in their first language. The results also show significant differences between the main language groups. This highlights the need for separate normative data for all the main

language groups in Singapore, as language dominance clearly impacts on the acquisition of English. These differences will be discussed in more detail for each of the areas of analysis.

Information

For information (i.e. expressive vocabulary), the SEAPT clearly allowed children to give a more representative sample of their expressive vocabulary than the original RAPT. The EL1 children achieved scores on the SEAPT comparable to the scores achieved in the RAPT original by the standardisation sample, whilst their scores on the RAPT and LRAPT overlapped in range but were markedly lower. This indicates that the cultural and linguistic modification of the test elicited more representative samples of the EL1 participants' expressive vocabulary. However, it also shows that the children's performance is comparable to the RAPT StdE speaking sample. This suggests that expressive vocabulary development for EL1 children in English in Singapore is similar to the development of expressive vocabulary for monolingual StdE speaking children. This requires further investigation.

The ML1 children achieved markedly lower mean scores on the SEAPT than the EL1 participants, as would be expected for children being tested in their non-dominant language. Furthermore, on comparison with the RAPT original sample results, the ML1 children scored significantly more poorly on the RAPT and LRAPT than the population for which the test was designed. This suggests that the development of expressive vocabulary in English for this group differs significantly from the original StdE speaking sample and also from their EL1 Singaporean peers. This, too, warrants further investigation.

Grammar

For grammar, the SEAPT clearly allowed both the EL1 and ML1 children to give a more representative sample of their abilities than the original RAPT, again demonstrating that the cultural and linguistic modification of the test elicited more representative samples of the children's expressive language abilities in English.

However, the EL1 children achieved scores on the SEAPT, RAPT and LRAPT that were markedly lower than the scores achieved in the RAPT original by the

standardisation sample. This indicates that the acquisition of expressive grammar is markedly different for EL1 children in Singapore than for StdE speaking children in Britain. Further investigation is needed to determine how acquisition differs and the implications for the valid assessment of children's expressive language abilities in English for Singaporean children.

The ML1 children achieved significantly lower mean scores on the SEAPT, LRAPT and RAPT in comparison with those of the RAPT original sample, showing that the ML1 children also scored significantly more poorly for expressive grammar on all three tests than the population for which the test was originally designed. Large floor effects were found during data analysis, highlighting that the ML1 children often were not using any of the StdE grammatical structures that the RAPT aims to elicit in children's language samples. These results are interesting and potentially very important. There is clearly a great need for more information on ML1 children's acquisition of English in Singapore, especially as formal schooling is conducted largely in SStdE. Therefore, this warrants further investigation.

MLU

The mean length of utterance (MLU) values obtained on the tests were analysed for both main language groups. The EL1 group produced significantly longer utterances than the ML1 group for both measures, as would be expected for children speaking in their dominant language. There was no significant difference in MLU for either language group across all three tests, with all tests eliciting utterances of roughly equivalent length. However, the complexity of thought expressed in the language samples across the tests differed, with the SEAPT eliciting more complex language than the RAPT. In comparison with the RAPT, on the SEAPT the children:

- used significantly more total word roots;
- used significantly more total words;
- omitted more words usually required in a StdE context;
- omitted significantly more inflectional morphemes usually required in a StdE context;
- used significantly more prepositional phrases;
- used significantly more conjunctions.

When taking into account the features of SStdE and SCE, these results demonstrate that the children were able to use more complex language on the SEAPT than on the RAPT.

Number of words and inflectional morphemes omitted

Whilst the samples show a higher number of omitted words and omitted inflectional morphemes than the original RAPT standardisation sample, this is characteristic of SCE, in which words or morphemes are omitted if they are not required by the context. However, an interesting result from this study was that there was no difference between the number of inflectional morphemes used by the EL1 and ML1 children. This had not been anticipated and requires further investigation. It is important to learn when the inflectional morphemes are emerging in the expressive language samples in English from preschool Chinese Singaporean children who are bilingual in English and Mandarin. This is a feature of SStdE rather than SCE, therefore it is important to look at when the characteristics of SStdE emerge in children's expressive language samples in order to make an accurate assessment of their language abilities in English. It is also important to look at this to enable planning of appropriate intervention for children with language impairment to maximise their ability to access the school curriculum, which is delivered in SStdE.

Conjunctions and prepositional phrases

The omission of words from the children's language samples may have impacted on the MLU values obtained. This requires further investigation as it has been suggested that MLU values above 3 are less valid as a measure of language complexity (Paul, 2007) and there are many possible factors at play with this measure. However, it is clear that in these language samples the increased complexity of thought expressed is indicated by the increased use of conjunctions and prepositional phrases in comparison with those used on the RAPT. Therefore, the cultural and linguistic modification did allow children to produce more representative samples of their expressive abilities in English.

Summary

These results demonstrate that the uncritical use of assessment tools designed in "western" cultures will not provide a valid and reliable assessment of children's expressive language skills in English in Singapore. In a Singapore context, assessment materials need to be designed specifically for the Singapore population. Alternatively, existing assessments should be carefully modified to reflect cultural and linguistic differences. Norms for the local population need to be obtained and divided into main language groups.

The use of language in Singapore is complex. The results suggest that children do not appear to speak only SCE or only SStdE when in a formal test situation. Where the Children used the SStdE structures in their repertoire when they had these, and used SCE where the SStdE structures had not yet developed. However, there were large floor effects for use of grammatical markers, particularly in the language samples of the ML1 participants. This highlights the extreme importance of the need for language assessments used in Singapore to be sensitive to the characteristics of SCE and SStdE, and the need for more information on the development of language forms for this population.

It is clear that the language situation in Singapore is complicated by the multilingual environment, as most Singaporeans are proficient in more than one language (Leow, 2000). By narrowing the sample of this study to focus on children bilingual in English and Mandarin, the results for the participants show significant differences in the expressive language samples in English, as would be expected for children with different main languages. The results show that, in comparison with the ML1 children, the EL1 children:

- achieved higher scores for information on the SEAPT and RAPT;
- achieved higher scores for grammar on the SEAPT and RAPT;
- had longer MLUs;
- used more word roots;
- used more total words;
- omitted more words.

However, as English is the medium of formal education in Singapore, it is critical that ML1 children develop English rapidly in order to cope in the fast-paced Singaporean school system. The results show that their development of English is markedly different than for their EL1 peers.

These results raise many questions, the most important of which is: when and how does the syntax and morphology characteristic of SStdE emerge in the expressive language samples of Singaporean children? The study has shown that the Singaporean sample did not use the same syntax and morphology as their age-matched peers on the original RAPT sample. Emergence of SStdE forms clearly differs for Singaporean children in comparison with speakers of StdE, and differs between EL1 and ML1 Singaporean children. This requires further investigation if clinicians are to accurately differentially diagnose children with language impairment from those with language difference. More information on the emergence of syntax and morphology in children's language in Singapore is clearly required. This is the focus of the second part of this research.

The next section of this thesis describes Part B of the research, which explores the development of English in preschool Chinese Singaporean English-Mandarin bilingual children.

RESEARCH PART B

Chapter 7 Development of English in Preschool Chinese Singaporean English-Mandarin Bilingual Children: Rationale and Method

Chapter 8 Results Part B

Chapter 9 Discussion of Results Part B and Overall

Chapter 7 Development of English in Preschool Chinese Singaporean English-Mandarin Bilingual Children: Rationale and Method

The results obtained and discussed in the previous chapter indicate that modifying the Renfrew Action Picture Test (RAPT) to make it more culturally and linguistically appropriate for preschool Chinese Singaporean children bilingual in English and Mandarin enabled the children to more easily recognise and describe the pictures, therefore eliciting an improved sample of their expressive language abilities. The results also showed that these children did not use the same syntax and morphology expected of monolingual speakers of StdE. Emergence of the SStdE form clearly differs for Singaporean children when compared with speakers of StdE, and differs between EL1 and ML1 Singaporean children. Gupta (1994) states that SCE is the earliest form of English that emerges for Singaporean children, but, as formal education in Singapore is in SStdE, the emergence of SCE as well as SStdE needs to be explored.

Rationale

Whilst the literature shows that SCE differs significantly from other forms of English both in linguistic structure and in language use (Gupta, 1994), there is very little information about children's development of the forms of English spoken in Singapore. Thorough assessment of language skills is vital to making an appropriate differential diagnosis between language difference and specific language impairment (SLI). A comprehensive understanding of normal development of the forms of English spoken in Singapore is necessary to be able to make this differential diagnosis between language difference and SLI in Singaporean children. There is increasing evidence that there may be clinical markers of SLI specific to languages (Klee, Gavin & Stokes, 2006). However, we need to have information on the normal development of language to be able to identify these markers. It is challenging to make an accurate differential diagnosis between language difference or SLI without information on language development. Clinicians rely on their understanding of normal language development for StdE speakers as well as their instinctive "gut feeling" about a child's language abilities (Gupta et al., 1998; Brebner et al., 2000).

There is an identified need for more information on children's development of the main languages in Singapore. Therefore, the continuation of this study focused on the development of the English spoken in Singapore by preschool Chinese English-Mandarin bilingual children. However, this study does not aim to provide a comprehensive linguistic description of the English spoken in Singapore by these children. Rather, it intends to consider some of the specific characteristics of language that are clinically useful for Speech Pathologists in the assessment and diagnosis of language impairment. It is hoped this study will provide some initial information on these characteristics that will inform future research projects.

Method

Expressive language samples in English from 515 Chinese Singaporean preschool children were obtained for this part of the study. It was hypothesised that analysis of the language samples would show differences in order and acquisition of aspects of syntax and morphology between the two language groups - EL1 (mainly English spoken in the home) and ML1 (mainly Mandarin spoken in the home) - primarily due to the different dominant languages and the influence of these on the English being acquired. A second hypothesis was that there would be some differences in the rate of acquisition of syntax and morphology for the EL1 participants, expecting that development would be approximately in line with that of other forms of StdE but at a slower rate because children acquired SCE before SStdE forms. For the ML1 participants, it was hypothesised that there would be differences in both the rate and order of acquisition of syntax and morphology due to the influences of their dominant language on the acquisition of SCE and SStdE. It was also hoped that the information obtained would provide some basic information about the patterns of normal development of English for EL1 and ML1 Chinese Singaporean preschool children, which would be useful for clinicians practising with this population.

In order to examine the use and acquisition of the syntax and morphology of SCE and SStdE, we required the expressive language samples to generate information on a wide number of features of the syntax and morphology of both SCE and SStdE from a broad sample of the population. It was decided to obtain information on the syntax and morphology elicited from typically developing English-Mandarin bilingual Singaporean preschool children on picture description tasks similar to those

commonly used in assessment of children's language abilities. This was done to make the information as clinically useful as possible. The Singapore English Action Picture Test (SEAPT] (Brebner, 2002) was used to obtain the samples because this test is known to be culturally and linguistically appropriate for the population. The SEAPT also provided information on what these children could do on a commonly used assessment task that could be made available for local clinicians to inform their differential diagnoses between language difference and SLI. However, there were limitations in using the SEAPT as the method of language sampling; the assessment focuses on use of language form rather than providing a more holistic language sample (which would include assessment of receptive ability and other aspects of language development).

Expressive language samples from the 515 participants aged between 3;9 (i.e. 3 years, 9 months) and 6;8 (6 years and eight months) were obtained by administering the SEAPT. The final form of the SEAPT comprises 13 action pictures (3 trial and 10 stimulus pictures) and requires children to answer questions to elicit a description of a series of pictures, which elicits information on grammatical targets and expressive vocabulary. The test procedure and questions are outlined in more detail later in this chapter. The samples obtained were tape recorded, transcribed and coded for various aspects of syntax and morphology using SALT software (Language Analysis Laboratory, 1984).

Participant sample

In order to minimise the variables associated with different language backgrounds in a multilingual society, only ethnic Chinese children (as the majority of the population at approximately 75%) were asked to participate in the study. Participants were from local government-run kindergartens willing to be involved, and permission for testing was obtained from the school principal (standard procedure in Singapore). Participation by the children was voluntary and they were able to withdraw from the study at any time. Ethical clearance for the project was obtained from both Flinders University Australia and National University of Singapore (Appendix 2).

Information on dominant home language was obtained from school records that were based on parent report and teacher findings about the child's preferred language and amount of exposure to different languages. Prior to testing, the dominant language

for all participants was discussed with class teachers. Where there was inconsistency between parent and teacher report, these children were eliminated from the study. It is recognised that there may be limitations to determining language dominance in this informal way, but it was the best available method in the absence of any validated language dominance questionnaire or tool. Further cross-checking of language samples was conducted by analysing the samples for code switching between Mandarin and English to minimise incorrect identification of language dominance and to eliminate any children from the study whose language dominance had been misidentified.

Thirty-four of the total 515 children were eliminated from the study because their language background did not match the criteria (e.g. Chinese-dialect such as Hokkien dominant, one parent a speaker of a different form of StdE such as Standard Australian English), they did not fit within the required age range, or there was teacher-parent inconsistency regarding dominant language.

Participants were divided into two language groups according to dominant language spoken in the home. Of the remaining 481 participants, 236 children spoke mainly English in the home (EL1) and 245 children spoke mainly Mandarin in the home (ML1). These groups were subdivided into six-month age ranges (e.g. 3;8-4;2, 4;3-4;8 and so on), with a minimum of 35 students in each language group tested per age range in order to make accurate statistical analysis possible. Numbers of participants per group ranged from 36-46, as shown in Table 7.1 with the age ranges for each group defined.

Table 7.1: Age groups

Age group	Age range (year;months)	Number of EL1 participants	Number of ML1 participants
1	3;8 – 4;2	38	37
2	4;3 – 4;8	37	42
3	4;9 – 5;2	46	46
4	5;3 – 5;8	40	41
5	5;9 – 6;2	39	39
6	6;3 – 6;8	36	40

The sample was fairly equally distributed for gender with boys representing 47.7% and girls representing 52.3% of the sample.

The sample for the study was obtained by visiting a number of centres from different socio-economic areas across the island. In order to determine whether a representative sample of the population had been obtained, the sample's distribution was analysed by comparing the data obtained from the sample with the information in the Singapore Census of Population 2000 (Leow, 2000) for dominant language, gender, housing type and educational background of the participants' fathers. The information available from the Census was for housing type and educational level according to race (i.e. Chinese, Malay etc.) but was not for home language. This made comparison between the two language groups impossible.

At the time of data collection, approximately 88 percent of the population in Singapore lived in Housing Development Board (HDB) flats (Leow, 2000), which vary in size from two-room flats to five rooms or more. As can be seen in Table 7.2, the sample is roughly equivalent for four-room HDB flats, private apartments and private houses. Participants living in HDB flats of three rooms or less are under-represented. This probably reflects the trend for lower income families to be less likely to send their children to preschool, which is not compulsory in Singapore.

Table 7.2: Type of residence

Type of residence	**% in sample**	**% in population (Chinese citizens)**
HDB flat - 3 room or less	18.2	30.1
HDB flat - 4 room	32.7	32.3
HDB flat - 5 room or more	37.4	24.2
Private apartment	4.2	6.7
House	7.3	5.7

Table 7.2 also shows that the sample is over-represented for participants residing in HDB flats of five rooms or more. This, too, most likely reflects a socio-economic trend for higher income families to send their children to preschool.

Although language ability in children in Western societies is known to closely correlate with their mother's educational level (Paul, 2007), these data were not available from the Singapore Census, so the data for fathers were selected as the next most appropriate for comparison. Table 7.3 shows the distribution of the sample by father's educational level based on statistics for men aged between 25 and 44 years (Leow, 2000). As for the trend for lower income families by housing type, it can be seen that the sample is slightly under-represented for participants whose fathers have lower educational qualifications. Again, this is likely to be because parents with lower levels of formal education often do not send their children to preschool. Conversely, the sample is over-represented for fathers with Upper Secondary education (O and A levels) and Diplomas. These results were also expected because these families are most likely to send their children to preschool at one of the local government kindergartens. It can be seen that the sample is slightly under-represented for fathers with Degrees, which most likely reflects the trend for graduate parents to put their children in private kindergartens rather than local government kindergartens.

Table 7.3: Educational level of father compared by age 25 – 44 years

Educational level	% in sample	% in population 25–44 yrs
No formal schooling	1.5	7
Primary schooling	11.9	20.6
Secondary schooling	4	28.3
Upper Secondary schooling	36.6	17.9
Diploma	15.2	7.8
Degree or Higher Degree	13.1	18.4
Missing data	17.7	-

Procedure

The data from the 481 participants were collected at the schools. Each participant was tested individually in a quiet area of the kindergarten and their output was tape

recorded for later transcription. A few minutes were spent with each participant before testing in order to establish rapport.

Data were collected by administering the SEAPT. Participants were told about the activity before testing commenced, then the activity was introduced. The test commenced with three trial questions to further introduce participants to the task. These trials were used to familiarise participants with the requirements of the task. Prompts and demonstrations were given to ensure that the participants gave their best responses to the target pictures. Children who required prompting were not eliminated from the study. All children were compliant with the task and gave verbal responses to the questions. It was ensured that the pictorial material was facing the child and could not be seen easily by the tester. This was done to maximise the need for the child to use language to set context. The test was then administered according to the instructions shown in Table 7.4.

Reliability

The principal researcher conducted most of the testing. However, to obtain a measure of inter-rater reliability, 12 percent of samples were correlated with the scores obtained from another clinician's analysis of the same samples. A clinician with a similar number of years of clinical experience and years in Singapore as the principal researcher assessed and analysed the language samples from 20 participants. The principal researcher then transcribed and analysed these 20 samples. The clinician also transcribed and analysed a further 20 of the tapes of the language samples obtained by the principal researcher. Inter-rater reliability was high with Pearson's Correlations of r=0.985, p<.01 for information and r=0.972, p<.01 for grammar.

Although not formally measured, intra-rater reliability was also considered. Tape recorded language samples were analysed and transcribed, then reanalysed and transcriptions checked several months later. Transcriptions were coded for occurrence of aspects of syntax and morphology using the SALT software (Language Analysis Laboratory, 1984). Codes were checked thoroughly during the coding procedure, and rechecked once coding was complete. A final check of the consistency of the coding was made a few months after initial coding and prior to statistical analysis.

Table 7.4: Test procedure and questions

Procedure:
Ask the stimulus question;
Prompt further response by repeating answer with questioning intonation or saying things like "uh-huh?", "any more?" or pointing to the relevant part of the picture;
Repeat question if necessary;
If no response, ask direct question such as "why?", "what's this?";
Record all prompts
Trial items: (modeling permitted if prompting did not elicit a response)
What is the girl doing?
Where is the dog?
Tell me about the boy.
Test questions:
What is the girl doing?
What is the girl going to do?
What has been done to the balloon?
Tell me all about what the man is doing?
What has the boy just done?
What has happened to the girl?
What has the Jie Jie (big sister/girl) done?
Tell me what the KoKo (big brother/boy) is doing.
What is the girl doing?
Tell me what is happening / Tell me all about what is happening.

Data analysis

A comprehensive statistical analysis of the data obtained from 481 participants aged between 3;8–6;8 was conducted. The analysis aimed to determine differences in frequency of use of specific morphology or syntax, differences in omission of these structures and/or differences in error patterns with these structures. The linguistic analysis was conducted on all the data elicited from the children, rather than by only comparing test scores, in order to thoroughly explore the samples for syntax and morphology. Had comparison been made only on test scores, valuable information about the children's abilities would have potentially been lost because the test scoring only allocates points for one example of a target structure, and also targets

only specific structures with each test item. For example, for test item 7 (see Figure 7.1), the children's responses for grammar are scored for:

- use of two different verbs in one sentence (e.g. "carry the baby and see");
- use of co-ordinating or subordinating conjunctions.

Therefore, the two possible responses of "carry the baby to see" and "she is carrying the baby to see the clowns" would be awarded equal points for this test item. Any other grammatical or morphological information would not be awarded points, even though it is important information on the emergence of SStdE forms in a child's expressive language. Thus, for the purpose of this study, the samples elicited were analysed for use of a wider range of aspects of syntax and morphology than only those awarded points in the SEAPT.

Figure 7.1: SEAPT test item 7, "What has the Jie Jie/big girl done?"

Comparison was made between age groups 1–6 and between the main language groups EL1 and ML1. Univariate analyses of variance were run for the specified aspects of syntax / morphology. Where a difference between age groups was indicated, independent sample t-tests with posthoc Bonferroni correction were run to determine where the difference lay. Due to large numbers of tests being run, the t-tests were restricted largely to differences between one or two age groups, testing for differences across an age range of six months (i.e. one age group; e.g. comparing age group 1 with 2) or 12 months (i.e. two age groups; e.g. comparing age group 1 with 3). However, in some cases, t-tests were run and were reported only where there

were differences across wider age ranges. This was particularly important for detecting early emergence of use of some structures and is discussed in more detail where additional t-tests are reported.

The nature of SCE made it extremely complex to determine the emergence of structures. Whilst most studies claim emergence of a feature when it is used with 80 percent accuracy in an obligatory context (Paradis, 2005), the characteristic of optional marking in SCE (usually when not required by the context) makes this a challenging measure; determining whether the context has been established is fraught with difficulties. For example, during the pilot project, context was established for some children by having pictorial material present. For others it was not. Measurement of this was highly subjective. Therefore, analysis to determine whether features may have "emerged" was based on statistical evidence of increased frequency of usage in a large number of participants. This will be discussed in more detail in the following chapters. It is important to highlight again that this study does not aim to provide a comprehensive linguistic description of the development of children's English in Singapore. Rather, the intention is to provide a clinically relevant description of what typically developing children are able to produce on a picture description task to inform clinicians about what they could realistically expect. This will assist them to make differential diagnoses between language difference and language impairment.

The following aspects of the language samples were considered when analysing the words and morphemes used by the participants:

Utterance level

- MLU in words and morphemes;
- number of word roots used;
- total number of words used and omitted;
- errors in word order;
- number of inflectional morphemes used and omitted;
- overall fluency of expressive language production, evaluated by measuring:

- number of utterances given in response to the stimulus with less utterances therefore requiring less prompting to elicit the relevant information and equating to better fluency;
- percentage of single word utterances with increased utterance length equating to better fluency;
- number of vocabulary errors (i.e. semantic error in word used) with a decrease in errors equating to an increase in fluency;
- code switching between Mandarin and English with a decrease in code switching equating to improved fluency in English production (and also as a cross-check to ensure that children had been assigned to appropriate language dominance group).

Clause level

- subject omission;
- object omission.

Verb group

- Verb morphology:
  - third person singular marker "-s";
  - present progressive tense marker "-ing";
  - regular past tense marker "-ed";
  - irregular past tense forms;
  - irregular past participle forms;
  - "already";
  - "infinitive verbs".

- Aspect, modals and auxiliary verbs:
  - perfective aspect;
  - future aspect;
  - auxiliary and copula "to be".

Phrase level

- Articles:
  - definite articles;
  - indefinite articles.

- Plurality
  - plural "-s" marker;
  - quantifiers.

- Possession
- Pronouns
  - personal pronouns;
  - possessive pronouns;
  - object pronouns.

- Conjunctions
  - co-ordinating;
  - subordinating.

- Prepositions.

Each measure is discussed individually in the following chapters in relation to the results obtained. Some specific methodological issues are discussed below.

Methodological issues

Utterance Level

Mean length of utterance (MLU)

The international literature reports widely that MLU alone is not a valid measure of a child's expressive language abilities but it still has uses in the assessment of preschool children's expressive language abilities (Berko Gleason, 2001; Eisenberg, McGovern Fersko & Lundgren, 2001; Fey, 1986; Klee, Stokes, Wong, Fletcher & Gavin, 2004; Klee, Gavin & Stokes, 2006; Lund & Duchan, 1986; Owens, 2004, 2008; Paul, 2007; Reed, 1986; Rice, Redmond & Hoffman, 2006; Wells, 1986). Further caution is required in regard to the assessment of the expressive language abilities of children from culturally and linguistically diverse backgrounds because

applying expectations based on knowledge of MLU values for StdE speakers is likely to be problematic (Berko Gleason, 2001; Craig, Washington & Thompson-Porter, 1998; Eisenberg et al., 2001; Kayser, 1995; Klee, Stokes et al., 2004; Klee et al., 2006).

Miller and Chapman's 1981 study found that MLU correlates strongly with age, and Leadholm and Miller (1992) report on a study by Loban in 1976 in which he showed that MLU continues to increase with age from kindergarten to the end of schooling. Furthermore, the study by Klee et al. (2006) found that monolingual English-speaking children with SLI had significantly reduced MLU. The study by Klee, Stokes et al. in 2004 found that MLU, in conjunction with measures of lexical diversity and child's age, provides a marker of SLI in Cantonese-speaking children. They also found that MLU for Cantonese was significantly different for age-matched speakers of English. Therefore, evidence supports MLU as a valid criterion for consideration in the overall assessment of a child's expressive language abilities, and that information is required for speakers of SCE and SStdE because the values are likely to be different from those for speakers of StdE.

The measure of MLU is widely used in Singapore in the assessment of children's expressive language abilities even though clinicians understand there is no data on MLU for the Singapore population and that a direct comparison with MLU for StdE-speaking children should not be made. Klee et al. (2006) found significant differences between the MLU values for children from the UK and those from the USA, indicating that MLU is different across populations, even those speaking forms of StdE. Therefore, it was considered important to analyse the data obtained in this study for information on expected MLU for EL1 and ML1 participants aged between 3;9–6;8 in order to obtain approximate MLU ranges and to determine how these measures compare across the different age and language groups.

Although the language samples obtained were not designed specifically for calculation of MLU (i.e. minimum of 100 utterances using conversational sampling), it was decided to obtain MLU values from the language samples obtained in order to make a general investigation into the characteristics of the MLU obtained for the EL1 and ML1 participants. MLU was calculated for both MLU in morphemes and MLU in words. This analysis was chosen because of characteristics of SCE discussed

in Chapter 2, specifically omission of morphological markers (Alsagoff & Ho, 1998; Deterding & Poedjosoedarmo, 2001; Gupta, 1994; Ho & Platt, 1993). It was hypothesised that the EL1 children would achieve MLU scores that increased steadily with age similar to those of their StdE speaking counterparts, but at a slower rate to reflect the omission of morphological markers, subjects and objects, which are not required by the context in SCE. For the ML1 participants, it was hypothesised that MLU values would be significantly lower than for their StdE-speaking counterparts, also reflecting the characteristics of SCE, the fact that they would have had less exposure to English and that values would increase steadily with increasing age.

Number of word roots used

In his 1991 study, Miller found that an increase in the number of different words in a language sample was an indicator of semantic progress and lexical diversity. Owen and Leonard (2002) defined lexical diversity as being an important indication of expressive vocabulary available to a child to express themselves in a number of ways on a range of topics in their everyday communication. There has been a considerable amount of research into the usefulness of measuring the number of different words occurring in language samples, with debate over whether the language samples should be controlled for number of utterances or number of words (Klee, Stokes et al, 2004; Owen & Leonard, 2002). A more recent method of looking at lexical diversity (McKee, Malvern and Richards, 2000) involves the calculation of D, a parameter calculated by producing a curve of Type-Token Ratio against Tokens, which controls for both empirical and theoretical curve to produce a measure of vocabulary diversity. This method, using dedicated software, is designed to eliminate the problems associated with sample length when measuring lexical diversity, and is considered to be more valid and reliable than previous measures. Watkins, Kelly, Harbers and Hollis (1995) found that the number of different words used allows for a better estimate of a child's lexical diversity than type-token ratios. They found that children with SLI produced significantly less different words than children with normally developing language. Klee, Stokes et al. (2004) found that their Cantonese-speaking children with SLI produced significantly less words than their age-matched peers with normally developing language. Given these results, information on lexical

diversity in typically developing Singaporean children would be valuable in helping clinicians inform their differential diagnoses.

It is beyond the scope of this study, however, to analyse the language samples obtained using D as a measure of lexical diversity, as the task was not designed specifically for this measure and the study by Owen and Leonard (2002) found that the measure of D was not free of sample size effects. However, a simple analysis of data obtained in this study included the total number of word roots used in order to explore the lexical diversity in typically developing EL1 and ML1 participants' language samples. It was hypothesised that the EL1 children would produce a larger number of different words than their age-matched ML1 participants. This hypothesis was based on the premise that EL1 children would be expected to have a larger vocabulary of words in English than the ML1 children, who would have had less opportunity to develop their expressive vocabulary in English.

Total number of words used

Miller (1991) found that an increase in total number of words used equated to an increase in general language proficiency. Therefore, total number of words used was also measured in order to examine general language proficiency in the participants across the age ranges and main language groups. It was hypothesised that the EL1 children would produce more words in their language samples than their age-matched ML1 participants because they would be expected to have a larger vocabulary of words in English than the ML1 children, who would have had less opportunity to develop their expressive vocabulary in English.

Omission of words

As discussed in Chapter 2 the omission of words usually required in a StdE context is a feature of SCE (Alsagoff & Ho, 1998; Deterding & Poedjosodarmo, 2001; Gupta, 1994). For example, subjects or pronouns may be deleted from an utterance in SCE if they are not required by the context (e.g. StdE "I am happy" becomes "am happy" in SCE). Therefore, the data collected on this feature were analysed.

It was hypothesised that the EL1 children would omit fewer words than their age-matched ML1 participants, particularly with increasing age, as more SStdE forms develop after age 4 (Gupta, 1994). The ML1 children were expected to omit more

words because SCE is the form of English usually acquired first (Gupta, 1994) and this would be in line with the characteristics of this form of English. Furthermore, the omission of words not required by the context is characteristic of other Chinese languages including Mandarin (Yip & Rimmington, 1997), so the influence of main language on SCE may also impact on the occurrence of omission of words.

Use and omission of inflectional morphemes

As discussed previously, the omission of inflectional morphemes is a feature of SCE (Alsagoff & Ho, 1998; Deterding & Poedjosodarmo, 2001; Gupta, 1994; Ho & Platt, 1993). Use of inflectional morphemes would therefore be indicative of development of SStdE forms.

Consequently, analysis was conducted of both use and omission of inflectional morphemes. Findings of the initial study led to anticipation that the data analysis would show no differences between the language groups for omission of inflectional morphemes, as this is a feature of SCE, but that there may be differences in age of emergence of use of inflectional morphemes for the two language groups, with EL1 children acquiring some morphological markers at an earlier age than the ML1 children. It was hypothesised that the pattern of acquisition for EL1 children would be similar to that of their StdE-speaking counterparts around the world, but that the pattern of acquisition for ML1 children would be quite different due to the influences of their dominant language and the different stage of their English learning.

Fluency of production

The overall fluency (i.e. ease of expressing themselves by using the correct vocabulary, formulating sentences etc.) of the participants' expressive language abilities in English was assessed by analysing a number of characteristics of the language samples obtained, including: number of utterances used per picture description; number of single word utterances; semantic errors in vocabulary; and use of code switching. Errors detected were coded by error type and a numerical score was derived for frequency of occurrence of each feature.

Number of utterances per picture description

Fluency of production was also considered in terms of formulating phrases and sentences rather than just naming pictures with noun or verb labels. The number of

utterances given in response to the stimulus was analysed. Less utterances required in order to give an adequate picture description were considered to equate to better fluency. Thus, it was hypothesised that the EL1 children would use fewer utterances per picture description than their ML1 counterparts, with number of utterances used decreasing with increasing age for both language groups.

Number of single word utterances

Gavin, Klee and Membrino (1993) found that children with SLI use more single word utterances than children with normally developing language skills. This is another area to consider for the Chinese Singaporean preschool population and requires information on the number of single word utterances that children with normally developing language skills produce.

Something that was not possible to measure in a quantitative way was the pilot study observation that the ML1 participants in age groups 1 and 2 tended to seem more concerned about whether they would give a "correct answer" to a Caucasian, native English-speaking tester. Their overall behaviour was characterised by more frequent glances at the tester's face for positive reinforcement or acknowledgment that their message had been understood. Similar behaviours were reported in Yip and Matthews' (2006) study of Cantonese-English bilingual children. Whilst this behavior appeared to have no impact on the results of the pilot study, in order to minimise any possible impact on the results of this study, the three "trial" questions from the SEAPT were asked to warm the participants up to the procedure. This is an established method for minimising cultural bias in language assessment (Kayser, 1995).

The children in age groups 1 and 2, being in their first year of preschool, may also have had less exposure to Caucasian people and the formal testing process. These factors may have impacted on the children's sentence length, resulting in a higher number of single word responses. However, in the pilot study, the ML1 participants all tried to answer in English where they could and code switched if unable to produce the English vocabulary to describe the pictures. Very few children gave no verbal responses at all during the language sampling, using English if they could and Mandarin if that failed.

Therefore, the number of single word utterances was expected to decrease with increased fluency in English.This measure was analysed using analysis of the percentage of single word utterances. Increased utterance length was also used as a measure of increased fluency. It was hypothesised that the ML1 participants would use more single word utterances than their EL1 counterparts, and the number of single word utterances would decrease with increasing age for both main language groups as participants learned more English and showed improved fluency of production.

Semantic errors in vocabulary

The semantic errors in vocabulary used were analysed. A decrease in errors was considered to equate to an increase in fluency. Vocabulary errors were defined as errors where the incorrect word was selected to describe a picture (e.g. “eyes” for “spectacles”), or where generalised, non-specific words were used (e.g. “that” or “thing” for a noun). The vocabulary errors were analysed because significant differences were expected between the two main language groups, with ML1 participants making more vocabulary errors than their EL1 counterparts, particularly in the earlier stages of their exposure to English. It was also expected that the EL1 participants would show less errors in vocabulary used than their ML1 counterparts due to increased exposure to English.

Code switching

It was hypothesised that code switching would only occur in the language samples of the ML1 participants because English is the first language of the EL1 participants. The use of code switching was analysed for the ML1 participants, with a decrease in occurrences of code switching expected to equate to improved fluency in English production. It was anticipated that the frequency of code switching would decrease with increasing age as the participants learned more English and showed improved fluency of production. It was expected that the ML1 participants would code switch and use Mandarin vocabulary when they did not have the target vocabulary in English, and would make more errors in the vocabulary used.

Clause Level

Subject omission

As omission of the subject of a sentence when not required by the context has been described as a feature of SCE (Alsagoff & Ho, 1998; Deterding, 2007; Deterding & Poedjosoedarmo, 2001; Fong, 2004; Gupta, 1994), the data were analysed for appropriate (i.e. clear from the context) and inappropriate (i.e. not used when required in the context) subject omission. It was anticipated that there would be no differences in the pattern of appropriate subject omission between the main language groups but that there would be a difference in inappropriate subject omission, with EL1 children expected to omit less subjects inappropriately. It was also anticipated that there would be a decrease in inappropriate subject omission with the development of SStdE forms for both main language groups. The expectation was that inappropriate subject omission would be rare for both main language groups because the subject would be required in this context.

Object omission

Another feature of SCE is the omission of objects from an utterance when not required by the context (Deterding & Poedjosoedarmo, 2001; Fong, 2004; Gupta, 1994). The data were analysed for both appropriate (i.e. not required by the context) and inappropriate (i.e. required in the context) object omission. As was the case for subject omission, it was anticipated that there would be no differences in the pattern of appropriate object omission between the main language groups, but that the participants may start to decrease inappropriate object omission with increasing age and with the development of SStdE forms. It was also expected that inappropriate object omission would be rare for both main language groups because the object would be required by the context.

Verb group

Verb morphology

Significant differences in the verb morphology of SCE and StdE have been described extensively in the literature (Alsagoff & Ho, 1998; Ansaldo, 2004; Bao, 1995; Deterding, 2007; Deterding & Poedjosoedarmo, 2001; Fong, 2004; Gupta, 1993; Gupta, 1994; Ho & Platt, 1993; Platt & Ho, 1983; Platt & Ho, 1988; Platt & Weber, 1980; Wee & Ansaldo, 2004). Many papers outlining the features of SLI for both

monolingual and bilingual children often highlight errors and omissions in verb morphology as being characteristic of SLI (Conti-Ramsden & Hesketh, 2003; Jia, 2003; Klee et al., 2006; Leonard et al., 1997; Montgomery & Leonard, 2006; Paradis, 2006; Paradis, 2007; Rice & Wexler, 1996; Schuele & Dykes, 2005; Shin & Milroy, 1999). Therefore, the language samples in Part B of this research were analysed for use, omission and/or errors in:

- third person singular marker "-s";
- progressive tense marker "-ing";
- regular past tense marker "-ed";
- irregular past tense forms;
- irregular past participle forms;
- "already";
- infinitive verbs.

It was hypothesised that there would be significant differences in the use, omission and errors in all of these markers between the main language groups, with the EL1 participants expected to show emergence of use of these forms at an earlier age than their ML1 counterparts due to their increased exposure to English.

It was anticipated that these forms would emerge for the EL1 participants at a slower rate than for their StdE speaking counterparts due to the use of SCE before SStdE, but that the morphological markers would emerge in a pattern similar to that for Brown's (1973) StdE speakers (i.e. present progressive "-ing" marker acquired earlier than regular past tense "-ed" marker).

With regard to errors in verb morphology, it was anticipated that whilst forms might be omitted or acquired at a later age than for StdE speakers in countries such as the UK or the USA, errors for the EL1 participants would be uncommon.

For the ML1 participants, it was anticipated that some of the earlier acquired verb morphology would be acquired during their preschool years. It was hypothesised that the age of emergence would be slower than that of the EL1 participants, and that the pattern would differ from that for StdE speakers due to the influence of Mandarin. With regard to errors in verb morphology, it was hypothesised that there may be

more errors in verb morphology for the ML1 group than for the EL1 participants due to the complex nature of acquisition of English for this main language group.

Hypotheses for the individual markers are discussed in the following section.

Third person singular marker "-s"

The third person singular marker "-s" is a later acquired marker in StdE, usually emerging by about 46 months (Brown, 1973). This marker is often omitted in SCE (Deterding, 2007; Deterding & Poedjosoedarmo, 2001), and because the time between the emergence of plural "-s" marking and third person singular marking for StdE-speaking children has been suggested as a potential marker of SLI (Pawlowska et al., 2008), the data were analysed for its use, omission and errors in use. It was expected that this marker might not yet be established for either language group, which would have significant implications for differential diagnosis of language impairment rather than language difference.

Progressive tense marker "-ing"

The present progressive verb ending "-ing" marker has been identified as one which is commonly used correctly in SCE and SStdE (Deterding, 2007; Deterding & Poedjosoedarmo, 2001; Gupta, 1994). For monolingual English-speaking children with SLI, use of the present progressive verb ending "-ing" marker has not been highlighted as an area of difficulty (Beverly & Williams, 2004; Conti-Ramsden & Hesketh, 2003; Leonard, Eyer et al., 1997; Leonard, Deevy, Kurtz et al., 2007; Montgomery & Leonard, 2006; Paradis, 2005; Pawłowska et al., 2008; Restrepo & Kruth, 2000; Rice & Wexler, 1996). Analysis of the use, omission and errors in use of the present progressive tense marker "-ing" was conducted to determine whether it may be an important marker for children speaking SCE and SStdE.

It was hypothesised that there would be significant differences in the use of the tense marker between the main language groups, with the EL1 participants expected to show emergence of use of the form at an earlier age than their ML1 counterparts due to their increased exposure to English.

It was also anticipated that emergence of this form for the EL1 participants would be at a slower rate than for their StdE-speaking counterparts due to the use of SCE before SStdE, but that the morphological marker would emerge in a pattern similar to

that for Brown's (1973) StdE speakers (i.e. present progressive "-ing" marker acquired earlier than regular past tense "-ed" marker).

With regard to errors in, and omission of, the present progressive "-ing" tense marker, it was anticipated that errors and omission for both the EL1 and ML1 participants would be uncommon due to the perceptual saliency of the marker, and perhaps would be indicative of language impairment.

For the ML1 participants, it was anticipated that the present progressive "-ing" tense marker would be acquired during their preschool years. It was hypothesised that the age of emergence would be slower than that of the EL1 participants due to the amount of exposure to English.

Allomorphs and regular past tense

In addition to analysing the samples for use, errors and omission of verb morphology, the samples of regular past tense marking were further analysed. In their 1993 study, Ho and Platt found that adult speakers of SCE were more likely to mark verbs for regular past tense if the allomorph was more salient. That is, the allomorph syllable /əd/ (e.g. as in "wanted") is most likely to be used correctly in SCE, followed by the markers /d/ or /t/ (e.g. /d/ as in "marked" and /t/ as in "stopped"). In her 2004 study, Fong found that the option of marking was not dependent on whether the verb uses regular or irregular inflections but there is a clear pattern based on context. For example, if there is an adverbial such as "yesterday", the tense is marked correctly on the following verb or the verb is used in finite form. Deterding (2007) and Lim (2004) highlight the difficulty in distinguishing between word final cluster reduction and tense omission. Therefore, for this study the data were analysed to determine whether this pattern was consistent for use of these allomorphs as verb morphology is acquired, although it was not known whether there would be any clear influence on regular past tense marking because of allomorphic variation.

Irregular past tense forms

Irregular past tense verb forms do not develop at the same rate or in the same way for monolingual English-speaking children with SLI as for their age-matched peers with typically developing language. However, their difficulties with irregular past

forms are not as significant as those with the regular past tense "-ed" marker (Leonard, Deevy, Miller, Rauf, Charest & Kurtz, 2003; Leonard, Eyer et al., 1997; Rice et al., 2000). Rice et al. (2000) state that irregular past tense use in this population is comparable with that of language-matched peers, and that errors tend to be in the use of the verb stem (e.g. "run" instead of "ran").

Variable past tense marking, including irregular past tense, is a characteristic of SCE (Deterding, 2007; Deterding & Poedjosoedarmo, 2001; Fong, 2004; Gupta, 1994; Ho & Platt, 1993; Lim; 2004). Most researchers state that the verb is less likely to be marked correctly if it is not required by the context (Deterding, 2007; Deterding & Poedjosoedarmo, 2001; Fong, 2004; Gupta, 1994; Lim; 2004), but Ho and Platt (1993) believe that irregular past tense forms are more likely to be used correctly than regular past tense verbs. The data on irregular past tense verbs were therefore analysed for use and errors in use.

It was anticipated that there would be significant differences in the use and errors in the use of irregular past tense verbs between the main language groups. The EL1 participants were expected to commence use of these forms at an earlier age than their ML1 counterparts due to their increased exposure to English, and later than for monolingual speakers of StdE due to the exposure to SCE before SStdE. However, it was thought that the morphological markers would emerge in a pattern similar to that for monolingual StdE speakers. Errors were expected and it was anticipated these would most likely be the use of the bare verb stem instead of the irregular form.

For the ML1 participants, it was anticipated that irregular verbs would be acquired later than for the EL1 participants due to their reduced time and amount of exposure to English. It was also thought that the pattern would differ from that of the EL1 participants due to the influence of Mandarin using a "le" particle to mark the tense, rather than irregular verb forms, making errors in terms of use of a bare verb stem more likely.

Irregular past participle forms

As for irregular past tense verbs, it was anticipated there would be significant differences between the main language groups in the use and errors in the use of irregular past participle forms. The EL1 participants were expected to commence use

of these forms at an earlier age than their ML1 counterparts due to their increased exposure to English, and later than for monolingual speakers of StdE due to the exposure to SCE before SStdE. It was also expected that the forms would emerge in a pattern similar to that for monolingual StdE speakers. Errors were expected and it was anticipated these would most likely be the use of the bare verb stem instead of the irregular form.

For the ML1 participants, it was anticipated that irregular past participle forms would be acquired in the same manner as for irregular past tense verbs, that is, later than the EL1 participants and in a different way due to the influence of Mandarin on their English.

"Already"

The data were also examined for use of "already" rather than verb morphology for the indication of the completed / perfective aspect of an action (e.g. "finish already" rather than "finished"). The use of "already" has been described as a means of indication of the past nature of an action (Ansaldo, 2004; Bao, 1995; Deterding, 2007) that is a direct translation of the past aspect marker "le" from Mandarin (Bao, 1995; Yip & Rimmington, 1997). It is also used in Hokkien, another language used in Singapore particularly since English was introduced to the nation (Ansaldo, 2004). Therefore, analysis was conducted of use this feature across the language and age groups.

It was expected that the ML1 participants would show higher use of "already" in comparison with their EL1 counterparts due to the influences of Mandarin on their English language development. It was also anticipated that both language groups would use "already" to indicate the completed nature of an action, but that use would decrease as use of the verb morphology developed.

Infinitive verb forms

Infinitive forms of the verb are those where there is no marking of the verb for tense or agreement. The verb can appear with or without "to". In monolingual StdE-speaking children, there is a period of time where verbs are used in this form. Rice, Wexler and Cleave (1995) account for SLI by suggesting that these children extend this period of optional infinitive. As it is a feature of SCE to use verbs without

morphological marking, that is, in their infinitive form, it was considered important to analyse this characteristic in the participants' language samples. It seemed probable that the younger children would be more likely to use the bare verb stem, with EL1 participants demonstrating decreased use of the infinitive form as verb morphology started to develop.

Aspect, modals, auxiliary and copula verbs

In SCE, complex verb forms are used less frequently than in SStdE (Deterding & Poedjosodarmo, 2001). Therefore, analysis included the indication of aspect and the use, omission and errors in use of modal and auxiliary verbs as follows:

- perfective aspect using "has";
- infinitive verbs to indicate future aspect;
- future aspect using "going to";
- auxiliary verbs "is" and "are";
- copula verbs "is" and "are".

Perfective aspect

The indication of perfective aspect using "has", as well as the omission of "has", were also analysed. It was anticipated that both main language groups would omit this marker but that as SStdE forms started to develop, use would increase for both groups, with the EL1 participants showing use earlier than the ML1 participants due to the level of English exposure.

Future aspect

In StdE there are a number of ways of indicating future time reference (Deterding & Poedjosodarmo, 2001). Therefore, the data were analysed for the following four ways in which future aspect might be indicated in SCE:

- infinitive verb + modal auxiliary "will" (e.g. "tomorrow the boy will run");
- infinitive verb without the modal auxiliary "will" but implied by the context ("tomorrow the boy run");
- "going to" + infinitive verb (e.g. "tomorrow the boy going to run");
- "want" + infinitive verb (e.g. "tomorrow the boy want run").

The data were analysed to consider these means of indicating future aspect in SCE, in particular to determine whether emergence of indication of future aspect develops

before the end of preschool (emerging 5;9-6;8 approximately) but that the EL1 children would show use of all forms earlier than the ML1 participants.

With regard to type of indication of future aspect, it was anticipated that both groups would develop use in order of 1) "want", 2) "going to", 3) infinitive verb with omission of "will" assumed by context and 4) use of infinitive verb and modal auxiliary "will", demonstrating increased complexity in verb use with increasing age and exposure to SStdE forms.

Auxiliary and copula "to be"

The omission of the verb "to be" has been highlighted as a characteristic of SCE (Gupta, 1994; Deterding, 2007). Gupta (1993) hypothesised that errors in agreement between subject, regular present tense and auxiliary form of the verb "to be" were uncommon in speakers of SCE and might be indicative of language impairment. Therefore, with the analysis of the use of the present progressive tense verb ending "-ing" (see Chapter 8), the use of the auxiliary verb forms "is" and "are" was also analysed (see Chapter 8) to determine whether these forms were always used in conjunction with the present progressive tense marker "-ing" in SCE, and whether there were agreement errors. It was hypothesised that the EL1 children would show use of the copula and auxiliary "to be" earlier than the ML1 participants, due to their level of exposure to English and SStdE forms. A second hypothesis was that agreement errors (i.e. subject plurality-auxiliary / copula form such as "he <u>is</u> / they <u>are</u>") would be uncommon.

Phrase level

Articles

Analysis of the use, omission and errors in use of definite and indefinite articles was performed for this study. For monolingual speakers of StdE, articles typically emerge between 40-46 months (Brown, 1973). For preschool-aged, monolingual speakers of StdE with SLI, omission of articles has been found to be common, albeit less so than problems with verb morphology (Leonard, Eyer et al., 1997; Restrepo & Kruth, 2000; Rice & Wexler, 1996).

In Gupta and Chandler's (1994) chapter on speech and language therapy issues related to SCE, they describe disordered use of articles in Singaporean children with

SLI. However, as there is little information in the literature on normal use of articles for children speaking SCE, analysis of definite and indefinite articles was performed on the data obtained in this study.

It was hypothesised that use and omission of articles would occur in the language samples from both main language groups but that errors in their use would be rare for both groups. It was also hypothesised that the EL1 participants would show higher use of articles at a younger age than their ML1 counterparts, in line with the level of exposure to English and the fact that Mandarin does not have clear definite and indefinite articles (White, 2008).

Plurality

In her study of the acquisition of noun plural marking in 10 successive bilingual Mandarin Chinese-speaking children, Jia (2003) found plural marking to be variable among the group, with large individual differences. She concluded that there were differences between the plural marking of this population in comparison with monolingual English speakers with SLI. Shin and Milroy (1999) investigated the acquisition of noun plural marking in 12 successive bilingual Korean children who spoke Korean in the home and English in school. This study noted the significant difference between noun plural marking in English and Korean, finding that the bilingual Korean-English speakers acquired noun plural marking later than monolingual English speakers, and in different order (i.e. later than other morphological markers). In 2001, Bland-Stewart and Fitzgerald studied the use of Brown's (1973) fourteen morphemes in 15 bilingual Hispanic preschoolers. They found emergent use of all of the morphemes but in a different rank order.

These studies have implications for the diagnosis of SLI in these multilingual populations if using similar criteria to those used with monolingual English-speaking children. Whilst monolingual English-speaking children with SLI usually acquire marking of noun plurals, this may not be the case for Singaporean bilingual populations, and rate of acquisition may also differ. Further information on the typical development of SStdE and SCE is clearly required.

In SStdE, regular plurals are indicated using the '-s' marker on the noun, but in SCE it is more commonly omitted or indicated using a quantifier plus the noun (e.g., 'two

cat' rather than 'cats') (Deterding & Poedjosoedarmo, 2001; Ho & Platt, 1993). There has been discussion as to whether this can be explained by the phonological features of SCE, in that word final consonant clusters are reduced, resulting in omission of the morphological marker (Deterding & Poedjosoedarmo, 2001; Gupta, 1994, Platt & Weber, 1980). However, with the pattern of consonant cluster simplification preserving the '-s', it is more likely to be explained by morphological features of SCE. Furthermore, in Mandarin (and many other Chinese dialects), plurality is indicated not by altering the noun but by placing a number and a measure word (e.g. 'liǎng' meaning 'two' and the measure word 'gè') before the noun (Yip & Rimmington, 1997). These two explanations are not mutually exclusive since all ethnic Chinese children are expected to learn Mandarin as a mother tongue alongside SStdE as the main medium for instruction in school. Although SCE was used historically in Singapore prior to the use of Mandarin, the mix of, and exposure to, different languages (e.g. Hokkien) and their consequential influences are very complex.

Plural morphemes are acquired relatively early in StdE, emerging by Brown's (1973) stage II at approximately 30 months (Berko-Gleason, 1997; Brown, 1973; Jia, 2003; Mervis & Johnson, 1991). Previous studies have shown that noun plural marking emerges in four stages. Initially, in the pre-plural stage, children produce no noun plurals (Jia, 2003; Mervis & Johnson, 1991). This is followed by the transitional pre-plural stage when the noun plural is marked correctly but only used occasionally. Next comes the transitional post-rule period, in which there is overuse of the marker with irregular plurals (e.g., 'mans' instead of 'men'), before plural mastery, in which correct noun plural marking is used 80-90 percent of the time (Jia, 2003; Mervis & Johnson, 1991).

In SStdE, regular plurals are indicated using the "-s" marker on the noun, but in SCE this is optional and is more commonly indicated using a quantifier plus the noun (e.g. "two cat" rather than "two cats") (Fong, 2004; Ho & Platt, 1993; Wee & Ansaldo, 2004). Wee and Ansaldo (2004) believe there is no clear pattern on plural use and omission for Singaporean speakers of English. Ho and Platt (1983), however, believe that use is related to emergence of SStdE forms. Use and omission can also be explained by the phonological features of SCE in that word final consonant clusters

are reduced, thereby omitting the morphological marker (Deterding & Poedjosoedarmo, 2001; Gupta, 1994). It is more likely to be explained by morphological features of SCE, with the pattern of consonant cluster simplification preserving the '-s' (Deterding, 2007; Gupta, 1994). Furthermore, noun plural marking can be compared with the way in which plurality is indicated in Mandarin, where the noun does not alter but a number and a measure word (e.g. "liǎng" meaning "two" and the measure word "gè") are placed before it (Yip & Rimmington, 1997).

Therefore, analysis of the use and omission of the plural "-s" marker and of use of a quantifier was conducted. It was anticipated that for both language groups, omission of the plural "-s" marker would decrease with increasing age. It was also expected that the EL1 participants would show use of this marker at an earlier age and in a similar pattern to that of StdE speakers in comparison with the ML1 participants due to their level of exposure to English. It was expected that both main language groups would show evidence of use of this marker by the end of preschool (i.e. 6;8) because it is one of their earlier acquired grammatical morphemes (Brown, 1973).

It was expected that both groups would show use of a quantifier to indicate plurality, as this is characteristic of SCE. However, due to the language influences, it was anticipated that the ML1 children would use the quantifier to indicate plurality more often and this use would continue for a longer duration than for their EL1 counterparts. It was expected that as the use of the morphological marker "-s" emerged, use of the quantifier would decrease.

Possession

Shin and Milroy (1999), in their study of Korean-English bilinguals in New York, found that their participants had difficulties using the "-s" marker to indicate plurality but that they were able to mark nouns correctly using the "-s" marker for possession. Overall, they found clear differences in the order of acquisition of English morphemes for this population.

Further to the discussion of the use and omission of the plural "-s" marker in Singapore, the use of the possessive "-s" marker in SCE could be expected to be limited by the morphosyntactic nature or phonology of the language as final

consonant clusters are reduced (although the pattern of cluster reduction would in fact be more likely to preserve the "-s") (Deterding, 2007; Deterding & Poedjosoedarmo, 2001; Gupta, 1994). Furthermore, in Mandarin, possession is marked with the "de" particle, which is placed between two nouns to indicate possession (Yip & Rimmington, 1997). Therefore, the sentence "the girl's shoe" would be "nu hai de xie" in Mandarin.

In SStdE, marking for possession by adults is the same as for StdE. For monolingual children acquiring StdE, possessive marking emerges between approximately 36 and 42 months (Brown, 1973). Therefore, use and omission of the possessive "-s" marker by the Chinese Singaporean preschool participants was also analysed. As was the case for the plural "-s" marker, it was anticipated that omission of the possessive "-s" marker would decrease with increasing age for both language groups. It was also expected that the EL1 participants would show use of this marker at an earlier age and in a similar pattern to that of StdE speakers in comparison with the ML1 participants due to their level of exposure to English. Both main language groups were expected to show evidence of use of this marker by the end of preschool (i.e. 6;8).

Pronouns

There has been considerable study into the development of pronouns for monolingual English-speaking children. For example, Rispoli (1994; 1998) devised the Pronoun Paradigm Building Hypothesis to account for developmental patterns and errors in pronoun use made by typically developing children. Further studies have considered the acquisition of pronouns by children with SLI (Moore, 2005), with conflicting findings as to whether children with SLI do in fact have difficulties with pronouns in comparison with their age-matched peers and their MLU-matched peers (Loeb & Leonard, 1991; Moore, 2005; Wexler, Schutze & Rice, 1998).

Exploration of pronoun use in Singapore has focused more on the influence of Mandarin on the English of Mandarin-English bilinguals because Mandarin makes no gender distinction in personal pronouns (Yip & Rimmington, 1997). To date there is no published information on children's acquisition of pronouns in Singapore. Therefore, the data on pronouns collected in this study were analysed to explore how English-Mandarin bilingual Chinese preschoolers may use pronouns and make errors

in pronoun use. The data were divided into personal pronouns, possessive pronouns and object pronouns. Analysis of the use, omission and errors in use of pronouns was conducted in order to explore the use of pronouns for this population. Whilst the data on use and errors in use of pronouns for monolingual children with SLI suggests that difficulties with pronoun use are not indictors of SLI (Moore, 2001; Pine, Joseph & Conti-Ramsden, 2004), it was considered useful to have more information on the emergence of pronouns in the language samples of children speaking SStdE and SCE. This information is needed in order to expand knowledge of the forms of English spoken in Singapore, and to inform differential diagnosis of language impairment.

Personal pronouns

Analysis was conducted of use of "he/she" and errors in use of "he/she" because as it was anticipated there would be significant differences between main language groups. There is no gender differentiation between personal pronouns in Mandarin, with the same pronoun being masculine or feminine and indicated by the context (Yip & Rimmington, 1997). That is, the pronoun "tā" can mean "he/she/it". Therefore, differences were expected between the main language groups in both use of, and errors in use of, personal pronouns, with the EL1 participants showing development of these pronouns earlier than their ML1 counterparts and in a pattern similar to that for StdE speakers.

Possessive pronouns

As is the case for personal pronouns, possessive pronouns in Mandarin are not differentiated for gender (Yip and Rimmington, 1997). That is, the pronoun "tāde" can mean "his/her/its". Therefore, analysis was conducted of use and errors in use of the possessive pronouns "his/her" to determine whether there was a significant difference between the main language groups in the use of these pronouns. The EL1 participants showed development of these pronouns earlier than their ML1 counterparts, and in a pattern similar to that for StdE speakers.

Object pronouns

Analysis was also conducted of use and errors in use of object pronouns. The object pronouns "it", "him" and "her" were grouped into one category for statistical analysis due to the low mean number of uses of object pronouns. As was the case for

personal and possessive pronouns, it was anticipated that there would also be a significant difference between the main language groups in the use of these pronouns, with the EL1 participants showing development of these pronouns earlier than their ML1 counterparts and in a pattern similar to that for StdE speakers.

Conjunctions

In StdE, conjunctions start to emerge early, with "and" starting to be used by children as young as about 27 months, and being used to join clauses by approximately three years of age (Brown, 1973; Lund & Duchan, 1988; Owens, 2008).

Gupta (1994) reported that emergence of the use of conjunctions is relatively early in SCE in comparison with StdE. However, she stated that their use is only mandatory when required by the context, so omission where they would usually be required in a StdE context is a feature of SCE (e.g. in SCE "run here, fall over" as compared with StdE "if you run here then you will fall over"). Therefore, the data were analysed for use, omission and errors in use of coordinating and subordinating conjunctions.

For omission of conjunctions where they would be required in a StdE context, it was not possible to determine which type of conjunction had been omitted. Therefore, it was not possible to subdivide the data into coordinating and subordinating conjunctions. This category was analysed as a whole, but the data were subdivided into their subcategories for use and errors in use. Use of specific conjunctions was also analysed.

It was expected that both main language groups would show evidence of omission of conjunctions. It was thought that the EL1 participants would use conjunctions earlier than their ML1 counterparts due to level of exposure to English and therefore linguistic complexity of language used. It was also thought that use of conjunctions would develop in a pattern similar to that of StdE-speakers for both main language groups (i.e. earlier acquired co-ordinating conjunctions "and" and "then" emerging earlier than subordinating conjunctions "because" and "to"). Another expectation was that omission of conjunctions would decrease as use increased, and it was hypothesised that errors in use of conjunctions would be uncommon for both main language groups.

Prepositions

Deterding and Poedjosodarmo (2001) report that prepositions usually required in a StdE context are often omitted in SCE, and in other cases prepositions may be overused in SCE where not required in a StdE context.

Prepositions start to emerge relatively early for typically developing, monolingual StdE-speaking children, with locative prepositions (e.g. "in" and "on") emerging at a young age (approximately 2 years) and dative prepositions (e.g. "to" and "for") emerging relatively late but by late preschool (Brown, 1973; Grela, Rashiti & Soares, 2004). However, there is also evidence that use of prepositions, particularly dative prepositions, is difficult for children with SLI (Grela et al., 2004).

In other aspects of language development, there is evidence that bilingual children acquire prepositions differently. For example, Shin and Milroy (1999) found that their Korean-English bilingual participants acquired early prepositions in a different developmental sequence to that described by Brown (1973). Bland-Stewart and Fitzgerald (2001) also found differences in the order of acquisition of Brown's morphemes in their Hispanic preschool participants.

Knowledge of these research findings highlighted the importance of analysing the participants' use, omission and errors in use of a range of prepositions in order to explore these aspects of preposition use for Chinese Singaporean preschool children. During the data analysis, omission in use of a preposition was coded where its use would be expected in a StdE context. Incorrect selection of a preposition and overuse of a preposition where it would not be required in a StdE context were coded as being errors in use of the preposition. The data were also analysed for use of individual prepositions.

It was hypothesised that both main language groups would show evidence of use of earlier developing locative prepositions (e.g. "in" and "on"), with the EL1 participants acquiring these prepositions at an earlier age than their ML1 counterparts due to the level of exposure to English they had received. It was also expected that prepositions would develop in a pattern similar to that of StdE speakers for both main language groups (i.e. earlier acquired locative prepositions "in" and "on" emerging earlier than later acquired dative preposition "to").

Furthermore, it was anticipated that omission of prepositions would decrease as use increased for both main language groups. It was also hypothesised that errors in use of prepositions would be uncommon for both the EL1 and ML1 participants.

Summary

The aim of this study was to analyse the language samples of typically developing English-Mandarin bilingual Chinese Singaporean children aged 3;9-6;8 for some of the specific characteristics of syntax and morphology that Speech Pathologists would usually analyse in language samples from children with identified problems in order to determine whether the child has a language impairment or language difference. Whilst this study does not provide a comprehensive linguistic description of the forms of English spoken in Singapore, it is hoped it will provide some initial information on these characteristics to facilitate clinical decision-making by allowing the clinician to make a more informed comparison between the client and typically developing children. There is a great need for an extended study into the languages spoken in Singapore and it is hoped the data collected will inform future research projects.

In summary, the hypotheses for the study are as follows:

MLU

- EL1 children will achieve MLU scores increasing steadily with age but at a slower rate;
- ML1 children will achieve MLU values significantly lower than for their StdE speaking counterparts, with values increasing steadily with age.

Number of word roots used

- EL1 children will produce a larger number of different words than their age-matched ML1 participants.

Total number of words used

- EL1 children will produce more words in their language samples than their age-matched ML1 participants.

Omission of words

- EL1 children will omit fewer words than their age-matched ML1 participants, particularly with increasing age.

Use and omission of inflectional morphemes

- there will be no differences between language groups for omission of inflectional morphemes;
- the age of emergence of use of inflectional morphemes will be earlier for EL1 participants than ML1 participants;
- EL1 children will have a similar pattern of emergence of inflectional morphemes to StdE speaking children;
- ML1 children will have a different pattern of emergence of inflectional morphemes in comparison with EL1 children.

Number of utterances per picture description

- EL1 children will use fewer utterances per picture description than their ML1 counterparts;
- the number of utterances used will decrease with increasing age for both language groups.

Number of single word utterances

- ML1 participants will use more single word utterances than their EL1 counterparts;
- the number of single word utterances will decrease with increasing age for both main language groups.

Semantic errors in vocabulary

- ML1 participants will make more vocabulary errors than their EL1 counterparts.

Code switching

- ML1 participants will code switch and use Mandarin vocabulary if they do not know the English word;
- EL1 participants will not code switch.

Subject omission

- there will be no differences in appropriate subject omission between the main language groups;
- EL1 participants will omit fewer subjects inappropriately;
- inappropriate subject omission will decrease with increasing age for both main language groups;
- inappropriate subject omission will be rare for both main language groups.

Object omission

- there will be no differences in appropriate object omission between the main language groups;
- EL1 participants will omit fewer objects inappropriately;
- inappropriate object omission will decrease with increasing age for both main language groups;
- inappropriate object omission will be rare for both main language groups.

Verb morphology

- EL1 participants will show emergence of use of morphological markers at an earlier age than their ML1 counterparts;
- EL1 participants will acquire inflectional morphemes at a slower rate than their StdE-speaking; counterparts;
- EL1 participants will follow a similar pattern of emergence of morphological markers as StdE speakers;
- errors in morphological markers will be rare for EL1 participants;
- ML1 participants will acquire verb morphology at a slower rate than their ML1 peers;
- ML1 participants will follow a different pattern of emergence of morphological markers compared with StdE speakers;
- ML1 participants will make more errors in verb morphology than their EL1 age-matched peers.

"Already"

- ML1 participants will use "already" more than their EL1 counterparts;
- both language groups will use "already" to indicate the completed nature

of an action more often than their StdE-speaking counterparts;

- use of "already" will decrease with increasing age for both age groups.

Perfective aspect

- both main language groups will omit perfective "has" more than their StdE speaking counterparts;
- use of this marker will increase with increasing age for both language groups;
- EL1 children will use the perfective "has" marker more than their ML1 counterparts.

Future aspect

- both language groups will indicate future time reference by the end of preschool;
- EL1 children will show use of all forms earlier than the ML1 participants;
- both groups will develop use in order of:

  1) "want";

  2) "going to";

  3) infinitive verb with omission of "will" assumed by context;

  4) use of infinitive verb and modal auxiliary "will".

Auxiliary and copula "to be"

- EL1 children will use the copula and auxiliary "to be" earlier than the ML1 participants;
- agreement errors will be uncommon for both language groups.

Articles

- the use and omission of articles will occur in the language samples from both main language groups;
- errors in their use will be rare for both groups;
- EL1 participants will use more articles at a younger age than their ML1 counterparts.

Plurality

- omission of the plural "-s" marker will decrease with increasing age for both language groups;
- EL1 participants will show use of this marker at an earlier age and in a similar pattern to that of StdE speakers in comparison with the ML1 participants;
- both main language groups will show evidence of use of this marker by the end of preschool;
- both groups will show use of quantifiers rather than the plural "-s" marker;
- ML1 children will use quantifiers to indicate plurality more often and for longer than their EL1 counterparts;
- for both language groups, as use of the morphological marker "-s" emerges, use of the quantifier will decrease.

Possession

- omission of possessive "-s" marker will decrease with increasing age for both language groups;
- EL1 participants will show use of this marker at an earlier age and in a similar pattern to that of StdE speakers in comparison with the ML1 participants;
- both main language groups will show evidence of use of this marker by the end of preschool.

Personal pronouns

- EL1 participants will show development of personal pronouns earlier than their ML1 counterparts;
- EL1 participants will show development of personal pronouns in a pattern similar to that for StdE speakers;
- ML1 participants will show development of personal pronouns in a pattern dissimilar to that for StdE speakers;
- ML1 participants will make more errors with personal pronouns than their EL1 counterparts.

Possessive pronouns

- EL1 participants will show development of possessive pronouns earlier than their ML1 counterparts;
- EL1 participants will show development of possessive pronouns in a pattern similar to that for StdE speakers;
- ML1 participants will show development of possessive pronouns in a pattern dissimilar to that for StdE speakers;
- ML1 participants will make more errors with possessive pronouns than their EL1 counterparts.

Object pronouns

- EL1 participants will show development of object pronouns earlier than their ML1 counterparts;
- EL1 participants will show development of object pronouns in a pattern similar to that for StdE speakers;
- ML1 participants will show development of object pronouns in a pattern dissimilar to that for StdE speakers;
- ML1 participants will make more errors with object pronouns than their EL1 counterparts.

Conjunctions

- both main language groups will omit conjunctions usually required in a StdE context;
- EL1 participants will use conjunctions earlier than their ML1 counterparts;
- EL1 and ML1 participants will develop conjunctions in a pattern similar to that of StdE speakers;
- the omission of conjunctions will decrease as use increases for both main language groups;
- errors in use of conjunctions will be uncommon for both main language groups.

Prepositions

- both main language groups will use earlier developing locative prepositions;

- EL1 participants will acquire these prepositions at an earlier age than their ML1 counterparts;
- EL1 and ML1 participants will develop prepositions in a pattern similar to that of StdE speakers;
- omission of prepositions will decrease as use increases for both main language groups;
- errors in use of prepositions will be uncommon for both language groups.

The results and a short discussion for each aspect of syntax and morphology tested are presented in the following chapters.

Chapter 8 Results Part B

Test results for all aspects of language samples described in the previous chapter are presented and discussed here. A table of key findings is included in each section, together with more detailed reporting and discussion. More detailed information on the statistical analyses (i.e. effect sizes, confidence intervals etc.) can be found in Appendix 2. The chapter begins with results for utterance level and continues through results for clause level, verb morphology and phrase level.

A 2 (language group) x 6 (age group) mixed analysis of variance was calculated for all aspects of syntax and morphology analysed to determine potential differences between main language groups and age groups and whether there was any interaction between main language and age group. Where difference between age groups was indicated by analysis of variance results, simple effects testing was conducted (with posthoc Bonferroni corrections at .05). Unless stated otherwise, the results of these tests are reported for the data analysis.

As stated previously, test results with significant differences between closest age groups only (e.g. between age groups 1 and 2 and between 1 and 3) have been reported; differences between wider age ranges were assumed.

Utterance level

The following aspects of the language samples are discussed in this section of the chapter:

- MLU in morphemes;
- MLU in words;
- number of word roots used;
- total number of words used;
- number of words omitted;
- errors in word order;
- number of inflectional morphemes used;
- number of inflectional morphemes omitted;
- overall fluency of expressive language production, evaluated by measuring:

- number of utterances given in response to the stimulus;
- percentage of single word utterances;
- number of vocabulary errors;
- code switching.

Each measure is discussed individually in relation to the results obtained. Key findings are presented in Table 8.1.

Mean length of utterance (MLU)

The hypotheses for MLU were:

- EL1 children will achieve MLU scores that increase steadily with age but at a slower rate than speakers of StdE;
- ML1 children will achieve MLU values significantly lower than for their StdE speaking counterparts, with values increasing steadily with age and exposure to English.

MLU was calculated for both MLU in morphemes and MLU in words, as discussed previously. Paired sample t tests with posthoc Bonferroni corrections for each language group were run to determine whether sufficient inflectional morphemes were elicited to result in a difference between MLU morphemes and MLU words. As use of SStdE morphology started to emerge, a difference was expected between the mean values for the two MLU measures. Results showed significant differences between the two measures, with the mean value for MLU morphemes being higher than for MLU words for all age and main language groups (see Tables 8.2 and 8.3). This indicated that children from both language groups used some morphological markers, which will be discussed further in Chapters 9 and 10.

Table 8.1: Key findings from utterance level results

Variable	Main effect for language	Main effect for age group	Interaction between language & age group	EL1	ML1
MLU words	Yes	Yes	Yes	Significant increase for age 6;6	Significant increase for age 5;0 then plateau
MLU morphemes	Yes	Yes	Yes	Significant increase for age 6;6	Significant increase for age 5;0 then plateau
Total word roots	Yes	Yes	Yes	Significant increase for age 6;6	Significant increase for age 5;0 then plateau
Total words used	Yes	Yes	Yes	Significant increase for age 6;6	Significant increase for age 5;0 then plateau
Omission of words	Yes	Yes	Yes	Significant decrease for age 6;6	Significant increase for age 5;0 then plateau
Errors in word order	No	No	No	n/a	n/a
Inflectional morphemes	Yes	Yes	Yes	Significant increase for age 6;0	No difference between age groups
Omission of inflectional morphemes	No	Yes	Yes	Significant decrease for age 6;0	Significant increase for age 5;0 then plateau
Total number of utterances	Yes	Yes	Yes	No difference between age groups	Significant increase for age 5;0 then plateau
Percentage of single word utterances	Yes	Yes	Yes	Significant decrease for age 5;6	Significant decrease for age 5;0 then plateau
Vocabulary errors	Yes	No	No	n/a	No difference between age groups
Code switching	Yes	Yes	No	n/a	Significant decrease for age 5;0 then plateau

Table 8.2: Paired sample t test results for MLU morphemes versus MLU words for EL1 participants

Age group	Mean & SD MLU Morphemes	Mean & SD MLU Words	*df*	*t*	*p* with Bonferroni correction (*p*<.0056)
1 (3;9-4;2)	4.25 / 1.69	3.90 / 1.60	37	-10.056	.001
2 (4;3-4;8)	4.73 / 1.62	4.34 / 1.49	36	-8.769	.001
3 (4;9-5;2)	4.86 / 1.54	4.52 / 1.45	45	-9.746	.001
4 (5;3-5;8)	5.75 / 1.80	5.20 / 1.56	39	-9.857	.001
5 (5;9-6;2)	6.35 / 2.67	5.71 / 2.45	38	-11.314	.001
6 (6;3-6;8)	7.59 / 2.75	6.88 / 2.63	35	-10.468	.001

Table 8.3: Paired sample t test results for MLU morphemes versus MLU words for ML1 participants

Age group	Mean & SD MLU Morphemes	Mean & SD MLU Words	*df*	*t*	p with Bonferroni correction (p<.0056)
1 (3;9-4;2)	2.32 / 1.46	2.20 / 1.34	36	-5.144	.001
2 (4;3-4;8)	2.72 / 1.88	2.54 / 1.80	41	-5.592	.001
3 (4;9-5;2)	4.65 / 2.28	4.44 / 2.20	45	-7.547	.001
4 (5;3-5;8)	4.39 / 1.43	4.23 / 1.32	40	-4.903	.001
5 (5;9-6;2)	5.05 / 2.54	4.79 / 2.38	38	-6.604	.001
6 (6;3-6;8)	2.94 / 2.39	4.90 / 2.16	39	-5.696	.001

MLU in words

There were significant main effects for first language for MLU in words [$F_{(1,480)}$=50.528, p<.001] and age group [$F_{(1,480)}$=24.085, p<.001], and an interaction between language and age group [$F_{(5,480)}$=2.971, p<.05]. This suggests that, as hypothesised, the pattern of increased MLU in words is markedly different between the language groups (see Figure 8.1).

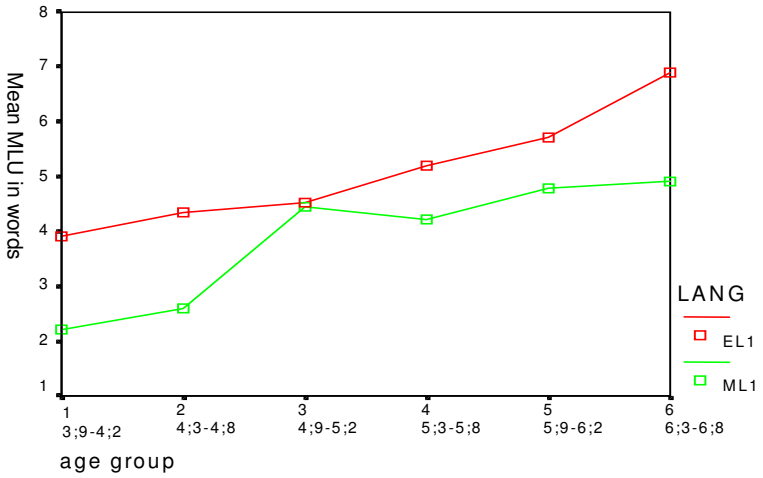


Figure 8 1: MLU in words

Table 8.4: Means and standard deviations for MLU words for EL1 and ML1 participants

Language group	Age group (age in years)	Mean	Standard Deviation
EL1	4 (5;3-5;8)	5.20	1.55
	6 (6;3-6;8)	6.88	2.53
ML1	1 (3;9-4;2)	2.19	1.34
	2 (4;3-4;8)	2.58	1.80
	3 (4;9-5;2)	4.44	2.20
	4 (5;3-5;8)	4.22	1.33

Simple effects testing for the EL1 participants revealed significant differences only between age groups 4 and 6 ($t_{(1,75)}$= -3.522, p<.001), indicating a significantly higher MLU in words for children in age group 6 than age group 4.

As can be seen from Figure 8.1 and Table 8.4, ML1 participants show a trend of increased MLU in words in age group 3 (at approximately 5;0 years); after which the scores plateau; that is, they remain consistent for age groups 4, 5 and 6. The difference in MLU in words was only significant between groups 1 and 3 ($t_{(1,81)}$= -5.430, p<.001]), 2 and 3 ($t_{(1,86)}$= -4.301, p<.001), and 2 and 4 ($t_{(1,81)}$= -4.705, p<.001).

MLU in morphemes

For MLU in morphemes, analysis of variance revealed significant main effects for first language [$F_{(1,480)}$=67.083, p<.001] and age group [$F_{(1,480)}$=24.820, p<.001], and an interaction between language and age group [$F_{(5,480)}$=2.999, p<.05] (see Figure 8.2).

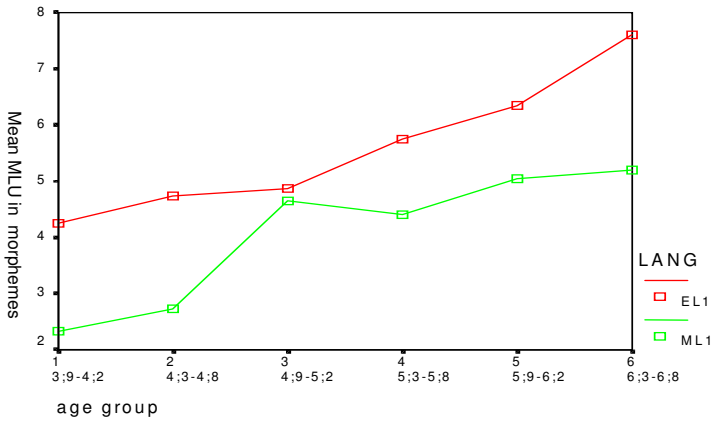


Figure 8.2: MLU in morphemes

Table 8.5: Means and standard deviations for MLU morphemes for EL1 and ML1 participants

Language group	Age group (age in years)	Mean	Standard Deviation
EL1	3 (4;9-5;2)	4.86	1.54
	4 (5;3-5;8)	5.75	1.80
	5 (5;9-6;2)	6.35	2.67
	6 (6;3-6;8)	7.59	2.75
ML1	1 (3;9-4;2)	2.32	1.46
	2 (4;3-4;8)	2.72	1.88
	3 (4;9-5;2)	4.64	2.28
	4 (5;3-5;8)	4.39	1.43

For the EL1 children, simple effects testing revealed significant differences only between age groups 3 and 5 ($t_{(1,83)}$=-3.204, p<.01) and 4 and 6 ($t_{(1,74)}$= -3.481,

p<*.001*), indicating a significantly higher MLU in morphemes for children in age group 6 than age group 4.

For the ML1 children there were significant differences between age groups 1 and 3 ($t_{(1,81)}$= -5.363, *p*<*.001*), 2 and 3 ($t_{(1,86)}$= -4.283, *p*<.001) and 2 and 4 ($t_{(1,81)}$= -4.545, *p*<.001). As for MLU in words, ML1 participants show a trend of increased MLU in words for children at approximately 5;0 years, after which the scores plateau (see Figure 8.2 and Table 8.5). The result obtained accounts for the interaction between language and age group. The pattern of increased MLU in morphemes is markedly different between the language groups (see Figure 8.2), with the sharp increase for ML1 participants at age group 3 interacting with the more gradual increase in MLU morphemes made by the EL1 participants.

This result did not support the hypothesis that the ML1 children would show continued increased length of utterance in English across their preschool years, just as the EL1 children did. The reasons for this are most likely the omission of morphological markers continuing for ML1 children, possibly due to the influence of the characteristics of Mandarin on their English, whilst use is developing for EL1 children. This finding is particularly interesting given that kindergarten schooling is in English and improvement would have been expected for both language groups. These results will be examined further later in this section and in Chapters 9 and 10.

As hypothesised, the EL1 participants' MLU for morphemes roughly matches the age ranges obtained for Standard American English speakers in the studies by Miller and Chapman (1981) for children up to 5;0, and by Leadholm and Miller (1992)on MLU for children aged between 3 and 13 years of age (see Table 8.6). Unfortunately, Leadholm and Miller's study contained no data for children aged between 4;4 and 5;1, making some comparisons impossible (see Table 8.6). Also, Miller and Chapman's data only goes up to 5;0, making comparison with the older participants in this study impossible. However, comparing the data available with the data from the EL1 participants' MLU for morphemes, morphological development for EL1 participants seems to follow the same general trends and timing as for other forms of Standard English. Figure 8.3 represents the data obtained from this study with the MLU in morphemes obtained in Miller and Chapman's (1981) study, illustrating the similar rate and pattern of development for the EL1 children.

Table 8.6: EL1 and ML1 MLU in morphemes and age equivalent for StdE

Age range of participants	EL1 mean MLU in morphemes	Leadholm & Miller's age equivalent	ML1 mean MLU in morphemes	Miller & Chapman's/ Leadholm & Miller's age equivalent
3; 9 – 4;2	4.25	3;7 – 4;2	2.32	1;9 – 2;11
4;3 – 4;8	4.73	no data	2.72	2;0 – 3;5
4;9 – 5;2	4.86	no data	4.64	no data
5;3 – 5;8	5.75	5;2 – 5;5	4.39	no data
5;9 – 6;2	6.35	5;5 – 6;4	5.05	3;7 – 4;3
6;3 – 6;8	7.59	6;7 – 7;5	5.19	3;7 – 4;3

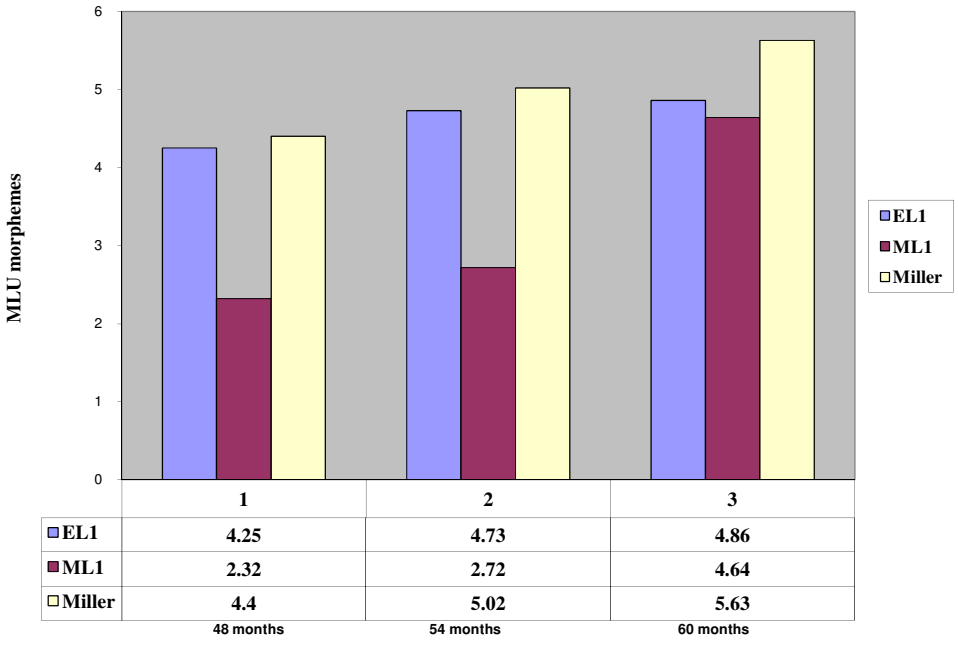


Figure 8.3: MLU in morphemes for EL1, ML1 and Miller and Chapman (1981)

The stages for the ML1 participants were not equal to those of Miller and Chapman (1981), as can be seen in Figure 8.3, or Leadholm and Miller (1992), as seen in Table 8.6. These results are consistent with the hypothesis for the ML1 participants, who had a smaller MLU than would be expected for American speakers of StdE. Whilst this would be expected as these children's first language is not English, the pattern is of possible concern because MLU seems to plateau for the ML1 participants from

4;9 to the end of kindergarten at 6;8, with implications for schooling, especially as English is the language of instruction in kindergarten. This result requires further discussion in later chapters.

Words and word roots

Total number of word roots used

It was hypothesised that EL1 children would produce a larger number of different words than their age-matched ML1 participants. Therefore, total number of word roots used was analysed (e.g. "go, goes, going" all having the same word root of "go"). There were significant main effects for first language [$F_{(1,480)}$=114.374, p<.001] and age group [$F_{(5,480)}$=39.882, p<.001], and an interaction between language and age [$F_{(5,480)}$=4.080, p<.001]. This suggested different patterns in the number of different words used in a language sample between the language groups (see Figure 8.4), which agrees with the hypothesis.

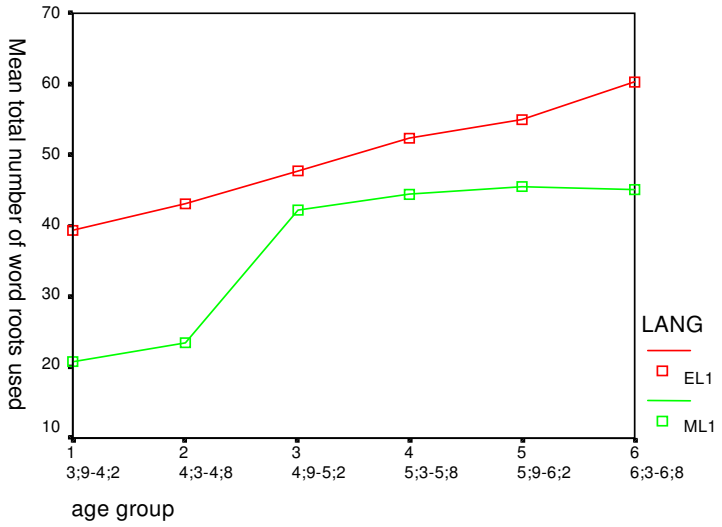


Figure 8.4: Total number of word roots used

Simple effects testing revealed significant differences for the EL1 children between age groups 1 and 3 [age group 1 M=39.32, SD=11.07, age group 3 M=47.80, SD=9.73, $t_{(1,82)}$= -3.738, p<.001], 2 and 4 [age group 2 M=43.05, SD=9.72, age group 4 M=52.33, SD=7.87, $t_{(1,75)}$= -4.616, p<.001], and 4 and 6 [age group 4 M=52.33, SD=7.87, age group 6 M=60.25, SD=9.87, $t_{(1,74)}$= -3.889, p<.001]. Participants used significantly more word roots in their entire language sample in age group 6 at the

end of kindergarten, indicating continued lexical development throughout their preschool education.

There were significant differences for the ML1 children between age groups 1 and 3 [age group 1 M=20.84, SD=13.33, age group 3 M=42.11, SD=16.34, $t_{(1,81)}$= -6.389, p<.001], 2 and 3 [age group 2 M=23.50, SD=14.0, age group 3 M=42.11, SD=16.34, $t_{(1,86)}$= -5.712, p<.001], and 2 and 4 [age group 2 M=23.50, SD=14.0, age group 4 M=44.44, SD=14.87, $t_{(1,81)}$= -6.609, p<.001]. This indicates the increase in number of different word roots used by ML1 participants in age group 3 (approximately age 5;0), which plateaued for the older age groups, suggesting that the increase in number of word roots used represents lexical development in English for ML1 participants at this age, once again with development not continued into the later kindergarten years. This would also account for the increase in MLU words and morphemes seen at the same age.

Total number of words used

It was hypothesised that EL1 children would produce more words in their language samples than their age-matched ML1 participants. Total number of words used was measured. There were significant main effects for language [$F_{(1,480)}$=59.241, p<.001] and age group [$F_{(5,480)}$=25.539, p<.001], with an interaction between the two [$F_{(5,480)}$=4.840, p<.001] suggesting that the pattern of total number of words used in a language sample is markedly different between the language groups (see Figure 8.5), as hypothesised.

Simple effects testing for the EL1 children revealed significant differences between age groups 4 and 6 [age group 4 M=97.83, SD=20.37, age group 6 M=117.72, SD=28.90, $t_{(1,74)}$= -3.496, p<.001], with the participants in age group 6 (approximately age 6;6) using significantly more words in their entire language sample than the younger children. Therefore, based on these language samples, by completion of kindergarten EL1 participants have shown marked lexical development, as hypothesised.

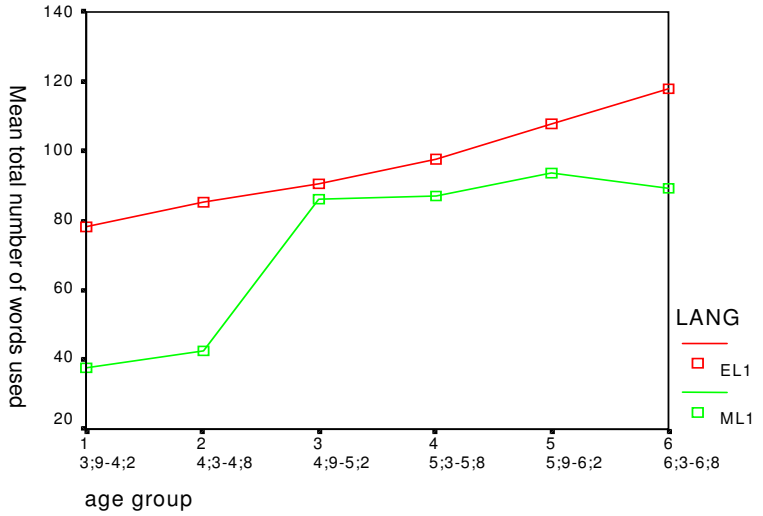


Figure 8.5: Total words used

There were significant differences for the ML1 participants between age groups 1 and 3 [age group 1 *M*=37.84, *SD*=31.67, age group 3 *M*=86.22, *SD*=41.15, $t_{(1,81)}$= -5.884, *p*<.001], 2 and 3 [age group 2 *M*=42.55, *SD*=33.80, age group 3 *M*=86.22, *SD*=41.15, $t_{(1,86)}$= -5.410, *p*<.001], and 2 and 4 [age group 2 *M*=42.55, *SD*=33.80, age group 4 *M*=87.24, *SD*=34.40, $t_{(1,81)}$= -5.970, *p*<.001]. Similar to the results for total number of word roots used, this result does not support the hypothesis that total number of words would increase with age throughout the preschool years. This may reflect lexical development in English for ML1 participants at age group 3 which, based on these language samples from preschool children, does not appear to continue beyond this age group.

Omission of words

The data collected on omission of words usually required in a StdE context were also analysed. It was hypothesised that the EL1 children would omit fewer words than their age-matched ML1 participants, particularly with increasing age. The ML1 children were expected to omit more words in line with the characteristics of this form of English.

The results for the total number of omitted words show significant main effects for language [$F_{(1,480)}$=45.107, *p*<.001] and age group [$F_{(5,480)}$=4.282, *p*<.001], and once

again an interaction between first language and age [$F_{(5,480)}$=10.090, p<.001]. This suggests a different pattern for the omission of words between the language groups (see Figure 8.6), although not with the ML1 children omitting more words as hypothesised. Although omission of words is a feature of SCE (see discussion in Chapter 2) and should therefore be consistent in both language groups, these differences are explained by the overall higher number of words used by the EL1 participants and therefore the increased number of opportunities available for omission of words from their language samples.

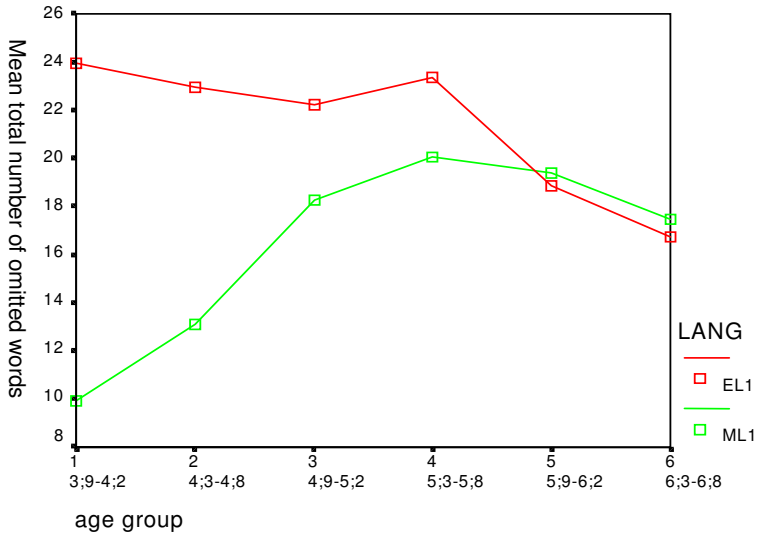


Figure 8.6: Total omitted words

Simple effects testing for the EL1 participants showed differences between age groups 4 and 6 [age group 4 M=23.33, SD=8.82, age group 6 M=16.72, SD=8.37, $t_{(1,74)}$=3.337, p<.001], with a significant decrease in the number of words omitted for children in age group 6 (approximate age 6;6), as was hypothesised. This reflects the emergence of some features of SStdE and an understanding that words must be used in certain contexts, which may explain the interaction effect between total words and omitted words across the two language groups.

Their pattern for the ML1 participants was not a gradual decrease in omission of words as had been hypothesised. Instead, there were significant differences between age groups 1 and 3 [age group 1 M=9.95, SD=7.95, age group 3 M=18.28, SD=8.23, $t_{(1,81)}$=-4.659, p<.001], and 2 and 4 [age group 2 M=13.12, SD=9.56, age group 4

M=20.05, *SD*=6.58, $t_{(1,81)}$=-3.837, *p*<.001], reflecting the increase in use of expressive vocabulary in English for children in age group 3. The number of omitted words remained constant for children in age groups 4 to 6, rather than the expected decrease. This may relate to the other findings that number of words and different word roots used does not appear to show continued development for these age groups. Another suggestion is that it may reflect the ML1 children's acquisition of SCE rather than SStdE, making their language samples with emerging features of SCE more similar to those of the EL1 group.

The results for the total number of words and omitted words show a significant main effect for language [$F_{(1,486)}$=59.51, *p*<.001] and an interaction between the total number of words used and omitted [$F_{(1,486)}$=3247.78, *p*<.001] (see Figure 8.7).

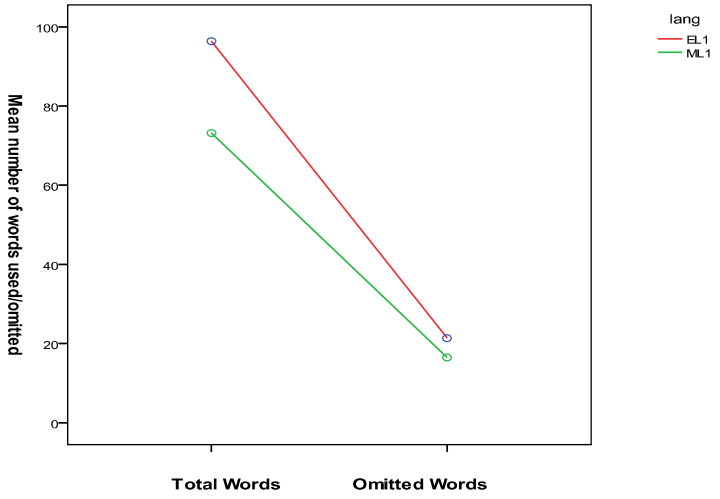


Figure 8.7: Total words used vs omitted words

This suggests a different pattern for the use and omission of words between the language groups. It supports the theory that the EL1 children are acquiring features of SStdE and therefore using more and omitting fewer words, while the ML1 children are gradually developing SCE and changes to use and omission of words are occurring less quickly than for the EL1 group. This raises another interesting question as to the exposure to English that the ML1 children are receiving and its impact on their acquisition of English. The language of instruction in kindergarten is English and should be SStdE, yet the ML1 children appear to be learning SCE. This issue will be discussed in Chapter 10.

Errors in word order

It was expected that errors in word order would be uncommon. The mean number of errors for the entire EL1 group was only 0.25 and for the ML1 group 0.24. There were no significant differences between language or age groups, and no interaction between them. The possible significance of this result will be discussed further in later chapters.

Inflectional morphemes

It was anticipated that:

- there would be no differences between language groups for omission of inflectional morphemes;
- the age of emergence of use of inflectional morphemes would be earlier for EL1 participants than ML1 participants;
- EL1 children would have a similar pattern of emergence of inflectional morphemes to StdE-speaking children;
- ML1 children would have a different pattern of emergence of inflectional morphemes in comparison with EL1 children.

Total number of inflectional morphemes used

There were significant main effects for first language [$F_{(1,480)}$=156.816, p<.001] and age group [$F_{(5,480)}$=11.528, p<.001], with a significant interaction between language and age [$F_{(5,480)}$=56.042, p=.05] for the total number of inflectional morphemes used in the participants' language samples. This suggests a different pattern in the use of inflectional morphemes between the language groups (see Figure 8.8), as was expected.

Simple effects testing for EL1 participants showed significant differences between age groups 3 and 5 [age group 3 M=6.72, SD=4.59, age group 5 M=12.03, SD=6.38, $t_{(1,83)}$=-4.449, p<.001]. This indicates a significant increase in the use of inflectional morphemes for children in age group 5 compared to age group 3 (approximately age 6;0), which was expected. It reflects the emergence of some SStdE morphology, which is discussed in more detail in later chapters. The result is further evidence of development of some SStdE forms starting at age groups 5 for EL1 participants.

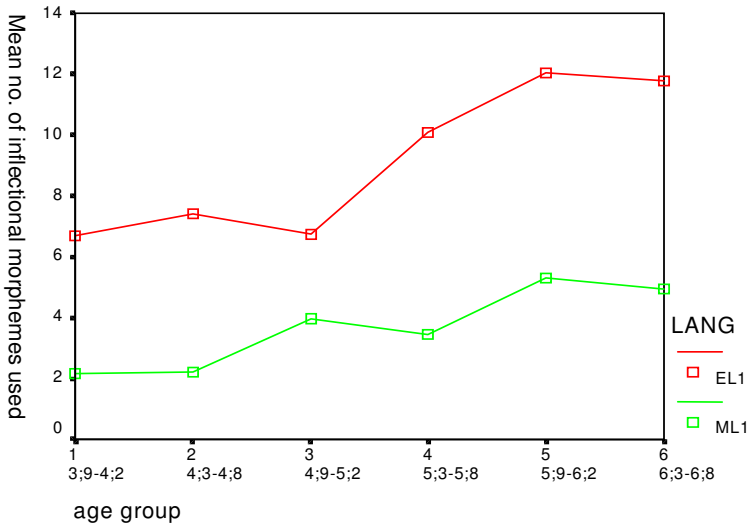


Figure 8.8: Inflectional morphemes used

There was no significant change in use of inflectional morphemes for the ML1 participants, with the number of inflectional morphemes remaining constant for the participants at all stages of their preschool education (see Figure 8.8). It had been hypothesised that there would be differences between the main language groups and that the ML1 participants would show a different pattern of use of inflectional morphemes, but results indicate that this was not the case. The actual use of the different morphemes will be discussed in later chapters.

Omission of inflectional morphemes

There were no differences between the language groups for omission of inflectional morphemes. However, there was a significant main effect for age group [$F_{(5,480)}$=4.662, p<.001] and an interaction between first language and age [$F_{(5,480)}$=13.194, p<.001]. This reflects the strongly differing patterns of omission of inflectional morphemes for the two main language groups at different ages, and indicates that expressive language abilities in English are acquired differently in the two language groups (see Figure 8.9).

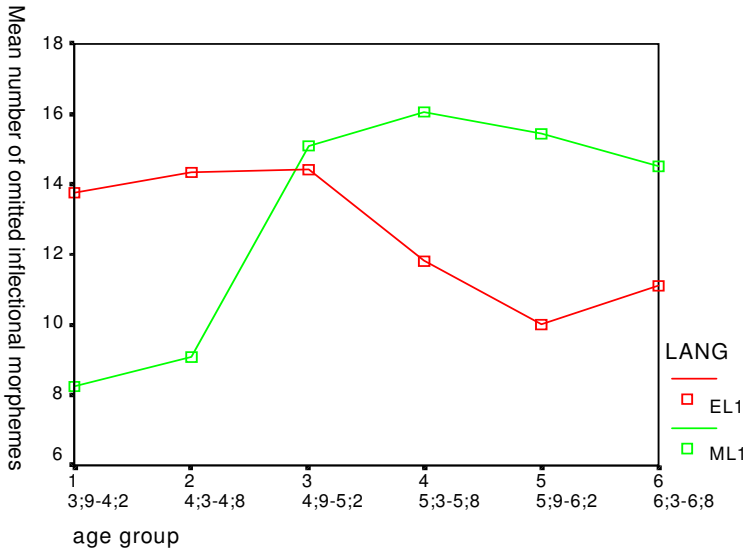


Figure 8.9: Total omitted inflectional morphemes

For the EL1 participants, simple effects testing revealed significant differences between age groups 3 and 5 [age group 3 *M*=14.43, *SD*=5.58, age group 5 *M*=10.0, *SD*=4.92, $t_{(1,83)}$=3.856, *p*<.001], where the number of omissions of inflectional morphemes decreased significantly. This coincides with the increased use of inflectional morphemes at this age, as discussed previously, and is another indication of the emergence of some SStdE morphology at this age for the EL1 participants.

For the ML1 participants, there were significant differences between age groups 1 and 3 [age group 1 *M*=8.24, *SD*=4.90, age group 3 *M*=15.09, *SD*=6.51, $t_{(1,81)}$=-5.295, *p*<.001], 2 and 3 [age group 2 *M*=9.07, *SD*=6.53, age group 3 *M*=15.09, *SD*=6.51, $t_{(1,86)}$=-4.323, *p*<.001], and 2 and 4 [age group 2 *M*=9.07, *SD*=6.53, age group 4 *M*=16.07, *SD*=4.99, $t_{(1,81)}$=-5.482, *p*<.001], with a significant increase in the number of omissions for children in age group 3 (approximately age 5;0). This increase is most likely due to the previously discussed increase in utterance length as well as an acquisition of verb structures by this age, offering more opportunities to omit inflectional morphemes. This was confirmed as there were no differences between language groups for MLU in morphemes and omitted inflectional morphemes [$F_{(1,4806)}$=1.79, *p*=n.s.], but there was an interaction between MLU morphemes and omitted inflectional morphemes [$F_{(1,486)}$=2877.32, *p*<.001] (see Figure 8.10). These findings show that the relationship between the two variables is different for the two

language groups (i.e. the EL1 children use more and omit fewer inflectional morphemes than the ML1 group). This may be further evidence that the ML1 children are developing SCE whilst the EL1 children appear to be developing SStdE.

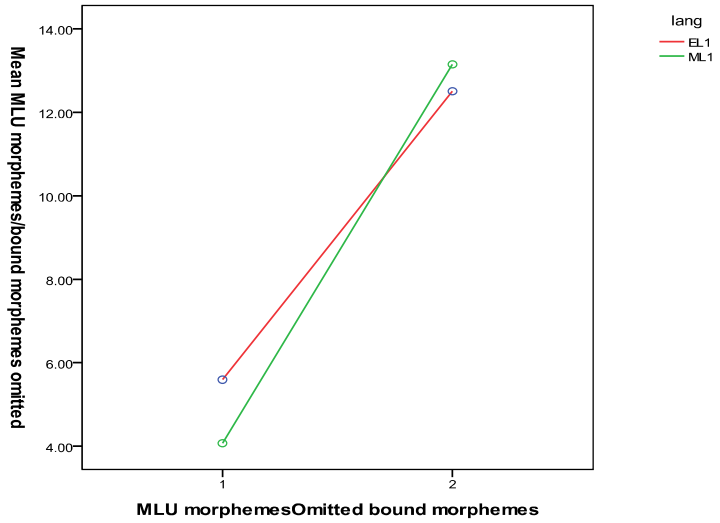


Figure 8.10: Mean MLU morphemes vs total omitted inflectional morphemes

Fluency of production

Total number of utterances used

It had been hypothesised that the EL1 children would use fewer utterances per picture description than their ML1 counterparts, with number of utterances used decreasing with increasing age for both language groups. There were very few occasions where the participants gave no verbal responses during the language sampling and those children who appeared to be less proficient in English seemed to give a higher number of shorter utterances to express themselves. The more proficient children seemed to formulate less utterances but with more length and linguistic complexity.

For the total number of participants' utterances there were significant main effects for language [$F_{(1,480)}$=14.772, p<.001], as hypothesised, and age group [$F_{(5,480)}$=4.161, p<.001], and an interaction between first language and age [$F_{(5,480)}$=4.792, p<.001] suggesting a different pattern in the total number of utterances used by the language groups (see Figure 8.11).

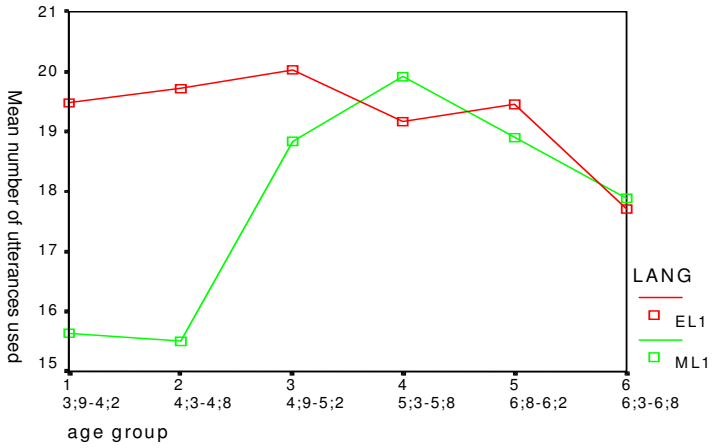


Figure 8.11: Total number of utterances used

Simple effects testing for the EL1 participants found no significant differences between age groups, which suggests this measure is not a good measure of fluency of production for EL1 participants.

For the ML1 participants, however, there were significant differences between age groups 2 and 3 [age group 2 M=15.50, SD=5.91, age group 3 M=18.85, SD=4.69, $t_{(1,86)}$=-2.956, p=.004], and 2 and 4 [age group 2 M=15.50, SD=5.91, age group 4 M=19.93, SD=4.70, $t_{(1,81)}$=-3.771, p<.001]. This reflects the participants' increase in expressive language abilities in English at this age, which has been discussed previously.

The results show that the ML1 participants had a significant increase in number of utterances by age group 4. The pattern then follows a similar pattern as for the EL1 participants who used significantly more utterances than the ML1 participants, reflecting their more developed abilities to label, describe and answer questions about pictures in English. This measure appears to be a better measure of fluency of production for the ML1 participants in the early stages of exposure to English. Using this measure, it would seem that a child having difficulties learning a second language, or with language impairment, would show less fluency of production than a bilingual child with normally developing skills.

Percentage of single word utterances

It was hypothesised that ML1 participants would use more single word utterances than their EL1 counterparts and that the number of single word utterances would decrease with increasing age for both main language groups. There were very few occasions where the participants gave no verbal responses during the language sampling, using English where possible and Mandarin if that failed. There were, however, a high percentage of single word utterances used by the ML1 participants in age groups 1 and 2, where they labelled the target pictures using mainly nouns. Therefore, with increased fluency in English, the number of single word utterances was expected to decrease.

Results showed significant main effects for first language [$F_{(1,480)}$=95.887, p<.001] and age group [$F_{(5,480)}$=23.165, p<.001] as well as an interaction between the two [$F_{(5,480)}$=9.467, p<.001], suggesting a different pattern of use of single word utterances between the two main language groups (see Figure 8.12). As expected, the EL1 participants used significantly less single word utterances than the ML1 participants, reflecting their longer MLU in English and developing abilities to describe rather than only label a picture. For the EL1 participants, simple effects testing revealed significant differences between age groups 2 and 4 [age group 2 M=14.28, SD=12.35, age group 4 M=7.27, SD=7.78, $t_{(1,75)}$=3.006, p<.01], with the participants using significantly less single word utterances after those in age group 4 (approximately age 5;6). This reflects development in their ability to express more complex ideas, describing rather than just labeling a picture.

For the ML1 participants there were significant differences between age groups 1 and 3 [age group 1 M=55.49, SD=30.85, age group 3 M=21.49, SD=26.87, $t_{(1,81)}$=5.363, p<.001], 2 and 3 [age group 2 M=48.41, SD=34.64, age group 3 M=21.49, SD=26.87, $t_{(1,86)}$=4.093, p<.001], and 2 and 4 [age group 2 M=48.41, SD=34.64, age group 4 M=14.03, SD=11.92, $t_{(1,81)}$=6.015, p<.001]. There was a significant decrease in the number of single word utterances for children in age group 3 (approximately age 5;0) compared with the younger groups. This result provides further evidence of the development of the ML1 participants' expressive language abilities in English by this age.

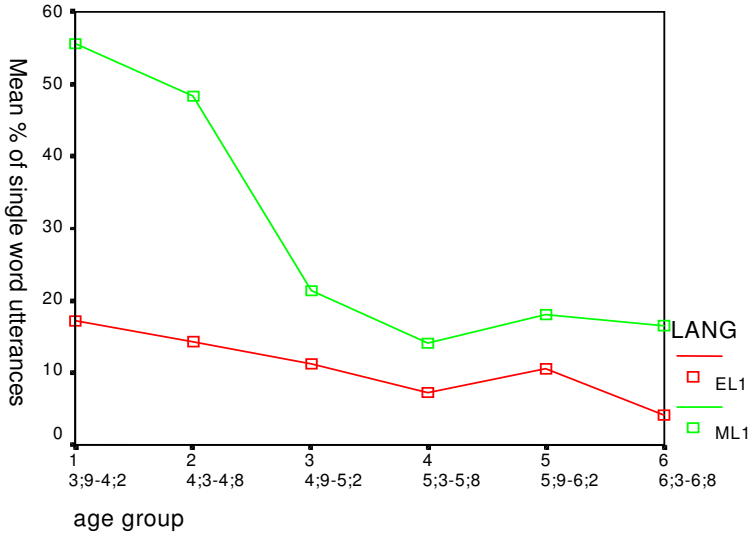


Figure 8.12: Percentage of single word utterances

Whilst use of single word utterances, particularly nouns and verbs, among monolingual children has been identified as a characteristic of children with SLI (Gavin, Klee & Membrino, 1993), these results show it is also characteristic of Mandarin dominant bilingual children in Singapore in the early stages of their exposure to English. This will be discussed further in later chapters.

Vocabulary errors

The vocabulary errors (i.e. where the incorrect word was selected, or generalised, non-specific words were used) were analysed because it was expected there would be significant differences between the two main language groups. ML1 participants were expected to make more vocabulary errors than their EL1 counterparts, particularly in the earlier stages of their exposure to English. EL1 participants were expected to show less errors in vocabulary used than their ML1 counterparts due to increased exposure to English. However, for vocabulary errors, there was a low mean number of errors for both the EL1 (M=1.21, SD 1.32) and ML1 participants (M=1.98, SD=2.30). There was a significant main effect for language [$F_{(1,480)}$=18.649, p<.001], with the ML1 participants making significantly more vocabulary errors than the EL1 participants, as was expected for these students who were being tested in their second/foreign language. There were no differences

between the age groups and no interaction between first language and age group that was not as hypothesised, as it had been expected there would be steadily decreasing errors with increasing age. To an extent, this probably reflects the content of the SEAPT, which was designed to be easily recognisable to young Singaporean children, limiting opportunity for this type of error.

Code switching

It was hypothesised that ML1 participants would code switch and use Mandarin vocabulary if they did not know the English word, and that the EL1 participants would not code switch. There was a significant main effect for first language in code switching [$F_{(1,480)}$=16.706, p<.001] (see Figure 8.13), as expected. As hypothesised and as one would intuitively expect, it appeared that the ML1 participants code switched and used Mandarin vocabulary when they did not have the target vocabulary in English. However, there was a very low mean occurrence of code switching (ML1 Mean=0.31, SD=1.24), indicating that the participants tried hard to give responses in English and that they may have recognised that a Caucasian tester would be less likely to understand responses given in Mandarin. This may also reflect the easily recognisable format of the SEAPT limiting the need for code switching.

As expected, there were no incidences of code switching in the EL1 participants' samples. This shows that the information gathered on main home language was accurate.

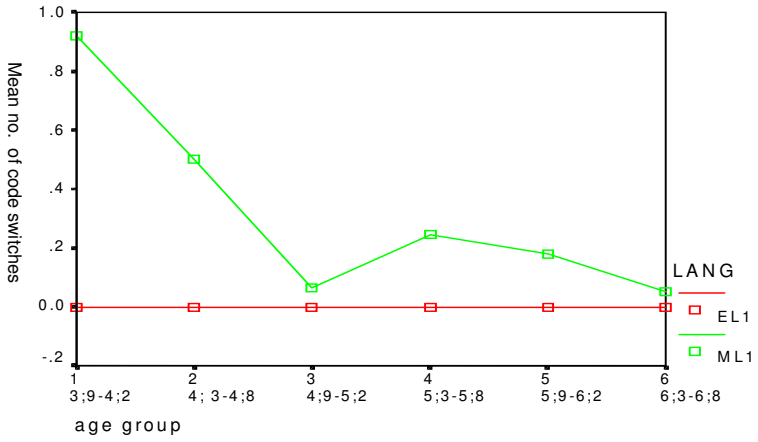


Figure 8.13: Mean number of code switches

There was a significant main effect for age group [$F_{(5,480)}$=2.819, p<.05] and simple effects testing for the ML1 participants found significant differences between age groups 1 and 3 [age group 1 M=.92, SD=1.99, age group 3 M=.0065, SD=.25, $t_{(1,81)}$=2.884, p<.01]. For this age group, code switching decreased significantly as hypothesised, reflecting the lexical development and increased MLU in English that the results have supported consistently throughout this chapter.

Summary

The results as a whole clearly show that the pattern of acquisition of SCE and SStdE is not the same for the two main language groups, which supports what would be expected intuitively when comparing performance on a test in English between English-dominant and Mandarin dominant speakers of English. The MLU in morphemes for the ML1 participants differs significantly from that expected for speakers of StdE. Therefore, assessments designed for StdE-speaking populations, particularly those utilising measures of MLU, are clearly not appropriate for use in assessing the expressive language abilities of ML1 Chinese Singaporean children in their preschool years.

Results also show significant lexical development and increase in length of utterance in English for the ML1 participants in age group 4 (approximate age 5;6) in comparison with younger age groups, but their expressive language abilities in English then appear to plateau. This does not necessarily represent that their global language abilities are less advanced than the EL1 participants, but that there are significant differences between the English language abilities of the children who are EL1 and those who are ML1. This will be discussed in Chapters 9 and 10.

The results for the EL1 participants show that the development of MLU is comparable with that for American speakers of StdE, with a steady increase in MLU in words and morphemes throughout kindergarten. There is also evidence of emergence of use of inflectional morphemes for children in age group 5 (approximately age 6;0) in comparison with the younger children. This is explored further in Chapter 9.

The measures of fluency of production of expressive language showed that the number of single word utterances, the number of utterances used and code switching

are useful indicators of fluency of production for the younger ML1 age groups (1 and 2). This, too, will be discussed further in Chapter 9.

The next section of this chapter explores the omission of subjects and objects by the two main language groups.

Clause level

This section of the chapter discusses the two following aspects of the language samples:

- subject omission;
- object omission.

Each measure is discussed individually in relation to the results and the key findings are presented in Table 8.7.

Table 8.7: Key findings for subject and object omission results

Variable	Main effect for language	Main effect for age group	Interaction between language & age group	EL1	ML1
Appropriate subject omission	Yes	Yes	Yes	Consistent across age groups Omit more than ML1	Consistent across age groups Omit less than EL1
Inappropriate subject omission	Yes	Yes	Yes	Significant decrease for age 6;6	Consistent across age groups
Appropriate object omission	No	Yes	No	Not significant	Not significant
Inappropriate object omission	No	No	No	Low mean occurrence	Low mean occurrence

Subject omission

The data were analysed for appropriate (i.e. clear from the context) and inappropriate (i.e. not used when required by the context) subject omission. It was hypothesised that appropriate subject omission would be the same across the main language groups, but that there would be differences between the age groups, with the children decreasing appropriate subject omission with the development of SStdE forms. It was also expected that inappropriate subject omission would be rare for both main language groups.

There were significant main effects for appropriate subject omission for language [$F_{(1,480)}$=34.519, p<.001] and age group [$F_{(5,480)}$=4.662, p<.001], with an interaction between first language and age [$F_{(5,480)}$=2.756, p<0.05]. This suggests a different pattern in the appropriate subject omission of the two main language groups (see Figure 8.14). However, simple effects testing revealed results were not significant for either language group, suggesting that this feature is not variable over age. This was not consistent with the hypothesis that appropriate subject omission would decrease with age and an increase in SStdE forms. These results suggests that appropriate subject omission is a feature of both SCE and SStdE, as found by Deterding (2007) in his analysis of the language of an adult speaker of SStdE. It may also be related to the types of sentences elicited in children's early years, and had the study continued with older children, the patterns may have varied with the emergence of an increased range of sentence types.

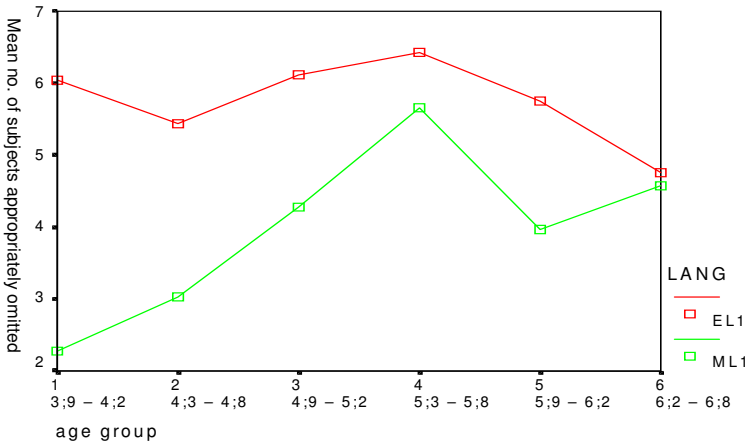


Figure 8.14: Appropriate subject omission

The results show that EL1 participants appropriately omit significantly more subjects than the ML1 participants (see Figure 8.14). This difference is likely to be due to the differences in the vocabulary size and utterance length of the two main language groups, giving the EL1 participants more opportunities to omit subjects than the ML1 participants.

There were also significant main effects for inappropriate subject omission (i.e. subjects that are required by the context) for language [$F_{(1,480)}$=5.409, p<.05] and age group [$F_{(5,480)}$=18.434, p<.001], and an interaction between first language and age

group [$F_{(5,480)}$=2.879, p<.05]. This shows a markedly different pattern for inappropriate subject omission between the two language groups (see Figure 8.15).

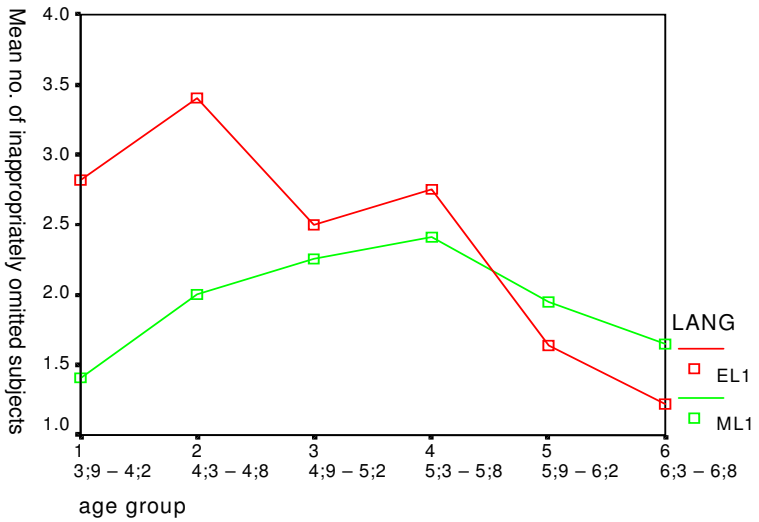


Figure 8.15: Mean number of inappropriately omitted subjects

The results were not what was anticipated, as it appears the younger age groups of both main language groups drop subjects inappropriately, even when obligatory in the context. This suggests that young children have not yet learned the "rules" about when it is appropriate to omit the subject from their utterance. Alternatively, it may be that the determination of when a subject is required by context is more complex than first thought, as had been observed during the pilot project (discussed in earlier chapters), where determination of context appeared to be variable between participants. As the SEAPT uses pictures, it was controlled so that the researcher could not see the pictures during testing. However, it is possible that the children omitted subjects from their utterances because they believed the context had been determined by the nature of the task.

Simple effects testing for the EL1 participants revealed there was a significant difference between age groups 4 and 6 [age group 4 M=2.75, SD=2.51, age group 6 M=1.22, SD=1.55, $t_{(1,74)}$=3.150, p<.01]. This significant drop in the number of inappropriately omitted subjects by the EL1 participants in age group 6 (approximately 6;6) reflects an increase in awareness of SStdE sentence structure and the necessity to use the subject when required by the context. This finding supports

the notion that children learn the "rules" about when it is appropriate to omit the subject as they get older. The results also account for the interaction effect as there is a sharp decrease in number of inappropriate subject omissions for the EL1 participants, intersecting with the consistent number of inappropriate subject omissions shown by the ML1 participants (see Figure 8.15). The number of inappropriate subject omissions remained consistent for the ML1 participants across the age groups, which was not as expected but reflects the finding that less SStdE forms emerged in the language samples of the ML1 children than had been anticipated. This will be discussed further in later chapters.

Object omission

The data were analysed for both appropriate (i.e. not required by the context) and inappropriate (i.e. required by the context) object omission. As was the case for subject omission, it was hypothesised that appropriate object omission would be the same across the main language groups, with differences between the age groups and children decreasing appropriate object omission with the development of SStdE forms. It was also expected that inappropriate object omission would be rare for both main language groups, perhaps showing that this is characteristic of impaired language development.

There was no significant difference for appropriate object omission between the language groups, supporting the hypothesis that this is a feature of SCE common across all main language groups. There was a significant main effect of age group [$F_{(5,480)}$=8.474, p<.001] but simple effects testing results were not significant.

The unexpected difference in appropriate subject and appropriate object omission across language groups may reflect the types of utterances elicited in early childhood. It may be that the sentence types elicited by the SEAPT afforded the children more opportunity to omit objects than subjects. Further testing with older participants may reveal more about the omission of subjects and objects when not required by the context.

There were no significant differences between language groups or age groups for inappropriate object omission. However, the mean number of times that objects were inappropriately omitted was low for both language groups (EL1 M=1.24, SD=1.39,

ML1 M=1.15, SD=1.61), providing support for the hypothesis that errors in omitting objects when required by the context are uncommon.

Summary

These results demonstrate that the pattern of acquisition of SCE and SStdE is not the same for the two main language groups in all areas analysed. They also show that the EL1 participants developed an awareness of the mandatory nature of subjects required by context in their sentences at age group 6 (approximately 6;6), but this does not appear to develop for the ML1 participants during their preschool years. The implications of these results will be discussed in Chapters 9 and 10.

Verb group – inflectional morphology

Results for use, omission and/or errors in verb morphology for the following markers are presented in this section, which discusses:

- third person singular "-s" marker;
- present progressive "-ing" tense marker;
- regular past tense "-ed" marker;
- irregular past tense forms;
- irregular past participle forms;
- "already";
- infinitive verbs.

Key findings are presented in Table 8.8.

It was hypothesised that there would be significant differences in the use, omission and errors in all of these markers between the main language groups, with the EL1 participants expected to show emergence of use of these forms at an earlier age than their ML1 counterparts due to their increased exposure to English. It was also expected that emergence of these forms for the EL1 participants would be at a slower rate than for the StdE speaking counterparts, but that the morphological markers would emerge in a pattern similar to that for Brown's (1973) StdE speakers (i.e. present progressive "-ing" marker acquired earlier than regular past tense "-ed" marker).

In relation to errors in verb morphology, it was anticipated that whilst forms might be omitted or acquired at a later age than for StdE speakers in countries such as the UK or USA, errors for the EL1 participants would be uncommon and perhaps indicative of language impairment.

Table 8.8: Key findings from results for verb group inflectional morphology

Variable	Main effect for language	Main effect for age group	Interaction between language & age group	EL1	ML1
Use of the third person singular "-s" marker	Yes	No	No	Low mean occurrence Use more than ML1	Low mean occurrence
Omission of third person singular "-s" marker	Yes	Yes	Yes	Significant decrease for age 6;0	Significant increase for age 5;0 then plateau
Use of present progressive "-ing" tense marker	Yes	Yes	No	Significant increase for age 6;0	Significant increase for age 6;0
Errors in use of present progressive "-ing" tense marker	No	No	No	n/a	n/a
Use of regular past tense marker "-ed"	Yes	Yes	No	Low mean occurrence Significant increase for age 6;0	Not consistently used
Omissions of regular past tense marker "-ed"	Yes	Yes	Yes	Significant decrease for age 6;0	Significant increase for age 5;0, then decrease for age 6;0
Use of irregular past tense	Yes	Yes	Yes	Significant decrease for age 6;0	Not consistently used
Errors in use of irregular past tense	Yes	No	Yes	Consistent across age groups	Significant increase for age 5;0
Use of irregular past participles	Yes	Yes	No	Significant increase for age 5;6	Low mean occurrence
Errors in use of irregular past participles	No	No	No	Low mean occurrence	Low mean occurrence
Use of "already"	Yes	Yes	Yes	Low mean occurrence	Significant increase for age 5;0
Use of infinitive verb forms	No	Yes	No	n/a	n/a

It was anticipated that for the ML1 participants, some of the verb morphology acquired earlier in monolingual speakers of StdE (e.g. plural "-s") would be acquired during their preschool years. It was hypothesised that the age of emergence would be slower than that of the EL1 participants, and that the pattern would differ than that for StdE speakers due to the influence of Mandarin on the participants' English. With reference to errors in verb morphology, it was hypothesised that there may be more errors in verb morphology for this main language group than for the EL1 participants, due to the complex nature of their acquisition of English. Part of the hypothesis was that such errors may not be indicative of language impairment but may reflect the influence of Mandarin and English language learning in a complex linguistic environment.

Third person singular "-s" marker

Analysis of frequency of use of the third person singular "-s" marker was conducted. There were very low mean values for use of the marker, consistent with characteristics of SCE, which frequently results in omission of this marker. There was no interaction between language and age group, and no significant differences between age groups. However, there was a significant main effect for first language [$F_{(1,480)}$=7.442, p<.01], with the EL1 participants using the marker significantly more often than the ML1 participants (see Figure 8.16), as hypothesised.

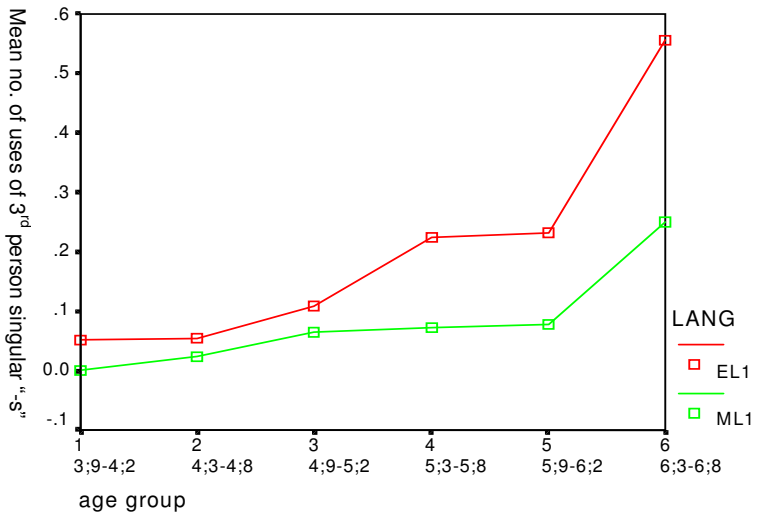


Figure 8.16: Use of third person singular "-s" marker

The graph in Figure 8.16 shows an increase in use of the third person singular "-s" marker for both main language groups at age group 6. Whilst this increase was not statistically significant, it would be interesting to further study the use of this marker in older, school-aged children from both language groups to determine the pattern of acquisition.

As expected, across all six age groups for both language groups there were frequent omissions of the third person singular "-s" marker where it would normally be required in a StdE context (see Figure 8.17). There were significant main effects for first language [$F_{(1,480)}$=8.432, p<.01] and age group [$F_{(1,480)}$=3.808, p<.01], and an interesting interaction between language and age group [$F_{(5,480)}$=9.325, p<.001] that suggests a different pattern of omission of the third person singular "-s" marker between language groups.

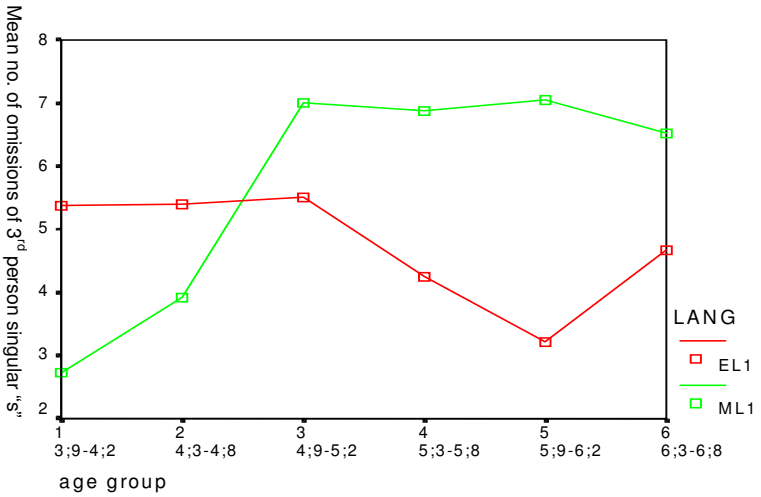


Figure 8.17: Omission of third person singular "-s" marker

Simple effects testing revealed significant differences for the EL1 children between age groups 3 and 5 [age group 3 M=5.50, SD=3.24, age group 5 M=3.21, SD=2.85, $t_{(1,83)}$=3.439, p<.001], and between age groups 1 and 3 [age group 1 M=2.73, SD=2.46, age group 3 M=7.0, SD=3.98, $t_{(1,81)}$=-5.703, p<.001], 2 and 3 [age group 2 M=3.93, SD=3.90, age group 3 M=7.0, SD=3.98, $t_{(1,86)}$=-3.650, p<.001] and 2 and 4 [age group 2 M=3.93, SD=3.90, age group 4 M=6.88, SD=3.22, $t_{(1,81)}$=-3.754, p<.001] for the ML1 group.

The drop in the number of omissions of the marker "-s" for the EL1 participants in age group 5 reflects the emergence of other SStdE verb morphology (see present progressive "-ing" below). Additionally, although not statistically significant, the graph in Figure 8.16 shows an increase in use of the "-s" marker for the EL1 participants in age group 6. This may indicate emerging use of this marker, with full acquisition occurring during school rather than preschool years. As mentioned previously, this warrants further investigation.

The increase in the number of omissions of the marker "-s" for the ML1 participants in age group 3 reflects the development of expressive language abilities and increase in utterance length in English at this age (discussed in previous chapters), which therefore provides more opportunities for omission of the morphological marker "-s".

Present progressive "-ing" tense marker

Analysis was conducted of frequency of use, errors in use and omission of the present progressive "-ing" tense marker.

There was no interaction between language and age group for use of the present progressive "-ing" tense marker, suggesting a similar pattern of use of the present progressive "-ing" marker for both language groups, as was hypothesised. However, there were significant main effects for first language, [$F_{(1,480)}$=150.861, p<.001], with the EL1 participants using the marker significantly more often than the ML1 participants (see Figure 8.18), also as expected, and significant main effects for age group [$F_{(5,480)}$=5.518, p<.001].

Simple effects testing showed significant differences between age groups 3 and 5 [age group 3 M=4.26, SD=3.30, age group 5 M=6.510, SD=3.88, $t_{(1,83)}$=-2.894, p<.01] for the EL1 participants. These results indicate a clear pattern of age of emergence in use of the structure for the EL1 participants, with a high degree of correct use expected in children aged approximately 6;0, which is a later age of emergence than for other forms of StdE (Brown, 1973; Crystal, Fletcher & Garman, 1976). These results confirmed the hypotheses about age and pattern of emergence of the marker for the EL1 participants.

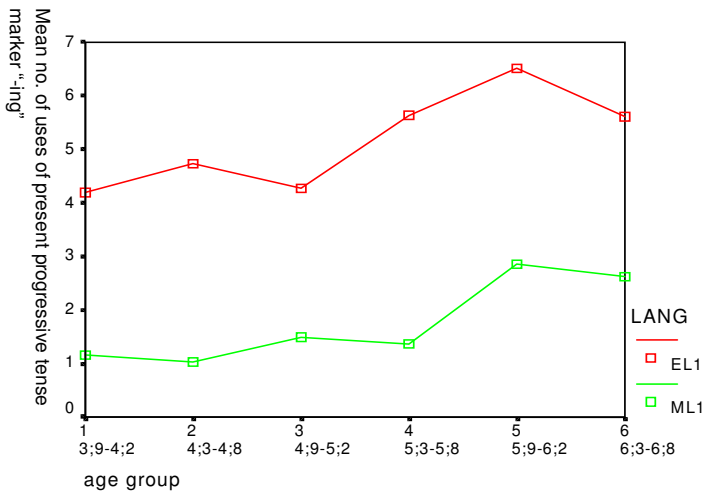


Figure 8.18: Use of present progressive "-ing" tense marker

For the ML1 children, simple effects testing showed significant differences between age groups 2 and 5 [age group 2 M=1.02, SD=1.83, age group 5 M=2.85, SD=3.26, $t_{(1,79)}$=-3.134, p<.01] and age groups 2 and 6 [age group 2 M=1.02, SD=1.83, age group 6 M=2.63, SD=3.23, $t_{(1,80)}$=-2.778, p<.01]. This shows that the ML1 participants are starting to use the "-ing" marker more consistently in age group 5 (approximately age 6;0) in comparison with the younger age groups.

Errors in the use of the present progressive "-ing" marker were also examined. Although there were no significant differences between language or age groups, this indicates that errors in the use of this marker are uncommon in SCE, which was expected.

Furthermore, also as expected, there were very low mean numbers of occurrence of omission of the "-ing" progressive tense marker for both language groups, suggesting that omission of this marker is not a feature of SCE.

Regular past tense "-ed" marker

Analysis was conducted of use and omission of the regular past tense marker "-ed". As expected, there were very low mean occurrences of use of this structure. However, there were significant main effects for first language [$F_{(1,480)}$=14.873, p<.001] and age group [$F_{(1,480)}$=6.319, p<.001] but no interaction between the two, suggesting a similar pattern of use for the two language groups.

The EL1 participants used the marker significantly more often than the ML1 participants, which was expected (see Figure 8.19).

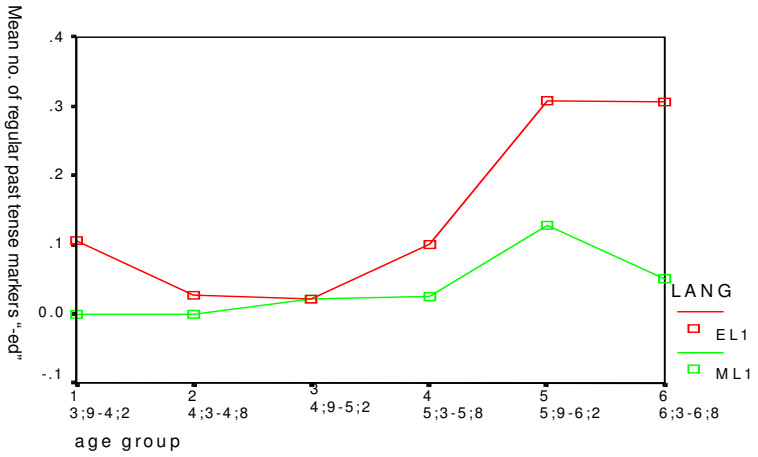


Figure 8.19: Use of regular past tense "-ed" marker

Simple effects testing revealed significant differences between age groups 3 and 5 for the EL1 participants [age group 3 *M*=.002, *SD*=.15, age group 5 *M*=.31, *SD*=.61, $t_{(1,83)}$=-3. 061, *p*<.01]. This indicates that use of the marker increases significantly for the children in age group 5 (age approximately 6;0 years), suggesting emergence of use of the structure for the EL1 participants, as was hypothesised. This is an interesting finding because it supports the hypothesis that regular past tense marking appears to be mastered relatively late in comparison with StdE but before irregular past tense forms (see following section), which is not consistent with the order of acquisition in other forms of StdE (Brown, 1973; Crystal et al., 1976). This finding had not been predicted.

Use of the regular past tense marker "-ed" was consistent across all age groups for the ML1 participants, showing that use of the marker does not develop prior to completing kindergarten.

There were frequent omissions of the "-ed" marker for both language groups and across all six age groups. The results showed significant main effects for first language [$F_{(1,480)}$=17.681, *p*<.001] and age group [$F_{(1,480)}$=8, *p*<.001], and an interesting interaction between language and age group [$F_{(5,480)}$=5.499, *p*<.001],

suggesting different patterns in the omission of the "-ed" marker between language groups (see Figure 8.20), as anticipated.

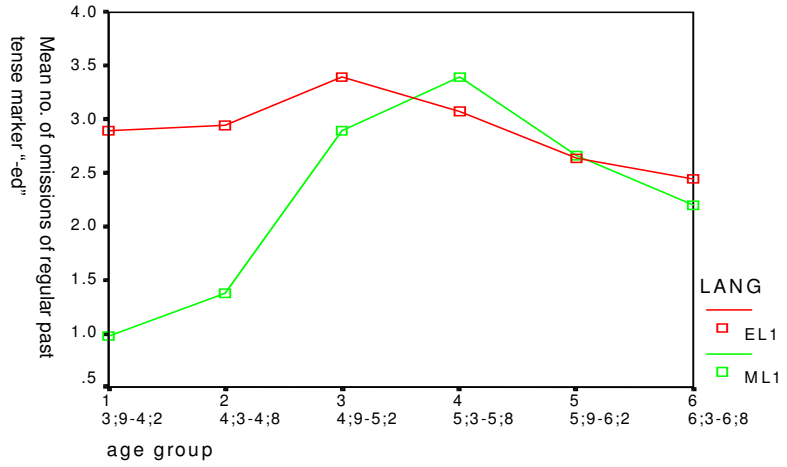


Figure 8.20: Omission of regular past tense "-ed" marker

Simple effects testing revealed significant differences between age groups 3 and 5 for the EL1 children [age group 3 *M*=.02, *SD*=.15, age group 5 *M*=.31, *SD*=.61, $t_{(1,83)}$=-3.06, *p*<.01], and also between age groups 4 and 6 [age group 4 *M*=.10, *SD*=.30, age group 6 *M*=.02, *SD*=156, $t_{(1,74)}$=-2.12, *p*<.05]. The decreased omission for children in age group 5 is consistent with their emerging use of the regular past tense "-ed" marker.

Simple effects testing revealed significant differences for the ML1 children between age groups 1 and 3 [age group 1 *M*=.97, *SD*=1.32, age group 3 *M*=2.89, *SD*=1.96, $t_{(1,81)}$=-5. 095, *p*<.001], 2 and 3 [age group 2 *M*=1.38, *SD*=1.71, age group 3 *M*=2.89, *SD*=1.96, $t_{(1,86)}$=-3. 838, *p*<.001], 2 and 4 [age group 2 *M*=1.38, *SD*=1.71, age group 4 *M*=3.39, *SD*=1.81, $t_{(1,81)}$=-5.192, *p*<.001] and 4 and 6 [age group 4 *M*=3.39, *SD*=1.81, age group 6 *M*=2.2, *SD*=1.73, $t_{(1,79)}$=3.022, *p*=.003]. The increased omission for children in age group 3 reflects the development of their expressive language abilities in English at this age, giving them increased opportunities to omit the verb morphology. However, the decrease in omission at age group 6 appears to relate to an apparent (but non-statistically significant) increase in use of the structure, as shown previously in Figure 8.20. This warrants further investigation because it

could indicate a developing awareness of the structure that had not emerged in use by the end of kindergarten.

Irregular past tense

Analysis was conducted of use and errors in use of irregular past tense. Mean occurrence of the irregular past tense form was low but there were significant main effects for language [$F_{(1,480)}$=41.840, p<.001] and age group [$F_{(5,480)}$=7.760, p<.001], and an interaction between language and age group [$F_{(5,480)}$=3.885, p<.01] (see Figure 8.21).

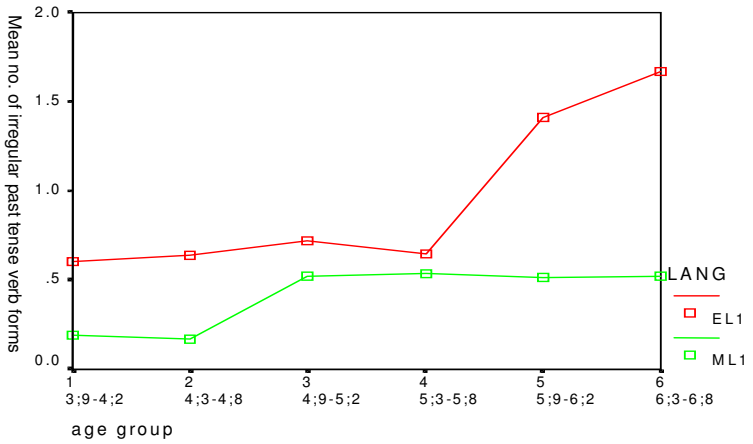


Figure 8.21: Use of irregular past tense verb forms

Simple effects testing revealed significant differences between age groups 4 and 6 for the EL1 children [age group 4 M=.65, SD=.95, age group 6 M=1.67, SD=1.39, $t_{(1,74)}$=-3.749, p<.001]. This result confirmed the hypothesis that more consistent use of irregular past tense forms emerges later than would be expected for other forms of StdE (Brown, 1973; Crystal et al., 1976) for children in age group 6 (approximately age 6;6). However, the higher mean occurrence of the forms and earlier use than the marking of regular past tense was not expected. The pattern of emergence is consistent with irregular forms having to be learned individually rather than in a rule-based way as happens for regular verbs.

The expected differences between the EL1 and ML1 groups were confirmed. The ML1 participants demonstrated low use of irregular past tense forms, indicating that use does not fully develop during their preschool years. This may be due to the

influence of Mandarin tense marking on the ML1 participants' tense marking in English, which and will be further examined later.

For errors in the irregular past tense forms, there was a significant main effect for language [$F_{(1,480)}$=5.374, p<.05] and an interaction between language and age group [$F_{(5,480)}$=4.999, p<.001], suggesting differences in the pattern of errors in irregular past tense forms for the two language groups (see Figure 8.22), which confirmed the research hypothesis.

There were no differences between the age groups and the EL1 participants were consistent with the number of errors across age groups.

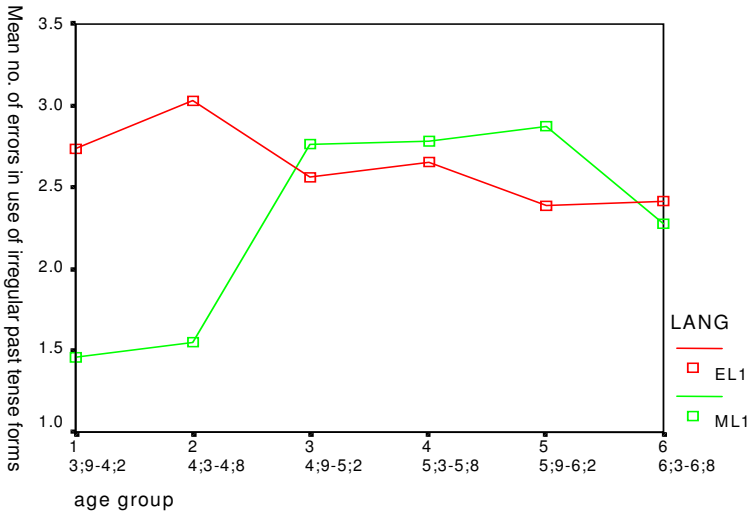


Figure 8.22: Errors in irregular past tense forms

Although the analysis of variance shows no significant difference for age group, simple effects testing revealed significant differences for the ML1 children between age groups 1 and 3 [age group 1 M=1.46, SD=1.59, age group 3 M=2.67, SD=1.75, $t_{(1,81)}$=-3.501, p<.001], 2 and 3 [age group 2 M=1.55, SD=1.53, age group 3 M=2.67, SD=1.75, $t_{(1,86)}$=-3.441, p<.001], and 2 and 4 [age group 2 M=1.55, SD=1.53, age group 4 M=2.78, SD=1. 75, $t_{(1,81)}$=-3.615, p<.001]. Once again, this most likely reflects the increase in the ML1 participants' expressive language abilities in English in age group 3 and therefore the increase in their opportunities to make errors in irregular past tense verb forms.

Irregular past participle forms

A similar analysis to that used for irregular past tense verb forms was conducted for use and errors in irregular past participle verb forms. Mean occurrence of the irregular past participle form was low but there were significant main effects for language [$F_{(1,480)}$=4.896, p=.027] and age group [$F_{(5,480)}$=7.479, p<.001]. There was no interaction between language and age group, as was expected (see Figure 8.23).

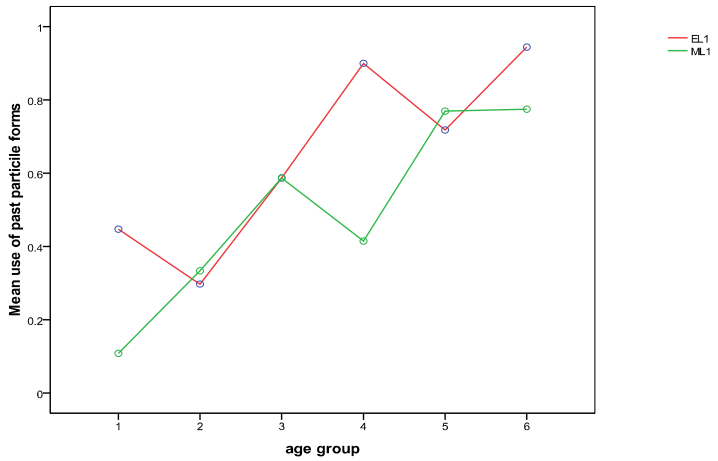


Figure 8.23: Use of irregular past participle forms

For the EL1 children, simple effects testing revealed significant differences between age groups 2 and 4 [age group 2 M=.33, SD=0.65, age group 4 M=.41, SD=.81, $t_{(1,75)}$=-3.964, p<.001]. This result confirmed the hypothesis, indicating that the use of irregular past participle forms starts to emerge for children in age group 4, (approximately age 5;6), later than would be expected for other forms of StdE (Brown, 1973; Crystal et al., 1976).

For the ML1 children, simple effects testing revealed significant differences between age groups 1 and 3 [age group 1 M=.11, SD=0.39, age group 3 M=.59, SD=.91, $t_{(1,81)}$=-2.986, p<.01], demonstrating once again the development in expressive language abilities in English for the ML1 speakers at this age. However, the mean value of use of the irregular past participle form for the entire ML1 participant sample was only 0.1 (SD 0.11), indicating that this result reflects only use of some rote learned past participle forms (e.g. “got”) rather than generalised emergence of use of the form.

There were no differences between language groups or age groups for errors in the irregular past participle forms. This was expected based on the characteristics of SCE and the means of past tense marking in Mandarin (by adding the particle "le" after the verb as opposed to using inflectional morphological markers), both resulting in use of the bare verb stem. However, the mean number of occurrences of errors was low, suggesting that such errors are not common in the SCE and SStdE spoken by Chinese Singaporean preschool children. This could be due to the easily recognisable and familiar targets in the SEAPT (i.e. the target "got" being frequently used), but could also have clinical significance, a possibility that is discussed further in the following chapters.

"Already"

There were significant main effects for use of "already" for language [$F_{(1,480)}$=15.144, p<.001] and age group [$F_{(5,480)}$=3.651, p<.01], and an interaction between language and age group [$F_{(5,480)}$=3.394, p<.01] suggesting markedly different patterns of use of "already" by the two language groups (see Figure 8.24), as had been hypothesised.

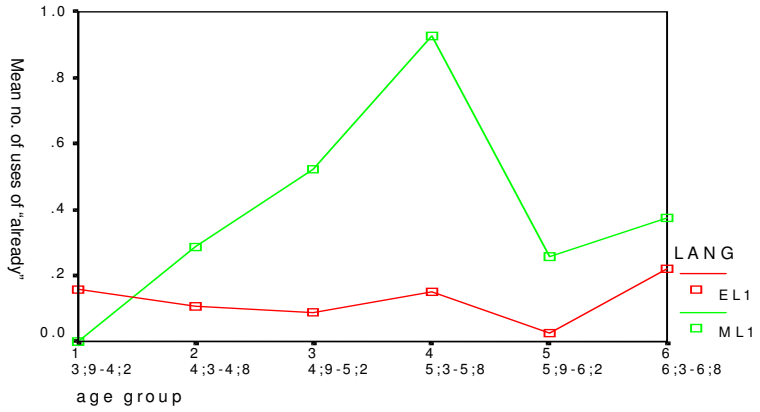


Figure 8.24: Use of "already" for perfective aspect

The relatively low mean number of uses of "already" by the EL1 participants (see Figure 8.24) shows that this group does not frequently use "already".

For the ML1 children, simple effects testing revealed significant differences between age groups 1 and 3 [age group 1 M=0, SD=0, age group 3 M=.52, SD=1.05, $t_{(1,81)}$=-

3.023, $p<.01$]. This increase in use of "already" for children in age group 3 (approximately age 5;0) indicates an awareness at this age of the necessity to mark the verb for past tense or completed aspect. The ML1 participants' higher level of usage of "already" can be attributed to direct translation of the past aspect marker "le" used in Mandarin to "already" in English (Deterding & Poedjosodarmo, 2001, Yip & Rimmington, 1997), or influences of Hokkien on SCE (Ansaldo, 2004). Therefore, as expected, the ML1 participants seemed to use this structure for indicating the perfective aspect of an action before other past tense verb morphology emerges. The lack of evidence of emergence of StdE past tense verb morphology before the ML1 participants complete kindergarten indicates that further investigation is required into the emergence of verb morphology in primary school-aged Chinese Singaporean children.

Infinitive verbs

There was no significant difference between the language groups for use of the bare verb stem but there was a significant main effect of age group [$F_{(5,480)}=2.236$, $p<.05$], with an unanticipated increase in number of uses of infinitive verbs with increasing age (EL1 M=1.5, SD=1.86, ML1 M=1.29, SD=2.02). There was no interaction between main language group or age groups, suggesting similar patterns of use for the two main language groups. The results show that the use of verbs in their infinitive form increases with age but simple effects tests indicated this increase were not significant. It is likely that the increase occurs only as expressive vocabularies of children from both main language groups develop, but in the absence of the development of morphological marking of verbs there are increased opportunities for use of the bare infinitive stem.

Summary

The results presented demonstrate that the development of SCE and SStdE do not follow the same pattern of acquisition as for other forms of StdE used world-wide. Patterns of use and omission of verb morphology are consistent with more recently described differences in the morphology and phonology of SCE (Deterding, 2007; Deterding & Poedjosoedarmo, 2001; Gupta, 1994). Additionally, the order of acquisition of some verb morphology (e.g. regular past tense before irregular past

tense) differs from that for other forms of StdE spoken around the world. The results will be discussed in more detail in Chapters 9 and 10.

For the EL1 participants, when compared with the acquisition of Standard Englishes used world-wide, age of acquisition for all forms of verb morphology acquired occurs later, following a different pattern of emergence of structures, (Brown, 1973; Crystal et al., 1976).

For the ML1 participants, there is evidence of emergence of the present progressive "-ing" marker at about 6;0. There is no evidence of consistent use of any other Standard English verb morphology before completion of kindergarten, although it appears that an awareness of the necessity to mark verbs for their completed aspect develops during this time.

The following section discusses aspects of complex verb marking in terms of indication of aspect, and modal and auxiliary verbs.

Verb group – aspect, modal and auxiliary verbs

Analyses included indication of perfective and future aspect, as well as the use, omission and errors in use of modal and auxiliary verbs. Key findings are presented in Table 8.9.

Table 8.9: Key findings from results for verb group aspect, modal and auxiliary verbs

Variable	Main effect for language	Main effect for age group	Interaction between language & age group	EL1	ML1
Use of perfective "has"	Yes	Yes	No	Significant increase for age 6;6	Low mean occurrence
Omission of perfective "has"	No	Yes	No	Low mean occurrence No significant differences (NSD)	Low mean occurrence NSD
Future aspect using infinitive verbs without the modal "will"	No	Yes	Yes	Consistent across age groups	Significant increase for age 5;0
Future aspect using infinitive verbs with the modal "will"	No	No	No	n/a	n/a
Future aspect using "going to + infinitive verb"	Yes	Yes	No	NSD	NSD
Future aspect using "want"	No	No	Yes	n/a	n/a
Use of auxiliary "is"	Yes	Yes	No	Significant increase for age 6;6	Significant increase for age 6;6
Omission of auxiliary "is"	Yes	No	No	Omit more than ML1	n/a
Errors in use of auxiliary "is"	No	No	No	n/a	n/a
Use of auxiliary "are"	No	Yes	No	NSD	NSD
Omission of auxiliary "are"	Yes	No	No	Low mean occurrence	Low mean occurrence
Errors in use of auxiliary "are"	No	No	No	n/a	n/a

Table 8.9 continued

Use of copula "is"	No	Yes	No	NSD	NSD
Omission of copula "is"	No	No	No	Low mean occurrence	Low mean occurrence
Errors in use of copula "is"	No	No	No	Low mean occurrence	Low mean occurrence
Use of copula "are"	No	No	No	Low mean occurrence	Low mean occurrence
Omission of copula "are"	No	No	No	Low mean occurrence	Low mean occurrence
Errors in use of copula "are"	No	No	No	Low mean occurrence	Low mean occurrence

Perfective aspect

It had been hypothesised that:

- both main language groups would omit perfective "has" more than their StdE-speaking counterparts;
- use of this marker would increase with increasing age for both language groups;
- EL1 children would use the perfective "has" marker more than their ML1 counterparts.

The data were analysed for the use and omission of the perfective "has" (e.g. "the boy has done it"). There was a low mean occurrence for use of "has" but there were significant main effects for language [$F_{(1,480)}$=5.907, p<.05] and age group [$F_{(5,480)}$=7.192, p<.001]. However, there was no interaction between the two, suggesting similar patterns of use for the two language groups.

Simple effects testing results were only significant for the EL1 participants in age group 1 versus age group 6 [age group 1 M=0, SD=0, age group 6 M=.47, SD=.97, $t_{(1,72)}$=-3. 0, p<.01], showing a significant increase in use of the perfective "has" for EL1 children in age group 6 (the end of kindergarten). This is relatively late in comparison with other forms of StdE (Lund & Duchan, 1988).

There was low mean occurrence of omission of the perfective "has" and no significant difference between language groups. There was a significant main effect for age group [$F_{(5,480)}$=2.694, p<.05] but simple effects tests were not significant. Means values for use and omission were low, suggesting that omission does not occur often in SCE.

Future aspect

It had been hypothesised that:

- both language groups would indicate future time reference by the end of preschool;
- EL1 children would show use of all forms earlier than the ML1 participants;
- both groups would develop use in order of:

1) “want”;

2) “going to”;

3) infinitive verb with omission of “will” assumed by context;

4) use of infinitive verb and modal auxiliary “will”.

Mean values for usage of each of the above are presented in Table 8.10. There were low mean values for occurrence of all of the potential ways of indicating future aspect.

Use of infinitive verbs without the modal “will” was low and there were no significant differences between main language groups, indicating that this is a feature of SCE. This is consistent with the observations made by Deterding and Poedjosodarmo (2001) that complex verb forms are used less frequently in SCE. There was a significant main effect for age group [$F_{(5,480)}$=2.330, p<.01] and an interaction between language and age group [$F_{(5,480)}$=3.55, p<.01], suggesting a different pattern in use of the infinitive verb without the modal “will” for the two main language groups (see Figure 8.25).

Table 8.10: Mean uses of structures for indicating future aspect

Structure	**Both language groups**	**EL1**	**ML1**
	Mean / SD	**Mean / SD**	**Mean / SD**
infinitive without modal	.92 / 1.15	.98 / 1.14	.86 / 1.15
want	.70 / 1.3	.66 / 1.28	.75 / 1.32
going to	.0758 / .29	.11 / .36	.0447 / .21
infinitive with modal “will”	.0144 / .14	.0124 / .11	.0163 / .16

Simple effects testing for the ML1 participants revealed significant differences between age groups 1 and 3 [age group 1 M=.32, SD=.58, age group 3 M=1.13, SD=.58, $t_{(1,81)}$=-3.296, p<.001] as well as 2 and 4 [age group 2 M=.52, SD=.83, age group 4 M=1.24, SD=1.16, $t_{(1,81)}$=-3.259, p<.01], with the significant increase in the

use of this structure for children in age group 3 coinciding with the rapid development of expressive language skills in English for the ML1 participants at this stage.

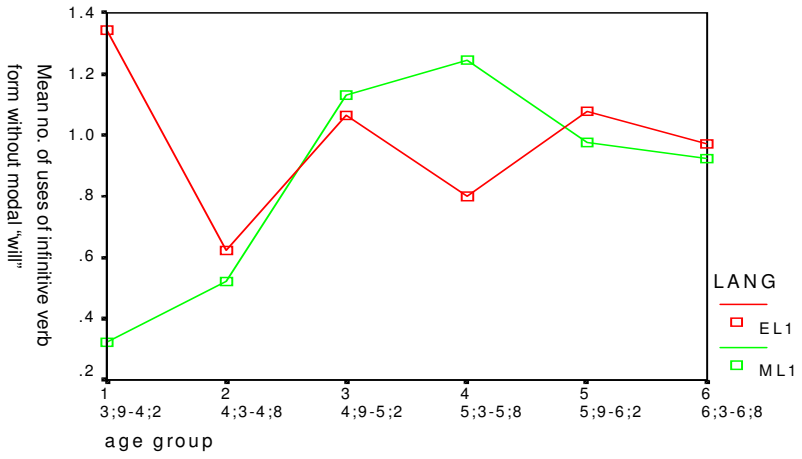


Figure 8.25: Use of infinitive verbs without modal auxiliary "will"

There was a very low mean usage for use of infinitive verbs + the modal auxiliary "will" (see Table 8.10), which supports Deterding and Poedjosodarmo's (2001) statement that complex verb forms are used less frequently in SCE. There were no significant differences between language groups or age groups and no interaction between the two, suggesting a similar pattern of use for the two language groups. The results indicate that the modal "will" is not being used by either main language group by the end of kindergarten. This is late in comparison with the age of emergence for the structure in other forms of StdE around the world (Brown, 1973; Lund & Duchan, 1988; Stephany, 1986; Weist, 1986).

Another possible way of indicating future aspect is to use "going to + infinitive verb" (e.g. "going to drink"). For use of "going to" to indicate future aspect, there were significant main effects for language group [$F_{(1,480)}$=5.443, p<.05] and age group [$F_{(5,480)}$=2.297, p<.05] but no interaction between the two, suggesting a similar pattern of use for the two language groups. Simple effects tests for age were not significant. Mean values for use of "going to + infinitive verb" were low (see Table 8.10), suggesting that future aspect is not often indicated in this manner in SCE, a pattern that differs from StdE (Lund & Duchan, 1988; Stephany, 1986).

Future aspect can also be indicated using "want" (e.g. "he wants to drink"). Data analysis revealed no significant main effects for language or age group, but there was an interaction between the two [$F_{(5,480)}$=3.591, p<.01], which suggests a different pattern of use for the two language groups (see Figure 8.26). Although the data obtained did not show any consistent means of indicating future aspect, the mean number of uses of "want" to indicate future aspect was higher than for "going to" (see Table 8.10). Further investigation into the emergence of indication of future aspect in the expressive language of Chinese Singaporean preschool children would be useful.

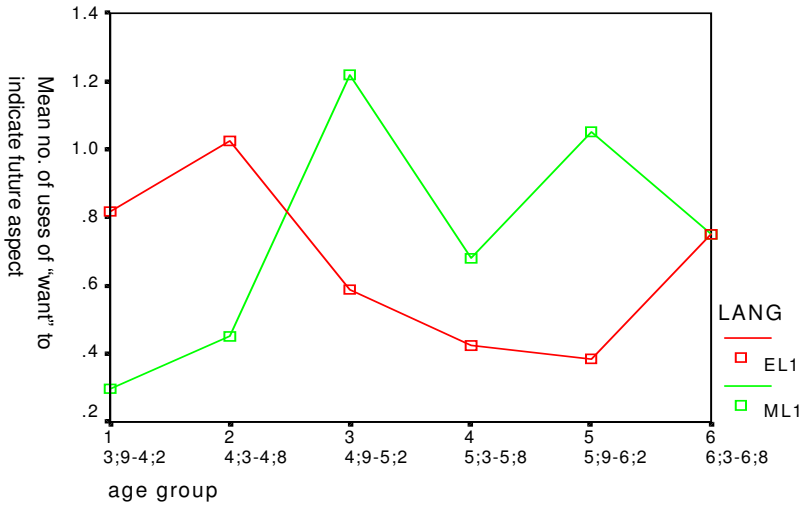


Figure 8.26: Future aspect using "want"

Auxiliary "to be"

It was expected that EL1 children would use the auxiliary "to be" earlier than the ML1 participants and that agreement errors would be uncommon for both language groups. Analysis was conducted of frequency of use, errors in use and omission of the use of the auxiliary verb forms "is" and "are".

There were significant main effects for use of the auxiliary form "is" for language [$F_{(1,480)}$=8.297, p<.01] and age group [$F_{(5,480)}$=7.389, p<.001] but there was no interaction between the two, suggesting similar patterns of use for the two language groups (see Figure 8.27).

For the EL1 participants, simple effects testing showed there were significant differences between age groups 1 and 6 [age group 1 M=.79, SD=1.44, age group 6 M=2.97, SD=3.42, $t_{(1,72)}$=-3.615, p<.001], reflecting a steady increase in use of the auxiliary "is" across the different participant age groups with increasing age. For the ML1 participants, there were significant differences between age groups 2 and 3 [age group 2 M=.0095, SD=.30, age group 3 M=.98, SD=1.68, $t_{(1,86)}$=-3.358, p<.001], 2 and 5 [age group 2 M=.0095, SD=.30, age group 5 M=1.74, SD=3.0, $t_{(1,79)}$=-3.547, p<.001], and 2 and 6 [age group 2 M=.0095, SD=.30, age group 6 M=1.93, SD=2.94, $t_{(1,80)}$=-4.015, p<.001]. This demonstrates a steady increase in the use of the auxiliary "is" between the younger and older participants from the beginning to the end of preschool.

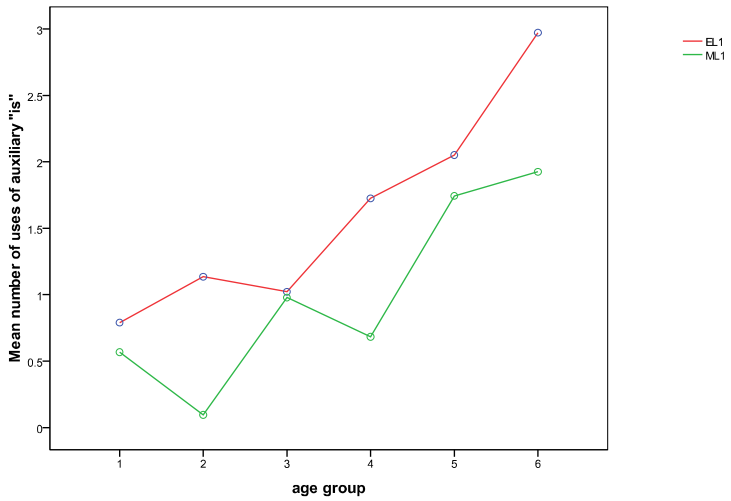


Figure 8.27: Use of auxiliary verb "is"

For omission of the auxiliary form "is" there was a significant main effect for language [$F_{(1,480)}$=141.434, p<.001] but no difference between the age groups and no interaction between the two, suggesting similar patterns in the omission of the auxiliary "is" (see Figure 8.28).

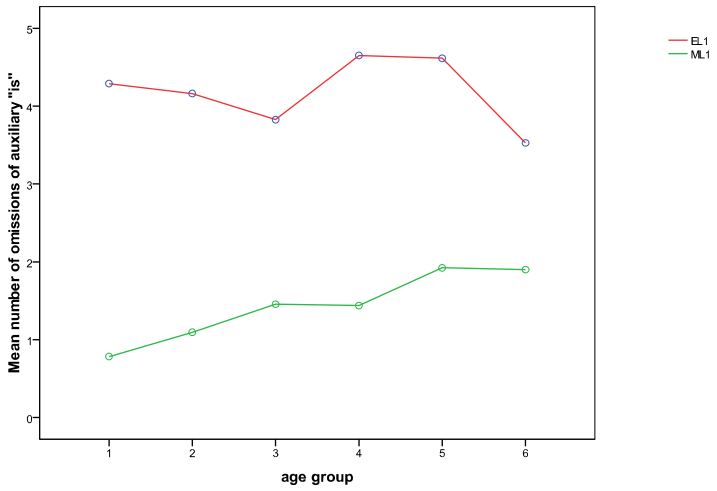


Figure 8.28: Omission of auxiliary verb "is"

The results show that the EL1 participants omitted the auxiliary verb significantly more than the ML1 participants [EL1 *M*=4.18, *SD*=3.02, ML1 *M*=1.44, *SD*=1.94]. This result is linked to the use and omission of the "-ing" marker (discussed in the previous section related to inflectional morphology), where the EL1 participants were noted to use significantly more "-ing" markers (indicating higher levels of use of the present progressive tense) which would, in StdE, require the use of an auxiliary verb. However, results for omission of auxiliary "is" show that use of the auxiliary verb occurs only when it is required by the context and its use with the "-ing" marker is not mandatory in SCE.

Analysis was also conducted of errors in the use of the auxiliary verb "is". There were no differences between language or age groups and no interaction between the two, suggesting similar errors patterns for the two language groups (see Figure 8.29). The mean number of errors was very low [EL1 *M*=.10, *SD*=.60, ML1 *M*=.033, *SD*=.18].

There was no difference between language groups for use of the auxiliary form "are". There was a significant main effect for age group [$F_{(5,480)}$=3.022, p<.01] but no interaction between language and age group, suggesting a similarity in use of the auxiliary "are" for the two language groups (see Figure 8.30).

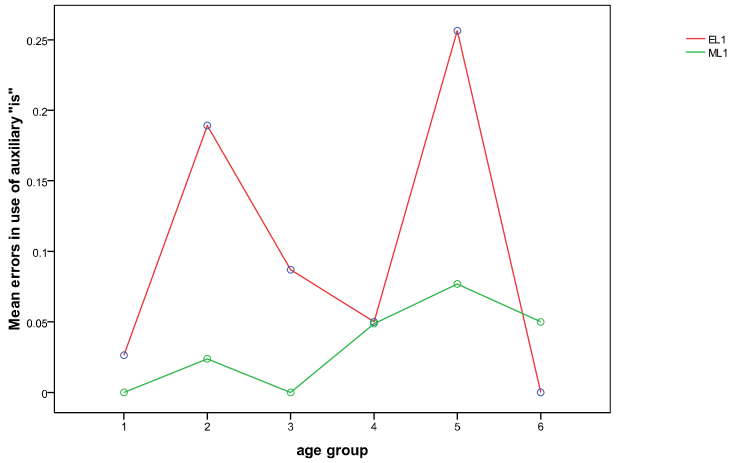


Figure 8.29: Omission of auxiliary verb "is"

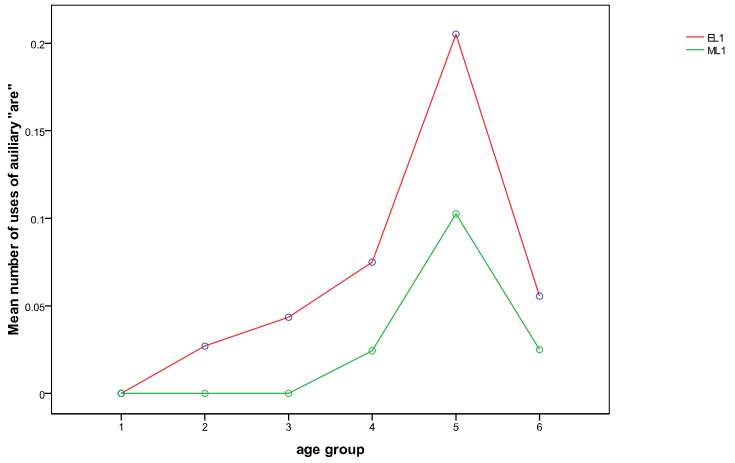


Figure 8.30: Use of auxiliary verb "are"

Simple effects testing revealed no significant differences between the age groups. Mean number of occurrences was low [EL1 M=.068, SD=.34, ML1 M=.025, SD=.22]. Further investigation into use of the auxiliary "are" is required as little information was obtained from the data collected for this study.

There was a significant main effect for omission of the auxiliary verb "are" for language [$F_{(1,480)}$=4.911, p<.05] but no difference between age groups or interaction between language and age group, suggesting a similar pattern of omission of the auxiliary "are" for the two language groups(see Figure 8.31). The EL1 participants omitted significantly more of the auxiliary "are" forms than the ML1 participants

[EL1 M=.20, SD=.48, ML1 M=.11, SD=.34]. The mean number of omissions was also very low, reflecting that the ML1 participants had less opportunities for omitting the auxiliary verb because their use of the present progressive tense was significantly lower than that of the EL1 participants. This finding was consistent with omission of the auxiliary "is" form.

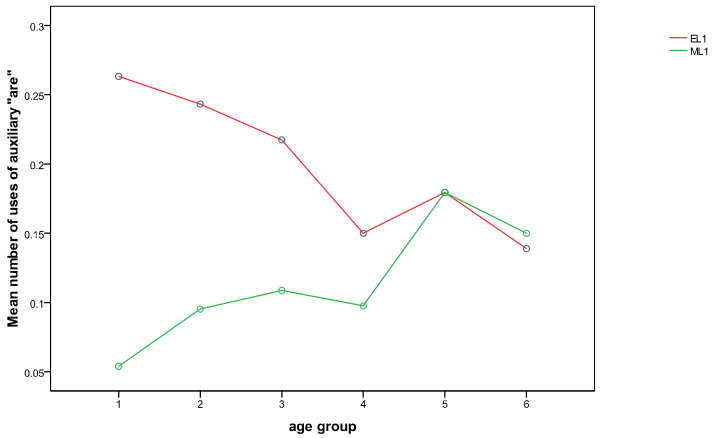


Figure 8.31: Omission of auxiliary verb "are"

Analysis was conducted for errors in use of the auxiliary verb "are", as it had been for errors in the use of the auxiliary verb "is". There were no differences between language or age groups and no interaction, suggesting a similar pattern of errors with the auxiliary "are" for the two language groups (see Figure 8.32). The mean number of errors was also very low [EL1 M=.029, SD=.19, ML1 M=.028, SD=.19].

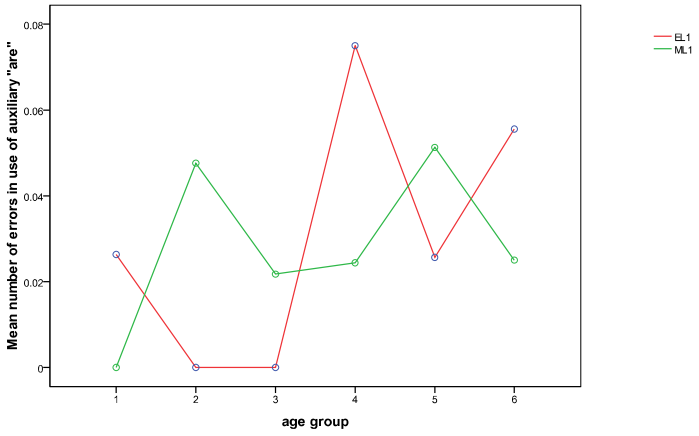


Figure 8.32: Errors in use of auxiliary verb "are"

Copula "to be"

It had been hypothesised that EL1 children would use the copula "to be" earlier than the ML1 participants and that agreement errors would be uncommon for both language groups. There were no significant differences in use of the copula verb "is" between the language groups but there was a significant main effect of age group [$F_{(5,480)}$=2.539, p<.05]. There was no interaction between language and age group, suggesting a similar pattern of use of the copula "is" for the two language groups (see Figure 8.33).

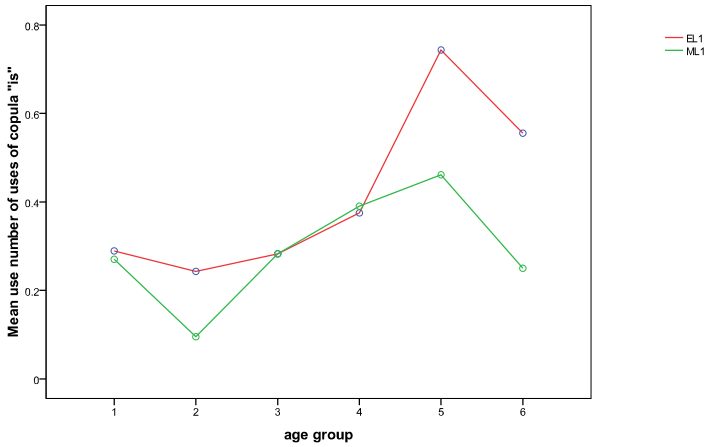


Figure 8.33: Use of copula verb "is"

Simple effects testing found no significant differences between age groups. Further investigation into use of this verb form is required to determine patterns of acquisition and use.

For omission of the copula verb "is", analysis found no differences between language groups or age groups, and no interaction between language and age group, suggesting similar patterns in the omission of the copula "is" for the two language groups (see Figure 8.34). The mean number of omissions was also very low [EL1 M=.21, SD=.47, ML1 M=.13, SD=.39], supporting the theory that use and omission of the verb in SCE is context driven (Deterding & Poedjosodarmo, 2001; Gupta, 1994). That is, the copula verb "is" would only be omitted if its use was implied by the context of the utterance (e.g. "the boy happy" where the "is" is implied by the presence of the subject "the boy").

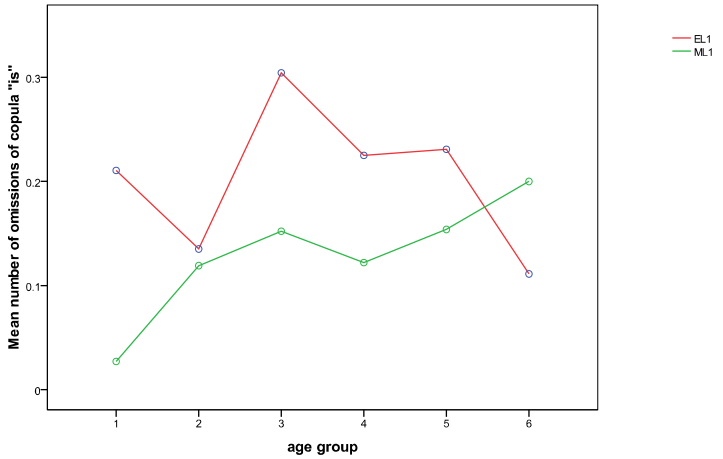


Figure 8.34: Omission of copula verb "is"

Analysis was also conducted of errors in use of the copula verb "is". There were no differences between language groups or age groups and the mean number of errors was low [EL1 *M*=.017, *SD*=.13, ML1 *M*=.012, *SD*=.11] (see Figure 8.35).

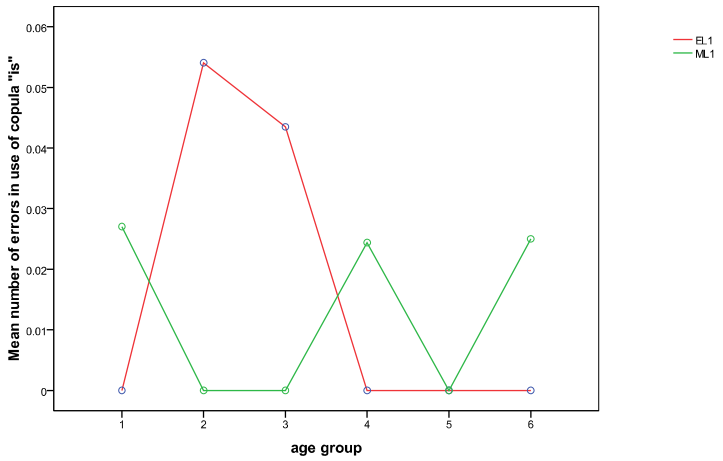


Figure 8.35: Errors in use of copula "is"

The use, omission and errors in use of the copula verb "are" were analysed, but overall mean occurrence was very low [use of copula "are" EL1 *M*=.021, *SD*=.17, ML1 *M*=.008, SD=.09, omission of copula "are" EL1 *M*=.0085, *SD*=.09, ML1 *M*=.012, SD=.11, errors in copula "are" EL1 *M*=.004, *SD*=.065, ML1 *M*=.008, SD=.09]. There were no significant differences between language groups or age groups for use, omission or errors in use. As was the case for the auxiliary verb

"are", the data collected did not have many examples of the copula verb "are". Therefore, further data collection would be required in order to accurately assess the significance of the use, omission and errors made in use of this verb.

Summary

The results relating to the perfective "has", the modal "will" and auxiliary "is/are" presented in this chapter are congruent with Deterding and Poedjosodarmo's (2001) observations that complex verb forms are used less frequently in SCE. Whilst the task used to elicit the language samples did not appear to allow adequate opportunities for use of the auxiliary "are" and the copula "is/are", there were opportunities for the participants to use the perfective "has" and the auxiliary "is". Results show a pattern of use dissimilar to that of other forms of StdE spoken around the world, and that these structures do not emerge at the same age as for other forms of StdE spoken around the world (Brown, 1973; Lund & Duchan, 1988, Stephany, 1986).

The results for the auxiliary "is" were interesting in that they suggest the use of "is" with the present progressive verb ending "-ing" is context driven in SCE and not mandatory as for StdE. Emergence occurred steadily across the increasing age groups for the EL1 participants, with no clear age of emergence indicated. As the present progressive "-ing" marker appears relatively late in comparison with StdE (Brown, 1973), the auxiliary "is" could possibly increase in use during school years. This warrants further investigation with an older participant sample.

Interestingly, although use of "is/are" in the auxiliary form does not appear to be mandatory in SCE, there were very few errors in use of these forms, or of the copula "is/are". Additionally, the results suggest indication of future aspect has not emerged for either main language group by the end of kindergarten. This also requires further investigation with an older participant sample.

Overall, there is evidence to suggest that use of complex verb forms does not emerge at the same rate or time as for other forms of StdE. It is possible that these complex verb forms are acquired after preschool, that is, during school years, if at all. This will be discussed further in Chapters 9 and 10.

Phrase level - articles

Analysis was conducted of the use, omission and errors in use of definite and indefinite articles. The results of these analyses are discussed in this section. Key findings are presented in Table 8.11.

It was hypothesised that use and omission of articles would occur in the language samples from both main language groups but that errors in their use would be rare for both groups. It was also hypothesised that the EL1 participants would show higher use of articles at a younger age than their ML1 counterparts, in line with their level of exposure to and proficiency in English.

Table 8.11: Key findings from results for articles

Variable	Main effect for language	Main effect for age group	Interaction between language & age group	EL1	ML1
Use of definite article "the"	Yes	Yes	Yes	Consistent across age groups Use more than ML1	Significant increase for age 5;0 then plateau
Omission of definite article "the"	No	Yes	No	Not significant	Not significant
Errors with definite article "the"	No	No	No	Low mean occurrence	Low mean occurrence
Use of the indefinite article "a"	Yes	Yes	No	Low mean occurrence Consistent across age groups	Low mean occurrence Significant increase for age 5;0 then plateau
Omission of the indefinite article "a"	No	No	No	n/a	n/a
Errors in use of the indefinite article "a"	No	No	No	n/a	n/a

Definite article "the"

For use of the definite article "the" there were significant main effects for language [$F_{(1,480)}$=69.549, p<.001] and age group [$F_{(5,480)}$=16.878, p<.001], and an interaction between main language and age group [$F_{(5,480)}$=3.622, p<.01] which suggests a different pattern in use of the definite article "the" between the language groups (see Figure 8.36).

The EL1 participants used significantly more definite articles than the ML1 participants. This result is unsurprising because the language samples of the EL1 children were more complex and therefore had more opportunities to include definite articles. Simple effects testing for the ML1 participants showed significant differences between age groups 1 and 3 [age group 1 M=5.03, SD=7.80, age group 3 M=14.35, SD=9.68, $t_{(1,81)}$=-4.746, p<.001], 2 and 3 [age group 2 M=5.17, SD=8.25, age group 3 M=14.35, SD=9.68, $t_{(1,86)}$=-4.767, p<.001] and 2 and 4 [age group 2 M=5.17, SD=8.25, age group 4 M=15.22, SD=8.45, $t_{(1,81)}$=-5.483, p<.001]. These findings indicate that the ML1 participants in age group 3 (approximately age 5;0) used significantly more definite articles, which coincides with the increase in expressive language abilities in English at this age (see previous chapters).

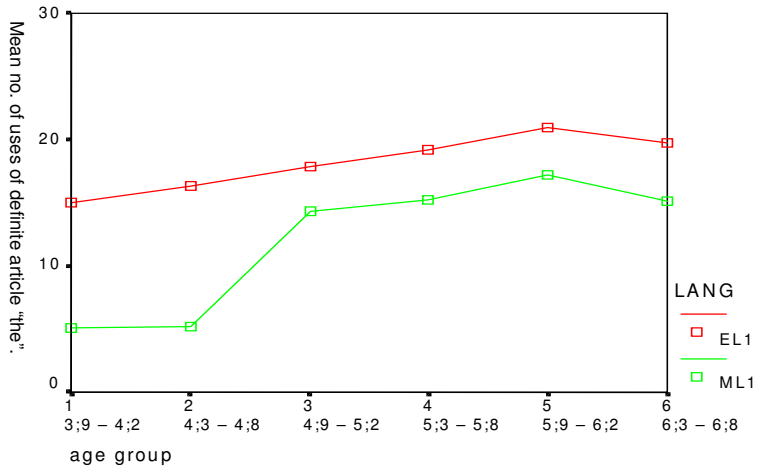


Figure 8.36: Use of definite article "the"

The omission of the definite article "the" was also analysed and, as hypothesised, no difference was found between the language groups. There was a significant main effect for age group [$F_{(5,480)}$=2.705, <.05] (see Figure 8.37) but simple effects testing

results were not significant. However, the graph in Figure 8.37 clearly suggests a decrease in the omission of the definite article for the EL1 participants as they mature, which is reflected in the increase in usage discussed previously. There was, however, no interaction effect to suggest that the two language groups were omitting the definite article "the" in different ways.

There was a very low mean occurrence of errors in the use of the definite article "the" for both language groups (EL1 M=.00, SD=.07, ML1 M=.01, SD=.11). There were no significant differences between language or age groups. These results support the hypothesis that errors in definite articles are rare for both EL1 and ML1 children.

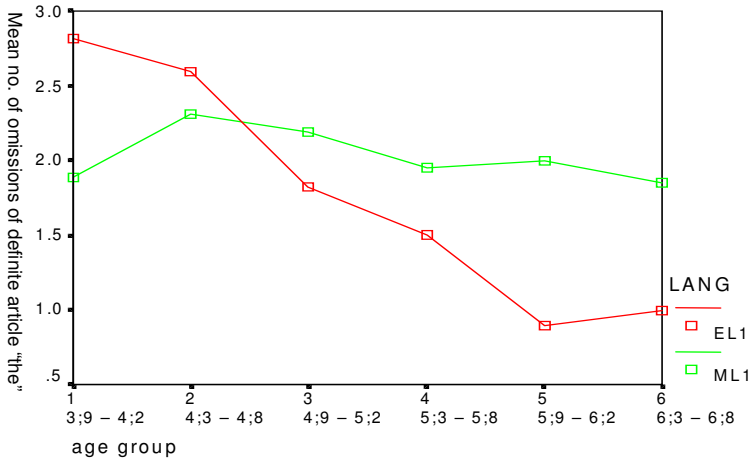


Figure 8.37: Omission of definite article "the"

Indefinite article "a"

There was a fairly low mean occurrence of use of the indefinite article "a" for both language groups, which may reflect the test items in the SEAPT as well as opportunities to use this article. The analysis of variance for differences in use of the indefinite article "a" showed significant main effects for language [$F_{(1,480)}$=12.244, p<.001] and age group [$F_{(5,480)}$=2.776, p<.05] but no interaction between the two, suggesting no difference in the pattern of use of the indefinite article "a" between the language groups (see Figure 8.38), as hypothesised. For the ML1 participants, simple effects testing found significant differences between age groups 1 and 3 [age group 1 M=.27, SD=.77, age group 3 M=1.26, SD=1.99, $t_{(1,81)}$=-2.854, p<.01], representing a

significant increase in usage of the indefinite article for the children aged approximately 5;0. This again reflects the development of the ML1 participants' expressive language abilities in English at age group 3, as discussed in earlier chapters.

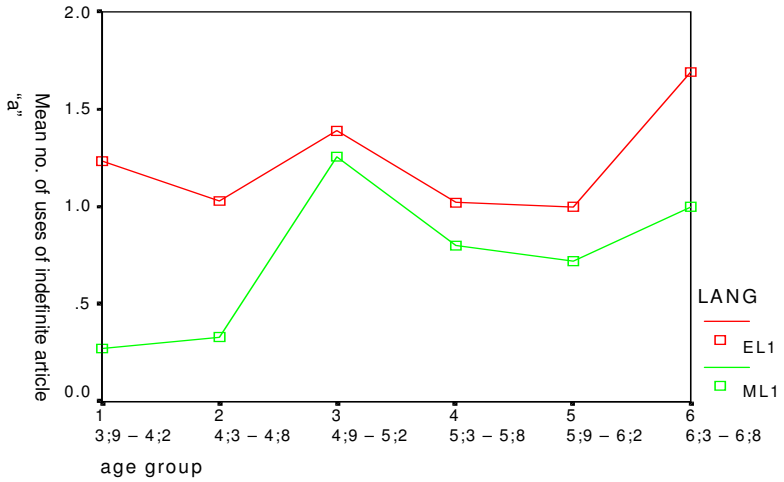


Figure 8.38: Use of indefinite article "a"

Analysis was also conducted of omission of the indefinite article "a". There was a very low mean occurrence of omission of "a" (EL1 M=.12, SD=.34, ML1 M=.09, SD=.34) and there were no differences between the language or age groups.

There was very low mean occurrence in errors in the use of the indefinite article "a" for both language groups (EL1 M=.15, SD=.68, ML1 M=.18, SD=.93) and no significant differences between language or age groups. This mirrors the findings for omission of the indefinite article "a" and the omission and errors in use of the definite article "the".

Summary

The results discussed in this section reflect two significant findings. Firstly, the results show that errors in use of definite and indefinite articles, and omission of indefinite articles are rare for both main language groups. Secondly, as mean length of utterance increased, the use of definite and indefinite articles in the samples from the ML1 participants increased. As discussed in earlier chapters, the results reflect the increase in the expressive language capabilities of the ML1 participants in

English at approximately age group 3. This will be discussed further in the following chapters.

Phrase level - Plural marking

An analysis was conducted of the use and omission of the plural "-s" marker and of use of quantifiers. Key findings are presented in Table 8.12.

The hypotheses for plural marking were that:

- omission of the plural "-s" marker would decrease with increasing age for both language groups;
- EL1 participants would show use of this marker at an earlier age and in a similar pattern to that of StdE speakers in comparison with the ML1 participants;
- both main language groups would show evidence of use of this marker by the end of preschool;
- both groups would show use of quantifiers rather than the plural "-s" marker;
- ML1 children would use quantifiers to indicate plurality more often and for longer than their EL1 counterparts;
- for both language groups, as use of the morphological marker "-s" emerges, use of the quantifier would decrease.

In Singapore Standard English (SStdE), as in StdE, there are three phonetic realisations of the plural '-s' marker; /əz/, /z/, /s/. The data collected for this study were analysed by considering each of these realisations separately. There was no significant difference between the groups, so this discussion is of acquisition of the plural marker as one entity.

Table 8.12: Key findings from results for plural marking

Variable	Main effect for language	Main effect for age group	Interaction between language & age group	EL1	ML1
Use of the plural "-s" marker	Yes	Yes	Yes	Significant increase for age 6;0	Not consistently used
Omission of the plural "-s" marker	No	No	Yes	Significant decrease for age 6;0	No difference between age groups
Use of quantifier with a noun	Yes	Yes	No	Significant increase for age 6;0	No difference between age groups

The analysis of the use of the plural "-s" marker revealed significant main effects for language [$F_{(1,480)}$=73.144, p<.001] and age group [$F_{(5,480)}$=8.446, p<.001], and an interaction between main language and age group [$F_{(5,480)}$=4.302, p<.001], which suggests different patterns in the use of this structure between the two main language groups (see Figure 8.39). Simple effects testing for the EL1 participants revealed significant differences between age group 3 [M=2.04, SD=1.85] and age group 5 [M=4.10, SD=2.48, $t_{(1,83)}$=-4.378]. The EL1 participants used the marker significantly more than the ML1 participants, with a marked increase in use by the EL1 participants in age group 5 compared with age group 3. EL1 participants showed a clear pattern of emergence by approximately age 6;0, as hypothesised. This is later than would be expected for other forms of StdE spoken around the world (Brown, 1993; Crystal et al., 1976; Jia, 2003). There were no differences between age groups for the ML1 participants, showing that they had not demonstrated consistent use of the "-s" plural marker before completion of their preschool education. Whilst differences between main language groups had been anticipated, it was somewhat surprising that the ML1 group were not showing increased use of the "-s" plural marker to indicate plurality by the end of kindergarten, given that the curriculum is delivered in SStdE. However, this result is consistent with the results discussed previously in this chapter.

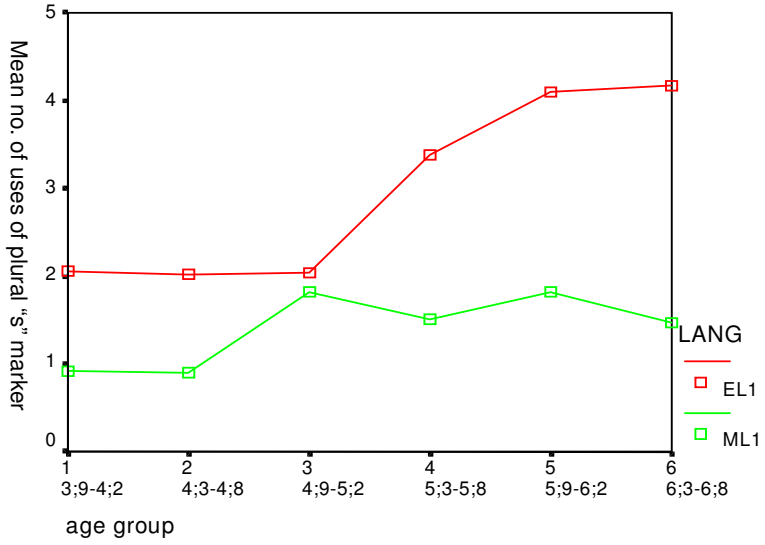


Figure 8.39: Use of plural "-s" marker

Further investigation found that use of the plural "-s" marker was closely associated with the school where testing occurred, suggesting that specific teaching of the morphological marker was carrying over into spontaneous use in the children's expressive language samples. Independent sample t tests (with Bonferroni corrections at $p<0.5$) revealed that participants from two centres (Centres 1 and 3) used significantly more plural "-s" markers than participants from other centres. Results were compared between Centre 1 [N=60, M=2.97, SD=2.20] and Centre 2 [N=101, M=1.68, SD=1.84, $t_{(1,159)}$=3.969, $p<.001$], Centre 2 [N=101, M=1.68, SD=1.84] and Centre 3 [N=53, M=3.49, SD=2.94, $t_{(1,152)}$=-4.677, $p<.001$], and Centre 3 [N=53, M=3.49, SD=2.94] and Centre 4 [N=68, M=1.84, SD=1.83, $t_{(1,119)}$=3.793, $p<.001$].

There were no main effects of language or age group for omission of the plural "-s" marker where it would be required in a Standard English context, but there was an interaction [$F_{(5,480)}$=6.926, $p<.001$] suggesting different patterns in omission of this marker for the two main language groups (see Figure 8.40). Simple effects testing for the EL1 participants revealed a significant decrease in omission of the plural "-s" at age groups 4 and 5 [age group 2 M=5.22, SD=1.77 and age group 4 M=3.90, SD=1.74, $t_{(1,75)}$=3.296, $p<.001$, age group 3 M=5.0, SD=2.27 and age group 5

M=3.41, SD=2.33, $t_{(1,83)}$=3.181 , p<.01]. This corresponds with the increase in use of the plural "-s" marker at the same age, as discussed above, and was consistent with the hypothesis that omission of the plural marker would decrease with age.

However, there were no differences between age groups for the ML1 group, suggesting consistent omission of the plural "-s" marker throughout kindergarten. This had not been anticipated, but is consistent with the finding that use of the noun plural marker "-s" had not increased in use with age.

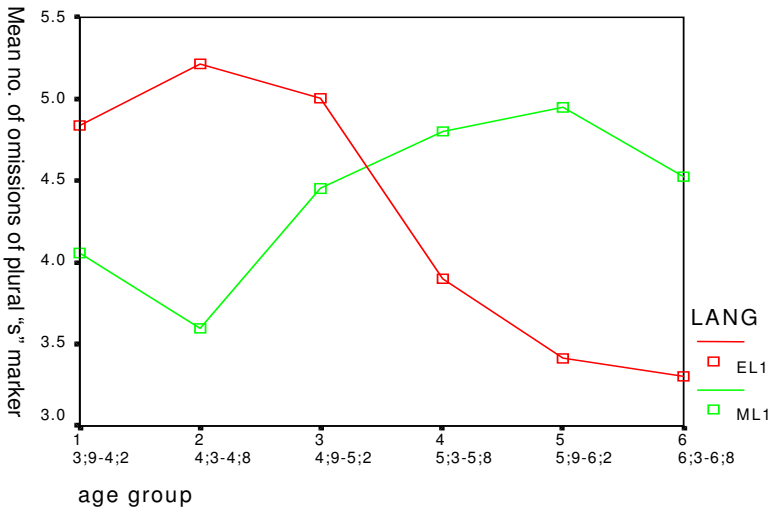


Figure 8.40: Omission of plural "-s"

Analysis of use of a quantifier with a noun to indicate plurality revealed significant main effects for language [$F_{(1,480)}$=16.806, p<.001] and age group [$F_{(5,480)}$=15.418, p<.001] but no interaction between language and age group (see Figure 8.41). For the EL1 participants, simple effects testing revealed significant differences between age group 3 [M=.96, SD=.92] and age group 5 [M=1.72, SD=1.23 $t_{(1,83)}$=-3.256, p<.001]. This shows that as well as using the plural "-s" marker to indicate plurality, the EL1 participants in age group 5 also had increased use of quantifiers to indicate plurality. The mean values and patterns shown in Figures 8.39 and 8.41 show that the EL1 participants started to indicate plurality using the "-s" marker or quantifier by nursery (i.e. age group 1). Therefore, it is suggested that the EL1 preschool Chinese Singaporean children have started indicating plurality before commencing preschool by marking the noun with the plural "-s" marker or a quantifier.

For the ML1 group there were no differences between age groups for use of quantifiers to indicate plurality, showing that there was little change in any aspect of noun plural marking for this group throughout their preschool education. This contradicted the hypothesis that use of quantifiers would decrease across kindergarten, and that the ML1 group would use quantifiers to mark plurality more frequently than the EL1 group.

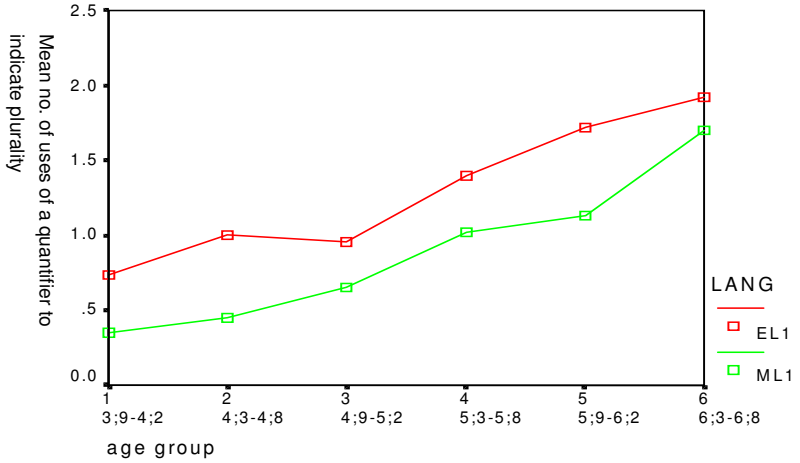


Figure 8.41: Use of quantifier to indicate plurality

The data were also analysed informally to look at whether quantifiers and plural "-s" markers were used simultaneously, or whether the markers were more likely to be used independently. One of the pictures used in obtaining the language samples encouraged specific use of the number quantifier as well as the morphological marker in describing it (see Figure 8.42). Use of the plural "-s" marker was low, with the most common response being to label the picture without any plural marking as "star" (see Table 8.13). This result indicates that the plural "-s" marker and the quantifier are more likely to be used independently than together in an utterance.

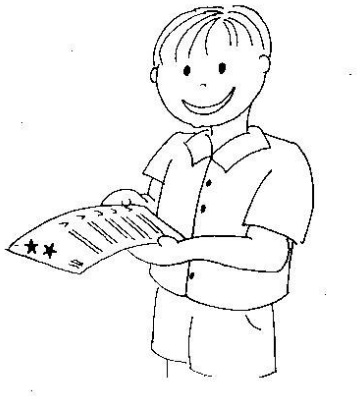


Figure 8.42: SEAPT picture 5 with target of "two stars"

Table 8.13: Percentage of types of plural marking

Responses	two stars	two star	stars	star
% of responses	13%	38.2%	4.8%	44%

Summary

The results in this chapter correspond with the observations by Deterding and Poedjosoedarmo (2001), and Ho and Platt (1983) on the use of quantifiers to indicate plurality. They also show that the use of a quantifier or plural "-s" marker is likely to be independent of the other, rather than being used together.

Additionally, the results support those of Gupta (1994) on the emergence of the morphological marker as SStdE forms are acquired during schooling. The results show that the EL1 participants indicated plurality by either using a quantifier or the plural "-s" marker as early as age group 1 (approximately 4;0 years), with clear acquisition of use of the plural "-s" marker for children aged approximately 6;0 years. The age of acquisition for the morphological marker is relatively late in comparison with other forms of StdE. However, the pattern of emergence appears to be similar to the development of plurality in other forms of StdE. It would be

interesting to extend the study into the use of irregular plural forms to determine whether acquisition of all forms of plurality is highly similar to that found in StdE.

For the ML1 participants there was no indication of acquisition of the plural "-s" marker although there was a steady increase in the use of a quantifier to indicate plurality throughout the preschool years. This is consistent with the means of indicating plurality in Mandarin by placing a number and measure word before the noun (Yip & Rimmington, 1997). There is, therefore, a significantly different pattern in the indication of plurality for the main language groups. Thus, further investigation into development of the English language for ML1 participants throughout their school years is warranted.

These results will be discussed further in Chapters 9 and 10.

Phrase level - Possession

The use and omission of the possessive marker in SCE was analysed. Key findings are presented in Table 8.14.

Table 8.14: Key findings from results for marking possession

Variable	Main effect for language	Main effect for age group	Interaction between language & age group	EL1	ML1
Use of the possessive "-s" marker	Yes	Yes	No	Significant increase for age 6;6	Not consistently used
Omission of the possessive "-s" marker	No	No	No	n/a	n/a

It had been hypothesised that:

- omission of possessive "-s" marker would decrease with increasing age for both language groups;
- EL1 participants would show use of this marker at an earlier age and in a similar pattern to that of StdE speakers in comparison with the ML1

participants;

- both main language groups would show evidence of use of this marker by the end of preschool.

The mean occurrence of the possessive "-s" marker was very low for both language groups (see Table 8.15), possibly reflecting that there were few opportunities to mark for possession in the SEAPT. However, there were significant main effects for main language [$F_{(1,480)}$=3.857, p<.05] and age group [$F_{(5,480)}$=4.399, p<.001] but no interaction between the two, suggesting a similar use of the marker for the two language groups. This had not been anticipated.

Table 8.15: Mean number of uses of possessive "-s" marker by language and age

Language	Age Group	Mean	Std. Deviation
EL1	1	.03	.16
	2	.03	.16
	3	.02	.15
	4	.13	.34
	5	.10	.31
	6	.28	.51
ML1	1	.03	.16
	2	.00	.00
	3	.07	.33
	4	.02	.16
	5	.08	.27
	6	.10	.30

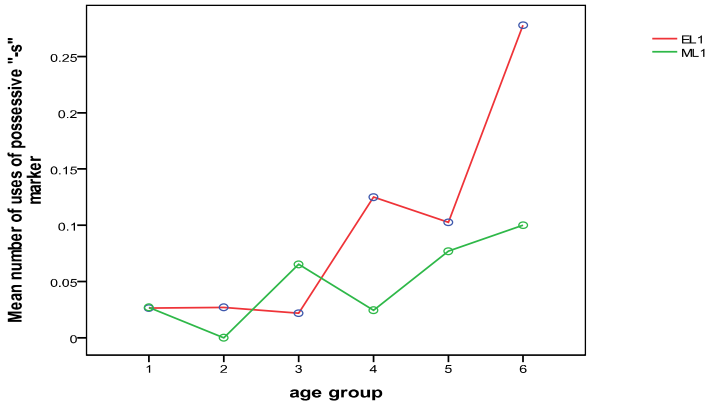


Figure 8.43: Mean number of uses of possessive "-s" marker

For the EL1 participants, simple effects testing revealed significant differences between age groups 3 and 6 [age group 3 *M*=.002, *SD*=.15, age group 6 *M*=.28, *SD*=.51, $t_{(1,80)}$=-3.222, *p*<.01] (see Figure 8.43). EL1 participants in age group 6 (approximately 6;6) had started to use the possessive "s" marker, possibly indicating an age of beginning use of this morphological feature. However, given the mean number of uses of the marker, further investigation into marking for possession in older EL1 children is required.

The very low mean of use of the marker for children of this age is relatively late in comparison with its emergence in other forms of StdE where it emerges between approximately 3;0-3;6 years (Brown, 1973; Lund & Duchan, 1988). Qualitative analysis of the data found that both EL1 and ML1 participants commonly used word combinations indicating possession but omitted the possessive marker (e.g. "the girl doll"). This stage, followed by the emergence of use of the morphological marker, is comparable with the pattern of emergence of marking of possession for other forms of StdE around the world (Lund & Duchan, 1988). This similarity had been anticipated. Further investigation into marking for possession in older EL1 children is required.

There was no evidence of emergence of use of the morphological marker for the ML1 participants from any age group. This had not been anticipated and further investigation into its use by school-aged ML1 participants is warranted.

For omission of the possessive "-s" marker, once again there was a relatively low mean occurrence of omission where its use was required by context. This also indicates that the testing material used to elicit the language samples possibly gave few opportunities for children to use the possessive marker. There was no difference for main language [$F_{(1,480)}$=.126, *n.s.*] or for age group [$F_{(5,480)}$=.741, *n.s.*], and no interaction between the two, showing that the pattern of omission of the marker was similar across language groups (see Figure 8.44).

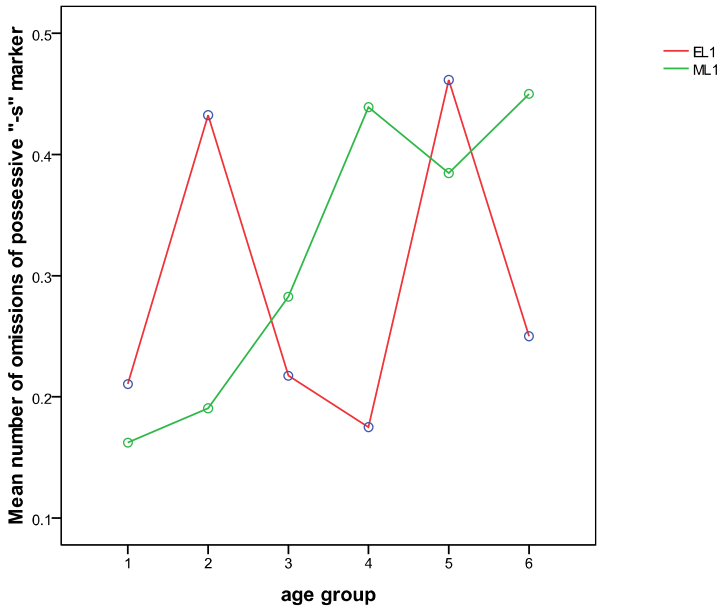


Figure 8.44: Mean number of omissions of possessive "-s" marker

Summary

The results show that the EL1 participants appeared to develop use of the possessive marker in a similar way as for other forms of StdE around the world (Lund & Duchan, 1988) although the emerging use of the morphological marker for participants aged approximately 6;6 is later than for other forms of StdE (Brown, 1983; Lund & Duchan, 1988). There was no evidence of emergence of use of the morphological marker by the ML1 participants by the end of their preschool education. This once again demonstrates the differences in the pattern of acquisition of English morphology between the two main language groups studied. These results will be discussed further in Chapters 9 and 10.

Phrase level - Pronouns

The data were analysed for use, omission and errors in use of personal, possessive and object pronouns. Key findings are presented in Table 8.16.

Personal pronouns

For personal pronouns, it had been hypothesised that:

- EL1 participants would show development of personal pronouns earlier than their ML1 counterparts;
- EL1 participants would show development of personal pronouns in a pattern similar to that for StdE speakers;
- ML1 participants would show development of personal pronouns in a pattern dissimilar to that for StdE speakers;
- ML1 participants would make more errors with personal pronouns than their EL1 counterparts.

There was no difference between language groups for use of the personal pronoun "he" but there was a significant main effect for age group [$F_{(5,480)}$=6.926, p<.001] and an interaction between language and age group [$F_{(5,480)}$=2.531, p<.05].This suggests a different pattern in use of the pronoun "he" for the two language groups, as had been anticipated (see Figure 8.45 on page 211).

Simple effects testing for the ML1 participants revealed significant differences between age groups 1 and 3 [age group 1 M=.24, SD=.64, age group 3 M=1.96, SD=2.28, $t_{(1,81)}$=-4.427, p<.001], 2 and 3 [age group 2 M=.38, SD=1.21, age group 3 M=1.96, SD=2.28, $t_{(1,86)}$=-3.994, p<.001], and 2 and 4 [age group 2 M=.38, SD=1.21, age group 4 M=1.37, SD=1.37, $t_{(1,81)}$=-3.470, p<.001]. There was a sharp increase in use of "he" for ML1 participants in age group 3, then usage reached a plateau for the older age groups.

For the EL1 participants, somewhat unexpectedly there were no significant differences between age groups although it appears there was an increase in use at age group 6 (see Figure 8.45 on page 211). This may warrant further investigation into the use of the pronoun "he" at a later age for the EL1 participants.

Table 8.16: Key findings from results for pronouns

Variable	Main effect for language	Main effect for age group	Interaction between language & age group	EL1	ML1
Use of the pronoun "he"	No	Yes	Yes	No difference between age groups	Significant increase at approximately 5;0 then plateau
Errors in use of the pronoun "he"	No	No	No	n/a	n/a
Use of the pronoun "she"	Yes	Yes	Yes	No difference between age groups	No difference between age groups
Errors in use of the pronoun "she"	Yes	Yes	Yes	No difference between age groups	Significant increase at approximately 5;0 then plateau
Use of the pronoun "his"	Yes	Yes	No	No difference between age groups	Significant increase at approximately 5;0 then plateau
Errors in use of the pronoun "his"	No	No	No	n/a	n/a
Use of the pronoun "her"	Yes	Yes	Yes	Significant increase at approximately 6;0	No difference between age groups
Errors in use of the pronoun "her"	No	Yes	No	No difference between age groups	Significant increase at approximately 5;0 then plateau
Use of object pronouns	Yes	Yes	No	No difference between age groups	Significant increase at approximately 5;0 then plateau
Errors in use of object pronouns	No	Yes	No	Significant increase at approximately 6;0	No difference between age groups

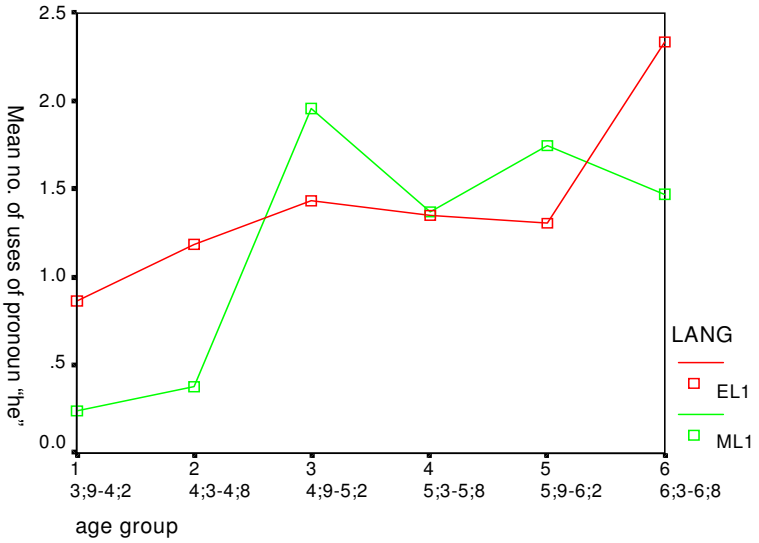


Figure 8.45: Use of pronoun "he"

For errors in the use of the pronoun "he" there were no differences between language groups or age groups, and no interaction between the two. This suggests a similar pattern for errors in use of the pronoun for the two language groups.

Analysis of data for use of personal pronoun "she" showed significant main effects for language [$F_{(1,480)}$=26.614, p<.001] and age group [$F_{(5,480)}$=6.989, p<.001], and an interaction between them [$F_{(5,480)}$=3.266, p<.001], which suggests different patterns in the use of "she" for the two language groups, as had been hypothesised (see Figure 8.46). The results show that the EL1 participants used the pronoun "she" significantly more than the ML1 participants in their language samples, which can be explained by the absence of gender distinction between personal pronouns in Mandarin (Yip & Rimmington, 1997).

Simple effects testing found no significant differences between age groups.

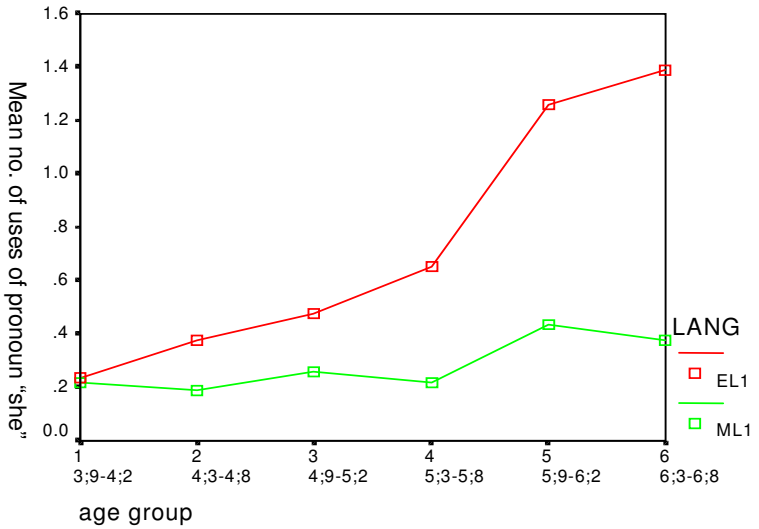


Figure 8.46: Use of pronoun "she"

For errors in the use of the pronoun "she" there were significant main effects for language [$F_{(1,480)}$=7.335, p<.01] and age group [$F_{(5,480)}$=3.470, p<.01] and an interaction between the two [$F_{(5,480)}$=2.341, p<.05]. This suggests a different pattern to the errors made by the two language groups, as had been hypothesised (see Figure 8.47).

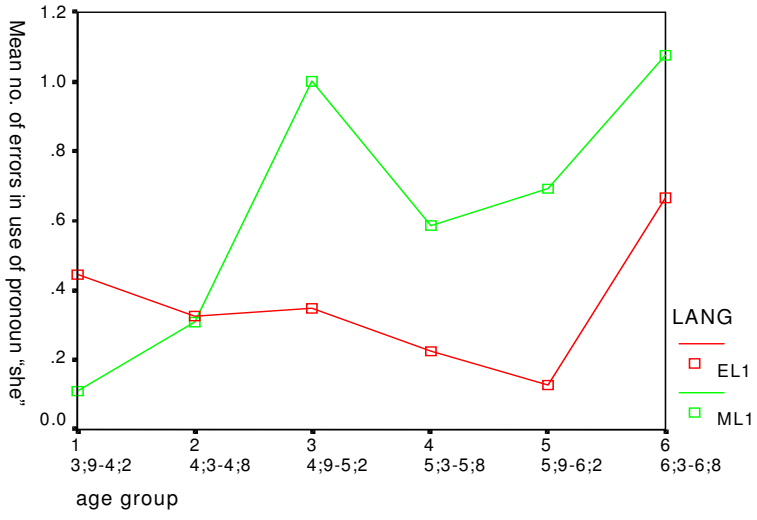


Figure 8.47: Errors in use of pronoun "she"

The ML1 participants made significantly more errors in use of the female gender personal pronoun than the EL1 participants. Errors were less common for the EL1 participants.

Simple effects testing for the ML1 participants showed significant differences between age groups 1 and 3 [age group 1 M=.11, SD=.39, age group 3 M=1.0, SD=1.76, $t_{(1,81)}$=-3.013, p<.01]. Participants in age group 3 (approximately age 5;0) made a significant increase in the number of errors in use of the pronoun "she". This result can be explained by the lack of gender specific pronouns in Mandarin (Yip & Rimmington, 1997) leading to more errors with gender specific pronouns in English for the ML1 participants, particularly as their expressive abilities in English develop further at age group 3 (as discussed in previous chapters).

Possessive pronouns

For possessive pronouns it had been hypothesised that:

- EL1 participants would show development of possessive pronouns earlier than their ML1 counterparts;
- EL1 participants would show development of possessive pronouns in a pattern similar to that for StdE speakers;
- ML1 participants would show development of possessive pronouns in a pattern dissimilar to that for StdE speakers;
- ML1 participants would make more errors with possessive pronouns than their EL1 counterparts.

For analysis of use of the possessive pronoun "his", results show significant main effects for language [$F_{(1,480)}$=15.096, p<.001] and age group [$F_{(5,480)}$=8.280, p<.001] but no interaction between them, suggesting a different pattern of use of the possessive pronoun for the two language groups as anticipated (see Figure 8.48).

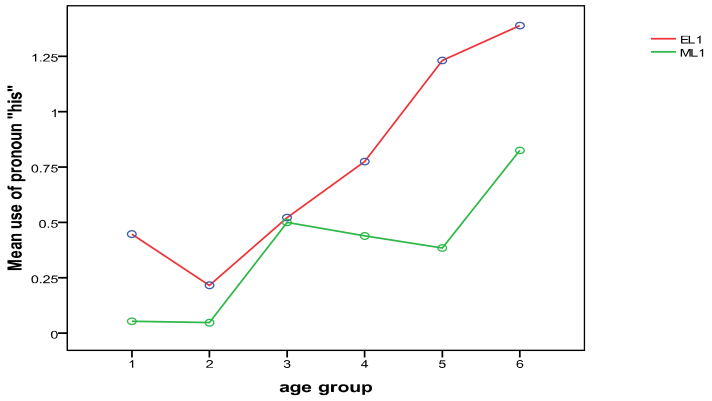


Figure 8.48: Use of possessive pronoun "his"

Simple effects testing revealed significant differences between age groups 2 and 4 for the ML1 participants [age group 2 M=.005, SD=.22, age group 4 M=.44, SD=.71, $t_{(1,81)}$=-3.421, p<.001]. This most likely represents the development of the ML1 participants' expressive language abilities in English at this age, allowing them more opportunities for use of the structure.

For errors in the use of the possessive pronoun "his" there were no significant differences for language or age group and no interaction between them, suggesting a similar pattern in making errors with the pronoun for the two language groups. The mean number of errors made was low (see Table 8.17).

For use of the female possessive pronoun "her" there were significant main effects for language [$F_{(1,480)}$=16.500, p<.001] and age group [$F_{(5,480)}$=13.434, p<.05] and an interaction between them [$F_{(5,480)}$=2.456, p<.05], suggesting, as hypothesised, a different pattern in use of the pronoun for the two language groups (see Figure 8.49). The EL1 participants used the possessive pronoun "her" significantly more often than the ML1 participants. This is likely to be due to the lack of gender distinction between possessive pronouns in Mandarin (Yip & Rimmington, 1997).

Table 8.17: Mean occurrence of errors in the use of possessive pronoun "his"

Language	Age Group	Mean	Std. Deviation
EL1	1	.21	.58
	2	.24	.49
	3	.17	.38
	4	.32	.69
	5	.21	.57
	6	.17	.56
ML1	1	.00	.00
	2	.21	.68
	3	.41	.96
	4	.32	.65
	5	.36	.71
	6	.53	1.09

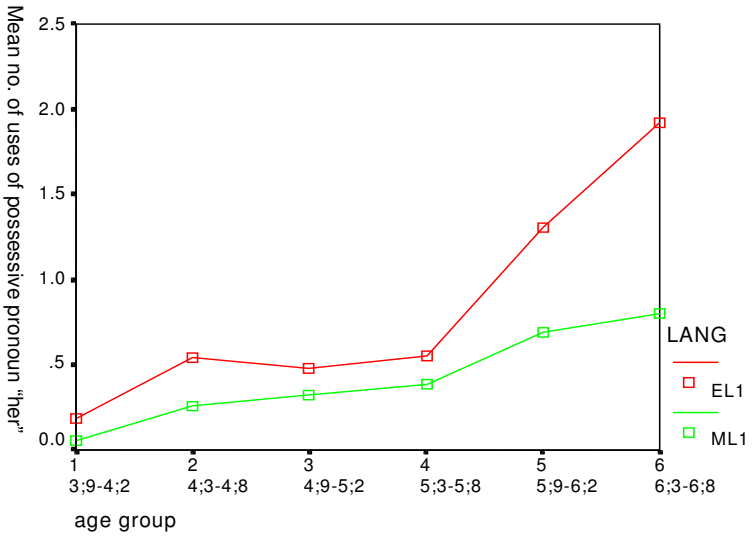


Figure 8.49: Use of possessive pronoun "her"

For the EL1 participants, simple effects testing found significant differences between age groups 3 and 5 [age group 3 *M*=.48, *SD*=.75, age group 5 *M*=1.31, *SD*=1.49, $t_{(1,83)}$=-3.313, *p*<.001] and 4 and 6 [age group 4 *M*=.55, *SD*=1.04, age group 6

M=1.92, *SD*=2.10, $t_{(1,74)}$=-3.649, *p*<.001]. This indicates emerging acquisition of the structure for EL1 participants in age group 5 (approximately age 6;0), a little later than would be expected in other forms of StdE (Brown, 1973; Chiat, 1986). There were no differences between age groups for the ML1 participants, indicating that use of "her" does not develop during preschool.

For errors in the use of the possessive pronoun "her" there were no differences between language groups but there was a significant main effect for age group [$F_{(5,480)}$=2.606, *p*<.05] (see Figure 8.50). There was no interaction between language and age group, suggesting similar error patterns in use of the pronouns for the two language groups.

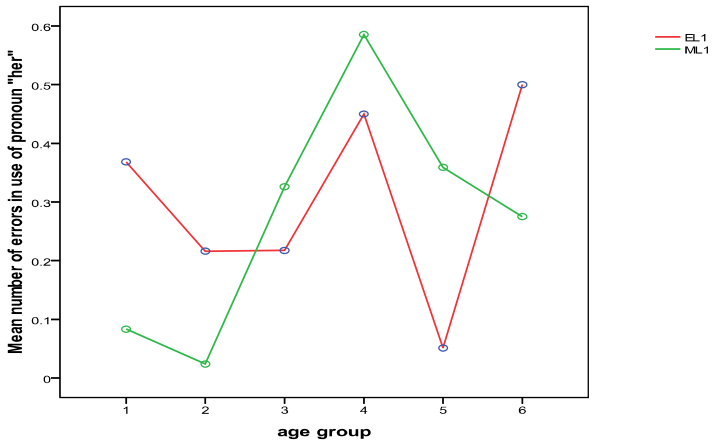


Figure 8.50: Errors in use of possessive pronoun "her"

For the EL1 participants there were no differences between age groups, suggesting that errors with the pronoun "her" were not increasing for this group. For the ML1 participants, errors were made predominantly with the gender of the pronoun only. Simple effects testing results were computed and results show a significant difference between age groups 2 and 6 [age group 2 *M*=.002, *SD*=.15, age group 6 *M*=.28, *SD*=.51, $t_{(1,80)}$=-3.073, *p*<.01]. This result could reflect the development of the ML1 participant's expressive language abilities in English in age group 3, therefore increasing the number of opportunities for them to make errors. Or, the result may be indicating that the ML1 participants are developing an awareness of the need to use a possessive pronoun but are selecting the wrong gender due to the lack of gender specific possessive pronouns in Mandarin (Yip & Rimmington, 1997).

Object pronouns

For the analysis of use and errors in use of object pronouns, the object pronouns "it", "him" and "her" were grouped into one category as frequency of occurrence of each individual object pronoun was low. It had been hypothesised that:

- EL1 participants would show development of object pronouns earlier than their ML1 counterparts;
- EL1 participants would show development of object pronouns in a pattern similar to that for StdE speakers;
- ML1 participants would show development of object pronouns in a pattern dissimilar to that for StdE speakers;
- ML1 participants would make more errors with object pronouns than their EL1 counterparts.

For use of object pronouns there were significant main effects for language [$F_{(1,480)}$=5.543, p<05] and age group [$F_{(5,480)}$=11.865, p<.001] but no interaction between them, suggesting similar patterns in the use of these pronouns for the two language groups (see Figure 8.51). The EL1 participants used significantly more object pronouns than the ML1 participants, as had been anticipated. Simple effects testing showed a significant difference between age groups 1 and 3 for the ML1 participants [age group 1 M=.054, SD=.33, age group 3 M=.54, SD=.98, $t_{(1,81)}$=-2.90, p<.01]. This increase in use of object pronouns for participants in age group 3 again most likely represents their increased English language abilities at this age.

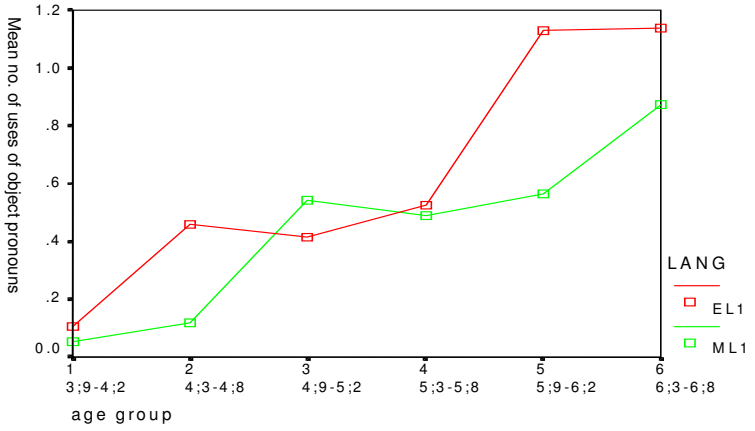


Figure 8.51: Use of object pronouns

Although not statistically significant, there was a marked increase in use of object pronouns for the EL1 participants in age group 5 (see Figure 8.51). This suggests that further investigation into use of object pronouns in older Chinese Singaporean children would be useful in determining if, and when, use of these pronouns is fully acquired.

The mean occurrence of errors in the use of object pronouns was very low for both language groups (see Table 8.18). There was no difference between the language groups but there was a significant main effect for age group [$F_{(5,480)}$=5.148, p<.001] . There was no interaction between main language and age group, suggesting a similar pattern in errors for the two language groups (see Figure 8.52).

As has been the case for errors in the use of the possessive pronoun "her", simple effects testing for the EL1 participants revealed a significant difference between age groups 5 and 6 [age group 5 M=0, SD=0, age group 6 M=.25, SD=.44, $t_{(1,73)}$=-3.557, p<.001] (see Figure 8.52). The increase in errors in use of object pronouns for participants in age group 6 may be an artefact of the data, or may indicate increase in use of object pronouns, albeit the incorrect one.

Table 8.18: Mean occurrence of errors in the use of object pronouns

Language	Age Group	Mean	Std. Deviation
EL1	1	.11	.31
	2	.05	.23
	3	.13	.34
	4	.22	.53
	5	.00	.00
	6	.25	.44
ML1	1	.05	.23
	2	.05	.22
	3	.30	.66
	4	.17	.38
	5	.08	.27
	6	.30	.52

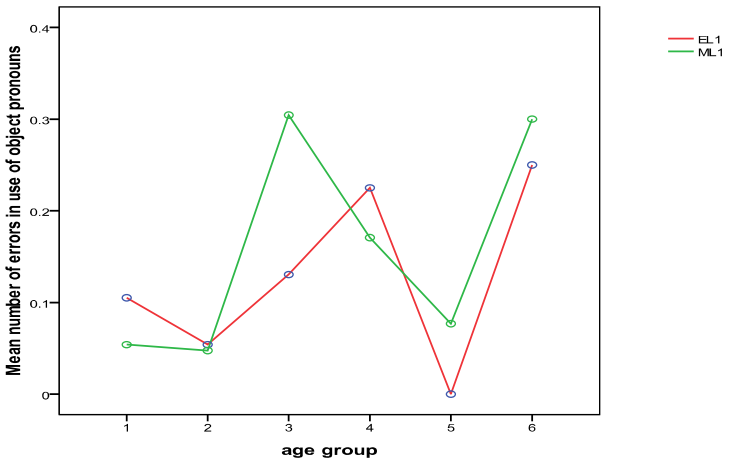


Figure 8.52: Errors in use of object pronouns

Summary

The results show that for both the ML1 and the EL1 participants, the use of personal, possessive and object pronouns emerges later than for StdE (Brown, 1973; Chiat, 1986) and their use has not been fully acquired by the end of their preschool education. Further investigation into the use of pronouns during the primary school years would be useful in order to obtain information on their use and acquisition.

The results also show that the ML1 participants used less feminine personal and possessive pronouns than the EL1 participants and made more errors in the use of the feminine personal and possessive pronouns. This reflects the lack of gender distinction between pronouns in Mandarin (Yip & Rimmington, 1997). Further study of the use of these pronouns throughout primary schooling would provide useful information on their acquisition for ML1 speakers.

These results will be discussed further in Chapters 9 and 10

Phrase level - Conjunctions

The data were analysed for use, omission and errors in use of coordinating and subordinating conjunctions. Key findings are presented in Table 8.19. It had been hypothesised that:

- both main language groups would omit conjunctions usually required in a StdE context;
- EL1 participants would use conjunctions earlier than their ML1 counterparts;
- EL1 and ML1 participants would develop conjunctions in a pattern similar to that of StdE speakers;
- the omission of conjunctions would decrease as use increased for both main language groups;
- errors in use of conjunctions would be uncommon for both main language groups.

Table 8.19: Key findings from results for conjunctions

Variable	Main effect for language	Main effect for age group	Interaction between language & age group	EL1	ML1
Omission of conjunctions	Yes	Yes	Yes	No difference between age groups	Significant increase at approximately 5;0 then plateau
Use of coordinating conjunctions	Yes	Yes	No	No difference between age groups	Significant increase at approximately 5;0 then plateau
Use of "then"	No	No	No	n/a	n/a
Use of "and"	Yes	Yes	No	Significant increase at approximately 6;6	Significant increase at approximately 5;0 then plateau
Errors in use of coordinating conjunctions	No	No	No	n/a	n/a
Use of subordinating conjunctions	Yes	Yes	Yes	Significant increase at approximately 6;0	Significant increase at approximately 5;0 then plateau
Use of "because"	Yes	No	Yes	Significant increase at approximately 6;0	Significant increase at approximately 5;0 then plateau
Use of "to"	Yes	Yes	No	Use higher than ML1 participants Significant increase at approximately 6;0	Significant increase at approximately 6;0
Errors in use of subordinating conjunctions	No	No	No	n/a	n/a

For omission of conjunctions where they would be required in a Standard English context, the results show significant main effects for main language [$F_{(1,480)}$=6.327, p<.05] and age group [$F_{(5,480)}$=2.303, p<.05], and an interesting interaction between language and age group [$F_{(5,480)}$=3.485, p<.01]. This suggests a different pattern in the omission of conjunctions for the two language groups (see Figure 8.53).

Simple effects testing for the ML1 participants found significant differences between age groups 1 and 3 [age group 1 M=.46, SD=.2, age group 3 M=1.65, SD=1.99, $t_{(1,81)}$=-3.310, p<.001] and 2 and 3 [age group 2 M=.64, SD=1.14, age group 3 M=1.65, SD=1.99, $t_{(1,86)}$=-2.879, p<.01]. The increase in omissions for participants in age group 3 represents the increase in their expressive language abilities in English at this age, and therefore increased opportunities to omit the conjunction. There were also a higher mean number of omissions of conjunctions for the ML1 participants, suggesting that the EL1 participants were using the structure more consistently.

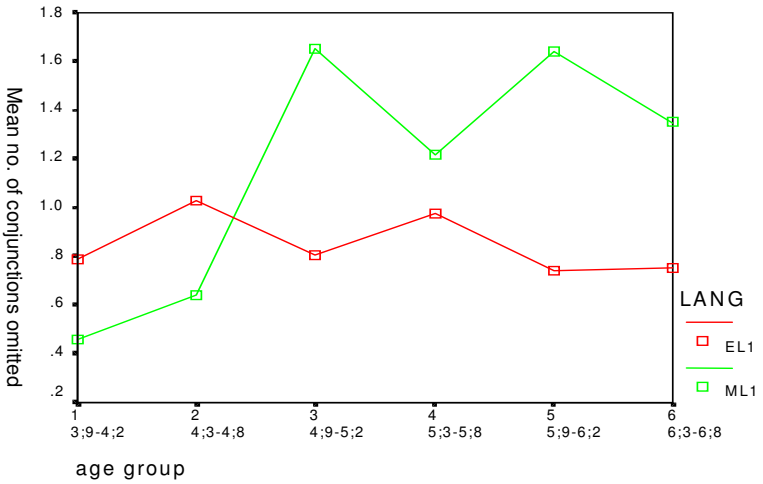


Figure 8.53: Omission of conjunctions

Coordinating conjunctions

There were significant main effects for the use of coordinating conjunctions for main language [$F_{(1,480)}$=11.612, p<.001] and age group [$F_{(5,480)}$=11.353, p<.001] but no interaction between them, suggesting similar patterns in the use of coordinating conjunctions for the two language groups, as had been anticipated. Figure 8.54 shows that the use of coordinating conjunctions by the EL1 participants had emerged prior

to commencing preschool, with a relatively high mean occurrence for participants in age group 1. In order to determine whether this is relatively early in comparison with Standard English, as reported by Gupta (1994), further investigation into use of conjunctions in younger children is required because use of the conjunction "and" emerges at approximately 26-28 months for Standard English speakers (Lund & Duchan, 1988; Owens, 2008) and this population was not included in this study.

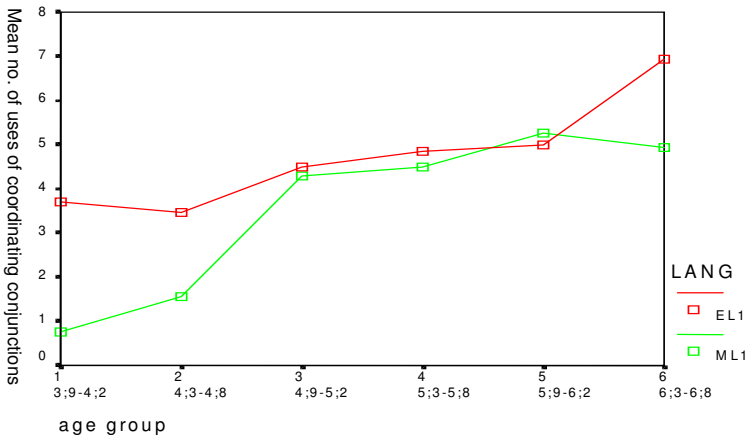


Figure 8.54: Use of coordinating conjunctions

Simple effects testing for the ML1 participants showed significant differences between age groups 1 and 3 [age group 1 *M*=.76, *SD*=1.48, age group 3 *M*=4.25, *SD*=4.1, $t_{(1,81)}$=-4.969, *p*<.001], 2 and 3[age group 2 *M*=1.57, *SD*=3.17, age group 3 *M*=4.25, *SD*=4.1, $t_{(1,86)}$=-3.445, *p*<.001], and 2 and 4 [age group 2 *M*=1.57, *SD*=3.17, age group 4 *M*=4.49, *SD*=3.75, $t_{(1,81)}$=-3.830, *p*<.001]. This result was not as anticipated, but it supports the previous results that show rapid development of the ML1 participants' expressive language abilities in English at age group 3 in comparison with earlier age groups. The fact that the use of coordinating conjunctions then reaches a plateau for the older age groups also suggests there is no further significant increase in their use of coordinating conjunctions throughout their preschool education.

The data were further analysed to consider the use of coordinating conjunctions "and" and "then". For the use of "then", there were no significant differences between age or main language groups (see Figure 8.55).

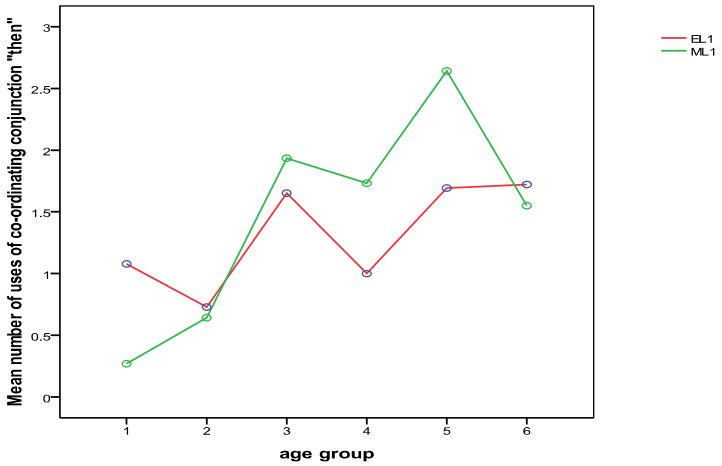


Figure 8.55: Use of coordinating conjunction "then"

For the use of "and", however, there were significant main effects for main language [$F_{(1,480)}$=21.916, p<.01] and age group [$F_{(5,480)}$=8.117, p<.05] but no interaction between them, suggesting similar patterns in the use of "and" for the two language groups (see Figure 8.56), also as anticipated.

The results show that the EL1 participants used the coordinating conjunction "and" significantly more often than the ML1 participants, which was expected for the English-dominant participants. Simple effects testing for the EL1 participants showed significant differences between age groups 5 and 6 [age group 5 M=3.21, SD=2.81, age group 6 M=5.17, SD=3.08, $t_{(1,73)}$=-2.886, p<.01], indicating a significant increase in use of "and" for participants in age group 6 (approximately 6;6) and perhaps reflecting increased complexity in their language output.

For the ML1 participants, simple effects testing showed significant differences between age groups 1 and 3 [age group 1 M=.51, SD=.99, age group 3 M=2.35, SD=2.70, $t_{(1,81)}$=-3.920, p<.001] and 2 and 4 [age group 2 M=1.0, SD=2.57, age group 4 M=2.76, SD=2.79, $t_{(1,81)}$=-2.985, p<.01]. This result is again indicative of the development of the ML1 participants' expressive language abilities in English at age group 3. As for coordinating conjunctions as a whole category, the use of "and" then reaches a plateau, showing no further significant increase in use throughout the ML1 participants' preschool education.

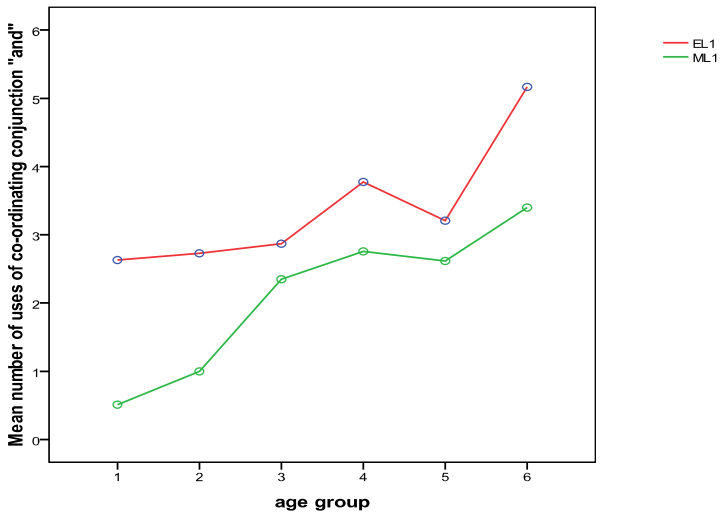


Figure 8.56: Use of coordinating conjunction "and"

There was a very low mean occurrence for both language groups for errors in the use of coordinating conjunctions (see Table 8.20). Results show no significant differences between main language groups or age groups.

Table 8.20: Errors in use of co-ordinating conjunctions

Language	Age Group	Mean	Std. Deviation
1	1	.05	.23
	2	.03	.16
	3	.04	.21
	4	.00	.00
	5	.00	.00
	6	.03	.17
2	1	.00	.00
	2	.14	.78
	3	.09	.28
	4	.05	.22
	5	.05	.22
	6	.00	.00

Subordinating conjunctions

The results for the use of subordinating conjunctions show significant main effects for main language [$F_{(1,480)}$=40.484, p<.001] and for age group [$F_{(5,480)}$=15.504, p<.001]. There was an interaction between main language and age group [$F_{(5,480)}$=3.039, p<.05], which suggests differences in use of the structure between the different language groups across the age groups (see Figure 8.57).

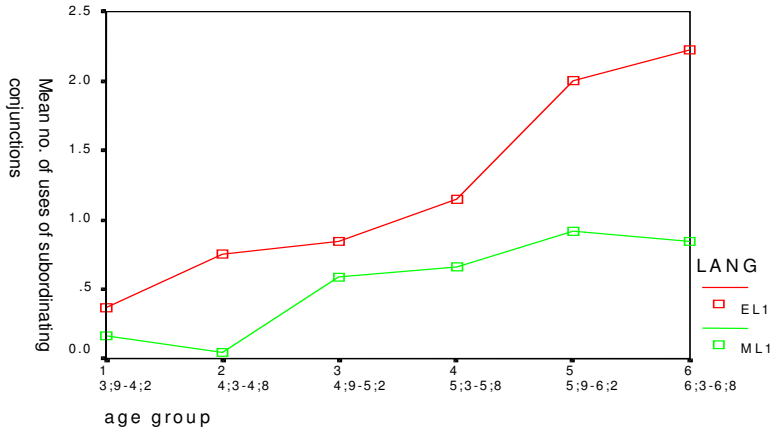


Figure 8.57: Use of subordinating conjunctions

Simple effects testing for the ML1 participants revealed significant differences between age groups 2 and 3 [age group 2 M=.005, SD=.22, age group 3 M=.59, SD=1.05, $t_{(1,86)}$=-3.280, p=.002], and 2 and 4 [age group 2 M=.005, SD=.22, age group 4 M=.66, SD=1.02, $t_{(1,81)}$=-3.814, p<.001], followed by a plateau in the use of subordinating conjunctions in the older age groups. Once again, this result reflects the development in the ML1 participants' expressive language abilities in English at age group 3.

For the EL1 participants, the post hoc t tests that were computed showed significant differences between age groups 3 and 5 [age group 3 M=.85, SD=1.01, age group 5 M=2.0, SD=1.81, $t_{(1,83)}$=-3.699, p<.001], and 4 and 6 [age group 4 M=1.15, SD=1.29, age group 6 M=2.22, SD=1.81, $t_{(1,74)}$=-2.998, p<.01]. This indicates an age of emergence in the use of subordinating conjunctions for participants in age group 5 (approximately 6;0), which is relatively late in comparison with other forms of StdE (Crystal et al., 1976; Lund & Duchan, 1988).

The data for subordinating conjunctions were further analysed to study the use of the subordinating conjunctions "because" and "to". For the use of "because", there was a significant main effect for main language [$F_{(1,480)}$=12.717, p<.05] but no difference between age groups. There was an interaction between language and age group [$F_{(5,480)}$=2.331, p<.05], suggesting a different pattern in use of "because" for the two language groups (see Figure 8.58).

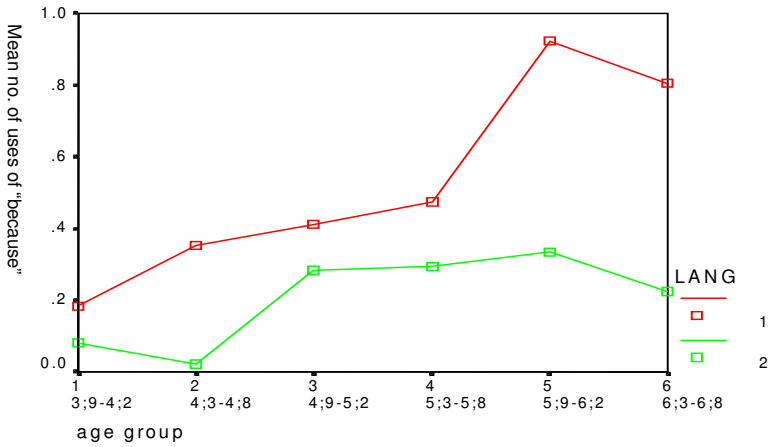


Figure 8.58: Use of "because"

Simple effects testing for the EL1 participants showed significant differences between age groups 1 and 5 [age group 1 M=.18, SD=.46, age group 5 M=.92, SD=1.04, $t_{(1,75)}$=-4.032, p<.001] and 1 and 6 [age group 1 M=.18, SD=.46, age group 6 M=.81, SD=.95, $t_{(1,72)}$=-3.614, p<.001]. This result indicates a significant increase in use of the subordinating conjunction "because" for participants in age group 5 (approximately 6;0), which tallies with the increase in use of all subordinating conjunctions found at this age, as discussed above.

For the ML1 participants, simple effects testing showed significant differences between age groups 2 and 4 [age group 2 M=.024, SD=.15, age group 4 M=.15, SD=.51, $t_{(1,81)}$=-3.255, p<.01]. This result is again indicative of the development of the ML1 participants' expressive language abilities in English at age group 3. From age group 4 onwards, there is no evidence of increased use of the subordinating conjunction "because".

For the use of "to", there were significant main effects for main language [$F_{(1,480)}$=8.993, p<.05] and age group [$F_{(5,480)}$=6.102, p<.05] but no interaction between them, suggesting a similar pattern in the use of "to" for the two language groups.

The results show that the EL1 participants use the subordinating conjunction "to" significantly more often than the ML1 participants, as was expected. Simple effects testing for the EL1 participants showed significant differences between age groups 1 and 5 [age group 1 M=.078, SD=.27, age group 5 M=.97, SD=1.01, $t_{(1,75)}$=-5.266, p<.001], 1 and 6 [age group 1 M=.078, SD=.27, age group 6 M=.94, SD=.95, $t_{(1,72)}$=-5.364, p<.001], 2 and 5 [age group 2 M=.22, SD=.58, age group 5 M=.97, SD=1.01, $t_{(1,74)}$=-3.970, p<.001], and 2 and 6 [age group 2 M=.22, SD=.58, age group 6 M=.94, SD=.95, $t_{(1,71)}$=-3.944, p<.001], indicating a significant increase in use of "to" as a subordinating conjunction for children in age group 5 (approximately 6;0).

For the ML1 participants, simple effects testing showed significant differences between age groups 2 and 5 [age group 2 M=.024, SD=.15, age group 5 M=.36, SD=.58, $t_{(1,79)}$=-3.587, p<.001] and 2 and 6 [age group 2 M=.024, SD=.15, age group 6 M=.53, SD=.96, $t_{(1,80)}$=-3.338, p<.001]. This result shows that the ML1 participants increased use of the subordinating conjunction "to" in age group 5 (approximately 6;0), although use is significantly lower than for the EL1 participants as would be expected for children speaking their second language.

There was a very low mean occurrence of errors in the use of subordinating conjunctions for both language groups, as hypothesised (see Table 8.21). Results show no significant differences between main language groups or age groups. These findings reflect those for errors in the use of coordinating conjunctions.

Table 8.21: Errors in use of subordinating conjunctions

Language	Age Group	Mean	Std. Deviation
1	1	.00	.00
	2	.03	.16
	3	.00	.00
	4	.00	.00
	5	.03	.16
	6	.08	.28
2	1	.03	.16
	2	.05	.22
	3	.04	.21
	4	.00	.00
	5	.00	.00
	6	.03	.16

Summary

Gupta (1994) has reported that the use of conjunctions emerges relatively early in SCE in comparison with StdE. This study did not obtain language samples from EL1 participants young enough to determine whether the use of coordinating conjunctions does develop earlier than for StdE. Further research into the expressive language development for Chinese Singaporean children prior to commencing preschool would be useful for obtaining such information.

However, the results of this study suggest that the use of subordinating conjunctions emerges relatively late in comparison to StdE, not earlier, or that they are omitted but implied by the context earlier than for StdE. The ML1 participants were found to omit more conjunctions than the EL1 participants who had a relatively low mean number of omissions in the language samples obtained.

For the ML1 participants, from the language samples obtained for this study it could be seen that there was development in their expressive language abilities in English at age group 3, as evidenced by the increased use of both coordinating and subordinating conjunctions at this age, indicating increased syntactic complexity in

their utterances. The use of coordinating conjunctions, however, then reached a plateau and did not significantly increase in use for the older age groups, although use of the subordinating conjunctions did show an increase in use at approximately age 6;0.

These results will be discussed further in Chapters 9 and 10.

Phrase level - Prepositions

The hypotheses for prepositions were that:

- both main language groups would use earlier developing locative prepositions;
- EL1 participants would acquire these prepositions at an earlier age than their ML1 counterparts;
- EL1 and ML1 participants would develop prepositions in a pattern similar to that of StdE speakers;
- omission of prepositions would decrease as use increased for both main language groups;
- errors in use of prepositions would be uncommon for both language groups.

The data were analysed for use, omission and errors in use of prepositions. Key findings are presented in Table 8.22.

Table 8.22: Key findings from results for prepositions

Variable	Main effect for language	Main effect for age group	Interaction between language & age group	EL1	ML1
Use of prepositions	Yes	Yes	Yes	Significant increase at approximately 6;0	Significant increase at approximately 5;0 then plateau
Use of preposition "down"	No	No	No	No difference between age groups	Significant increase at approximately 5;0 then plateau
Use of preposition "on"	Yes	Yes	No	No difference between age groups	Significant increase at approximately 5;0 then plateau
Use of preposition "up"	Yes	No	Yes	Steady increase across age groups	Significant increase at approximately 5;0 then plateau
Omission of prepositions	Yes	No	Yes	n/a	n/a
Errors in use of prepositions	Yes	Yes	No	Significant increase at approximately 5;0 then plateau	Significant increase at approximately 5;0 then plateau

Use of prepositions

For use of prepositions there were significant main effects for language [$F_{(1,480)}$=125.412, p<.001] and age group [$F_{(5,480)}$=22.157, p<.001]. There was an interaction between them [$F_{(5,480)}$=3.148, p<.01] suggesting a different pattern of use of prepositions for the two language groups (see Figure 8.59). For the EL1 participants, simple effects testing revealed a significant difference between age groups 3 and 5 [age group 3 M=5.67, SD=2.90, age group 5 M=8.05, SD=3.74, $t_{(1,83)}$=-3.298, p<.001], indicating that use of prepositions increased in age group 5, , as had been hypothesised.

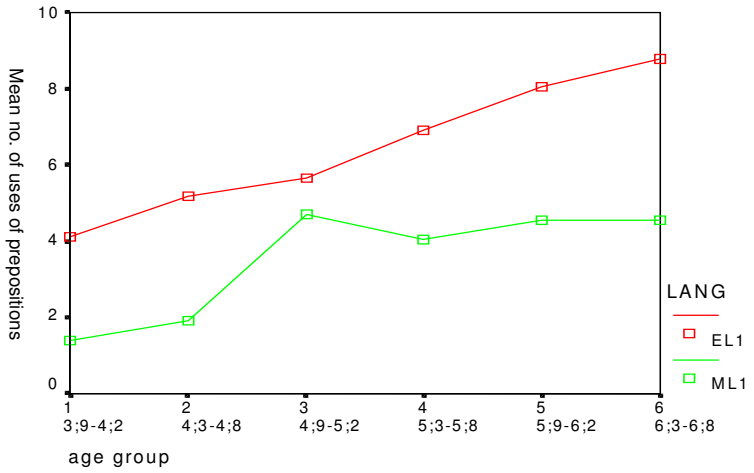


Figure 8.59: Use of prepositions

For the ML1 participants, simple effects testing showed significant differences between age groups 1 and 3 [age group 1 M=1.41, SD=1.34, age group 3 M=4.70, SD=3.27, $t_{(1,81)}$=-5.746, p<.001], 2 and 3 [age group 2 M=1.9, SD=2.22, age group 3 M=4.70, SD=3.27, $t_{(1,86)}$=-4.646, p<.001], and 2 and 4 [age group 2 M=1.9, SD=2.22, age group 3 M=4.05, SD=2.22, $t_{(1,81)}$=-4.397, p<.001]. This result demonstrates the increase in the ML1 participants' expressive language abilities in English at age group 3, as discussed previously. The ML1 participants' use of prepositions then plateaued for age groups 3–6.

Fourteen different prepositions occurred in the language samples, although the mean number of occurrences for 11 of these was relatively low. Unfortunately, the task used to elicit the language samples did not encourage use of a full range of

prepositions or elicit many occurrences of the prepositions. However, there was sufficient data to allow for analysis of the use of the locative prepositions "down" [EL1 *M*=.57, *SD*=.98 ML1 *M*=1.38, *SD*=1.08], "on" [EL1 *M*=.1.69, *SD*=1.56 ML1 *M*=.70, *SD*=1.10] and "up" [EL1 *M*=1.01, *SD*=.97 ML1 *M*=.45, *SD*=.68].

There were no significant main effects for language or age group for use of the preposition "down", and no interaction between them, suggesting a similar pattern of use for the two language groups, as expected (see Figure 8.60). However, simple effects testing for the ML1 participants revealed significant differences between age groups 1 and 3 [age group 1 *M*=.89, *SD*=.91, age group 3 *M*=1.65, *SD*=1.27, $t_{(1,81)}$=-3.068, *p*=.003] and 2 and 3 [age group 2 *M*=.90, *SD*=.93, age group 3 *M*=1.65, *SD*=1.27, $t_{(1,86)}$=-3.124, *p*<.01], showing an increase in use of the preposition at age group 3. Once again, this is an example of their increased expressive language abilities in English at this age.

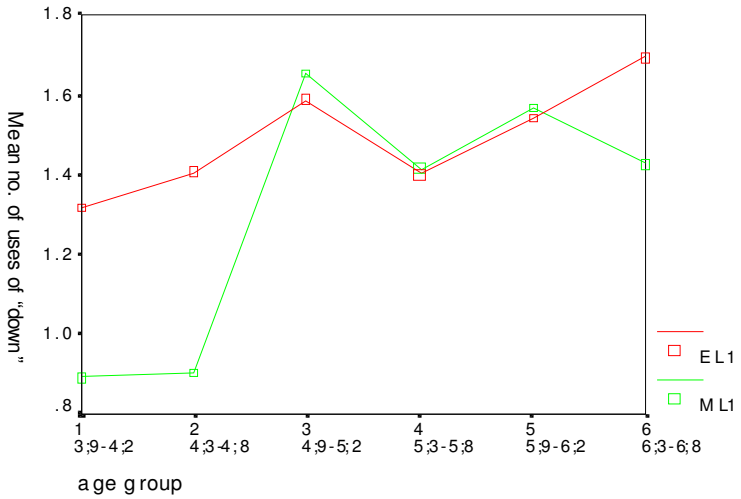


Figure 8.60: Use of preposition "down"

There were no differences between age groups for the EL1 participants, showing consistent use of the preposition "down" across ages. This suggests it had been established in these children's expressive vocabularies by this age.

For use of the preposition "on", there were significant main effects for main language group [$F_{(1,480)}$=128.93, *p*<.001] and age group [$F_{(5,480)}$=10.70, *p*<.05], with the EL1 participants using the preposition significantly more often than the ML1

participants, as expected (see Figure 8.61). There was no interaction between language and age, suggesting that the two language groups use the preposition "on" in a similar manner, also as anticipated. The comparatively high use of "on" in comparison with the other prepositions could be consistent with earlier emergence of these prepositions as would be expected for speakers of StdE (Brown, 1973; Wales, 1986). This requires further investigation and a larger number of prepositions sampled.

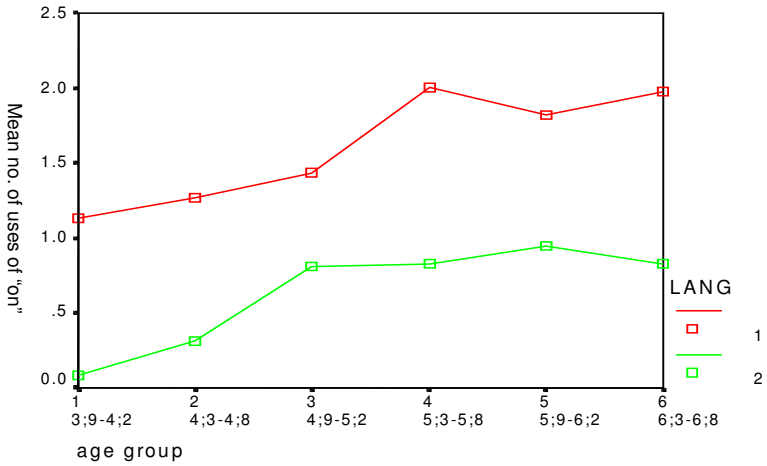


Figure 8.61: Use of preposition "on"

Simple effects testing revealed a significant difference between age groups 2 and 3 for the ML1 participants [age group 2 M=.08, SD=.28, age group 3 M=.8, SD=1.0, $t_{(1,81)}$=-4.255, p<.001]. As discussed previously in relation to other aspects of the ML1 children's expressive language development, this reflects the increase in their expressive language abilities in English at this age.

As expected, analysis of the use of the preposition "up" found a significant main effect for main language [$F_{(1,480)}$=22.43, p<.01]. However, it found no difference between age groups, which had not been anticipated. There was also an interaction between main language and age group [$F_{(5,480)}$=2.381, p<0.05], suggesting a different pattern in use of the preposition for the two language groups (see Figure 8.62). This also was not anticipated.

Simple effects testing showed significant differences between age groups 2 and 4 for the ML1 participants [age group 2 M=.19, SD=.45, age group 4 M=.61, SD=.77, $t_{(1,81)}$=-3.027, p<.01]. The EL1 participants used the preposition significantly more often than the ML1 participants but whilst there was a steady increase in use of "up" across age groups for the EL1 participants, the use by the ML1 participants increased significantly at age group 3 then remained constant (see Figure 8.62). This is another example of the development of their expressive language abilities in English at this age.

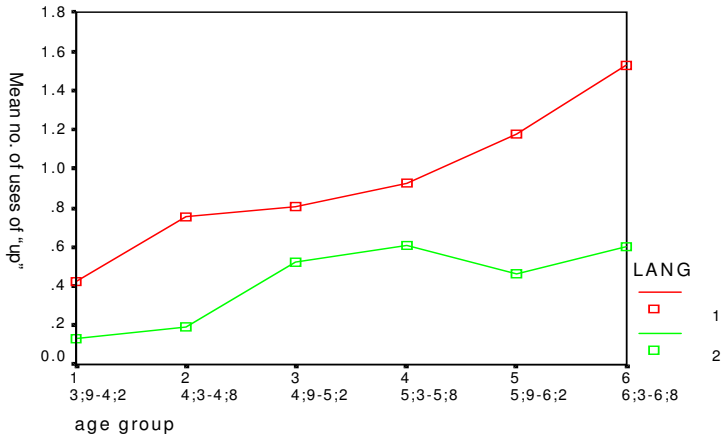


Figure 8.62: Use of preposition "up"

Omission of prepositions

The results for the omission of prepositions showed a significant main effect for main language, as expected [$F_{(1,480)}$=6.117, p<.05], but no difference for age group. There was an interaction between main language and age group [$F_{(5,480)}$=7.338, p<.001], suggesting a marked difference in the pattern of omission between the two language groups (see Figure 8.63). The data support Deterding and Poedjosodarmo's (2001) report that omission of prepositions occurs for both main language groups, and that this is a feature of SCE.

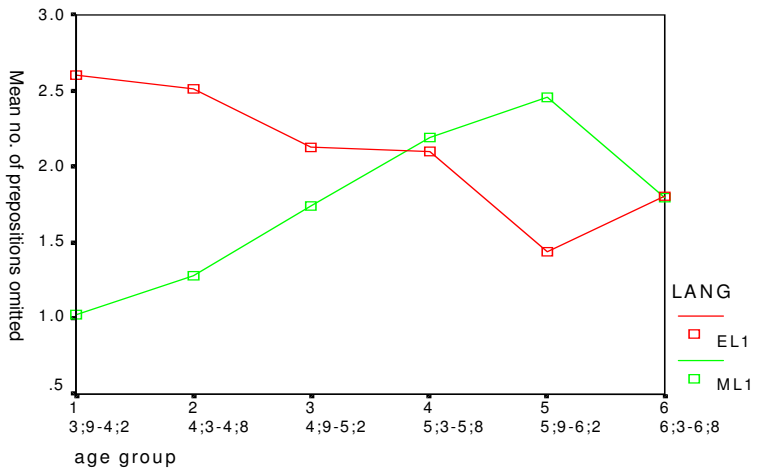


Figure 8.63: Omission of prepositions

Errors in the use of prepositions

There were significant main effects for language [$F_{(1,480)}$=6.117, p<.05] and age group [$F_{(5,480)}$=8.751, p<.001] for errors in the use of prepositions (including both incorrect selection of preposition and overuse of a preposition), but no interaction between them. This suggests a similar pattern in the errors made with prepositions for the two language groups (see Figure 8.64).

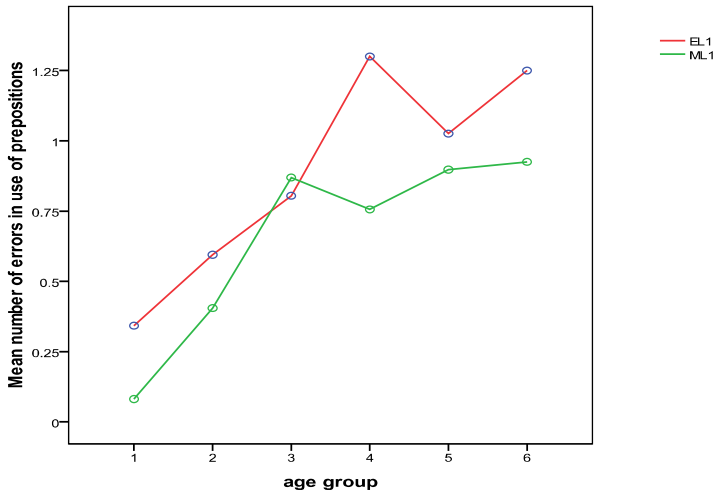


Figure 8.64: Errors in use of prepositions

Simple effects testing for the EL1 participants found a significant difference between age groups 1 and 3 [age group 1 M=.34, SD=.58, age group 3 M=.80, SD=.81, $t_{(1,82)}$=-2.954, p<.01]. This showed there was a steady increase in the mean number of errors made with prepositions across age groups 1 to 3, after which a more consistent number of errors was reached.

There was a significant difference between age groups 1 and 3 for the ML1 participants [age group 1 M=.008, SD=.28, age group 3 M=.87, SD=1.24, $t_{(1,81)}$=-3.788, p<.001], showing the increase in errors in use of prepositions for children in age group 3. This relates directly to the increase in their expressive language abilities in English at this age and therefore increased opportunities to make such errors, as discussed in previous chapters.

Summary

The results of the data analysis for prepositions show that use of prepositions increased for both the EL1 and ML1 participants across the age groups during their preschool years. For the EL1 participants, use increased steadily across the age groups, and for the ML1 participants use increased for children in age group 3 then reached a plateau across the older age groups. This finding is similar to other aspects of their English language development, as discussed in previous chapters.

The results also support Deterding and Poedjosodarmo's (2001) report that omission in use and errors in use of prepositions are a feature of SCE. However, the results are not consistent with the finding of Gupta and Chandler (1994), who suggest that errors with prepositions are indicative of SLI. On closer examination of the examples given in Gupta and Chandler's chapter, it may be that the child in their case study was making errors in word order with prepositions, rather than only in selection of a suitable preposition. Further research into use of prepositions is warranted and is discussed further in the next chapter.

In looking at the use of the different prepositions that occurred in the language samples, it can be seen that the locative prepositions "down", "on" and "up" occurred relatively frequently in both language groups. The higher use of "on" could be consistent with earlier emergence of these prepositions, as would be expected for speakers of StdE (Brown, 1973; Wales, 1986). However, the mean occurrence of all

prepositions was relatively low in the language samples obtained, and further investigation into the use of prepositions is required in order to determine whether prepositions emerge in a pattern similar to that for other forms of StdE. These results will be discussed further in Chapters 9 and 10.

Chapter 9 Discussion of Results Part B and Overall

The purpose of Part B of the study was to obtain further information on preschool Chinese English-Mandarin bilingual children's development of the syntax and morphology of English in Singapore. The study did not aim to provide a comprehensive linguistic description of the English spoken in Singapore by these children. Rather, it aimed to consider some of the specific characteristics of language that are clinically useful for Speech Pathologists in the assessment and diagnosis of language impairment.

Some interesting results were obtained from the analysis of expressive language samples in English from 481 Chinese Singaporean English-Mandarin bilingual preschool children. This chapter focuses on the discussion of these results and the differences in the morphosyntax used by the main language groups: mainly English spoken in the home (EL1) and mainly Mandarin spoken in the home (ML1). It is not possible to discuss the results of Part B of the study in isolation from Part A. Therefore, this chapter integrates discussion of the overall study results. This discussion is followed by the final chapter, which will discuss clinical implications for speech pathologists arising from the overall study. The final chapter will also discuss the limitations of the study and summarise directions for future research.

Discussion of overall results

The results from the study showed differences in order and acquisition of many aspects of syntax and morphology between the two language groups, as hypothesised. It is important to remember that all the children tested were bilingual in English and Mandarin, and the differences seen are primarily due to differences in language dominance. For the ML1 group in particular, there is a clear influence of Mandarin on the English being acquired. The results as a whole are summarised in Table 9.1.

Table 9.1: Summary of results between main language groups

Feature	Differences	No differences
Utterance Level		
MLU	MLU in morphemes and words	
Lexical diversity	number of different words used total number of words used	vocabulary errors
	total number of omitted words	
	total number of inflectional morphemes used	
	omission of inflectional morphemes	
	total number of participants' utterances	
	percentage of single word utterances	
	code switching	
Clause level		
Subject & object	appropriate subject omission	appropriate object omission
	inappropriate subject omission	inappropriate object omission
Verb morphology	omission of the third person singular "-s" marker	use of the present progressive "-ing" tense marker
	omission of the "-ed" marker	errors in the use of the present progressive "-ing" marker
	use of irregular past tense	use of the "-ed" marker
	errors in the irregular past tense forms	use of irregular past participle forms
	use of "already"	errors in the irregular past participle forms
		use of infinitive verbs

Modals and auxiliaries	use of the infinitive verb without the modal “will”	use and omission of the perfective “has”
	future aspect using “want”	indication of future aspect through use of infinitive
		verbs without the modal auxiliary “will”
		indication of future aspect through use of infinitive verbs with the modal auxiliary “will”
		indication of future aspect through use of “going to + infinitive verb”
		use of the auxiliary form “is”
		omission of the auxiliary form “is”
		errors in the use of the auxiliary verb “is”
		use of the auxiliary form “are”
		omission of the auxiliary verb “are”
		errors with the auxiliary “are”
		use of the copula verb in the form “is”
		omission of the copula verb “is”
		errors in use of the copula verb “is”
		use, omission and errors in use of the copula verb “are”

Phrase level		
Articles	definite article “the”	omission of the definite article “the”
		errors in the use of the definite article “the”
		use of the indefinite article “a”
		omission of the indefinite article “a”
		errors in the use of the indefinite article “a”
Plurals	use of the plural “-s” marker	use of a quantifier with a noun to indicate plurality
	omission of the plural “-s” marker	
Possessives		use and omission of the possessive marker
Pronouns	use of the personal pronoun “he	errors in the use of the pronoun “he”
	use of personal pronoun “she”	use of the possessive pronoun “his”
	errors in the use of the pronoun “she”	errors in use of the possessive pronoun “his”
	of the female possessive pronoun “her”	errors in use of the possessive pronoun “her”
		use of object pronouns
		errors in the use of object pronouns
Conjunctions	omission of conjunctions	use of coordinating conjunctions
	use of subordinating conjunctions	use of coordinating conjunctions “and”
	use of “because”	errors in the use of coordinating conjunctions
		use of “to”
		errors in the use of subordinating conjunctions
Prepositions	use of prepositions	use of the preposition “down”
	use of the preposition “up”	use of the preposition “on”
	omission of prepositions	errors in the use of prepositions

With regard to the differences in the morphosyntax used (see Table 9.1), the results show that these aspects of syntax and morphology develop quite differently between the main language groups across the different age groups. This is likely to be due to language dominance factors and the influence of Mandarin on the acquisition of English for the ML1 participants. The results also show that during the preschool years the EL1 participants were developing SCE with characteristics of SStdE, whilst the ML1 participants were developing SCE with fewer, if any, characteristics of SStdE. The plateauing of English skills for the ML1 participants was striking, as this occurred even though the language of instruction at kindergarten is English. These differences will be considered in more detail later in this chapter when the findings for the two main language groups will be discussed.

Where there was no difference in the morphosyntax between the main language groups (see Table 9.1), the similarity in pattern between the main language groups across the age groups for means of elicitation of language samples, characteristics of SCE and emergence of SStdE is most likely due to the following three reasons.

The first explanation for the similarity in some of these features is that the content of the Singapore English Action Picture Test (SEAPT), which is a picture description task with pictures that designed to be easily recognisable to young Singaporean children, is a modified version of the Renfrew Action Picture Test (RAPT), which determined the test content. Therefore, there were restricted opportunities for use and errors in some morphosyntax. For example, although the SEAPT looks to elicit vocabulary ranging from simpler/earlier acquired words to more complex items, the number of vocabulary errors is possibly reduced because the pictures in the SEAPT have been designed specifically to be familiar and easily recognisable for the targeted population. Another example is in the use of prepositions, which is restricted to a small sample of prepositions, limiting the information that can be obtained on their use, omission and errors in use.

The second reason for the similarity in some of these features is that they are consistent with the characteristics of SCE and therefore are seen in the language samples from both main language groups. For example, appropriate and inappropriate object omission are features of SCE common across all main language groups in Singapore, and the results demonstrate that this is also true in the English

as children develop their competence with the language. Another example is with errors in use of the definite article "the", indefinite article "a" and omission of the indefinite article "a", all of which had very low mean occurrence in the language samples. This suggests that these errors and omissions are not common features of SCE, which is congruent with the findings by Deterding and Poedjosodarmo (2001). A further example is with complex verb forms such as the modal auxiliary "will" and perfective "has". From their study of the English spoken by adults in Singapore, Deterding and Poedjosodarmo (2001) observed that complex verb forms are used less frequently in SCE. The current results are congruent with that observation. They demonstrate that this is the case in the English spoken by English-Mandarin bilingual preschool children in Singapore; neither language group used these verb forms consistently by 6;6 years. Thus, differences across the language groups for a range of characteristics of SCE demonstrate that these are also characteristic of the language spoken by children in Singapore as they develop or acquire English.

The third reason for the similarity in some of these features lies in the age at which children from both language groups start to use many of the features of SStdE. The results of the study show that, whilst many aspects of the development of syntax and morphology differ across the main language groups, the age of emergence of morphosyntax is late in comparison with other forms of StdE and that the ML1 children do not appear to be developing SStdE in their preschool years. There are significant differences in expressive syntax and morphology across the main language groups, however, which needs more detailed exploration. The following discussion considers each of the main language groups separately.

Discussion of results for EL1 participants

The results obtained from this study support the expected differences in rate of acquisition of morphosyntax but some of the later acquired features (e.g. complex verb forms) had not emerged in the language samples of the EL1 children at age 6;6. Appendix 1 contains some samples of the language produced by EL1 participants from different ages, and many of the examples discussed in this section are evident in those samples.

The pattern of development is discussed in terms of utterance and clause level. It should be noted that using more traditional measures (i.e. used 80% of the time in obligatory contexts) to determine the age of emergence is complicated by the feature of SCE that allows for omission of many structures and words once context has been broadly determined. Thus, the approximate ages of emergence in SCE and SStdE discussed here relate to when the characteristic is seen significantly more often in the language samples analysed.

Utterance level

It was hypothesised that the EL1 children would achieve MLU scores increasing steadily with age similar to those of their StdE speaking counterparts, but at a slower rate to reflect the omission of morphological markers, subjects and objects which are not required by the context in SCE. The results supported this hypothesis, with the EL1 participants' MLU in morphemes and in words increasing significantly for the children at the end of kindergarten schooling (at approximately age 6;6). There were some methodological difficulties in that these MLU values were calculated from samples obtained from a picture description task rather than 100 utterances in a spontaneous language sample, which makes close comparison with data for Standard American English-speaking children from the studies by Miller and Chapman (1981) and Leadholm and Miller (1992) problematic. However, by making the comparison with some caution in extrapolation of results, it can be seen that that the development of MLU in morphemes for the EL1 participants follows a similar pattern and timing when compared with American StdE-speaking children. MLU values are a little smaller than for the StdE-speaking children, but this could be related to the length of the language samples used to calculate MLU. Another possible factor is that these participants, whilst English-dominant, are English-Mandarin bilingual, and MLU values for bilingual children are known to differ from those of monolingual speakers of English (Eisenberg et al., 2001; Klee et al., 2006).

This increase in utterance length shown by increase in MLU is also reflected in the increase in the measures of lexical diversity. The total number of word roots and total number of words used both show significant increase in number in the language samples by the end of kindergarten. Further evidence for the EL1 participants' increased length and complexity of utterances is found in the use of single word

utterances, which decreased significantly for participants at approximately age 5;6. This reflects development in the ability to express more complex ideas, and describing rather than just labeling a picture.

Furthermore, it was hypothesised that the EL1 children would omit fewer words than their age-matched ML1 participants, particularly with increasing age. The results show the opposite; that the EL1 children omitted more words from obligatory contexts than the ML1 participants. This can be explained by the overall higher number of words used by the EL1 participants and the resultant increased number of opportunities available for omission of words from their language samples. However, the EL1 participants did show a significant decrease in the number of words omitted at approximately age 6;6, reflecting the emergence of some features of SStdE, in particular an understanding that words must be used in certain contexts. Therefore, it can be seen that the EL1 participants showed continued lexical development throughout their preschool education, and emerging development of characteristics of SStdE as well as those of SCE.

Thus, it appears that the measures of MLU made in this study may not be a valid indicator of the EL1 participants' expressive abilities in English. However, when considering the results with the other aspects of morphosyntactic development studied, the measures demonstrate that the EL1 participants show continued development of their expressive abilities in length and complexity of utterances in English throughout their kindergarten schooling. Therefore, for children with typically developing language, this pattern of language development should be expected for EL1 children.

By comparing the scores for MLU in morphemes with MLU in words, the significantly higher values for MLU in morphemes shows that the EL1 participants used some morphological markers that are characteristic of SStdE rather than SCE . Exploration of the results for use and omission of inflectional morphemes provides further evidence of emergence of characteristics of SStdE. There was a significant increase in the use of inflectional morphemes for participants at approximately age 6;0, reflecting the emergence of some SStdE morphology. The omission of inflectional morphemes, a feature of SCE discussed previously (Deterding & Poedjosodarmo, 2001; Fong, 2004; Gupta, 1994; Wee & Ansaldo, 2004), did not

differ between main language groups. However, the number of omissions of inflectional morphemes by the EL1 participants decreased significantly at age 6;0, coinciding with the increased use of inflectional morphemes at this age. The development in use of morphological markers will be explored in more detail later in this chapter.

There are many directions for future research suggested by these results. Firstly, in order to make a valid comparison between MLU values for the EL1 participants and speakers of StdE, language samples would have to be collected following the methodology used by Miller and Chapman (1981) and Leadholm and Miller (1992) in their studies. It would also be important to make a comparison with the MLU values obtained for other bilingual speakers of StdE, given that other studies have shown that values differ between monolingual and bilingual speakers of StdE (Eisenberg et al., 2001; Klee et al., 2006). Singapore is a complex multilingual environment, and whilst formal education is in SStdE, the influence of the other main languages spoken on SCE and SStdE, as well as the influences on the English(es) spoken by the individual, is important.

Another area for potential research is in measures of lexical diversity. More detailed analysis of the omission of words, as well as exploration of expressive vocabulary development in English, may yield valuable information on language development for these children, which will facilitate differential diagnosis between language difference and language impairment. This is discussed further in the following chapter.

Clause level

Subject and object omission

Omission of the subject of a sentence when not required by the context has been described as a feature of SCE (Alsagoff & Ho, 1998; Deterding, 2007; Deterding & Poedjosoedarmo, 2001; Fong, 2004; Gupta, 1994) but also of SStdE (Deterding, 2007; Deterding & Poedjosoedarmo, 2001).

The results show that EL1 participants omitted subjects and objects appropriately in their language samples (i.e. omission when not required by the linguistic context),

and that this did not change across their time in kindergarten, as would be expected if this were a feature of both SCE and SStdE.

However, inappropriate subject omission (i.e. not used when would be required by the linguistic context) significantly reduced at approximately age 6;6, reflecting an increase in awareness of SStdE sentence structure and the necessity to use the subject when required by the context. This supports the notion that as children get older they learn the SStdE "rules" about when it is appropriate to omit the subject, and show that they are learning SStdE as well as SCE. It also supports other research findings that inappropriate subject omission is a characteristic of SCE rather than SStdE.

With regard to inappropriate object omission, the mean number of times that objects were omitted inappropriately was low, suggesting that errors in omitting objects when required by the context are uncommon and that this is therefore neither characteristic of SCE or SStdE. The clinical significance of this will be discussed further in the next chapter.

Further research into these characteristics of subject and object use and omission is necessary to provide detailed information to inform our understanding of language development in Singapore. However, the results suggest that, as is the case for adults, for children acquiring English in Singapore the omission of subjects and objects when not required by the context is a feature of SCE and SStdE, but when the context requires them they are used consistently in SStdE.

Verb group

The differences in verb morphology between SStdE and SCE have been widely discussed in the literature but most of the research has been conducted on samples of English from adult Singaporeans (see Deterding 2007 for a broad discussion of the differences).

The results of all of the verb group data from this study for the EL1 participants are interesting because they show that the development of SCE and SStdE do not follow the same pattern of acquisition as for other forms of StdE used world-wide. Patterns of use and omission of verb morphology are consistent with more recently described differences in the morphology and phonology of SCE (Deterding, 2007; Deterding &

Poedjosoedarmo, 2001; Gupta, 1994), as would be expected because this is the model of spoken English provided most frequently to young children (Gupta, 1994). As outlined in Chapter 2, the impact of the phonology of SCE on verb morphology may differ from what would be expected for StdE. For example, final cluster reduction would preserve the /s/, so this cannot explain the non-emergence of third person singular "-s" marking by 6;8 years.

The age of emergence for the EL1 participants, the frequency/pattern of errors, and the expected age of emergence in monolingual speakers of StdE for the results from the verb group data are shown in Table 9.2.

The results obtained show that the order of acquisition of verb morphology (e.g. regular past tense before irregular past tense) and complex verb forms (e.g. auxiliary "is") differs from that for other forms of StdE spoken by monolinguals around the world. It also shows that acquisition for all forms of verb structures occurs later, following a different pattern of emergence of structures (Brown, 1973; Crystal et al., 1976). This finding is not surprising, given that other studies of different bilingual populations have also shown differences in order of acquisition (Bland-Stewart & Fitzgerald, 2001; Jia, 2003, Shin & Milroy, 1999). However, it is significant because these results are for English-dominant English-Mandarin bilingual children. There are, therefore, implications for schooling for these children, as the curriculum in Singapore is delivered in SStdE and at a rapid pace, with children sitting for written tests and examinations from kindergarten. Thus, more needs to be known about the development of verb morphology for this group, and how this may impact on learning and teaching in preschools and schools.

Table 9.2: Morphological marking of verbs for EL1 and StdE

Morphological marker	Characteristics of emergence for EL1 participants	Pattern of errors for EL1 participants	Approximate age of emergence for monolingual speakers of StdE (Brown, 1973)
Present progressive "-ing"	Frequent use at 6;0	Omission and errors uncommon	2;6
Third person singular "-s"	Not observed at 6;8 Decreased omission at 6;0	Omission common	3;0
Regular past tense "-ed"	Very low mean usage Increased use at 6;0	Omission common	3;0
Irregular past tense	Low mean usage. More frequent use at 6;0	Errors made	3;0
Irregular past participle forms	More frequent use at 5;6	Errors uncommon	3;0
Perfective aspect "Already"	Less common usage by EL1 vs ML1	n/a	n/a
Perfective "has"	Low frequency of use Use starts at 6;6	Omission uncommon	

Morphological marker	Characteristics of emergence for EL1 participants	Pattern of errors for EL1 participants	Approximate age of emergence for monolingual speakers of StdE (Brown, 1973)
Future aspect			
infinitive verb + modal auxiliary "will"	Usage not consistently developed at 6;8	Omission common	3;0
infinitive verb without the modal auxiliary "will"	Usage not consistently developed at 6;8		n/a
"going to" + infinitive verb	Usage not consistently developed at 6;8		3;0
"want" + infinitive verb	Usage not consistently developed at 6;8		3;0
Auxiliary "is"	Use increases across kindergarten	Omission common Errors uncommon	3;3
Auxiliary "are"	Insufficient examples elicited	Insufficient examples elicited	3;3
Copula "is"	Usage not consistently developed at 6;8	Omission common Errors uncommon	2;9
Copula "are"	Insufficient examples elicited	Insufficient examples elicited	2;9

One potential flaw of this study is the means by which the language samples were collected. By using a standardized, expressive language screening tool that aims to elicit particular structures, evidence of children's true language abilities has been potentially restricted. However, the purpose of this study, which was to obtain further information on preschool Chinese Singaporean English-Mandarin bilingual children's development of English through a "snapshot" of what these children would be able to do on a commonly used assessment task in order to make some initial observations and to inform clinical diagnosis of language impairment, has been achieved. Nevertheless, the method for elicitation of language samples for future research will be important. Given the characteristics of SCE, it may be important to collect spontaneous language samples as well as samples elicited through imitation tasks to overcome the omission of structures not required by the context. Such a method would determine whether the children have, but omit, or do not have the morphosyntax.

Overall, the differences shown by the results highlight the need for further investigation into the acquisition of verb morphology and verb forms in greater detail and across a wider age range of children. Some verb morphology (e.g. present progressive "-ing") was already being used by the EL1 participants on starting kindergarten (at approximately 4;0), increasing to a high level of use at 6;0. Detailed study of its use in children from a much broader age range (i.e. before commencing preschool through to as late as the end of primary school) is required to explore acquisition of this marker more thoroughly.

With regard to later developing and more complex verb forms, detailed analysis is warranted of use in school-aged EL1 Chinese Singaporean children. Not all SStdE verb morphology has developed by the end of preschool (e.g. third person singular "-s"), nor has the use of complex verb forms (e.g. modal auxiliary verbs). Given the fast pace of education in Singapore, it is likely that children falling behind with their oral language abilities will also fall behind in their academic work, so a clear understanding of how verb forms emerge is necessary in order to accurately differentially diagnose between language difference and language impairment.

Further study would also be interesting from the perspective of markers of SLI. Rice, Wexler and Cleave (1995) proposed that monolingual StdE-speaking children with

SLI go through a period of extended optional infinitive (i.e. a longer period of using the bare verb stem than children with typically developing language), which they believe accounts for why children with SLI have particular difficulties acquiring verb morphology. However, due to the characteristics of the English spoken by young children in Singapore, it would be difficult to make a differential diagnosis between typically developing language and SLI using this model, given that the development of verb morphology is so different. Children use the bare verb stem for much longer than typically developing monolingual StdE-speaking children and tense marking is optional if context is established. Further study in this complex multilingual environment may yield valuable information on the acquisition of English, which may inform our understanding of SLI.

Phrase level

Articles

The results show that the EL1 participants started to use the definite article "the" more often in their language samples as they matured, which appears to be reflected in an apparent (but not statistically significant) decrease in omission in definite articles at the end of kindergarten (approximately 6;6). For monolingual StdE-speaking children, articles typically emerge between 3;4-3;10 (Brown, 1973). Therefore this apparent beginning in emergence of use of articles at 6;6 (evidenced by the pattern of decrease in omission and increase in use) occurs rather later than in comparison with StdE.

Whilst the results show that the definite article "the" is used more often than the indefinite article "a" in the language samples, this possibly reflects opportunity to use indefinite articles in description of the SEAPT pictures and warrants further investigation. Errors in the use of the articles "the" and "a" were low, as was omission of the indefinite article "a", suggesting reduced opportunities in the SEAPT for use of indefinite articles. Again, this warrants further investigation.

These results suggest that the use of articles continued to develop for the EL1 children after kindergarten. It would be interesting to look more closely at their use of articles, as well as patterns of omission and errors in their use, including opportunities to explore the use of the indefinite article and whether "a" and "an" use

occurs correctly. Obtaining longer samples of spontaneous speech for children from kindergarten through primary schooling may elicit more information on use of articles. It would be particularly interesting to compare the data from spontaneous language samples with usage on elicited imitation tasks, as the omission of structures is one of the features of SCE. Such a comparison would determine differences in use after a model has been provided, which would show whether the children have the grammatical knowledge of articles but use different rules about use of omission in SCE.

Plural marking

The results obtained on plural marking for the EL1 participants support those of Gupta (1994) on the emergence of the morphological marker as SStdE forms are acquired during schooling. The results show that the EL1 participants are indicating plurality by either using a quantifier or the plural "-s" marker at approximately 4;0 with consistent use of the plural "-s" marker at 6;0. This is relatively late in comparison with other forms of StdE, emerging at approximately 2;6 based on data from Brown (1973) but, as stated before, the characteristic of omission if context is established, particularly in SCE, make accurate determination of age of acquisition through percentage occurrence measures quite difficult. Further investigation into plural marking is required.

As outlined in Chapter 7, studies have shown that noun plural marking emerges in four stages: no noun plurals produced; noun plural is marked correctly but only used occasionally; followed by overuse of the marker with irregular plurals; finally correct noun plural marking 80-90 percent of the time (Jia, 2003; Mervis & Johnson, 1991). When analysing the results obtained from this study in the light of this pattern of emergence, the EL1 children appear to be going through the second phase of inconsistent plural marking when they enter kindergarten, moving to the final phase by the end of kindergarten. However, to establish if this pattern is the same for StdE, it would be necessary to extend the study. Firstly, it would be important to widen the age range of children sampled. The marking of plurality starts before the children commence kindergarten at approximately 4;0 years. Thus, data from younger children are required in order to observe the initial pre-plural stage and how this moves to the inconsistent marking of plurality. Furthermore, the SEAPT did not

allow opportunities for children to produce irregular noun plural forms, meaning there is no information on the third stage of StdE plural acquisition for this population. Further examination of the use of irregular plural forms is needed to determine whether acquisition of all forms of plurality is highly similar to the pattern found in monolingual speakers of StdE. In particular, it would be very interesting to look at how or whether EL1 children are learning rules (i.e. evidenced by a period of over-generalisation of the plural "-s" marker") or are learning the regular and irregular forms by rote (i.e. evidenced by no stage of over-generalisation of the plural "-s" marker").

Further study of plural marking would also need to ensure the collection of sufficient data for the three phonetic realisations of the plural '-s' marker; /əz/, /z/, /s/. There was no difference between the groups for the different phonetic realisations from the data collected for this study, making further item analysis for plural marking and omission impossible. However, the influence of phonology and perceptual saliency are important to consider in order to understand noun plural marking by EL1 children with typically developing language skills, even though the phonology of SCE would result in the /s/ being preserved if the cluster is reduced.

The use of quantifiers in SCE is interesting. At times the EL1 children used quantifiers to indicate plurality and it seemed that the quantifier itself set the context, allowing for omission of the plural "-s" marker. It would be interesting to examine the use of quantifiers further to indicate plurality with this population, comparing the use with that of age- and/or MLU-matched monolingual StdE-speaking children. This might provide insight into the nature of context-setting in the English spoken in Singapore (i.e. do young monolingual StdE-speaking children at the pre-plural stage use the quantifier with the plural marker or without it, like the Singaporean EL1 children?). It might also provide valuable information on language dominance and the influence of Mandarin on the English used by the bilingual children.

Another interesting area for further investigation is in the role of structured teaching of language in Singapore and the impact on oral language development. In most StdE-speaking countries where the school curriculum is delivered largely in a monolingual environment, oral language is enriched and developed, encouraging a language-rich environment and development of emergent literacy skills before

commencing structured literacy instruction (Justice, Mashburn, Hamre & Pianta, 2008). In Singapore, children start school the year they turn 7, with preschool attendance from 4-7 years. From the beginning of preschool at about 4;0, formal literacy instruction commences with a focus on production of written language and less emphasis on emergent literacy skills (e.g. familiarity with books and their layout) and oral language abilities. The results of this study suggest that specific teaching of the plural "-s" marker through oral language activities carries over into spontaneous use in the children's expressive language samples more efficiently than for those children being taught grammar through paper-based, "worksheet" activities. This conclusion is based on the results showing that children in these centres used significantly more plural "-s" markers than those in other kindergartens. This warrants further investigation as it may be the style of teaching in a language-rich environment that is helping the children to use this marker. Alternatively, it could be that the curriculum focus on oral language and grammatical marking may result in the staff using and modeling the structure more frequently. Further study to explore oral language development and curriculum delivery may yield interesting information on teaching methods, which could inform how clinicians work with teachers in early childhood settings in Singapore.

Possession

The results from this study show that the EL1 participants have started to use the possessive "-s" marker at 6;6 years, which is relatively late in comparison with its emergence in other forms of StdE where it emerges between approximately 3;0-3;6 years (Brown, 1973; Lund & Duchan, 1988). Qualitative analysis of the data found that the participants commonly used word combinations indicating possession, thereby setting context but omitting the possessive marker (e.g. "the girl doll"). This stage, followed by the emergence of use of the morphological marker, is comparable with the pattern of emergence of marking of possession for other forms of StdE around the world (Lund & Duchan, 1988).

However, the mean number of uses of the possessive "-s" marker was very low, possibly reflecting few opportunities to use the marker in the SEAPT, or that the marking of possession emerges relatively late for this population. When looking at the occurrence of omission of the marker, however, there was also a very low mean

number of omissions, suggesting that it was, in fact, the method of sample elicitation that inhibited marking the noun for possession. Therefore, further investigation into the marking of nouns for possession is required in this age range to determine when marking is used more consistently. Such an investigation should also extend to older EL1 children. Further study would be interesting in conjunction with a study of noun plural marking and use of third person regular "-s" markers to enable analysis of the morphological and phonological aspects of use of the "-s" suffix in Singapore. Again, the method of data collection in such a study would need to consider how to overcome the issue of context permitting omission of inflectional markers, and to ensure consistent phonological structure across the types of marking studied (i.e. ensure that it is not phonologically easier to produce the "-s" marker on some tasks).

Pronouns

The results show that for the EL1 participants, the use of personal, possessive and object pronouns emerges later than for StdE (Brown, 1973; Chiat, 1986), and that their use has not been fully acquired by the end of their preschool education. A low level of use of the pronoun "he" was evident from the beginning of preschool. There was no significant increase in frequency of use but there was a slight (non-significant) increase in use at age group 6 (approximately 6;6). A similar pattern was seen for use of object pronouns, with a marked (but non-significant) increase in use seen at age group 5 (approximately 6;0 years). For the pronoun "she" and possessive pronoun "his", there was no evidence of their use at the end of kindergarten schooling (6;6) but there was evidence of emerging use for the female possessive pronoun "her" at approximately age 6;0, which is later than would be expected in other forms of StdE (Brown, 1973; Chiat, 1986). The emergence in use of this pronoun may reflect the opportunities to produce pronouns afforded by the SEAPT. Whilst there are opportunities to use the pronouns "he/she/his/her" in describing the pictures, the materials might have had some influence on these results.

In considering the use of pronouns by monolingual StdE-speaking children, Rispoli developed the Pronoun Paradigm Building Hypothesis (1994) and Pronoun Paradigm Building Model (1998). These predict error patterns in pronoun use, basing the prediction on the structural characteristics of the pronouns and the ease with which the correct pronoun can be retrieved from the lexicon (which will be influenced by

both grammar and phonological structure of the pronoun). Using these models, Moore's study (2001) confirmed that for StdE-speaking children, feminine pronouns will be acquired later than the masculine set. The findings of this study do not seem to conform to this prediction, as it appears that the feminine possessive pronoun "her" emerged first for the EL1 participants. However, it seems likely that this result is due to the number of opportunities to produce the pronouns. There was a low level of use of the pronoun "he" for the youngest children in the study, suggesting that they may already be using "he" before commencing preschool. There was a significant increase in use of the pronoun "her" at 6;0. Further investigation is required to determine if pronoun use in SCE and SStdE would support Moore's prediction.

With regard to errors in use of pronouns, there were very low occurrences of errors with "he/she/her/his". Therefore, it seems that there are insufficient data from this study to thoroughly analyse and determine patterns of use, and errors in use of, pronouns. These early results are not consistent with Rispoli (1994, 1998) or Moore's (2001) findings on pronoun use and error patterns in StdE-speaking children. It seems likely that there were not sufficient opportunities for children to produce the different pronouns for the researchers to explore fully when their use becomes consistent. Therefore, further research into the way in which pronouns are learnt in SCE and SStdE would be valuable. It would be interesting to determine, for example, whether error patterns emerge first, or whether pronouns emerge immediately in their correct form. It would be interesting to look at Rispoli's predictions for pronoun use and errors, then compare the results for the English-Mandarin bilingual children to investigate how their pronoun systems are developing and to consider the phonology of SCE and SStdE in this process. Eliciting use of pronouns through specifically designed tasks would provide more information on the development of pronouns for the EL1 participants to determine if there are differences in the order and age of acquisition in comparison to StdE, whilst reducing some of the issues around the determination of context and minimising omission of the pronouns. Given that the older EL1 preschool children do not appear to be using pronouns consistently, further investigation into their use during both preschool and the primary school years would be useful; it would inform clinical practice.

Conjunctions

Early use of coordinating conjunctions usually emerges at approximately 2;2-2;4 for monolingual StdE-speaking children (Lund & Duchan, 1988; Owens, 2008). The participants of this study were aged 3;9-6;8. Therefore language samples from EL1 participants of this younger age were not obtained. Gupta (1994) states that conjunction use emerges relatively early in SCE in comparison with StdE. However, she states that conjunctions can be implied by the context of the sentence rather than expressly stated (e.g. "take food sit" in SCE as compared with "take the food and sit" in StdE), consistent with many other characteristics of SCE.

The results of this study found that use of coordinating conjunctions by the EL1 participants emerged prior to commencing preschool, with a relatively high mean occurrence at age approximately 4;0. However, in order to determine whether this is relatively early in comparison with StdE, as reported by Gupta (1994), further investigation into use of conjunctions in younger children is required (the youngest participants in this study were 3;9). It would also be necessary to gather data that allow for deeper exploration of the complexity of use (e.g. coordinating conjunctions joining noun phrases as in "there is a dog and cat", as opposed to coordinating conjunctions joining clauses such as "there is a dog running and there is a cat drinking").

Analysis of the data by conjunction type indicated a significant increase in use of "and" at approximately 6;6 years, which most likely reflects increased complexity in the EL1 children's language output at this stage. Perhaps more importantly, analysis of the data shows a very low mean occurrence of errors in the use of coordinating conjunctions, suggesting that while omission and use might be common, errors are not.

The study results show that the use of subordinating conjunctions emerges relatively late in comparison with StdE, not earlier as suggested by Gupta (1994). However, context is important in SCE with subordination; it is possible that subordinating conjunctions are omitted but implied by the context at a comparable age or earlier than for StdE. The age of frequent use of subordinating conjunctions for the EL1 participants was clear at approximately 6;0, which is relatively late in comparison with other forms of StdE (Crystal et al., 1976; Lund & Duchan, 1988). Use of

"because" and "to" emerged at this age. It would be interesting to collect data allowing for exploration of subordination where the subordinating conjunction is implied by the context.

There was a very low mean occurrence of errors in the use of subordinating conjunctions. The clinical significance of this will be discussed further in the next chapter.

Further exploration of the development of co-ordination and subordination, and how this develops with and without the use of conjunctions, It would necessitate conducting a study with a wider age range of participants. It would need to include those young enough to determine whether the use of coordinating conjunctions develops earlier for EL1 children than for StdE (i.e. children of approximately 2 years and above). As outlined in suggestions for further study of other structures, the method of data collection would need to control for omission if the context is established.

Prepositions

In StdE, prepositions are relatively early to emerge, with "in" and "on" emerging between 2;3-2;6 (Brown, 1973; Wales, 1986). The results of this study show that use of prepositions increases steadily for the EL1 participants throughout their preschool years, and that use of some prepositions has developed before they commence kindergarten at approximately age 4;0 (e.g. prepositions "on" and "down"), as would be expected for children developing StdE.

The data are interesting in that a variety of prepositions seem to have been acquired by the end of kindergarten, although omission and errors in their usage appears to be a feature of SCE. This supports Deterding and Poedjosodarmo's (2001) assertion that omission and errors in use of prepositions are characteristic of SCE. The clinical significance of this is discussed further in the following chapter.

Fourteen different prepositions occurred in the language samples, although the mean number of occurrences for 11 of these was relatively low. Therefore, a possible limitation of the study may be that the SEAPT did not encourage use of prepositions in a large number of participants. Therefore, data must be treated as a guide only, giving direction for further investigation into the use of prepositions in order to

determine whether prepositions emerge in a pattern similar to that for other forms of StdE. Further investigation into the use of a full range of prepositions would assist in establishing an order of acquisition of prepositions in SCE. Such information would be clinically useful for planning intervention. It would also potentially be useful in differential diagnosis of language impairment.

Summary of discussion - EL1 participants

The results obtained for the EL1 participants clearly demonstrate differences in rate of acquisition of morphosyntax in comparison with monolingual speakers of StdE. The results also show that the EL1 participants were acquiring SCE with evidence of development of some SStdE morphosyntax (e.g. noun plural marking, present progressive verb marking). However, some of the later acquired features (e.g. complex verb forms) had not emerged in the language samples of the oldest EL1 children (6;6) in the study. A summary of the key findings is contained in Table 9.3 at the end of this chapter.

These results are important and will inform clinical practice. The clinical significance of the results is discussed in more detail in the next chapter. What is most clear is that there are many directions for future research into the development of English for the EL1 participants that will inform not only clinical practice, but potentially inform learning and teaching in preschool and schools, whilst also possibly affording greater insight into children's language processing.

Discussion of results for ML1 participants

The results obtained for the ML1 participants show that this group's development of English differs significantly from the patterns of development shown by the English dominant English-Mandarin bilingual children, as well as to monolingual StdE-speaking children. Whilst this would be expected for children who are Mandarin dominant, it could potentially be problematic in the complex linguistic environment in Singapore, where education is delivered largely in SStdE. The need for accurate, early differential diagnosis between language impairment and language difference is extremely clear. There is currently also a lack of information on the development of children's Mandarin in Singapore, which could further complicate the situation. These results have implications for the education system in Singapore. They identify

the need to understand why the ML1 children are not developing their English skills throughout their kindergarten schooling, and what the impact of this is on their learning in this environment.

Appendix 1 contains samples of the language produced by the ML1 participants from different ages. The results and pattern of development of English for this group is discussed in terms of utterance and clause level. As discussed previously, the linguistic environment in Singapore is complex, with a number of different languages spoken. It is not appropriate to interpret the results for the ML1 children in terms of "ages of emergence", which was more feasible for the EL1 participants, because testing was in the ML1 children's second language and the amount of exposure to the different languages would vary between participants. Instead, results have been interpreted in terms of when the majority of ML1 children attending local government preschool are likely to be able to use particular structures/forms.

Utterance level

At an utterance level, the results for the ML1 participants clearly show that these children experienced development in their expressive language abilities in English across ages until approximately 5;0, after which their skills appear to plateau. This pattern was demonstrated in many areas, but there were some areas that showed development in skills after 5;0. The younger ML1 participants used a high percentage of single word utterances between 3;9 and 5;0 years, frequently labeling target pictures with high frequency nouns in accordance with what would be expected for children learning a new language. From approximately 5;0 onwards, there was a significant decrease in the number of single word utterances.

This pattern was also seen with code switching, with a significant decrease in the number of code switches from 5;0 onwards. This pattern with code switching may reflect development in pragmatic abilities, with older children recognising that a Caucasian tester might not understand Mandarin. However, given the decrease in single word utterances, it more likely reflects an increase in expressive ability in English by this age and the ability to respond appropriately to the task in English.

Although single word utterances increased from age 5;0 on for MLU in words and morphemes, there were large increases in MLU at approximately age 5;0 after which

MLU plateaued at approximately 5;6, with no significant continued increase in MLU at the end of kindergarten schooling. This plateau could be due to the influence of Mandarin on the ML1 participants' English, as inflections are not a feature of Mandarin (Yip & Rimmington, 1997) and language influence may result in them not being marked in English. Analysis of the use of inflectional morphemes showed that the number used by the ML1 participants remained constant throughout their preschool education. It is known that features of a non-dominant language are often learned more slowly or may fail to develop fully (Yip & Matthews, 2006). This could account for the plateau in development seen in these participants' English language samples. The possible influence of the characteristics of Mandarin on ML1 children's use of verb morphology in English needs further investigation. Furthermore, it is necessary to explore in more detail why the language of instruction is not having an impact on the ML1 children's English skills.

As outlined in previous chapters, MLU alone, particularly for bilingual children, is not an adequate measure of expressive language ability but must be considered in addition to other characteristics of expressive language (Berko Gleason, 2001; Craig, Washington & Thompson-Porter, 1998; Eisenberg et al., 2001; Kayser, 1995; Klee et al., 2004; Klee, Gavin & Stokes, 2006). In 2004, Klee et al. found that MLU, in conjunction with measures of lexical diversity and child's age, provided a marker of SLI in Cantonese-speaking children. They also found that MLU for Cantonese was significantly different for age-matched speakers of English.

The measures of lexical diversity (e.g. number of different word roots, total number of words used) and fluency (including number of utterances used) from this study also revealed a similar pattern of development up until approximately 5;0, followed by a plateau, with development not continued into the later kindergarten years. It would be interesting, therefore, to replicate Klee et al.'s (2004) study to determine if the combination of MLU, measures of lexical diversity and age also provide a marker for SLI for the Singapore ML1 population. The complex language environments of Hong Kong and Singapore are markedly different. In Hong Kong, Cantonese is the main language, whereas in Singapore English and Mandarin are the main languages, with an increasing amount of Mandarin spoken since 1997. This

may impact on results, but it would be interesting to further explore these measures as a marker of SLI.

Whilst the measures of lexical diversity obtained in this study show a plateau from age 5;0 until the end of kindergarten, there was evidence that the children were developing characteristics of SCE that may have impacted on MLU and the measures of lexical diversity. For omission of words, the pattern of omission for ML1 participants showed an increase in omissions at age 5;0, with the number then remaining constant across to 6;6, rather than the expected decrease. This may relate to the other findings that number of words and different word roots used does not appear to show continued development for these age groups, that is, they are omitted. Alternatively, it may reflect the ML1 children's acquisition of SCE rather than SStdE, with an increase of features of SCE (such as omission of subjects where they would usually be required by the context) in their language samples. This will be discussed in more detail later in this chapter.

Clearly, the development of English for the ML1 participants needs further investigation. It would be important for such a study to consider bilingual children's abilities in both languages to determine a clear pattern of development across the two languages, and the influences of each on the other. To date there have been no published studies on the development of Mandarin in children in Singapore. This is clearly another area requiring extensive study.

Given that Klee et al. (2004) have found a marker for SLI in MLU combined with measures of lexical diversity and age for the Cantonese-speaking population in Hong Kong, obtaining accurate MLU values in both English and Mandarin for the ML1 population in Singapore may be a good starting point. As discussed previously, in this study there were some methodological difficulties with calculating MLU because these values were calculated from samples obtained from a picture description task rather than 100 utterances in a spontaneous language sample. This makes broad interpretation problematic. However, given the plateau in development of expressive abilities in English for the ML1 participants at an utterance level from age 5;0 until the end of kindergarten at approximately 6;6, this clearly warrants further investigation to inform differential diagnosis between language difference and language impairment, and to inform assessment and intervention.

Clause level

Subject and object omission

Analysis of the language samples at clause level shows continuation of the pattern of increased expressive abilities in English. When considering appropriate subject and object omission (i.e. when not required by the context), the ML1 participants started to omit more subjects and objects at approximately 5;0 years when their language skills in English increased. Omitting these structures is characteristic of SCE. Thus, these results suggest that, when paired with their ongoing omission of inflectional morphemes throughout kindergarten, the ML1 participants were acquiring English with more features of SCE than SStdE.

For inappropriate subject omission (i.e. subjects that are required by the context), the number remained consistent for the ML1 participants across the age groups. The ML1 participants' awareness of the obligatory nature of subjects did not appear to develop during their preschool years. This result supports the interpretation that these children were acquiring SCE rather than SStdE.

Further investigation is required to explore the acquisition of SCE and SStdE. This is discussed further later in this chapter. Importantly, the implications of acquiring SCE in preschool rather than SCE and SStdE needs to be explored to determine the impact on children's academic achievement when schooling occurs primarily in SStdE.

Verb group

It was anticipated that verb morphology for the ML1 participants would be acquired differently in comparison with monolingual StdE-speakers and EL1 SCE/SStdE/Mandarin-speakers due to the influence of first language Mandarin on English language learning in a complex linguistic environment.

The results found this to be the case. The only form of verb marking used consistently by the ML1 participants was the present progressive "-ing" marker, which was used consistently at approximately age 6;0. This finding supports observations by Deterding (2007) and Deterding and Poedjosoedarmo (2001) that this marker is used in both SCE and SStdE, as there were no indications that the ML1 participants were developing any characteristics of SStdE, but were learning SCE.

Consistent with this finding was the steady increase in use of the auxiliary form "is" for the ML1 participants throughout preschool. Whilst omission remained constant, errors in the agreement of the auxiliary form were low. This increase in correct use shows an increased understanding of the need to use an auxiliary verb with a verb marked for present progressive tense. Whilst the data were not sufficient for this type of detailed analysis, it would be interesting to explore exactly when the auxiliary form was used, as it is possible it was used when the linguistic context required the use of the auxiliary to establish context.

The other interesting and somewhat unexpected result was the significant increase in use of irregular past participle forms at age group 5;0. However, the mean number of uses of this form was low, a result that probably reflects the rote learning of "got" and the picture targets in the SEAPT (e.g. picture 6 targets the past participle "broken"). A common response to picture 5 was "boy got star" which, whilst it is technically an irregular past participle form, was perhaps not intended to be used in this form by the ML1 participants, but rather as an indication of possession with omission of the auxiliary verb (e.g. "boy got star" for "the boy has got a star").

For all other forms of verb morphology, there was no statistical evidence that the ML1 children were starting to use the markers in their expressive language. However, for the third person singular "-s" marker there was an apparent (but non-significant) increase in use at age 6;6. Further study of tense marking in older ML1 participants may reveal that ML1 children start to use this marker in early primary school. Such a study would be useful to inform our understanding of bilingual language development for these children.

Throughout the data, the pattern of increased expressive language ability at 5;0 is repeated with the significant increase in omission of verb morphology. This reflects the increase in the ML1 participants' expressive language abilities in English, with increased use of verbs at approximately age 5;0 and therefore increased opportunity to omit verb markers. The clinical significance of this pattern will be discussed further in the following chapter.

Whilst errors in omission of markers were frequent, as would be expected given the characteristics of SCE, there were few errors in marking verbs using the "-ing"

present progressive tense marker. This suggests that such errors are not common in the English spoken by ML1 children, but it could be a result of the easily recognisable and familiar targets in the SEAPT and therefore warrants further investigation to inform our understanding of the ML1 participants' expressive abilities in English.

"Already" is used in SCE to indicate perfective / completed aspect (e.g. "finish already" rather than "finished") (Ansaldo, 2004; Bao, 1995; Deterding, 2007; Gupta, 1994). In this study, the ML1 children showed an increase in use of "already" to indicate the completed aspect at approximately age 5;0 when their expressive abilities in English had developed. This use of "already" can be seen to be a direct translation of the past aspect marker "le" used in Mandarin to "already" in English (Deterding & Poedjosodarmo, 2001, Yip & Rimmington, 1997), clearly demonstrating the influence of their first language on their English. This structure is used to indicate the perfective aspect of an action before other past tense verb morphology emerges. The clinical significance of this finding is discussed further in the following chapter.

Extensive further study of use of verb morphology, tense marking through other means (e.g. "already") and context for ML1 children beyond preschool years and into their school years is essential to explore how they are acquiring SCE and SStdE. It would be beneficial to conduct such a study in parallel with an exploration of their development of Mandarin to enable description of typical development in both languages for this population, and to understand the influences of the languages on each other. This would greatly advance differential diagnosis between language difference and language impairment, and inform clinical practice with this population.

Phrase level

Articles

Unlike StdE, Mandarin uses no definite or indefinite articles with the noun (White, 2008). In SStdE and SCE, correct articles are used. Gupta and Chandler (1994) describe incorrect use of articles as being a marker of language impairment.

The use of definite and indefinite articles significantly increased with the development of the ML1 participants' expressive abilities in English at about 5;0. For the definite article "the", this increased use at age 5;0 would indicate an age at which it would be expected that ML1 children would be able to use the article correctly. There was, however, a fairly low mean occurrence of use of the indefinite article "a", which may reflect the test items in the SEAPT and opportunities this method of data collection offered to elicit use of this article, or could demonstrate that the ML1 participants were not using this structure. This pattern of frequency of use is similar to that found for the EL1 participants. The low mean occurrence of errors in the use of the definite article "the" and indefinite article "a" also supports the findings from the EL1 participants in that these errors do not seem to be characteristic of SCE and occur infrequently in the samples from both main language groups. These results support Gupta and Chandler's (1994) findings that errors in use of articles are a marker of language impairment.

The use of articles warrants further investigation for the ML1 participants. Any study would need to collect data in a way that would maximise use of all articles to allow for detailed exploration of their use and errors in their use.

Plural marking

There was no indication of acquisition of the plural "-s" marker for the ML1 participants although there was a steady increase in the use of a quantifier to indicate plurality throughout the preschool years, which demonstrates that the children were becoming aware of the need to mark the noun for plurality in some way. The use of a quantifier is consistent with the means of indicating plurality in Mandarin by placing a number and measure word before the noun (Yip & Rimmington, 1997). Once again the influence of dominant language can be seen on the English spoken by the ML1 children. We know that by adulthood many ML1 adults have acquired SStdE (Deterding & Poedjosodarmo, 2001). Therefore, it is necessary to continue to study the acquisition of syntax and morphology by ML1 children throughout primary school to better understand the way in which these children acquire SCE and SStdE.

Possession

The results show that the ML1 participants commonly omitted the possessive marker (e.g. "the girl doll"), relying on linguistic context to indicate possession. In

Mandarin, possession is usually indicated by inserting the particle "de" between the possessor and the object. For example, "the girl's shoe" would be "nu hai de xie". The influence of Mandarin was apparent in some of the language samples from ML1 participants, with utterances such as "the girl de shoe". This was not a consistent pattern, perhaps reflecting that code switching is rule-based and this would not be an appropriate code switch with a Caucasian StdE speaker.

The results show the influence of the children's dominant language on the English they used, and highlight the need to continue to study the acquisition of the features of SStdE throughout the primary school years. Given the error pattern of inserting the "de" particle, exploration of marking for possession in more detail might highlight strong patterns of Mandarin influence on the English spoken by the ML1 participants. Therefore, as is the case for the EL1 participants, further study to explore the use of the "-s" suffix for plural marking, possession marking and third person singular tense marking in more detail may reveal distinct patterns of development and errors that may be clinically useful in making an accurate differential diagnosis between language difference and language impairment.

Pronouns

There is no gender differentiation between personal and possessive pronouns in Mandarin. The same pronoun is masculine or feminine and indicated by the context (Yip & Rimmington, 1997). For example, the pronoun "tā" can mean "he/she/it" and the pronoun "tāde" can mean "his/her/its". Mixing of pronoun gender is common in SCE, with many adult speakers using only pronouns of one gender. In SStdE, however, correct gender marking is used.

The results show the influence of the ML1 children's dominant language on their learning of pronouns in English. This influence is compounded by the features of SCE, the form of English this group of children acquire first. The ML1 participants showed a sharp increase in use of "he" at about age 5;0, then usage reached a plateau. There was very little use of the feminine personal pronoun "she", showing that the children were using only one personal pronoun and relying on context to determine gender. This is supported by the low occurrence of errors in the use of the pronoun "he" but there was also a significantly higher number of errors in use of "she". These results support those of Moore (2001), as discussed previously, who

predicted that the participants in her study would learn the masculine set of pronouns prior to learning the feminine set.

A similar pattern of influence from the dominant language can be seen for possessive pronouns. The use of the possessive pronoun "his" increased at about age 5;0. Errors in the use of the pronoun "he" were uncommon, but errors in use of "her" were more common. This result also supports the prediction made by Moore (2001).

There was a significant increase in the use of object pronouns at about 5;0 years, although the actual number of object pronouns used was very low. The results clearly show that further research into the development of pronouns through the primary school years is required to determine how and when their correct use might be expected in SStdE. Extending the study to incorporate predictions based on Rispoli's models (1994, 1998) for ML1 participants across a wider age range may enable much deeper exploration of the process for learning pronouns in English.

Conjunctions

The pattern of increase in expressive abilities in English until approximately 5;0 followed by a plateau in development also appeared in the use of conjunctions. The ML1 participants showed this pattern for use of both coordinating and subordinating conjunctions, also with very few errors in their use. Omission of both conjunction types increased, reflecting the ML1 participants' increased expressive language ability at 5;0 and therefore their increased opportunity to omit the conjunctions. Omission of conjunctions, unless required by the context, is characteristic in Mandarin (Yip & Rimmington, 1997). It is also a feature of SCE (Gupta, 1994), so the increased omission of conjunctions provides further evidence that the ML1 participants were acquiring SCE rather than SStdE in preschool. Furthermore, the very low mean occurrence of errors in the use of both types of conjunctions has clinical significance. This will be discussed further in the next chapter.

To study the acquisition of conjunctions and development of coordination and subordination in SCE and SStdE for the ML1 participants, the age range of the participant sample needs to be extended to include children in primary school. As discussed previously, to determine what conjunctions the participants are able to use,

and how coordination and subordination develops, the method of data collection would need to control for omission if the context is established.

Prepositions

The results of the study for use of prepositions (all prepositions used, as well as use of "down", "on" and "up") by the ML1 participants also demonstrate the increase in expressive language abilities in English at approximately 5;0 years. There is a significant increase in use of prepositions at this age, with use then reaching a plateau through to the end of kindergarten.

The data also support Deterding and Poedjosodarmo's (2001) suggestion that omission and errors in use of prepositions are features of SCE. The ML1 participants, like the EL1 participants, frequently omitted prepositions that would be required in a StdE context, or made errors in the preposition selected. The clinical significance of this is discussed further in the next chapter.

ML1 children's expressive abilities in English throughout the primary school years need to be studied to determine how they acquire SStdE. As the mean occurrence of the 14 different prepositions that occurred in the language samples was relatively low, further research needs to use tasks designed specifically to provide opportunities to use prepositions. It was a possible limitation of this study that the SEAPT may not have encouraged use of prepositions in a large number of participants. Further investigation into the use of a full range of prepositions in preschool and primary school would assist in furthering our understanding of use of prepositions in SCE. This would be clinically useful for planning intervention, and potentially useful in differential diagnosis of language impairment.

Summary of discussion - ML1 participants

The results of this study of the expressive language abilities in English of the ML1 participants are interesting, as they have highlighted many areas where further research is required.

The clearest pattern in the data is of an increase in expressive abilities in English across earlier age groups until approximately age 5;0, followed by an apparent plateau in skills. Whilst a rapid increase in abilities once children have settled into

kindergarten and started to acquire the new language would be expected, the plateau in their expressive skills is interesting as it would be expected that their skills would continue to increase with continued exposure to SStdE. This is one of the key findings of this research as it has powerful educational implications.

It is clear that these children are learning SCE rather than SStdE in kindergarten, as shown by characteristics of the English they were using (e.g. evidence that most morphological markers are not used by the end of kindergarten). It is also clear there is influence of the features of Mandarin on the English they were learning (e.g. use of "already" to marker perfective aspect), some of which is also consistent with the features of SCE (e.g. use of a quantifier to mark plurality). This may account for the apparent plateau in many skills due to the feature of omission of forms usually required in a StdE context (e.g. omission of verb tense marking, omission of subjects and objects if not required by the context, omission of conjunctions when implied by the context etc.). However, it is not clear from whom the children were learning SCE, as the teachers in kindergarten should be using SStdE and it is assumed that Mandarin is spoken in the home (the children were established as being Mandarin dominant).

The implications for learning in an educational environment are clearly significant. The children were being schooled in SStdE, and were expected to rapidly learn the features of SStdE to progress through both kindergarten and school. The results of this study are extremely concerning because the ML1 participants' English skills did not show consistent development, and plateaued at about 5;0 years. Thus there is a clear need for further investigation. The potential impact on learning for these children is enormous, given the fast-paced, SStdE-based education system in Singapore. There is also clearly insufficient information about how typically developing ML1 children learn Mandarin and both forms of English, and how this will impact on their learning in school.

There is an urgent need to further investigate the early development of Mandarin for ML1 children in Singapore, as well as their acquisition of both forms of English from an early age through to adulthood. At the very least, this information is required to inform differential diagnosis between language impairment and language difference. But the most powerful finding of this study is the limited development of skills in

English for the ML1 children. Whilst it is necessary to develop an understanding of the language learning of these children, it is also important to examine educational practices to inform curriculum design and delivery for this group of bilingual children.

Summary

Overall, the results of this study have shown differences in order and acquisition of many aspects of syntax and morphology between the two language groups, and that these aspects of syntax and morphology develop quite differently between the main language groups across different age groups. The main differences between the language groups are summarised in Table 9.3.

It is also clear that throughout the preschool years the EL1 participants were developing SCE with characteristics of SStdE, whilst the ML1 participants were developing SCE and not SStdE. These findings have great implications for schooling for children from these two main language groups. The clinical significance of the information is important as it will assist clinicians in making differential diagnoses between language difference and language impairment. This is discussed in detail in the next and final chapter.

Table 9.3: Summary of results for both main language groups

Feature	EL1	ML1
MLU	significantly higher MLU in words and morphemes than ML1 participants; MLU is comparable with that for StdE.	lower MLU in words and morphemes than for StdE; plateau in MLU from 5;6 until end of kindergarten.
Lexical diversity	number of words and word roots increases across preschool; single word utterances decrease at 5;6; omission of words decreases at 6;6.	single word utterances decrease from 5;0 onwards code switching decreases from 5;0 onwards omission of words increases by 5;0 then remains consistent
Subjects and objects	develop awareness of mandatory nature of subjects in sentences at age 6;6; do not often inappropriately omit an object from their utterances.	do not develop awareness of mandatory nature of subjects in sentences during kindergarten; do not often inappropriately omit an object from their utterances.
Verb morphology	emergence of use of inflectional morphemes at age approximately 6;0; pattern of acquisition differs from other forms of StdE; acquisition for all forms of verb morphology acquired occurs later than for other forms of StdE.	no evidence of emergence of Standard English verb morphology before completion of kindergarten; awareness of the necessity to mark verbs for their completed aspect.
Modals and auxiliaries	dissimilar pattern of use to other forms of StdE with later age of acquisition; use of "is" with the present progressive verb ending "-ing" is context driven in SCE and not mandatory as for StdE; use of "is" auxiliary increased steadily throughout kindergarten; no emergence of future aspect by the end of kindergarten; use of complex verb forms does not emerge at the same rate or time as for other forms of StdE; very few errors in use of auxiliary or copula "is/are".	dissimilar pattern of use to other forms of StdE with later age of acquisition; use of "is" with the present progressive verb ending "-ing" is context driven in SCE and not mandatory as for StdE; no emergence of future aspect by the end of kindergarten; use of complex verb forms does not emerge at the same rate or time as for other forms of StdE; very few errors in use of auxiliary or copula "is/are".
Articles	errors in use of definite and indefinite articles and omission of indefinite articles are rare.	errors in use of definite and indefinite articles and omission of indefinite articles are rare.

Feature	EL1	ML1
Plurals	indicate plurality by quantifier or plural "-s" marker at age 4;0 years; age of acquisition of plural "-s" marker at age 6;0 years; similar pattern of emergence of plurality to other forms of StdE.	no indication of acquisition of the plural "-s" marker; steady increase in use of quantifier across pre-school years.
Possessives	use of the possessive marker similar to other forms of StdE; age of emergence at 6;6.	no evidence of emergence of possessive "-s" at end of kindergarten.
Pronouns	later acquisition of personal, possessive and object pronouns than for StdE; use not fully acquired by end of kindergarten; errors in use of masculine personal pronoun "he" and possessive pronoun "his" uncommon.	later acquisition of personal, possessive and object pronouns than for StdE; use not fully acquired at end of kindergarten; use less feminine personal and possessive pronouns than EL1 participants; make more errors in use of feminine personal and possessive pronouns; errors in use of masculine personal pronoun "he" and possessive pronoun "his" uncommon.
Conjunctions	use of subordinating conjunctions emerges relatively late in comparison with StdE errors in use of coordinating and subordinating conjunctions rare.	omit more conjunctions than the EL1 participants; increased use of coordinating and subordinating conjunctions at age 5;0; plateau in use of co-ordinating conjunctions from 5;0 to end kindergarten; increased use of subordinating conjunctions at age 6;0. errors in use of coordinating and subordinating conjunctions rare.
Prepositions	use of prepositions increases steadily across preschool years; omission and errors in use common.	use of prepositions increases during pre-school until age 5;0 then plateaus; omission and errors in use common.

Chapter 10 Final Discussion: Implications of the Study

For clinicians practising in Singapore, conducting a valid and reliable assessment of children's language skills in order to make an accurate differential diagnosis between language difference and language impairment can be very challenging. Clinicians need to have a good understanding of typical language development for bilingual children for all four of the main languages spoken in Singapore, as well as numerous dialects. Additionally, it can be difficult to fully analyse the child's language environment in a society where young children are often primarily cared for by grandparents or maids. Consequently, a child of SStdE-speaking parents may actually have a main language of Mandarin if cared for by Mandarin-speaking grandparents. Furthermore, there is a stigma attached to the use of dialect rather than Mandarin, and SCE rather than SStdE, which can lead to misreporting of language use in the home to avoid loss of face/embarrassment for the family.

In looking at the English spoken by typically developing English-Mandarin bilingual Chinese Singaporean preschool children, a number of characteristics were identified that may be indicators of language impairment in this population. However, as part of this study, no data were collected for children diagnosed with language impairment. What the results of this study do offer is directions for future research with children with language impairment in that there are characteristic features of the errors made by children from both main language groups with typically developing SCE and SStdE, which may be useful in giving direction when starting to explore possible markers of SLI with this population.

Appendix 1 contains language samples from ML1 and EL1 children from each of the age groups sampled for the study. Samples represent the expected development of their expressive language abilities in English as they progress through kindergarten. These language samples are used to illustrate the points made in this chapter.

Continuing on from the previous discussion in Chapter 9, this chapter focuses on the clinical and educational implications of the study results in the aspects of utterance level, clause level, verb group and phrase level (articles, plural making, possession,

pronouns, conjunctions and prepositions). It also flags the implications for clinical and educational practice, the study's limitations and directions for future research.

Overview of implications for clinical practice

The results of this study have shown there is clearly a need for more information on children's development of the main languages in Singapore, which, in the case of this study, are English and Mandarin. Whilst this study did not aim to provide a comprehensive linguistic description of the English spoken in Singapore by EL1 and ML1 children, it has explored some of the specific characteristics of language that are clinically useful for speech pathologists in the assessment and diagnosis of language impairment. The study results and analysis have led to identification of characteristics that require further investigation with both typically developing and language impaired children.

In addition one of the clearest findings of this study is that the development of English for the EL1 and ML1 participants differs significantly between the groups, and that the development in both groups differs from that of monolingual, StdE-speaking children. Therefore, language assessments designed for other StdE-speaking populations are not appropriate for use in assessing the expressive language abilities in English of English-Mandarin bilingual Chinese Singaporean children in their preschool years. Using commercially available StdE-designed assessments will not elicit valid and reliable results if the assessments are administered and scored according to the instruction manual. Ideally, tests need to be designed specifically for the language group with which they are to be used to elicit reliable information about language comprehension and use that is in line with typical development for that main language group.

The results of this study show that the EL1 children in Singapore do start to acquire SStdE forms in kindergarten, but learn SCE first. The development of SStdE occurs at a different rate than for monolinguals learning StdE. More information needs to be gathered to clearly establish ages of emergence of many aspects of syntax and morphology. It would be misleading to assess EL1 children against acquisition data from other dialects of English. For the ML1 children, the results show that they acquire SCE in preschool. There is no evidence they are using SStdE at this time.

More information needs to be gathered for this group also to facilitate establishment of ages of use of many aspects of syntax and morphology, and to determine why these children are not learning SStdE in the kindergarten environment. The educational implications of these findings will be discussed in more detail in the section titled 'Implications for education and educational practice'.

The assessments of language skills for children from these different language groups needs to be different from the standard assessment if valid information is to be gained. Using a tool standardised for USA or UK populations will not elicit the information that will differentiate when the child is having difficulty with language in comparison to their peers. Obtaining more information about language development in Singapore will enable the design of language assessment instruments suitable for use by the local population. It is also essential to consider that these children are bilingual or multilingual, and language assessment should occur in both/all of their languages in order to establish a clear understanding of their skills. Thus, information on language development for all of the main languages spoken in Singapore is urgently required in order to inform the differential diagnosis of language impairment and language difference.

Thus, the results of the study highlight the themes in the introduction. Clinicians need to assess bilingual and multilingual children in all of their languages in order to make an accurate differential diagnosis (Abudarham, 1987; Adler, 1990; Carter et al., 2005; Holm & Dodd, 2001; Isaac, 2002; Jordaan, Shaw-Ridley, Serfontien, Orelowitz, & Monoghan, 2001; Langdon, 1989; Martin, 2000; Owens, 2004; Paul, 2007; Penn, 1998; Westby, 2000; Wyatt, 2002). But in Singapore there is little information on the acquisition of many languages other than English, which is the case world-wide. There are few locally standardised assessments in the local languages / dialects. There is also a paucity of information on the development of English in bilingual children (Paradis, 2005). Singapore offers a complex multilingual environment in which further study of children's development of English may yield valuable information to advance our understanding of language acquisition.

The assessment of children's language skills in Singapore presents a challenge to the local clinicians. A valid and reliable assessment will need to obtain information using

a variety of elicitation methods. Firstly, the use of standardised assessments designed or adapted for the local population where available will enable clinicians to make a comparison between the child and their peers. This comparison should be supported by information obtained from informal, criterion-referenced assessment based on the clinician's understanding of the development of the child's languages (for example, information for the two main languages for English is summarised in Table 10.2). As little such information is available on the local languages in Singapore, this should also be supported by information obtained through dynamic assessment, employing a test-teach-test methodology that allows the clinician to consider the child's ability to learn language upon instruction.

Having said that, it is important that clinicians are aware of the context-driven nature of SCE and can therefore design assessment tasks that mean the context is not set, or provide explicit instruction and models when testing to encourage the children to use all structures explicitly. Omission of structures in SCE and SStdE in itself is not sufficient to make a diagnosis of language impairment because of the nature of the languages. Instead, impairment is the inability to use the structure at all, even with clear prompts, models and instruction.

The results of this study have highlighted some structures and forms that may be markers of language impairment in Singapore. The possible clinical indicators of language impairment for preschool children aged between 3;9 and 6;8 years are summarised in Table 10.1.

[1]**Table 10.1: Possible clinical indicators of language impairment for Chinese Singaporean preschool children aged 3;9-6;8 years**

EL1 & ML1	EL1 specific	ML1 specific
At any age: Inappropriate object omission Errors in use of present progressive "-ing" marker Omission of present progressive "-ing" marker Errors in use of auxiliary and copula "is" Definite articles – errors in use Indefinite articles – errors in use or omission Errors in use of personal pronoun "he" Errors in use of possessive pronoun "his" Errors in use of coordinating conjunctions Errors in use of subordinating conjunctions	Absence* of plural marking (by quantifier/ plural "-s" marker) after 4;0 Absence or errors with plural "-s" marker after 6;0 Errors in use of past participle after 5;6 Errors in use of prepositions after 5;6 Errors or absence of possessive marking after 6;6	Continued code switching after 5;0 (when speaking to a non-Chinese adult) No increase in MLU by age 5;6 Continued use of mainly single word utterances from 4;6 No marking of plurality using quantifier by 5;6

*It is important to note that omission in itself may not be of concern, but omission where required by context would be of concern.

Table 10.2: Language characteristics of EL1 and ML1 children by age

AGE	EL1	ML1
Prior to nursery	• definite article "the" • personal pronoun "he" • coordinating conjunctions • use of prepositions "down / in / on"	
3;9 – 4;2		
4;3 – 4;8		
4;9 – 5;2		<u>Large increase then plateau in</u>: • MLU (words & morphemes) • word roots • total words used • definite article "the" • indefinite article "a" • use of "already" to indicate perfective aspect • use of personal pronoun "he" • use of coordinating conjunctions • use of subordinating conjunction "because" • use of prepositions "down", "on" • increased omission of 3rd person singular "-s" verb ending • increased omission of regular past tense "-ed" verb ending • increased omission of conjunctions • decrease in code switching
5;3 – 5;8	• decrease in omission of 3rd person singular "-s" verb ending • decrease in omission of plural "-s" marker • decrease in errors in preposition use + more consistent use of prepositions • very few single word utterances used	

5;9 – 6;2	• present progressive "-ing" verb ending • regular past tense "-ed" verb ending • irregular verb forms • plural "-s" marker & quantifier to indicate plurality • possessive pronoun "her" • subordinating conjunctions "because" & "to"	• use of subordinating conjunction "to"
6;3 – 6;8	• perfective "has" starts to emerge • possessive "-s" marker starts to emerge • large increase in use of "and" • preposition "for"	• use of prepositions "for", "in"
Steady increase with age	• MLU (words and morphemes) • word roots in a language sample • total number of words in a language sample • indefinite article "a" • auxiliary verb "is"	• auxiliary verb "is" • quantifiers to indicate plurality • errors in prepositions

Clinical implications of the study

The results obtained from this study show that there are significant differences in the expressive language abilities in English of the children from EL1 and ML1 backgrounds. Whilst the EL1 participants are acquiring SStdE, there are differences in rate of acquisition of morphosyntax in comparison with monolingual speakers of StdE. For the ML1 participants, however, the children are learning SCE rather than SStdE. Their English is characterised by an increase in expressive abilities across earlier age groups until approximately age 5;0, followed by an apparent plateau in

skills. These results have implications for Speech Pathologists working with this population. These are now discussed in detail.

Utterance level

For the ML1 participants, the increase in MLU and increase in fluency of production (measured by the decrease in single words and increase in number of utterances used to describe the pictures, as well as reduced code switching) at 5;0 was a marked pattern. This can be seen in the language samples from Participants P206, P200, P4 and P33 in Appendix 1, where the increase in length of utterance and fluency of production is clearly different between the children in age groups 1 and 2 in comparison with the more fluent in English children from age groups 3 and 4.

Thus, there is clinical significance if a Mandarin dominant child attending kindergarten and being exposed to English continues to have difficulties with their fluency in English past 5;0 years (e.g. continue to code switch, use a large number of single word utterances etc.). Such continued difficulties may indicate difficulties learning English as a second language, or could indicate language impairment. Further assessment in both languages would be required to make the differential diagnosis.

Clause level

Subject and object omission

With regard to subject omission, for the EL1 participants the results show that by the end of preschool they have developed an understanding of the obligatory nature of subjects when required by the context. Therefore, if a child older than 6;6 continues to omit subjects required by context, this may be indicative of language impairment and would warrant further investigation.

It is important to note that omission in itself may not be of concern, but omission where required by context would be of concern. The language sample from P35 (see Appendix 1), shows that this participant omitted the object of the sentence once the context was established by the previous utterance (picture 10 “All the thing fall down. The girl take [omitted object) for him”). On other occasions however, the object is used because the context has not been clearly established (e.g. picture 7 “Carry the baby to see the clown”). This participant also omits subjects when not

required by the context (all responses where the question to elicit the response has contained the subject) but uses them when required by the context (picture 10 "All the thing fall down. The girl take for him"). The importance of distinguishing between omission and inability to produce a structure is critical in the assessment process, a point that will be discussed in more detail later in this chapter.

For both main language groups, the inappropriate omission of objects required by the context could be indicative of language impairment. The results show that errors of omission of objects from obligatory contexts were uncommon, therefore this error pattern warrants further investigation; it may be characteristic of children with language impairment. As discussed in the previous chapter, further research is needed to explore occurrence of this type of error pattern for children with typically developing language, as well as children with language impairment.

Verb group

Omission of verb morphology in general is consistent with the characteristics of SCE. The data show that omission, and errors in use, of the present progressive "-ing" marker were uncommon for both language groups. Thus, these errors may be markers of language impairment.

This needs further exploration, and once again, it will be important to ensure that context has not been established (i.e. by using materials where it would be obligatory to define the context, rather than where context can be inferred) in order to determine when the "-ing" marker and the auxiliary form of "to be" are used. An EL1 child aged 6;3 (see P78, Appendix 1) demonstrates the ability to use the auxiliary "is" and the "-ing" marker correctly (picture 4 "The man is riding on a bridge"), but there is an occasion where the "-ing" marker is omitted (picture 1 "she is play__ with her doll"). As can be seen in the other samples from the EL1 participants, it was not common to omit the "-ing" marker when the auxiliary verb was used. This error made by P78 may just be an artefact of the test situation, as it is not highlighted as a common error type in the overall data. The sample from P78, however, shows frequent occasions where the "-ing" marker is used in the absence of the auxiliary "is" (picture 2 "She __ giving her mother the book"; picture 8 "He __ climbing up the chair and he want to take his boat"), which is consistent with the data from all participants.

With the auxiliary "to be" and copula "to be", errors in use (i.e. in agreement between the noun and the conjugation of the verb) were uncommon (e.g. "the girl are running"). This supports Gupta's (1993) findings and suggestion that this type of error might indicate language impairment for children from both language groups. Whilst the group data did not show errors of this type occurring often, there were some examples in the language samples (e.g. P35, EL1 aged 5;5, picture 8 "The boat are on the fridge"). Study of the use of auxiliary and copula verbs by children with language impairment, as well as further study of their use by children with typically developing language, is required to determine whether errors in agreement are characteristic of language impairment.

The results also show that the past participle is used correctly by EL1 participants at approximately 5;6, the ML1 participants start to use them more frequently at 5;0 and errors in use of past participles are uncommon for either language group. However, it seems likely that this result was obtained from a very small number of past participle targets, and the use of "got" was probably not used truly in its past participle form, but rather to indicate possession (as in "the boy has a star" as opposed to "the boy has got a star"). Thus, errors in use of "got" may be indicative of language impairment. It would be expected to see some correct use of frequently occurring past participles in the language samples of an EL1 child at 5;6 (particularly "got" and "broken"). This is exemplified in the language sample from P78 in which both "broke" and "broken" are used correctly. This suggests correct use of past participles by this EL1 child aged 6;3 (picture 6 "Then she broke her specs" and picture 10 "The boy the bag is broken and the pencil sharpener and the book drop and the girl want to pick it up").

For the, Whilst the ML1 participants did not develop use of any other verb morphology (other than present progressive "-ing"), the data provide evidence of the ability to mark verbs for completed aspect using "already" (e.g. P67, ML1 aged 6;5, picture 10 "The bag spoil already", see Appendix 1). Thus, an absence of indication of completed aspect in a situation where the context would require such marking may be indicative of language impairment for Mandarin dominant children.

Phrase level

Articles

Whilst the method of language sampling perhaps limited detailed study of the use of articles (see Chapter 9), the data obtained show that errors in use of definite and indefinite articles were uncommon, as were omissions of the indefinite article. These patterns may be indicators of language impairment, and support Gupta and Chandler's (1994) findings on the disordered use of articles in a child with SLI. As outlined in Chapter 9, this warrants further study to clearly identify patterns of development and use for both main language groups.

On considering the language samples elicited, further information on the development of use of articles is required, particularly for the ML1 participants. The EL1 participants made no errors in article use (see Appendix 1). However, P4 (see Appendix 1), a ML1 child aged 4;11, made no errors of omission but made errors in article use. The definite article "the" is used correctly but there are a number of utterances where the indefinite article "a" is used where the definite article would be more appropriate (picture 8 "He climb a chair and he take a boat. That is a door". Only one chair, boat and door pictured, thus "the" would be more appropriate). This could be due to the influence of Mandarin on this child's English. Mandarin has no definite and indefinite articles, and there is evidence to suggest that articles are difficult to acquire if the main language does not have them, resulting in errors of omission where required, mixing of definite and indefinite articles, and/or overuse where a bare noun would be expected (White, 2008).

Plural marking

For the indication of plurality, the results show that the ML1 children used quantifiers (e.g. "two star") to indicate the plural nature of the noun. Thus, an absence of marking plurality in this way at age 5;6 when required by the context could be indicative of language impairment for ML1 children. This is shown in the language samples in Appendix 1 where the children under 5;0 (P206, P200 and P4) all use the singular "star" in response to picture 5, but the older children (P33 and P65) use "two star". P67, aged 6;5, used the singular "star". This is likely to be an artefact of the test situation for this child because, despite no noun plural marking, there is evidence of well developed English language skills in the joining of clauses

(picture 8 “He stand on the chair and take on the ... take boat”) and past tense (picture 6 “fell down”), “already” to indicate past tense (picture 10 “The bag spoil already”), and past participle use (picture 5 “got star”).

There should be evidence of marking the noun for plurality whether with the “-s” marker or a quantifier at 4;0 years for EL1 children, with use of the plural”-s” marker established by 6;0 (see language samples in Appendix 1 for evidence of noun plural marking for all EL1 participants). Continuing errors or omission in an obligatory context after 6;6 may be indicative of language impairment.

The other interesting thing to note from the language samples in Appendix 1 is the inconsistency in plural marking between individuals (e.g. P206, ML1 aged 3;11, picture 6 “Glasses. Stairs”; P4, ML1 aged 4;11, picture 6 “spectacle_”; P214, EL1 aged 4;0, picture 2 “Buy books”; picture 6 “Fall down the stairs. His spectacle_ drop and break”). As mentioned in the previous chapter, further study of plural marking is required, allowing collection of sufficient data for the three phonetic realisations of the plural ‘-s’ marker; /əz/, /z/, /s/.

Possession

For possession, the data show that the EL1 children were able to mark the noun using the “-s” marker for possession at 6;6. Thus, as for plural marking, ongoing errors or omission in use of the marker (where required by the context) after 6;6 may be another indicator of language impairment. There are no examples of marking for possession in the language samples included in Appendix 1, although possession is indicated through use of possessive pronouns. This will be discussed later in this chapter.

For the ML1 participants, however, the use of the marker did not emerge before the completion of preschool, with the children marking nouns for possession from context alone (e.g. “the girl doll”). Examples of this type of marking for possession can be seen in Appendix 1 (P33, ML1 aged 5;3, picture 9 “The boy snatch the girl doll”; picture 10 “The boy bag have one hole”; P65, ML1 aged 6;1, picture 1 “The girl bear”).

Pronouns

For pronouns, the ML1 participants were found to use mainly masculine gender pronouns (i.e. "he" and "his") and to make errors with feminine pronouns (see Chapter 8) (e.g. P67, ML1 aged 6;5 self-corrects a gender error for picture 2 "He mother... She mother put the book", but selects the incorrect feminine pronoun). However, for both language groups, errors with "he" and "his" were found to be uncommon. Thus, this type of error may be indicative of language impairment in both main language groups. Further examples of pronoun use can be seen in Appendix 1 (e.g. P67, ML1 aged 6;5, picture 8 "He stand on the chair and take on the ... take boat"; P214, EL1 aged 4;0, picture 10 "The boy drop the pencil and the girl taking books. Drop his things.").

Conjunctions

As outlined by Gupta (1994), conjunctions are often implied by the context of the sentence in SCE. Examples are in the language samples in Appendix 1 (e.g. P33, ML1, aged 5;3, picture 2 "Girl pass to the woman the woman put on the drawer"; P65, ML1, aged 6;1, picture 7 "The mother take the baby want see the balloon"; P8, EL1, aged 4;9, picture 10 "And then the boy walks the book drop"). However, the data show that errors in co-ordinating and subordinating conjunctions were rare. Thus, errors rather than omission may be indicative of language impairment for both main language groups.

Prepositions

The data from the EL1 and ML1 participants support Deterding and Poedjosodarmo's (2001) suggestion that omission and errors in use of prepositions are features of SCE. Examples of both omission and errors in use are in the language samples in Appendix 1 (e.g. P4, ML1, aged 4;11 "Balloon go to the fan"; P8, EL1 aged 4;9 "Climbing __ a chair", P84, EL1 aged 5;10 "on upstairs the drawer").

It was stated in Chapter 8 that there were insufficient data to obtain a clear picture of the omission and use of prepositions for EL1 and ML1 children. However, from the data obtained, it is clear that for both EL1 and ML1 children frequent omission of prepositions where use is required in a StdE context and errors in use of prepositions would not necessarily be indicative of language impairment.

Summary of clinical implications

Whilst the above examples provide possible indicators of language impairment for EL1 and ML1 Chinese Singaporean preschool children, study of the language samples from children with language impairment is required to further explore the characteristics of their language use. As discussed in the previous chapter, much information needs to be gathered in a systematic way to further our understanding of the typical development of English for EL1 and ML1 children in Singapore. It is also necessary to obtain detailed language samples from children identified or suspected of having language impairment in order to facilitate diagnosis and broaden understanding of language impairment with these populations. This would enable study of these potential markers of language impairment to determine whether they are in fact clinically useful in the differential diagnosis between language impairment and language difference.

Implications for education and educational practice

The results of this study have clear implications for the clinical practice of Speech Pathologists. Additionally, however, the results of this study are extremely concerning with regard to the ML1 participants' English skills, which do not show consistent development and plateau at about 5;0 years. This finding has considerable implications for education and educational practice in Singapore.

At present, children in Singapore receive a bilingual education, with the majority of the curriculum delivered in SStdE and some instruction in their "mother tongue", which is the language of the father's ethnic background (i.e. a child with a Chinese father will have instruction in Mandarin). However, the findings of this study suggest that Mandarin dominant children in kindergarten are not showing development of their expressive abilities in English from approximately 5;0 until 6;6. The reason for this is not clear and requires further investigation. It is also not clear why these children appear to be learning SCE rather than SStdE, when the language of instruction is meant to be SStdE.

Furthermore, as the school curriculum is delivered at a rapid pace in Singapore, with few opportunities for children falling behind to catch up with their peers, the potential impact on learning for these Mandarin dominant bilingual children is

enormous. Further information is required in order to develop an understanding of these children's language abilities in English and Mandarin in all aspects of language (e.g. including receptive abilities), and how they develop across primary schooling. This will further our understanding of their learning needs, and allow for curriculum design and delivery that reflects the needs of this group of bilingual students.

A solid foundation in oral language skills is required for the attainment of literacy (Justice et al., 2008). It is possible that the early learning environment in Singapore may require an approach that emphasises an oral language-rich curriculum in order to provide the foundation skills that children need to achieve literacy in English (Justice et al., 2008). The preschool curriculum, its delivery and the language environment of the classroom need to be examined to determine whether they are effective in increasing English proficiency for ML1 children.

There is an urgent need to investigate further the development of Mandarin, the acquisition of both forms of English from an early age through to adulthood for ML1 children in Singapore, and the educational practices that support learning in preschool and school. This is required to inform curriculum design and delivery for this group of bilingual children.

The results of this study have yielded information that may help to inform the process of diagnosis. Importantly, it also provides suggested directions for future research. However, there were some limitations of this study that need consideration when designing future research.

Limitations of this study and directions for future research

A major strength of this study has been the number of children involved. However, one of the main limitations was that it was a "snapshot", cross sectional study which was not able to reflect the individual pathways in development of English for the participants. Whilst general patterns in English acquisition between age groups can be reported on, it is not possible to determine the pattern of development of English using this study design because it is not possible to look at the development of skills over time. A range of approaches is necessary in order to study language development in this context to obtain a clearer picture of the development of language skills in the main language groups. For example, a longitudinal study

tracking children's development of English throughout kindergarten would enable analysis of development over time.

Furthermore, this study has considered only the emergence of aspects of SCE and SStdE syntax and morphology. There are many other areas of language development, none of which have yet been examined in Singaporean children. For example, further studies into the receptive abilities in English for this population would also inform clinical and educational practice. There have been studies of expressive vocabulary in English-Mandarin bilinguals (Rickard Liow et al., 1992; Teoh et al., 2009) but no studies of receptive vocabulary development. Studies into language use in such a pragmatic language environment may also yield interesting results. Thus, broader studies of all aspects of language development are necessary to inform understanding of language development for these main language groups.

In terms of data collection, one of the main limitations for this study was the use of a picture description task to elicit language samples. Whilst this enabled a broad look at children's abilities to describe pictures in English using a commonly used clinical assessment task, the nature of the pictures meant there were limitations on the use of some English morphosyntax. It is possible, too, that the SEAPT in particular yielded limited information on morphosyntax, and this should be considered in future studies.

From the results obtained, and as discussed in the previous chapter, further investigation into many areas has been suggested. A summary is provided in Appendix 3.

In any further investigations, it is important that the methodology for eliciting the information should be designed specifically to elicit the target structure. For example, it has been suggested that further examination of MLU in English for both EL1 and ML1 participants would be a useful measure to further investigate, but to do so it would be good to collect data in a way that will allow comparison with data from speakers of StdE. Another example is that a more extensive language sample would also allow for better analysis of the use of prepositions in SCE and SStdE. In this study, the mean occurrence of all prepositions was relatively low in the language

samples obtained, and further investigation into the use of prepositions would be required to determine their pattern of acquisition.

Another limitation of this study was the absence of a clear-cut approach to determining language dominance. There have been some recent studies into determining language dominance for adults in Singapore (Lim, Rickard Liow, Lincoln, Chan & Onslow, 2008) and some early work into adapting this method for children (Tan, 2008; Ho, 2008). With these methods available, future studies should utilise a more standardised approach to determining language dominance for the participants, ensuring a clearer picture of the participants' language abilities.

A further limitation of this study was the age range of the participant sample. This limited the study of the acquisition of the forms of English spoken in Singapore. Widening the age range to include younger children would allow for exploration of the early characteristics of SCE and SStdE (e.g. emergence of marking for plurality and the emergence of use of conjunctions for EL1 participants), which were not examined in this study because the youngest participants for this study were 3;9 and plurals and conjunctions were already being used on commencing at preschool.

It is also apparent that the English development of the ML1 children needs to be tracked beyond the ages in this study to determine when the main characteristics of SStdE are acquired. Therefore, widening the age range to include children in primary school would also be important. For example, the results suggest that further investigation into the acquisition of verb morphology for all school-aged Chinese Singaporean children is warranted, as not all SStdE verb morphology has developed by the end of preschool.

However, for all children, but particularly for the ML1 participants, further study of their expressive language abilities in English during primary schooling is vital. The results of this study show there is significant semantic development and increase in length of utterance in English by approximately age 5;6 but that the ML1 children's expressive language abilities in English then appear to plateau. This result was repeated in many different areas, such as verb morphology, use of prepositions and use of conjunctions. The plateau in the development of the English language abilities of ML1 participants from age 5;6 onwards contrasted sharply with the ongoing

development made by the EL1 participants. Further study across a wider age range would allow for investigation into the acquisition of different aspects of the syntax and morphology for the ML1 participants, and the relationship between the development of these characteristics and the use of SStdE as the medium of teaching in the classroom.

One final limitation of this study, mentioned briefly at the outset, is that data were collected only for English-Mandarin bilingual children. Whilst Chinese speakers represent approximately 75 percent of the Singaporean population (Leow, 2000), it is important to remember that there are four official languages in Singapore (English, Mandarin, Malay and Tamil) and that the majority of the population are bilingual or multilingual in two or more of these languages. The language environment is multifaceted, and there is complex interplay between the languages, with characteristics of all languages influencing the lingua franca, English (Gupta, 1994). Thus, future studies should also encompass the development of children's languages from all of these main language groups.

In conclusion, the main findings of this study are that:

- assessment tools designed for monolingual children from other countries will not provide a representative picture of Chinese Singaporean English-Mandarin bilingual preschool children's language abilities in English;
- there are differences in the sequence of acquisition of the syntax and morphology of English for both EL1 and ML1 children, with EL1 children acquiring aspects of SStdE and ML1 children acquiring SCE;
- there is a need for more information on children's development of the main languages in Singapore to inform assessment practices and differential diagnosis between language difference and language impairment;
- the acquisition of expressive syntax and morphology of English for ML1 children appears to show initial development in the early stage of kindergarten, but then appears to plateau, with little change in skills seen in children aged between 5;0 and 6;8 but this finding should be regarded with caution until further studies have been conducted.

This study has achieved the goal of performing an initial investigation into some of the specific characteristics of language that are clinically useful for speech pathologists in the assessment and diagnosis of language impairment in Singapore. This study has also highlighted many future research projects. It is hoped that it has furthered understanding of the development of children's English in Singapore and of the complex factors to be considered when assessing the language skills in such a complex, multilingual environment.

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Appendix 1 Language Samples from ML1 and EL1 Children

Participant 206 ML1 3;11 (age group 1)

SEAPT picture	Child's response
1	Girl. Play doll.
2	Put book. Mum.
3	Fan.
4	Bicycle. Road.
5	Take paper. Star.
6	Fall. Glasses. Stairs.
7	See the clown. Mummy.
8	Take boat. Take chair. Table.
9	Boy doll. Cry.
10	Take book. Drop pencil. Bag.

Participant 200 ML1 4;6 (age group 2)

SEAPT picture	Child's response
1	Bear.
2	Books. Mummy.
3	Flan.
4	Bicycle.
5	Book. Star.
6	Fall down.
7	Baby. Balloon.
8	Chair.
9	Baby. XXX[Mandarin – "cry"].
10	Pencil. Mummy.

Participant 4 ML1 4;11 (age group 3)

SEAPT picture	Child's response
1	Take the doll.
2	Take the story book put in the thing. Cupboard.
3	Balloon go to the fan. Then he tie there.
4	Ride bicycle. Go to the bridge.
5	He take the paper. He got... inside got the star. Star.
6	Fall down. Then the spectacle also broke already.
7	Take the people. A baby. Carry. See.
8	He climb a chair and he take a boat. That is a door. Yes.
9	Cry. Then the boy take the doll.
10	The pencil drop down and the eraser drop down. And the book. The bag broke. Then the girl take the book.

Participant 33 ML1 5;3 (age group 4)

SEAPT picture	Child's response
1	Carry doll.
2	Put the book. To the drawer. Girl pass to the woman the woman put on the drawer.
3	Tie on the fan.
4	Ride bicycle. Over the bridge.
5	Do spelling. Two star. He have two star.
6	The girl slip over the staircase. The spectacle drop. And spoil.
7	Carry the baby. To see the clown.
8	Take the chair climb up to take the boat. On the drawer.
9	The girl crying. The boy snatch the girl doll.
10	The boy bag have one hole. All the thing drop down. One girl help him to pick up.

Participant 65 ML1 6;1 (age group 5)

SEAPT picture	Child's response
1	The girl bear.
2	Girl take book give Mummy. Take book and XXX...
3	The balloon is tie... this.
4	Man bike. Play the bicycle.
5	Is take paper. Two star.
6	The girl fall down he... Fall down. Then no more.
7	The mother take the baby want see the balloon.
8	The boy want to take the thing. Take chair is go up thing. Take thing.
9	This girl cry. The barbie doll give him. Oh! The brother take the barbie doll.
10	The girl... The book drop down. The pencil drop down and eraser drop down. The bag. Pluck.

Participant 67 ML1 6;5 (age group 6)

SEAPT picture	Child's response
1	The girl… the girl carry the doll.
2	He mother... She mother put the book. In the drawer.
3	The fan blow the balloon. Tie. No.
4	The man... Ride the bicycle.
5	The man take the paper. Got star.
6	Fell down. Spectacle. Down on the floor. You walk down.
7	Carry the baby see. He want to take balloon.
8	He stand on the chair and take on the ... take boat. The drawer.
9	Cry. The boy take her barbie doll.
10	The bag spoil already. The pencil eraser book fell down. The girl take. Pluck.

Participant 214 EL1 4;0 (age group 1)

SEAPT picture	Child's response
1	Taking a doll.
2	Buy books. Borrow books.
3	Tie on the fan.
4	Riding the bicycle. On the bridge.
5	Star. Two star.
6	Fall down. Fall down the stairs. His spectacle drop down and break.
7	Take the children there and see the clowns.
8	Taking a yacht and standing on the chair. On the cabinet.
9	Crying because the boy take her doll.
10	The boy drop the pencil and the girl taking books. Drop his things.

Participant 204 EL1 4;3 (age group 2)

SEAPT picture	Child's response
1	Taking doll.
2	Keep the book. Mummy keep the book.
3	Flying. Blowing. Fan.
4	Riding bicycle.
5	Two star.
6	Fall down. Spectacles broke.
7	Carrying baby. See clown.
8	Climbing up in the chair. Want to take the toys.
9	Crying. The brother take her doll.
10	The boy pencil and book drop. Pencil drop. The girl take her book.

Participant 8 EL1 4;9 (age group 3)

SEAPT picture	Child's response
1	The girl carrying with the doll.
2	Put the book in. Put all the book in.
3	Flying away. Tie.
4	Riding bicycle. Riding. Going to that way.
5	Write... write the homework. Finish up. And two star.
6	Her spectacle drop. And then she fall down.
7	See a clown. Baby to see.
8	Want to take a boat. The shoes. Climbing a chair.
9	Crying. This boy go and take the doll.
10	The bag torn. And then the boy walks the book drop. Then the girl take the book.

Participant 35 EL1 5;5 (age group 4)

SEAPT picture	Child's response
1	Carrying the doll.
2	Take the books. Put in the cupboard.
3	Fan it. Tie.
4	Driving. Sitting on a bicycle. Riding on a bridge.
5	Work. Two stars.
6	Fall down broke the spectacles. On the staircase.
7	Carry the baby to see the clown.
8	Take... take the...the boat. Climbing the chair. The boat are on the fridge.
9	Cry the brother take her doll.
10	Drop. Broken. All the thing fall down. The girl take for him.

Participant 84 EL1 5;10 (age group 5)

SEAPT picture	Child's response
1	Carry her doll.
2	Put... She... She is giving the book to her mother. Her mother is putting the book inside the drawer.
3	Tied to in the fan.
4	Cycling to his...his bicycle. Cycling on the... on the bridge there.
5	Put the star...put the stars on his paper.
6	Fall down and broke her spec... Her glasses. She fall on the staircase.
7	Carried the baby. Carrying the baby. To... Because the baby wants to see the clowns.
8	Um standing on a chair he is going to take his boat. On...on upstairs the drawer.
9	Crying because the boy snatching her doll.
10	The boy dropped his book the pencil the sharpener and the rubber. The girl...the girl pick up the things.

Participant 78 EL1 6;3 (age group 6)

SEAPT picture	Child's response
1	She is...she is play with her doll.
2	She giving her mother the book. Then her mother go and put inside the shelf.
3	The balloon tie up on the fan.
4	The man is riding on a bridge.
5	He got stars.
6	She fall... She fall on the staircase. Then she broke her specs.
7	The mother carrying the baby. The people all seeing the clown.
8	He climbing up the chair and he want to take his boat. Upstairs the cupboard.
9	She crying. He go to take her doll away.
10	The boy the bag is broken and the pencil sharpener and the book drop and the girl want to pick it up.

Participant Language impaired 1 EL1 4;5

SEAPT picture	Child's response
1	Girl.....baby. Hand.
2	Girl book mummy. Jie Jie book keep
3	Boom... in the fan. Need the balloon, the goes.
4	Ride bicycle. Baby duck.
5	Stars. Newspaper. Stars.
6	Fall down. XXXX Glasses.
7	Carry... XXX balloon. Boy. Balloon... clowns.
8	Take the boat. Chair XXX (echolalia) Chair
9	Cry Girl Boy Baby.
10	Walking. Pencil....book. Fall down. Boy...girl...cow.

Appendix 2 Additional Statistical Information

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
MLU words – group	24.085	.000	.204	1	2.621	3.484
				2	3.043	3.886
				3	4.091	4.871
				4	4.299	5.130
				5	4.826	5.673
				6	5.465	6.324
MLU words – language	50.528	.000	.097	EL1	4.851	5.339
				ML1	3.618	4.097
MLU words - groupxlanguage	2.971	.012	.031	1	3.299	4.513
				2	1.584	2.814
				3	3.729	4.959
				4	2.008	3.162
				5	3.969	5.071
				6	3.890	4.993
MLU morphemes – group	24.820	.000	.209	1	2.822	3.753
				2	3.277	4.187
				3	4.334	5.175
				4	4.626	5.523
				5	5.247	6.160
				6	5.928	6.855

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
MLU morphemes – language	67.083	.000	.125	EL1	5.329	5.856
				ML1	3.797	4.313
MLU morphemes - groupxlanguage	2.999	.011	.031	1	3.597	4.906
				2	1.661	2.987
				3	4.076	5.403
				4	2.102	3.347
				5	4.268	5.458
				6	4.051	5.240
% 1 word utt – group	23.165	.000	23.165	1	31.713	40.941
				2	26.846	35.855
				3	12.238	20.570
				4	6.212	15.092
				5	9.753	18.801
				6	5.810	14.989
% 1 word utt – language	95.887	.000	95.887	EL1	-21.864	-14.556
				ML1	14.556	21.864
% 1 word utt - groupxlanguage	9.467	.000	9.467	1	10.679	23.643
				2	48.924	62.062
				3	7.715	20.853
				4	42.252	54.583
				5	5.426	17.209
				6	15.599	27.382

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
% utt om – group	4.223	.001	.043	1	67.015	74.588
				2	69.467	76.859
				3	75.364	82.200
				4	77.426	84.713
				5	71.546	78.971
				6	69.776	77.308
% utt om – language	15.097	.000	.031	EL1	76.260	80.541
				ML1	70.372	74.571
% utt om - groupxlanguage	12.239	.000	.115	1	78.295	88.932
				2	52.599	63.379
				3	76.785	87.565
				4	59.093	69.210
				5	77.040	86.708
				6	70.856	80.524
Word roots – group	39.882	.000	.298	1	27.126	33.027
				2	30.397	36.157
				3	42.293	47.620
				4	45.543	51.221
				5	47.287	53.072
				6	49.740	55.610

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Word roots – language	114.374	.000	.196	EL1	47.948	51.285
				ML1	35.263	38.535
Word roots - groupxlanguage	4.080	.001	.042	1	35.171	43.460
				2	16.638	25.038
				3	38.854	47.254
				4	19.558	27.442
				5	44.037	51.571
				6	38.342	45.876
Total words – group	25.359	.000	.213	1	50.547	65.633
				2	56.519	71.245
				3	81.538	95.157
				4	85.277	99.792
				5	93.310	108.10
				6	95.971	110.97
Total words – language	59.241	.000	.112	EL1	91.939	100.46
				ML1	68.624	76.989
Total words - groupxlanguage	4.840	.000	.049	1	67.747	67.747
				2	27.100	27.100
				3	74.478	74.478
				4	32.469	32.469
				5	80.848	80.848
				6	76.587	76.587

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Total bound morphemes – group	11.528	.000	.109	1	3.343	5.503
	156.816	.000	.251	2	3.744	5.852
	2.474	.032	.026	3	4.362	6.312
				4	5.718	7.796
				5	7.608	9.726
				6	7.303	9.452
Total bound morphemes – language	156.816	.000	.251	EL1	8.508	9.730
				ML1	3.069	4.267
Total bound morphemes - groupxlanguage	2.474	.032	.026	1	5.167	8.201
				2	.625	3.700
				3	5.868	8.943
				4	.747	3.634
				5	5.338	8.096
				6	2.577	5.336
Total omitted words – group	4.282	.001	.044	1	15.114	18.779
				2	16.243	19.822
				3	18.617	21.926
				4	19.923	23.450
				5	17.331	20.925
				6	15.276	18.922

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Total omitted words – language	45.107	.000	.088	EL1	20.305	22.378
				ML1	15.364	17.397
Total omitted words - groupxlanguage	10.090	.000	.097	1	21.373	21.373
				2	7.337	7.337
				3	20.337	20.337
				4	10.670	10.670
				5	19.921	19.921
				6	15.943	15.943
Code switch – group	2.819	.016	.029	1	.261	.658
				2	.057	.443
				3	-.146	.211
				4	-.069	.313
				5	-.104	.284
				6	-.172	.222
Code switch – language	16.706	.000	.034	EL1	-.112	.112
				ML1	.216	.436
Code switch - groupxlanguage	2.819	.016	.029	1	-.278	.278
				2	-.282	.282
				3	-.253	.253
				4	-.271	.271
				5	-.275	.275
				6	-.286	.286

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Errors word order – group	1.756	.121	.018	1	.063	.336
				2	-.003	.263
				3	.192	.438
				4	.203	.465
				5	.046	.313
				6	.195	.466
Errors word order – language	.070	.792	.000	EL1	.178	.332
				ML1	.165	.316
Errors word order - groupxlanguage	1.041	.393	.011	1	.046	.428
				2	-.005	.383
				3	.043	.391
				4	.214	.586
				5	-.061	.317
				6	.165	.558
Inappropriate subject omission – group	4.260	.001	.043	1	1.639	2.583
				2	2.242	3.164
				3	1.954	2.807
				4	2.128	3.037
				5	1.332	2.258
				6	.967	1.906

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Inappropriate subject omission – language	5.409	.020	.011	EL1	2.122	2.656
				ML1	1.685	2.208
Inappropriate subject omission - groupxlanguage	2.879	.014	.030	1	2.153	3.479
				2	.733	2.077
				3	2.733	4.077
				4	1.369	2.631
				5	1.897	3.103
				6	1.658	2.864
Subject omission – group	3.509	.004	.036	1	3.406	4.917
				2	3.491	4.965
				3	4.514	5.877
				4	5.315	6.768
				5	4.119	5.599
				6	3.911	5.414
Subject omission – language	34.519	.000	.069	EL1	5.325	6.179
				ML1	3.545	4.383

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Subject omission - groupxlanguage	2.756	.018	.029	1	4.992	7.113
				2	1.195	3.345
				3	4.357	6.507
				4	2.015	4.033
				5	5.145	7.073
				6	3.319	5.247
Inappropriate object omission – group	2.163	.057	.023	1	.603	1.277
				2	.719	1.378
				3	1.250	1.859
				4	.910	1.559
				5	1.003	1.664
				6	.635	1.306
Inappropriate object omission – language	.408	.523	.001	EL1	1.033	1.414
				ML1	.950	1.324
Inappropriate object omission - groupxlanguage	2.828	.016	.029	1	.974	1.921
				2	-.048	.912
				3	.736	1.696
				4	.430	1.331
				5	1.157	2.017
				6	1.091	1.952

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Object omission – group	6.887	.000	.068	1	-.106	.398
				2	-.027	.464
				3	.360	.814
				4	.585	1.069
				5	.663	1.157
				6	.575	1.075
Object omission – language	.018	.893	.000	EL1	.450	.735
				ML1	.439	.718
Object omission - groupxlanguage	1.186	.315	.012	1	-.169	.538
				2	-.250	.466
				3	-.088	.629
				4	-.170	.503
				5	.287	.930
				6	.244	.887
Total omitted bound morphemes – group	4.662	.000	.047	1	9.678	12.328
				2	10.405	12.991
				3	13.565	15.957
				4	12.674	15.224
				5	11.419	14.017
				6	11.488	14.123

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Total omitted bound morphemes – language	.849	.357	.002	EL1	11.827	13.326
				ML1	12.334	13.803
Total omitted bound morphemes - groupxlanguage	13.194	.000	.123	1	11.902	15.624
				2	6.357	10.129
				3	12.438	16.210
				4	7.301	10.842
				5	12.743	16.126
				6	13.395	16.778
3rd person singular omitted – group	3.808	.002	.039	1	3.235	4.863
				2	3.872	5.462
				3	5.515	6.985
				4	4.781	6.347
				5	4.330	5.927
				6	4.786	6.406
3rd person singular omitted – language	8.432	.004	.018	EL1	4.272	5.193
				ML1	5.234	6.137

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
3rd person singular omitted - groupxlanguage	9.325	.000	.090	1	4.225	6.512
				2	1.571	3.889
				3	4.246	6.564
				4	2.841	5.016
				5	4.460	6.540
				6	5.960	8.040
3rd person singular used – group	6.003	.000	.060	1	-.085	.138
				2	-.070	.148
				3	-.014	.188
				4	.041	.257
				5	.044	.263
				6	.292	.514
3rd person singular used – language	7.442	.007	.016	EL1	.141	.268
				ML1	.020	.144
3rd person singular used - groupxlanguage	.884	.491	.009	1	-.104	-.104
				2	-.159	-.159
				3	-.105	-.105
				4	-.126	-.126
				5	-.034	-.034
				6	-.078	-.078

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
3rd person singular error – group	.394	.853	.004	1	-.021	.021
				2	-.020	.020
				3	-.008	.030
				4	-.008	.032
				5	-.007	.033
				6	-.007	.034
3rd person singular error – language	.773	.380	.002	EL1	-.007	.016
				ML1	.000	.023
3rd person singular error - groupxlanguage	1.024	.403	.011	1	-.029	.029
				2	-.029	.029
				3	-.029	.029
				4	-.028	.028
				5	-.026	.026
				6	-.005	.048
- ing omitted – group	1.865	.099	.019	1	.105	.454
				2	.026	.367
				3	.201	.516
				4	.103	.439
				5	.124	.466
				6	.371	.718

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
- ing omitted – language	.360	.549	.001	EL1	.204	.402
				ML1	.248	.442
- ing omitted - groupxlanguage	1.197	.309	.013	1	.071	.561
				2	-.005	.492
				3	.049	.546
				4	-.138	.329
				5	.060	.506
				6	.212	.658
-ing used– group	5.518	.000	.056	1	1.986	3.360
				2	2.206	3.547
				3	2.260	3.501
				4	2.834	4.156
				5	4.006	5.353
				6	3.435	4.801
-ing used – language	150.861	.000	.243	EL1	4.766	5.542
				ML1	1.373	2.135
-ing used - groupxlanguage	.731	.601	.008	1	3.219	5.149
				2	.184	2.140
				3	3.752	5.708
				4	.106	1.942
				5	3.384	5.138
				6	.623	2.377

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
-ing error – group	.542	.744	.006	1	.021	.164
				2	.025	.165
				3	.000	.130
				4	.030	.168
				5	.071	.211
				6	.006	.149
-ing error – language	2.052	.153	.004	EL1	.075	.156
				ML1	.035	.114
-ing error - groupxlanguage	2.782	.017	.029	1	.057	.259
				2	-.075	.129
				3	.087	.291
				4	-.096	.096
				5	-.026	.157
				6	-.026	.157
Regular past tense -ed omitted – group	8.000	.000	.079	1	1.551	2.316
				2	1.790	2.537
				3	2.796	3.487
				4	2.864	3.601
				5	2.279	3.029
				6	1.942	2.703

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Regular past tense -ed omitted – language	17.681	.000	.036	EL1	2.682	3.115
				ML1	2.038	2.463
Regular past tense -ed omitted - groupxlanguage	5.499	.000	.055	1	2.357	3.432
				2	.428	1.518
				3	2.401	3.491
				4	.870	1.892
				5	2.903	3.880
				6	2.403	3.380
Regular past tense -ed used – group	6.319	.000	.063	1	-.016	.122
				2	-.054	.081
				3	-.041	.084
				4	-.004	.129
				5	.150	.286
				6	.109	.246
Regular past tense -ed used – language	14.873	.000	.031	EL1	.106	.184
				ML1	.000	.076

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Regular past tense -ed used - groupxlanguage	2.011	.076	.021	1	.008	.008
				2	-.098	-.098
				3	-.071	-.071
				4	-.092	-.092
				5	-.066	-.066
				6	-.066	-.066
Regular past participle -ed used – group	1.856	.101	.019	1	-.035	.035
				2	-.021	.048
				3	-.032	.032
				4	-.009	.059
				5	.029	.099
				6	-.009	.062
Regular past participle -ed used – language	1.569	.211	.003	EL1	.010	.050
				ML1	-.007	.032
Regular past participle -ed used - groupxlanguage	.765	.575	.008	1	-.050	.050
				2	-.050	.050
				3	-.023	.077
				4	-.047	.047
				5	-.045	.045
				6	-.045	.045

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Regular past participle -ed omitted – group	2.375	.038	.025	1	-.033	.060
				2	-.046	.046
				3	-.021	.064
				4	.029	.119
				5	-.046	.046
				6	.033	.126
Regular past participle -ed omitted – language	.342	.559	.001	EL1	.000	.052
				ML1	.011	.063
Regular past participle -ed omitted - groupxlanguage	.218	.955	.002	1	-.066	.066
				2	-.040	.094
				3	-.067	.067
				4	-.063	.063
				5	-.038	.082
				6	-.038	.082
Irregular past tense used – group	7.760	.000	.077	1	.191	.604
				2	.200	.606
				3	.433	.806
				4	.394	.792
				5	.759	1.164
				6	.890	1.301

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Irregular past tense used – language	41.840	.000	.082	EL1	.831	1.065
				ML1	.294	.523
Irregular past tense used - groupxlanguage	3.885	.002	.040	1	.315	.896
				2	-.105	.483
				3	.341	.937
				4	-.109	.443
				5	.454	.981
				6	.258	.786
Irregular past tense error– group	1.817	.108	.019	1	1.726	2.470
				2	1.924	2.650
				3	2.327	2.999
				4	2.357	3.073
				5	2.264	2.993
				6	1.976	2.716
Irregular past tense error – language	5.374	.021	.011	EL1	2.420	2.840
				ML1	2.076	2.489

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Irregular past tense error - groupxlanguage	4.999	.000	.051	1	2.214	3.259
				2	.930	1.989
				3	2.498	3.557
				4	1.051	2.045
				5	2.090	3.040
				6	2.286	3.236
Iregular past participle used – group	7.479	.000	.074	1	.108	.447
				2	.150	.481
				3	.434	.740
				4	.494	.820
				5	.577	.910
				6	.691	1.028
Iregular past participle used – language	4.896	.027	.010	EL1	.553	.745
				ML1	.404	.592
Iregular past participle used - groupxlanguage	1.773	.117	.019	1	.209	.685
				2	-.133	.349
				3	.056	.539
				4	.107	.560
				5	.371	.803
				6	.371	.803

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Iregular past participle error – group	4.070	.001	.042	1	-.070	.070
				2	-.041	.095
				3	.002	.128
				4	.032	.166
				5	.047	.184
				6	.130	.270
Iregular past participle error – language	.599	.439	.001	EL1	.056	.135
				ML1	.035	.112
Iregular past participle error - groupxlanguage	.437	.822	.005	1	-.098	.098
				2	-.100	.100
				3	-.045	.154
				4	-.093	.093
				5	-.024	.154
				6	-.024	.154
“already” – group	3.651	.003	.037	1	-.093	.251
				2	.029	.364
				3	.149	.459
				4	.373	.704
				5	-.027	.309
				6	.128	.469

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
"already" – language	15.144	.000	.031	EL1	.028	.222
				ML1	.299	.489
"already" - groupxlanguage	3.394	.005	.035	1	-.083	.399
				2	-.244	.244
				3	-.136	.352
				4	.056	.515
				5	-.132	.306
				6	.303	.741
Perfective "has" used – group	7.192	.000	.071	1	-.099	.099
				2	-.083	.110
				3	-.035	.144
				4	-.033	.158
				5	.121	.315
				6	.237	.435
Perfective "has" used – language	5.907	.015	.012	EL1	.107	.219
				ML1	.010	.120
Perfective "has" used - groupxlanguage	1.602	.158	.017	1	-.140	.140
				2	-.141	.141
				3	-.114	.168
				4	-.133	.133
				5	-.083	.170
				6	-.062	.192

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Perfective "has" omitted – group	2.694	.021	.028	1	-.018	.204
				2	.005	.222
				3	.139	.339
				4	.178	.391
				5	.148	.365
				6	.202	.423
Perfective "has" omitted – language	.674	.412	.001	EL1	.135	.261
				ML1	.173	.296
Perfective "has" omitted - groupxlanguage	.548	.740	.006	1	-.051	.261
				2	-.077	.239
				3	-.050	.266
				4	-.029	.267
				5	.054	.337
				6	.141	.424
Perfective "has" error – group	3.578	.003	.037	1	-.015	.202
				2	-.003	.209
				3	-.022	.174
				4	.230	.439
				5	.124	.337
				6	.079	.296

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Perfective "has" error – language	1.879	.171	.004	EL1	.140	.263
				ML1	.081	.201
Perfective "has" error - groupxlanguage	.952	.447	.010	1	-.074	.232
				2	-.047	.263
				3	-.020	.290
				4	-.074	.217
				5	-.052	.226
				6	-.074	.204
Future "want"– group	.891	.487	.009	1	.265	.848
				2	.456	1.024
				3	.639	1.165
				4	.274	.834
				5	.433	1.003
				6	.460	1.040
Future "want" – language	.431	.512	.001	EL1	.500	.830
				ML1	.580	.903
Future "want" - groupxlanguage	3.591	.003	.037	1	.407	1.225
				2	.613	1.441
				3	.215	.959
				4	.026	.824
				5	-.019	.788
				6	.330	1.170

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Future "going" – group	2.297	.044	.024	1	-.013	.119
				2	-.039	.090
				3	-.005	.114
				4	-.001	.125
				5	.102	.231
				6	.029	.160
Future "going" – language	5.443	.020	.011	EL1	.07	.144
				ML1	.008	.082
Future "going" – groupxlanguage	.987	.425	.010	1	-.014	.171
				2	-.067	.121
				3	-.019	.149
				4	-.015	.165
				5	.165	.348
				6	.044	.234
Infinitive verbs – group	5.096	.000	.052	1	.320	1.178
				2	.573	1.411
				3	.971	1.746
				4	1.106	1.932
				5	1.271	2.113
				6	1.684	2.538

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Infinitive verbs – language	1.979	.160	.004	EL1	1.283	1.768
				ML1	1.044	1.520
Infinitive verbs – groupxlanguage	2.236	.050	.023	1	-.024	1.182
				2	.659	1.881
				3	.561	1.657
				4	.987	2.163
				5	1.302	2.493
				6	2.103	3.342
Plural no. used – group	15.418	.000	.141	1	.300	.788
				2	.488	.964
				3	.584	1.025
				4	.977	1.447
				5	1.184	1.662
				6	1.566	2.051
Plural no. used – language	16.806	.000	.035	EL1	1.150	1.426
				ML1	.749	1.020
Plural no. used – groupxlanguage	.345	.886	.004	1	.394	1.080
				2	.653	1.347
				3	.645	1.268
				4	1.066	1.734
				5	1.380	2.056
				6	1.564	2.269

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Plural "s" used – group	8.446	.000	.083	1	1.036	1.936
				2	1.026	1.905
				3	1.528	2.341
				4	2.010	2.877
				5	2.520	3.403
				6	2.373	3.269
Plural "s" used – language	73.144	.000	.135	EL1	2.707	3.216
				ML1	1.160	1.659
Plural "s" used – groupxlanguage	4.302	.001	.044	1	1.420	2.685
				2	1.386	2.668
				3	1.469	2.618
				4	2.759	3.991
				5	3.478	4.727
				6	3.517	4.816
Possessive omitted – group	1.303	.261	.014	1	.044	.329
				2	.172	.451
				3	.121	.379
				4	.170	.444
				5	.283	.563
				6	.208	.492
Possessive omitted – language	.220	.639	.000	EL1	.210	.372
				ML1	.239	.397

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Possessive omitted - groupxlanguage	1.759	.120	.018	1	.010	.411
				2	.229	.636
				3	.035	.400
				4	-.020	.370
				5	.264	.659
				6	.044	.456
Possessive used – group	4.399	.001	.045	1	-.034	.087
				2	-.045	.072
				3	-.011	.098
				4	.017	.133
				5	.031	.149
				6	.129	.249
Possessive used – language	3.857	.050	.008	EL1	.063	.131
				ML1	.015	.082
Possessive used - groupxlanguage	1.777	.116	.019	1	-.059	.111
				2	-.059	.113
				3	-.055	.099
				4	.042	.208
				5	.019	.186
				6	.191	.365

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Conjunction omitted – group	2.303	.044	.024	1	.316	.933
				2	.534	1.136
				3	.950	1.507
				4	.801	1.394
				5	.890	1.495
				6	.743	1.357
Conjunction omitted – language	6.327	.012	.013	EL1	.674	1.023
				ML1	.990	1.332
Conjunction omitted - groupxlanguage	3.485	.004	.036	1	.356	1.223
				2	.588	1.466
				3	.411	1.198
				4	.553	1.397
				5	.316	1.171
				6	.305	1.195
Co-ord. Conjunction used – group	11.353	.000	.108	1	1.365	3.102
				2	1.667	3.364
				3	3.607	5.176
				4	3.833	5.505
				5	4.276	5.980
				6	5.083	6.811

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Co-ord. Conjunction used - language	11.612	.001	.024	EL1	4.253	5.235
				ML1	3.069	4.033
Co-ord. Conjunction used - groupxlanguage	2.133	.060	.022	1	2.490	4.931
				2	2.223	4.696
				3	3.391	5.609
				4	3.660	6.040
				5	3.795	6.205
				6	5.690	8.198
Co-ord. Conjunction error – group	.779	.565	.008	1	-.039	.091
				2	.022	.148
				3	.007	.124
				4	-.038	.087
				5	-.038	.089
				6	-.051	.078
Co-ord. Conjunction error – language	1.301	.255	.003	EL1	-.012	.062
				ML1	.019	.091

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Co-ord. Conjunction error - groupxlanguage	.871	.500	.009	1	-.039	.144
				2	-.065	.119
				3	-.039	.126
				4	-.089	.089
				5	-.090	.090
				6	-.066	.121
Subord. Conjunction used – group	15.504	.000	.142	1	-.002	.533
				2	.141	.663
				3	.476	.959
				4	.647	1.162
				5	1.199	1.724
				6	1.270	1.802
Subord. Conjunction used – language	40.484	.000	.079	EL1	1.073	1.376
				ML1	.390	.686
Subord. Conjunction used - groupxlanguage	3.039	.010	.031	1	-.007	.744
				2	.376	1.138
				3	.506	1.189
				4	.784	1.516
				5	1.629	2.371
				6	1.836	2.608

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Subord. Conjunction error – group	1.323	.253	.014	1	-.020	.047
				2	.004	.070
				3	-.009	.052
				4	-.033	.033
				5	-.020	.046
				6	.020	.088
Subord. Conjunction error – language	.008	.931	.000	EL1	.004	.042
				ML1	.005	.043
Subord. Conjunction error - groupxlanguage	1.273	.274	.013	1	-.048	.048
				2	-.021	.075
				3	-.043	.043
				4	-.046	.046
				5	-.021	.073
				6	.034	.132
Auxiliary "is" omitted – group	1.017	.407	.011	1	1.964	3.109
				2	2.069	3.188
				3	2.124	3.158
				4	2.493	3.596
				5	2.708	3.831
				6	2.144	3.284

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Auxiliary "is" omitted – language	141.434	.000	.232	EL1	3.855	4.502
				ML1	1.115	1.751
Auxiliary "is" omitted - groupxlanguage	1.388	.227	.015	1	3.485	5.094
				2	3.347	4.978
				3	3.095	4.557
				4	3.866	5.434
				5	3.821	5.410
				6	2.701	4.355
Auxiliary "is" used – group	7.389	.000	.073	1	.147	1.210
				2	.096	1.134
				3	.520	1.480
				4	.693	1.715
				5	1.376	2.419
				6	1.920	2.977
Auxiliary "is" used – language	8.297	.004	.017	EL1	1.315	1.916
				ML1	.704	1.293

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Auxiliary "is" used - groupxlanguage	.839	.522	.009	1	.043	1.536
				2	.378	1.892
				3	.343	1.700
				4	.997	2.453
				5	1.314	2.788
				6	2.205	3.739
Auxiliary "is" error – group	1.393	.225	.015	1	-.086	.112
				2	.010	.203
				3	-.046	.133
				4	-.046	.145
				5	.070	.264
				6	-.073	.123
Auxiliary "is" error – language	2.927	.088	.006	EL1	.046	.157
				ML1	-.022	.088
Auxiliary "is" error - groupxlanguage	.866	.504	.009	1	-.113	.165
				2	.048	.330
				3	-.039	.213
				4	-.085	.185
				5	.119	.394
				6	-.143	.143

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Auxiliary "are" omitted – group	.179	.970	.002	1	.064	.253
				2	.077	.262
				3	.078	.248
				4	.033	.215
				5	.087	.272
				6	.050	.239
Auxiliary "are" omitted – language	4.911	.027	.010	EL1	.145	.252
				ML1	.062	.167
Auxiliary "are" omitted - groupxlanguage	.825	.533	.009	1	.130	.396
				2	.109	.378
				3	.097	.338
				4	.020	.280
				5	.048	.311
				6	.002	.275
Auxiliary "are" used – group	3.022	.011	.031	1	-.064	.064
				2	-.049	.076
				3	-.036	.080
				4	-.012	.111
				5	.091	.217
				6	-.024	.104
Auxiliary "are" used – language	2.688	.102	.006	EL1	.031	.104
				ML1	-.010	.061

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Auxiliary "are" used - groupxlanguage	.283	.922	.003	1	-.090	.090
				2	-.064	.118
				3	-.038	.125
				4	-.013	.163
				5	.116	.294
				6	-.037	.148
Auxiliary "are" error – group	.554	.735	.006	1	-.030	.057
				2	-.019	.066
				3	-.029	.050
				4	.008	.092
				5	-.004	.081
				6	-.003	.084
Auxiliary "are" error – language	.014	.906	.000	EL1	.006	.055
				ML1	.004	.053
Auxiliary "are" error - groupxlanguage	.815	.540	.009	1	-.035	.088
				2	-.062	.062
				3	-.056	.056
				4	.015	.135
				5	-.035	.086
				6	-.007	.119

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Copula "is" used – group	2.539	.028	.026	1	.093	.467
				2	-.013	.352
				3	.114	.452
				4	.203	.563
				5	.419	.786
				6	.217	.589
Copula "is" used – language	2.672	.103	.006	EL1	.309	.521
				ML1	.188	.395
Copula "is"used - groupxlanguage	.609	.693	.006	1	.027	.552
				2	-.023	.510
				3	.044	.521
				4	.119	.631
				5	.484	1.003
				6	.286	.826
Copula "is"errors – group	.479	.792	.005	1	-.014	.041
				2	.000	.054
				3	-.003	.046
				4	-.014	.038
				5	-.027	.027
				6	-.015	.040
Copula "is"errors – language	.103	.748	.000	EL1	.001	.032
				ML1	-.002	.028

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Copula "is"errors – groupxlanguage	1.891	.094	.020	1	-.038	.038
				2	.015	.093
				3	.009	.078
				4	-.037	.037
				5	-.038	.038
				6	-.039	.039
Copula "is"omitted – group	.746	.590	.008	1	.020	.218
				2	.031	.224
				3	.139	.318
				4	.078	.269
				5	.095	.289
				6	.057	.254
Copula "is"omitted – language	3.432	.065	.007	EL1	.147	.259
				ML1	.074	.184
Copula "is"omitted – groupxlanguage	1.002	.416	.011	1	.072	.349
				2	-.006	.276
				3	.178	.431
				4	.090	.360
				5	.094	.368
				6	-.032	.254

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Copula "are" used – group	1.663	.142	.017	1	-.031	.031
				2	-.030	.030
				3	-.017	.039
				4	-.017	.042
				5	-.017	.043
				6	.024	.085
Copula "are" used – language	1.190	.276	.003	EL1	.004	.039
				ML1	-.009	.025
Copula "are" used – groupxlanguage	.852	.513	.009	1	-.043	.043
				2	-.044	.044
				3	-.018	.061
				4	-.042	.042
				5	-.017	.068
				6	.039	.128
Copula "are" errors – group	.570	.723	.006	1	-.005	.031
				2	-.018	.018
				3	-.005	.027
				4	-.017	.017
				5	-.018	.018
				6	-.005	.030
Copula "are" errors – language	.222	.638	.000	EL1	-.006	.015
				ML1	-.002	.018

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Copula "are" errors – groupxlanguage	1.082	.369	.011	1	.001	.051
				2	-.026	.026
				3	-.023	.023
				4	-.025	.025
				5	-.025	.025
				6	-.026	.026
Copula "are" omitted – group	.732	.599	.008	1	-.023	.023
				2	-.009	.036
				3	-.021	.021
				4	-.010	.035
				5	.003	.048
				6	-.010	.035
Copula "are" omitted – language	.190	.663	.000	EL1	-.004	.022
				ML1	-4.272E-5	.025
Copula "are" omitted - groupxlanguage	1.723	.128	.018	1	-.032	.032
				2	-.006	.060
				3	-.029	.029
				4	-.006	.056
				5	-.032	.032
				6	-.033	.033

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Preposition used – group	22.157	.000	.191	1	2.120	3.417
				2	2.914	4.180
				3	4.600	5.770
				4	4.851	6.098
				5	5.672	6.943
				6	6.019	7.309
Preposition used – language	125.412	.000	.211	EL1	6.087	6.821
				ML1	3.169	3.888
Preposition used - groupxlanguage	3.148	.008	.032	1	3.221	5.042
				2	4.266	6.112
				3	4.846	6.502
				4	6.012	7.788
				5	7.152	8.950
				6	7.842	9.713
Preposition omitted – group	.519	.762	.006	1	1.467	2.165
				2	1.559	2.240
				3	1.620	2.250
				4	1.812	2.483
				5	1.607	2.291
				6	1.456	2.150
Preposition omitted – language	6.098	.014	.013	EL1	1.901	2.296
				ML1	1.558	1.945

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
Preposition omitted - groupxlanguage	7.338	.000	.073	1	2.115	3.095
				2	2.017	3.010
				3	1.685	2.576
				4	1.623	2.577
				5	.952	1.919
				6	1.302	2.309
Preposition error – group	8.751	.000	.085	1	-.020	.443
				2	.274	.725
				3	.628	1.046
				4	.806	1.251
				5	.735	1.188
				6	.858	1.317
Preposition error - language	6.117	.014	.013	EL1	.755	1.017
				ML1	.527	.784
Preposition error - groupxlanguage	.851	.514	.009	1	.017	.667
				2	.265	.924
				3	.509	1.100
				4	.983	1.617
				5	.705	1.346
				6	.916	1.584

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
"he" used – group	6.926	.000	.069	1	.154	.958
				2	.393	1.177
				3	1.333	2.058
				4	.971	1.745
				5	1.132	1.920
				6	1.505	2.304
"he" used – language	1.841	.175	.004	EL1	1.187	1.641
				ML1	.971	1.417
"he" used - groupxlanguage	2.531	.028	.026	1	.304	1.433
				2	.617	1.761
				3	.922	1.948
				4	.800	1.900
				5	.751	1.865
				6	1.753	2.913
"he" error – group	1.864	.099	.020	1	-.038	.280
				2	-.035	.275
				3	.109	.398
				4	.179	.485
				5	-.028	.284
				6	-.119	.197
"he" error – language	1.044	.307	.002	EL1	.043	.223
				ML1	.110	.287

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
"he" error - groupxlanguage	.963	.440	.010	1	-.197	.250
				2	-.010	.443
				3	-.029	.377
				4	.007	.443
				5	-.092	.349
				6	-.202	.257
"she" used – group	6.989	.000	.069	1	.011	.442
				2	.074	.495
				3	.175	.564
				4	.227	.642
				5	.635	1.058
				6	.667	1.096
"she" used – language	26.614	.000	.054	EL1	.609	.853
				ML1	.163	.403
"she" used - groupxlanguage	3.266	.007	.034	1	-.066	.540
				2	.071	.685
				3	.203	.754
				4	.355	.945
				5	.957	1.556
				6	1.078	1.700

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
"she" error – group	3.470	.004	.036	1	.029	.527
				2	.074	.560
				3	.449	.899
				4	.166	.645
				5	.166	.654
				6	.623	1.119
"she" error – language	7.335	.007	.015	EL1	.216	.497
				ML1	.490	.766
"she" error - groupxlanguage	2.341	.041	.024	1	.098	.797
				2	-.030	.679
				3	.030	.666
				4	-.116	.566
				5	-.217	.474
				6	.307	1.026
"his" used – group	8.280	.000	.081	1	.003	.499
				2	-.110	.374
				3	.287	.735
				4	.368	.846
				5	.565	1.051
				6	.860	1.354
"his" used – language	15.096	.000	.031	EL1	.623	.904
				ML1	.238	.513

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
"his" used - groupxlanguage	1.466	.200	.015	1	.099	.796
				2	-.137	.569
				3	.205	.838
				4	.435	1.115
				5	.887	1.575
				6	1.031	1.747
"his" error – group	1.267	.277	.013	1	-.047	.258
				2	.080	.378
				3	.156	.431
				4	.174	.468
				5	.132	.432
				6	.194	.498
"his" error – language	1.866	.173	.004	EL1	.134	.307
				ML1	.220	.389
"his" error - groupxlanguage	1.824	.107	.019	1	-.004	.425
				2	.026	.460
				3	-.021	.369
				4	.116	.534
				5	-.006	.417
				6	-.053	.387

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
"his" omitted – group	.960	.442	.010	1	-.021	.021
				2	-.020	.020
				3	-.019	.019
				4	-.020	.020
				5	-.020	.020
				6	.004	.046
"his" omitted – language	.998	.318	.002	EL1	-.012	.012
				ML1	-.003	.020
"his" omitted - groupxlanguage	.960	.442	.010	1	-.029	.029
				2	-.029	.029
				3	-.026	.026
				4	-.028	.028
				5	-.029	.029
				6	-.030	.030
"her" used – group	13.434	.000	.125	1	-.131	.369
				2	.157	.645
				3	.177	.628
				4	.230	.710
				5	.755	1.245
				6	1.110	1.607
"her" used – language	16.500	.000	.034	EL1	.688	.971
				ML1	.282	.559

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
"her" used - groupxlanguage	2.456	.033	.026	1	-.167	.535
				2	.185	.896
				3	.159	.797
				4	.208	.892
				5	.961	1.654
				6	1.556	2.277
"her" error – group	2.606	.024	.027	1	.046	.406
				2	-.055	.295
				3	.110	.433
				4	.346	.690
				5	.030	.380
				6	.210	.565
"her" error – language	.121	.728	.000	EL1	.199	.402
				ML1	.176	.375
"her" error - groupxlanguage	1.818	.108	.019	1	.117	.620
				2	-.038	.471
				3	-.011	.446
				4	.205	.695
				5	-.197	.299
				6	.242	.758

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
"her" omitted – group	.963	.440	.010	1	-.010	.010
				2	-.010	.010
				3	-.009	.009
				4	.002	.022
				5	-.010	.010
				6	-.010	.010
"her" omitted – language	.950	.330	.002	EL1	-.006	.006
				ML1	-.002	.010
"her" omitted - groupxlanguage	.963	.440	.010	1	-.015	.015
				2	-.015	.015
				3	-.013	.013
				4	-.014	.014
				5	-.014	.014
				6	-.015	.015
"the" used – group	16.878	.000	.153	1	8.205	11.875
				2	8.941	12.523
				3	14.441	17.754
				4	15.419	18.950
				5	17.303	20.902
				6	15.587	19.238
"the" used – language	69.549	.000	.129	EL1	17.141	19.216
				ML1	10.994	13.029

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
"the" used - groupxlanguage	3.622	.003	.037	1	12.475	17.630
				2	13.685	18.910
				3	15.505	20.191
				4	16.638	21.662
				5	18.430	23.519
				6	17.102	22.398
"the" omitted – group	2.705	.020	.028	1	1.816	2.892
				2	1.927	2.977
				3	1.525	2.497
				4	1.208	2.243
				5	.921	1.976
				6	.890	1.960
"the" omitted – language	1.446	.230	.003	EL1	1.468	2.076
				ML1	1.735	2.331
"the" omitted – groupxlanguage	1.906	.092	.020	1	2.060	3.571
				2	1.829	3.360
				3	1.139	2.513
				4	.763	2.237
				5	.152	1.643
				6	.224	1.776

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
"the" error – group	.874	.499	.009	1	-.007	.034
				2	-.020	.020
				3	.003	.040
				4	-.020	.020
				5	-.020	.020
				6	-.008	.033
"the" error – language	1.080	.299	.002	EL1	-.008	.015
				ML1	.001	.024
"the" error – groupxlanguage	.421	.834	.004	1	-.029	.029
				2	-.029	.029
				3	-.005	.048
				4	-.028	.028
				5	-.029	.029
				6	-.030	.030
"a" used – group	2.776	.017	.029	1	.401	1.107
				2	.336	1.025
				3	1.007	1.645
				4	.575	1.255
				5	.513	1.205
				6	.996	1.698
"a" used – language	12.244	.001	.025	EL1	1.029	1.429
				ML1	.535	.927

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
"a" used – groupxlanguage	.921	.467	.010	1	.741	1.733
				2	.524	1.530
				3	.941	1.842
				4	.542	1.508
				5	.510	1.490
				6	1.185	2.204
"a" omitted – group	1.137	.340	.012	1	.056	.210
				2	-.012	.138
				3	-.015	.124
				4	.075	.223
				5	.027	.178
				6	.057	.210
"a" omitted – language	.857	.355	.002	EL1	.077	.164
				ML1	.049	.134
"a" omitted – groupxlanguage	.547	.741	.006	1	.050	.266
				2	-.055	.163
				3	-.033	.163
				4	.095	.305
				5	-.030	.183
				6	.056	.278

Variable	F	Sig.	Effect size (partial Eta^2)	Age group / Language	Confidence interval	
					Lower bound	Upper Bound
"a" errors – group	1.294	.265	.014	1	-.038	.332
				2	.189	.550
				3	-.004	.330
				4	-.019	.338
				5	-.092	.271
				6	-.105	.263
"a" errors – language	.138	.710	.000	EL1	.049	.259
				ML1	.079	.285
"a" errors - groupxlanguage	.188	.967	.002	1	-.129	.392
				2	.142	.669
				3	-.084	.389
				4	-.179	.329
				5	-.180	.334
				6	-.184	.351

Appendix 3 Directions for Future Research

Characteristic	Methodology
Mean Length of Utterance	Purpose-specific task to examine: • development for ML1 participants • comparison between EL1 participant values and other bilingual speakers of English, and monolingual speakers of StdE.
Lexical diversity	Broaden method for elicitation of data for both main language groups for: • vocabulary development • measures of lexical diversity (e.g. length of utterance)
Subject & object omission	Purpose-specific task for EL1 and ML1 participants • broaden age ranges
Articles	Purpose-specific task for EL1 and ML1 participants • broaden age ranges
Verb group	Purpose-specific task for EL1 and ML1 participants • broaden age ranges • particularly include primary school years
Plural marking	Purpose-specific task for EL1 and ML1 participants • task to include irregular plurals • targets to consider all phonetic realisations • broaden age ranges - include primary school years for both groups - include early years for EL1 participants
Possession	Purpose-specific task for EL1 and ML1 participants • broaden age ranges • particularly include primary school years
Pronouns	Purpose-specific designed task • perhaps utilising Rispoli's (1994 and 1998) models to predict usage • broaden age range to examine development for EL1 and ML1 participants - particularly in primary school years.
Conjunctions	Purpose-specific designed task to examine co-ordination and subordination for both EL1 and ML1 children. • broaden age ranges - include primary school years for both groups - include early years for EL1 participants
Prepositions	Purpose-specific designed task to examine use of prepositions for both EL1 and ML1 children. • broaden age ranges - include primary school years for both groups - include early years for EL1 participants