SLI OR 'SLOW' TO DEVELOP ENGLISH ADDITIONAL LANGUAGE (EAL) LEARNERS - HOW DO WE KNOW?

An In Depth Investigation of English Additional Language Learners in the Foundation Phase with Suspected Specific Language Impairment

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DECLARATION

I declare that this dissertation is my own unaided work. It is submitted for the degree of Masters in Speech Pathology by dissertation at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any other degree or examination in any other university.

Meera Surendar Rijhumal
30th day of January, 2011

This dissertation is dedicated with Love

To My Parents-

For without your immense amount of love, blessings and belief in me, I would not be where I am today

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ABSTRACT

Background: This study formed part of a larger longitudinal research study by Jordaan (2009), who tracked the development of language for academic purposes in grade 1- 3 English Additional Language (EAL) and English First Language (EFL) learners attending English only programmes in Gauteng over a period of three years. These learners attended schools in two different educational contexts where there is a marked heterogeneity in the linguistic backgrounds of both the learners and teachers investigated. Results from Jordaan's (2009) study revealed that some EAL and EFL learners appeared to be slow in the development of their academic language abilities (as no progress was evident over the period of three years), relative to their peers, and thus these learners may have a language impairment.

Purpose: This study investigated in detail, these "slow to learn" EAL and EFL learners in the foundation phase, in order to determine whether they have a language impairment and to determine how the language impairment manifests in these learners.

Participants: Sixteen learners (5 EFL learners and 16 EAL learners) who demonstrated no improvement in their academic language abilities from grade one to grade two as determined by their performance on the Diagnostic Evaluation of Language Variation Criterion Referenced (DELV-CR) test were the participants of this study.

Method: The participants were assessed on the Automated Working Memory Assessment (AWMA) test, a Non Word Repetition test (Dollaghan & Campbell, 1998), a Sentence Repetition test (Redmond, 2005) and the Gray Oral Reading Test (GORT-4). Educators were also asked to rate these learners' oral language, written language and reading comprehension abilities on a scale of 0- 5. The research design utilized was a non experimental, descriptive quantitative design, involving both correlational and comparative components. The data obtained was then analysed using descriptive and inferential statistics. Pearson correlation coefficients were calculated to establish whether there was a relationship between the cognitive processing and the language proficiency measures as well as the teacher ratings in order to provide information regarding these tests as assessment tools for EAL learners as well as to further enhance the validity of this study. Independent sample t-tests were also conducted to determine whether there were any significant differences between the EFL and EAL learners' performance in the two different educational contexts, so as to establish whether bilingual learners with

language impairment are more severely impaired than monolingual learners with language impairment.

Results: Based on the analysis of these learners' performance on the DELV-CR test, results indicated that all sixteen participants presented with SLI and were not just "slow to learn". The EAL-SLI learners in both contexts performed poorly on the reading comprehension test and were rated lower than their aged matched peers on the teacher rating scales. Furthermore, when comparing these EAL-SLI learners' performance on the DELV-CR test to the performance of the EFL-SLI learners, the EAL-SLI learners as a group appeared to have performed more poorly than the EFL-SLI learners on all three subtests. As significant differences were found between the EAL and EFL learners' performance on the DELV-CR test, the results suggested that bilingual learners with SLI, who acquire a second language sequentially, are more impaired than monolingual learners with SLI. The EAL-SLI learners also presented with visuo-spatial short term and working memory deficits and even though a large majority of the learners presented with verbal short term and working memory difficulties, not all the learners presented with cognitive processing difficulties. This finding has implications for the theories of SLI. However, the sentence repetition task was found to be a useful tool in differentiating between the "slow to learn" EAL learners and EAL-SLI learners and furthermore this test also positively correlated with various sections of the DELV-CR test which adds to the value of this test as an assessment tool in EAL learners. Positive correlations were also found between the teacher ratings of the EAL-SLI learners and the subtests of the DELV-CR test which indicates that teachers have the ability to correctly identify learners with language learning difficulties. Positive correlations were also found between the digit repetition subtest, the non word repetition test and the sentence repetition test which adds to the validity of this study.

Conclusion: The results obtained from this study demonstrated that bilingual learners with SLI who acquire a second language sequentially are additionally disadvantaged compared to their EFL-SLI peers in the acquisition of certain aspects of academic language. Furthermore, although research has shown that cognitive processing measures are less biased in the assessment of linguistically diverse learners, results indicated that the DELV-CR test identified more accurately, learners with language impairment whereas the cognitive processing measures provided contradictory and biased results with the verbal working memory subtest over identifying learners "at risk" for language impairment. Finally, the use of sentence repetition

tasks in the differentiation between “slow to learn” and language impaired EAL learners proves to be promising.

Key Words: Specific Language Impairment (SLI), English Additional Language (EAL), bilingualism, working memory, phonological memory, DELV, Foundation Phase, South Africa

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CHAPTER 1

INTRODUCTION AND OVERVIEW OF THE STUDY

Introduction and Purpose of the Study

"Wherever humans exist, language exists" (Fromkin & Rodmann, 1998, p.26). Given the universal nature of language, it might not appear to be worthy of study but upon closer inspection, it is clear that language is an extremely complex sociocultural and cognitive phenomenon. Because language is at the heart of learning, development and schooling it warrants investigation by teachers and therapists beyond ways usually taught and presented. We live in a world connected through language. "... Human culture in its great complexity... is unthinkable without the aid of language... Any particular language is a form... of learned behaviour and therefore part of the culture" (Salzmann, 1993, p.151, 156). Recently, most teachers worldwide find themselves working with learners who are from linguistically and culturally diverse backgrounds different to their own and are now realising they may not have received the necessary training and preparation to effectively reach all their students (Wong-Fillmore & Snow, 2000). This may be attributed to the fact that bilingualism or multilingualism have rapidly become worldwide phenomena. Bilingualism is recognized as the rule rather than the exception in most countries (Brown & Attardo, 2005). More and more children are being exposed to two languages simultaneously from birth and in addition are required to acquire another language sequentially when they enter school (Multilingual Affairs Committee of the IALP, 2006). Multilingualism in classrooms has significantly impacted schooling worldwide including South Africa over the last two decades. Today's classrooms are full of an array of children who have different needs and strengths, backgrounds and languages. Amongst this array of learners, are those who are learning in English as an additional language. In English dominant countries, such as the UK and USA, English Additional Language (EAL) learners have had experience with one or more languages from birth and then begin to acquire English in formal education programs as their language of academic learning (Cummins, 2000; Kohnert, 2007). The situation in South Africa is similar and will be explored in detail in chapter 2.

This research focuses on the critical role of language in education for multilingual and multicultural learners against the complex socio-linguistic, economic and political forces influencing the South African education system. The theory and findings presented in this study are intended to expand on and enhance our knowledge and understanding of bilingual learners acquiring English as an additional language in schools where English is the medium of instruction. Research shows that many of these learners can perform poorly academically due to learning in a language that is not their first language (Dawber & Jordaan, 1999; Statham, 1997) but are being referred to Speech Language Pathologists (SLP's) for having a "language disorder" (Crago, Eriks-Brophy, Pesco & McAlpine, 1997; Stoffels, 2004). These English Additional Language learners are thus being 'pathologised' because educators may interpret language differences as deficiencies (Crago et al., 1997). However, distinguishing between typical language behaviours and language behaviours that could be indicative of a language impairment in bilingual or multilingual learners, is not a simple task (Craig & Washington, 2000; Linan-Thompson & Ortiz, 2009). The primary purpose of this research was therefore to investigate in detail EAL learners in the foundation phase, who demonstrated slow development in their academic language skills over three years, relative to their EAL peers, in order to determine whether they could be identified as language impaired and furthermore to describe the manifestations of this language impairment so as to "isolate" the unique characteristics of language impairment.

Overview and Perspective

English additional language (EAL) learners in the USA represent the fastest growing segment in the pre-kindergarten to 12th grade student population (Linan-Thompson & Ortiz, 2009). In South Africa, EAL learners also constitute a significant portion of the school –going population. This is due to the fact that multilingualism in South Africa has substantially increased in the urban areas, since greater freedom of movement is now possible under the new constitution (De Klerk, 2000). When South Africa established a new political dispensation in 1994, it brought about changes to the political and educational systems (Kamwangamulu, 1997). This resulted in children who are multilingual or bilingual attending schools that do not offer tuition in their first language (Pan South African language Board [PANSALB], 2000). Research however suggests that learners develop academic language proficiency more effectively in their home language or in bilingual

education where instruction is provided in both the first and second languages (Genesee, Paradis and Crago, 2004; Malherbe, 1978; Ianco –Worrall, 1972; MacDonald, 1990 cited in Heugh, 2000). This is because language for communication and language for academic purposes are two distinct registers. Academic language proficiency involves more than the ability to communicate in everyday conversational contexts but is specifically related to the use of language for academic purposes (Cummins, 2000). Cummins (2000, p. 67) defines academic language proficiency as "the extent to which an individual has access to and command of the oral and written academic registers of schooling." Although learners may be able to use English competently among peers and in social settings, they may not be proficient in the type of language expected in the classroom (Cummins, 2000). While it takes EAL learners approximately two years to become competent in Basic Interpersonal Communication Skills (BICS), it takes them five to seven years to reach the same level as their first-language peers in terms of Cognitive Academic Language Proficiency (CALP) (Cummins, 2000). Therefore, Cunningham (2001, p. 165) proposed that: "continued development of both languages into literate domains... is a precondition for enhanced cognitive, linguistic and academic growth" and will thus prove to be beneficial to the learner. However, despite the convincing and comprehensive local and international literature supporting the social, linguistic and academic advantages of mother tongue education and bilingual schools (De Klerk, 2002), many parents in South Africa prefer to place their child in educational settings where English is the medium of instruction. Arguably then, English poses a threat to learning in the first language because of its popularity amongst caregivers and their belief that it is the key to tertiary education (Cunningham, 2001; Bosman, 2000; Cele, 2001).

Multilingualism in schools creates a challenge to both teachers and support staff such as speech language therapists. Educators need to know the difference between a learning difficulty and language based academic problem so as to avoid the mistaken diagnosis of a 'language disorder' (Statham, 1997). According to the American Speech-Language-Hearing Association [ASHA] (1991), it is vital that teachers and therapists are able to identify learners who are at risk for academic failure so that preventative or supportive measures can be provided in a timely and efficient manner. It is thus important that teachers obtain training in second language acquisition, learning in a second language, bilingualism and language impairment (O'Connor, 2003; Du

Plessis & Louw, 2008; Du Plessis & Naudé, 2003). Moreover, educators need language awareness and sensitivity about how the home, community and school environments affect the learner (Young, 1995). Teachers have expressed an interest in collaborating with SLPs (Du Plessis & Louw, 2008; Farber & Klein, 1999; Wadle, 1991) if they are made available to the wider community (Rossi & Stuart, 2007). SLPs can assist teachers to become more aware of language difficulties and how to adapt their language to meet the learners' needs as complex language demands high levels of the learners' auditory processing and short term memory skills (Cirrin & Penner, 1995; Brice & Brice, 2000). Thus, educators learning language techniques with broad applicability, (DiMeo, Merritt & Culatta, 1998; Jordaan & Yelland, 2003) may be beneficial for all learners in the class (Pershey & Rapking, 2002). Because SLPs are also 'language focused' and are able to explain the effects of language on learning, they could provide curriculum guidelines for all content areas in terms of the language skills required for listening, speaking, reading and writing (Wadle, 1991). Furthermore, SLPs can also ensure carryover of speech and language skills learnt in the classroom as well as provide the teacher with information and support to facilitate communicative competence and promote academic success (Lewis, 2004; Wadle, 1991). The overall knowledge of assessment and intervention the SLP can bring to the collaboration process may also further contribute to prevent academic failure and improve the academic performance of the learner acquiring English as an additional language in school. This research therefore specifically emphasised the collaborative roles between teachers and speech language therapists in differentiating children who are slow to learn from children with specific language impairment (SLI). This condition is explored further in Chapter 3.

The problem of "mistaken identity" for children and practitioners in multilingual settings is well known (Cummins, 1984, 2000; Genesee et al., 2004; Ortiz, 2001). Mistaken identity occurs when a typically developing second language learner is inappropriately and/or incorrectly diagnosed as being language or learning disabled resulting in the learner receiving unnecessary services or being placed inappropriately in special education classes. Equally important, and possibly more common now, is the problem of "missed identity" (Crutchley, Conti-Ramsden & Botting, 1997; Genesee et al., 2004; Roseberry-McKibbin, 1995). Missed identity occurs when a second language learner does in fact have a language impairment, but this impairment goes

unnoticed or undiagnosed because educators and SLP's assume that the learner's poor performance on English related academic activities is the result of not being a native speaker thereby adopting a "wait and see" approach that may extend for years. As a result a report from the American National institutes of Health (1999), specified that differentiation between second language learning and SLI should be a priority in future research. However, the assessment of these multilingual learners' language abilities proves to be difficult within a South African context because of the absence or limited variety of assessment tools available for this population and also because of the overlap in linguistic characteristics between EAL learners and monolingual English speaking learners with SLI (Genesee et al., 2004; Paradis, 2005). Literature recommends the use of informal contextual assessment for culturally and linguistically diverse learners (Evans & Miller, 1999). However, this is not a viable option when the teacher or the therapist is not proficient in the home language of the learner. This is currently the case for practicing therapists in South Africa who primarily speak English and/or Afrikaans and may have only one other of the eleven official languages in their repertoire (Uys & Hugo, 1997). This also results in the therapists not having access to the primary language of a number of learners so as to conduct the assessment in their first language as recommended by literature. Furthermore, the assessment of these learners' language abilities is further impeded by the fact that formal language tests that are appropriate to use with multilingual learners are not readily available in South Africa (South African Speech Language Hearing Association (SASLHA), 2003) and have not been normed on our population. The document, written by the ethics committee of SASLHA, *Working with Bilingual populations in Speech Language Pathology*, recommended the following:

> "In the case of children the performance of the clinical case on an assessment procedure should ideally be compared to that of an age matched normally developing bilingual child. This matched child should be from a similar background with respect to combination of languages spoken, as well as the amount and type of exposure to each language" (SASLHA, 2003).

However, because of the extent of language diversity in the schools and the heterogeneity of the learners, this task may be a difficult one. The identification of learners "at risk" for language impairment thus needs to be a collaborative effort between teachers and the SLP's especially

within a South African setting, due to the limited number of therapists available to service the entire population (Pickering, McAllister, Hagler, Whitehill, Penn, Robertson & McCready, 1998). Therefore further research needs to be conducted in order to determine which assessment tools are appropriate when assessing bilingual learners and which assessment measures will identify EAL learners with language impairment.

The participants of this study were foundation phase learners (grades 1- 3), as it is at this age that the school system should facilitate the development of language processes necessary for academic development and learners with language disorders should be identified. This stage of education should form the basis for the increasingly complex cognitive-academic language demands in the later grades (Westby, 1994). Also, because of the inconspicuous and subtle nature of SLI, these children are difficult to identify especially within the South African context. The language problems may therefore only become apparent when the children experience significant difficulties at school. This is because children in South Africa who appear to have a delay in their speech and language development without any obvious gross motor or behavioural difficulties may go unnoticed in the preschool period. This may be because their parents or caregivers a) may not have the finances to obtain help for their child who may be described as "simply a late talker" and b) a delay in learning to speak may not be a priority to caregivers who are more concerned with obvious difficulties and/or basic material needs. Thus, children with specific language impairment (SLI) are not identified at an early age as caregivers may not understand the nature, implications or outcome of this disorder.

CHAPTER 2

MULTILINGUALISM AND THE SOUTH AFRICAN EDUCATION CONTEXT

Language of instruction has far reaching consequences in all education systems. Issues of languages in education are particularly complex "due in part to the intense political, emotional, religious and identity factors that are associated with languages, ethnic identity and most importantly, power and status" (Carey, 1993 p.29). According to Alexander (1995) in a multilingual setting such as South Africa "the issue of language policy in the highly contested sphere of education is a battlefield that is strewn with the corpses of theories and theses that have failed" (Alexander, 1995 p.38). It can thus be suggested that the language of learning and teaching (LOLT) has always been a source of controversy especially within the South African context (Peirce & Ridge, 1997). The discussion of the language in education policy implemented in South African schools is thus important in order to enhance our understanding of the current problems experienced by South African learners learning through a medium of instruction that is not their mother tongue. The primary focus of the debate is on the contrast between policy and reality concerning the issues of language. Therefore, this chapter presents a historical review of the background against which the language in education policies in South Africa has developed and is followed by a discussion of the reality of multilingualism in South African schools.

Language Policy in South African Schools

In order to understand the language policy implemented in South African schools, it is important to go back in time and examine the history that led us to where we are today. As South Africa's educational history is a long, involved and complex one, only the important and relevant aspects shall be discussed for the purposes of this research. The history is divided into two separate periods for ease of discussion: the period between 1936 and 1994 and from 1994 to the present.

Language Policy (1936-1994)

Due to colonialism and the growth of the mining industry in South Africa before 1936, various social classes and social relations based on these classes started to emerge amongst the South

African population (Claassen, 1996). In 1948, the National Party came into power, and implemented a system to ensure separate development of different races. This was known as the policy of *apartheid* (Lemmer, 1995). The education of children was also affected in that white children were provided with free and compulsory education (Heugh, 1995), whereas the education of black children was left in the hands of the missionaries who constantly had a shortage of funds. With the growth of the South African population, there appeared to be a shortage of schools particularly for black learners and thus only a few black people received adequate schooling. This resulted in education becoming unequal and segregated. The National Party then also implemented pass laws and introduced the "homeland" policies which furthermore restricted the freedom of movement of black people in urban areas, as well as made access to education difficult as separate education departments were now being established (Lemmer, 1995).

In 1953, the Bantu Education Act was passed which required all schools to be registered with the government and as a result many missionary schools closed down (Van Zyl, 2002). Schools were now controlled by the state and thus the curriculum was also manipulated by the state. This was seen as the beginning of apartheid education (Van Zyl, 2002). Compulsory mother tongue instruction was introduced to black learners from grade one and English and Afrikaans were taught as subjects. Subsequent to the Bantu Education act, mother tongue education was extended to the first eight years of schooling from the original implementation of mother tongue education during the first four years of school (Van Zyl, 1997). However, these learners did not even achieve proficiency in their mother tongue due to the cognitively impoverished materials and sub-standard methods that were used to teach the African languages (Lemmer, 1995). As a result of having poor mother tongue proficiency, the learners lacked proficiency in all languages at school (Heugh, 1995). In 1975, black learners were expected to make a change from learning in English as the medium of instruction in grade seven to learning in both Afrikaans and English as the mediums of instruction (Heugh, 2002). This change contributed to the Soweto uprising in 1976- where students protested against the implementation of Afrikaans as a language of instruction in Bantu education (Van Zyl, 2002) as these learners now had to master difficult subject content in languages other than their mother tongue. These riots gave momentum to the liberation struggle and until 1996, nineteen separate education departments existed.

As a result of the apartheid language policy, two major concerns were raised. Firstly, the change from mother tongue education to learning in English as the medium of instruction was difficult for many learners as they did not have enough English proficiency to cope with the syllabus. According to Macdonald (1993), a vocabulary of at least 5000 words is required to cope with the curriculum however these learners were reported to have approximately 800 English words in their repertoire. Macdonald (1993) claimed that in order for learners to be effectively taught in English, certain conditions had to be in place namely:

- Learners should have sufficient opportunities to develop their mother tongue or first language, as learners who have difficulty with English as the LoLT, have not been able to accomplish cognitive academic language proficiency tasks in their first language.
- There should be sufficient opportunities for learners to develop their mother tongue outside of the school in a linguistically demanding formal context. However, this proves to be difficult within a South African context as many learners lack the necessary resources to learn the language outside of school probably due to poverty, especially within the rural areas where parents are struggling to make ends meet and lack the necessary funds to purchase books for their children.

Secondly, the nature of the syllabus was difficult for the African language learners as they were subjected to a cognitively impoverished curriculum which made it difficult for them to cope with the English curriculum. Thus, Bantu education resulted in resistance to mother tongue education and an overestimation of the role of English as the key to success in education. As a result of this segregated education, the apartheid language policy, unequal resources and a cognitively impoverished curriculum, there was a massive under education of the majority of the population (Heugh, 2002).

In 1981, De Lange Commission's report recognized the education crisis and recommended a move towards equality in education. It was over the next few years that the African National Congress (ANC) was unbanned, Nelson Mandela was released and the first democratic election in 1994 was held (Heugh, 1995). This allowed the ANC during the 1980's and 1990's to develop policies to address the discrimination and past injustices towards black people. The Department of Education also reverted back to the policy of mother tongue education for the first four years of school. For the first time in March of 1991, ministerial permission was granted to open white

state schools to black learners, thus leaving the decision of the medium of instruction to the parent body of each school (Peirce & Ridge, 1997; Lemmer, 1995). The language options they could choose from were:

- Straight for the long term medium of instruction from the first year of school, which could be in the mother tongue or the second language
- Sudden transfer from mother tongue instruction to learning in another language, for example, English after the fourth year of school
- Gradual transfer from mother tongue instruction to second language learning during the first four years of school.

Parents from the black communities were overwhelmingly in favour of sudden transfer to English after the fourth year at school (Lemmer, 1995).

It is thus clear that the language in education policy formed part of the struggle for political dominance. History bears evidence that the language policies in South Africa prior to 1991 were determined primarily by political and ideological agendas and therefore only English and Afrikaans were recognized as official languages on all levels (Cele, 2001; Peirce & Ridge, 1997; Lemmer, 1995). South Africa's history cannot be undone and it is clear that the country's language policy at the time made it difficult for learners, especially Africans, to gain an education. Currently the core ideological aims of racial tolerance, human rights, democracy and peaceful conflict resolution seen within the South African constitution are guiding educational reform thereby allowing new and emerging educational policies to rectify the injustices of the past and focus on the needs of society (Le Grange, 2002; Cele, 2001; Gumbo, 2001; Harber, 1999). In the transformation process of South African education, language in education has become a key issue (Peirce & Ridge, 1997; Alexander, 1995).

Language Policy (1994 to present)

In post-apartheid South Africa, eleven official languages are recognized, namely Sepedi, Sesotho, Setswana, isiZulu, siSwati, Xitsonga, isiNdebele, isiXhosa, English and Afrikaans (Sarinjeive, 1999; Peirce & Ridge, 1997). When the ANC came into power during 1994, they created a Language Task Action Group (LANGTANG) to establish the needs of the country. LANGTANG recommended a multilingual policy for South Africa as well as a wide spread use

of African languages in order to counterbalance the effect of English Instruction (Lemmer, 1995). In 1997 the Department of Education promoted multilingualism in education as the defining feature in the language in education policy. The new language policy (Department of Education, 1997), provides legitimacy to the learners' home language and advocates that learners should be taught in their mother tongue for as long as possible and other languages should be added to, rather than replace the mother tongue (Bosman & Van der Merwe, 2000). This change in the language policy recognized the indigenous languages as a resource in building a democratic South Africa and supports the language diversity in our country (Department of Education, 1997).

Subsequent to the Department of Education announcing that language instruction will be one of the core components of the new education curriculum (curriculum 2005), they then revised the curriculum and implemented the Revised National Curriculum Statement (RSA, 2002) which stated that English will be introduced gradually to learners from Grade R to Grade three, with compulsory English teaching from Grade four onwards (Sarinjeive, 1999; Peirce & Ridge, 1997). Furthermore, the method of instruction in all government secondary schools will be English except for Afrikaans medium schools. To gain entrance into University, it is also a requirement that all students pass a school leaving Grade 12 examination in English as a first or an additional language (Peirce & Ridge, 1997).

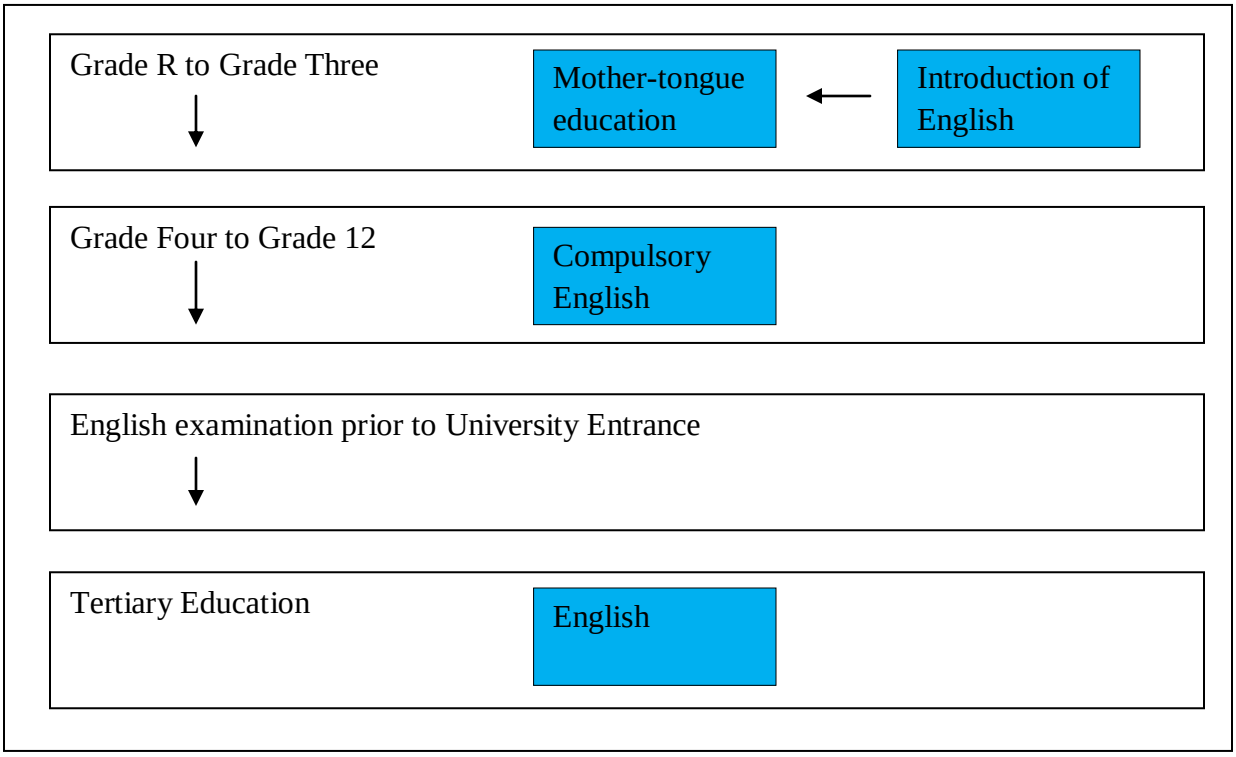

Figure 1: Language Policy Adopted for Black South African Learners (Sarinjeive, 1999; Peirce & Ridge, 1997; MacDonald, 1991)

The above diagram indicates that English as the method of instruction appears to be a reality for most South African learners. Despite the clearly stated language in education policy (Department of education, 1997), which advocates the maintenance of learners' home language at the same time as they acquire additional languages (additive multilingualism), more and more non-English parents and caregivers are opting for English pre and primary schools for their children (Lemmer, 1995; Jordaan, 1993) because of their belief that as the world of opportunity is primarily English speaking, learning in English is the key to success (Sarinjeive, 1999). According to Sarinjeive (1999), the desire for English is further fuelled in some black students and families by a deep resistance to mother tongue education, as it is seen as inferior and associated with the inferior apartheid education and limited employment opportunities as documented by history. Educators in South Africa have however strongly expressed favour towards mother tongue education as a foundation for additive bi/multilingualism. This is because researchers have shown that three years of English acquisition before the sudden transfer to English as the medium of instruction in grade four may not be adequate, as these learners may not have learnt a sufficient amount of English to cope with it as the method of instruction

(Heugh, 2005). However, in certain regions of South Africa it has not been easy to apply the additive bilingual approach as in the case of children who have one or many home languages other than English but are attending preschools (not always by choice but possibly by geographical location) where English is the medium of instruction (Naude, Meyer, De Jongh & Du Plessis, 2000). These learners are therefore forced to cope with English as the language of instruction from their preschool years (Jordaan, 1993). This is cause for concern as evidence shows that children who are plunged too quickly into an English only education without strong support for their home language in school, will experience failure in school (Heugh, 2002). Thus, despite the undisputed advantages of mother tongue education, where learners have meaningful engagement with the curriculum, this "ideal" condition cannot always be achieved in reality. Education authorities in South Africa have aimed to address this issue while remaining fully aware of the reality of the multilingual situation and the availability of both schools and teachers.

The Reality of Multilingualism in Schools

In 1991 when white government schools opened their doors to learners from all races, the majority of the teachers in English medium schools were caught off guard by the diverse language situation in their classrooms (Barkhuizen, 1993). The rapid political and demographic changes in South Africa forced these teachers to adapt to new situations (Peirce & Ridge, 1997). Classrooms were now filled with learners who spoke different African languages and who came from multilingual homes. Teachers also had to cope simultaneously with learners who were first language English speakers (Dawber & Jordaan, 1999) thus having to teach on different language levels to individual learners in the same class. According to Lemmer (1995), some teachers have sufficient knowledge of the African languages to provide additional support to multilingual learners through code-mixing or code-switching. The challenge however occurs when English is the only medium of instruction to these multilingual learners who are in the initial stages of acquiring English as the LOLT. Furthermore, many of the preschool teachers and most likely the primary school teachers teach in English without being fully proficient in English themselves (Lemmer, 1995). According to de Klerk (2002), the number of highly trained mother tongue English teachers in South Africa is declining. Where teachers themselves do not have English as their first language, there is a very real possibility that they are unable to speak and teach the standard form targeted at school (Owino, 2002). This creates stress on both physical and

emotional levels (Diedricks, 1997) and often leads to teachers feeling incompetent and unsure (Ashton & Webb, 1986). It is thus essential that the language teaching needs of teachers be addressed by support professionals such as speech-language therapists so as to prevent the academic failure of multilingual learners.

Multilingualism therefore poses a challenge, not only within the South African context but also internationally. Educators face the challenge of how best to respond to the diverse developmental, cultural, linguistic and educational needs of these multilingual learners and their families (National Association for the Education of Young Children (NAEYC), 1996). Research shows that education for multilingual learners in the home language or mother tongue for the first years is strongly advised both internationally and by national educational authorities (Heugh, 2002; Morris, 2002). The demographic make-up of urban and inner city primary schools in Gauteng, suggests that even though mother tongue education is advocated in South Africa (Department of Education, 1997) it is becoming obvious that it is no longer feasible in many schools as the heterogeneity in the language backgrounds of the learners and teachers makes English as the Language of Learning and Teaching (LOLT), the only practical choice. This study was conducted in two of these contexts where education through the Medium of English occurs from the first grade. Both have evolved from the former Model C schools, primarily because of the migratory patterns in the urban population since the new democracy in 1994 (Sekete, Shilubane, & Moila, 2001). In the first context, all the learners were English Additional Language (EAL) learners and came from a range of home language backgrounds, including indigenous and other African languages. The teachers were also EAL speakers and may have been able to communicate in some of the first languages spoken by the children in their classes (Jordaan, 2009). In the second context, first and additional language speakers of English were integrated in the same classes in varying proportions and the majority of teachers at these schools spoke English as a first language (Jordaan, 2009). These contexts imply that since there is a marked heterogeneity in the language backgrounds of these learners and teachers, English appears to be the only language of mutual understanding between the teachers and learners as well as their parents and therefore English as the LOLT is inevitably adopted (Granville, Janks, Joseph, Mphalele, Ramani, Reed & Watson, 1997). This furthermore provides justification for the assessment of these learners' language abilities only being conducted in English.

Overall, the extreme multilingualism of the learners and teachers, the predominant use of English as the medium of learning and teaching and the limited exposure to English from "role models" constitute the language challenges and potential barriers to academic learning and social development for learners in South Africa, specifically within urban school settings. However, even though multilingualism and the use of English as the LOLT appear to be the primary barriers to successful academic learning, there is one other barrier (the inclusive education policy) which also proves to be a great challenge for both learners and educators in South Africa, and is relevant to language impaired learners.

Inclusive Education

In 1994, ninety two governments around the world (including South Africa) adopted the Salamanca statement which declared that all learners should be accommodated in an inclusive education policy. This policy had to "recognize and respond to the diverse needs of the students, accommodate different learning styles and rates of learning and ensure quality education to all through appropriate curricula, organizational arrangements, teaching strategies, resource use and partnerships with their communities" (Swart & Pettipher, 2006, p.8). The White Paper 6 was therefore published in 2001, which outlined a route for South African education to move into the international trend of inclusion. Since this publication, South Africa has progressed (and is still progressing) towards a more socio-ecological education system which focuses on addressing the needs of the learner in any given context (Swart & Pettipher, 2006) and further away from the original medical model of education which considered the learner from a deficit perspective and was thus more concerned with the diagnosis, treatment, categorization and placement of a learner (Nel, 2007; Pillay & Terlizzzi, 2009; Swart & Pettipher, 2006).

According to the Guidelines for full service schools/inclusive education document prepared by the Department of Education (DoE) (2009), the emphasis of the White Paper 6 is on those learners who have been or continue to be disadvantaged in terms of educational provision. The Education White Paper 6 argues for the need to transform the education system in order to tackle barriers to learning and development (Department of Education (DoE), 2009) by building a single education and training system that can accommodate all learners (DoE, 2009). The term 'full service schools' is thus provided to those schools and colleges that are well supported and

equipped to accommodate these learners' vast range of learning requirements (Education White Paper 6, 2001). Emphasis is particularly placed on inclusive principles such as flexibility in learning and teaching and the provision of education support to the learners and educators when building the capacity of these schools (DoE, 2009). However, even though Education White Paper 6 argues the need to transform the education system to accommodate all learners, the problem arises when teachers are not adequately trained to deal with the challenges that inclusive education brings. Such is the case for many teachers in South Africa (Nel, 2007). The focal point of Education White Paper 6 as well as the follow-up draft policies is based on the notion that "all educators will have the knowledge and skills to identify and support learners experiencing barriers to learning in any educational context" (DoE, 2009; Education White Paper 6, 2001). However, in order for the teachers to correctly implement and carry out what is required of them according to the National Strategy on Screening, Identification, Assessment and Support (SIAS) document (DoE, 2008), teachers in South Africa need to have knowledge and skills regarding the following (Nel, 2007) :

- The various forms of extrinsic and intrinsic barriers
- Identifying and assessing learners who experience barriers to learning
- Compiling an assessment profile for learners experiencing barriers to learning
- Collaborating with all relevant role players including parents
- Implementing intervention strategies
- Keeping record of progress
- Utilization and Mobilization of available resources at school
- Preventing and addressing barriers to learning arising from
    - the content of learning programs
    - the language of learning and teaching (LoLT);
    - the management and organization of the classrooms
    - the learner's learning style and pace
    - time frames for completion of curricula;
    - the availability of materials and equipment
    - a variety of assessment methods and techniques including alternative assessment techniques and innovative new teaching strategies

(Nel, 2007)

However, Nel (2007), revealed in her study that many teachers felt that they were not sufficiently trained to deal with the challenges inclusive education brought and were thus unable to respond to the diverse needs of inclusive education. Furthermore, many of the teachers felt that they were also not well equipped to deal with children with one or more barriers to learning and have poor knowledge and skills in adapting the curriculum and methods of assessment for these learners (Nel, 2007) despite the fact that some of them had received some pre-service and in-service training and have had years of experience in teaching. Many policies have now been developed to guide teachers and provide further information on addressing barriers to learning for e.g. 'Draft Guidelines for Inclusive Learning Programmes' (DoE, 2005), The National Strategy on Screening, Identification, Assessment and Support (SIAS) (DoE, 2008) and the 'Support and adaptations for learners who experience barriers in assessment' (DoE, 2008). These documents provide information on specific barriers such as visual, hearing, physical, speech and language and how the curriculum and methods of assessments may be adapted for learners with these difficulties. However, even with these guidelines, teachers may still feel unsure of how to correctly identify and assess these learners making them feel even more stressed and less competent. Furthermore, when the barrier to learning is not as "obvious" i.e. in learners who have SLI, the identification of these learners may be missed. As SLI is inconspicuous in nature, and can easily be mistaken for another disorder/impairment, identifying these learners (especially EAL learners with SLI) specifically in an inclusive education setting where some teachers may be more concerned with managing those learners with more "physical" barriers to learning, may prove to be more challenging. If barriers to learning also arise from the language of learning and teaching, teachers may additionally be unsure of how to differentiate the slow to learn learners from learners with SLI.

Therefore in order for teachers to be able to effectively identify, manage and assess learners with barriers to learning in mainstream schools, a proper support system needs to be in place. Donald, Lazarus and Lolwana (2002, p.19) define support as help "from within schools as well as to schools in areas such as school health, social work, psychological and learning support, speech and hearing and physio/ occupational therapy and from other community resources." However these support structures may not be possible in many of the mainstream schools in South Africa. This is because many of the government schools for learners with special educational needs

(LSEN) are subsidised (more so than within the mainstream school environment) and thus the school fees at mainstream schools may not be sufficient to provide the facilities and resources these LSEN require (Pillay & Terlizzi, 2009). Furthermore by having speech- language therapists, occupational therapists and psychologists on site, they are able to provide their services and meet the learners' needs as part of the school fee structure without having to put pressure on the learners' parents to transport their children to and from therapy after school (Pillay & Terlizzi, 2009) and perhaps pay more money for therapeutic services. This considered, it is still the trend in South Africa to refer these LSEN to more specialized schooling environments so that the learners' best interests and needs can be met through obtaining learning support and therapeutic intervention that cannot always be provided within mainstream school environments (Pillay & Terlizzi, 2009).

This chapter aids in our understanding of the reality of multilingualism in South African schools and furthermore demonstrates the role speech- language therapists can play in assisting teachers to ensure that the EAL learners are acquiring the English language to the best of their ability as well as in identifying EAL learners with SLI (one of the barriers to learning) so as to ensure that these learners obtain the appropriate intervention services in mainstream and specialized classrooms.

CHAPTER 3

PROFILING THE LANGUAGE AND COGNITIVE PROCESSING ABILITIES OF LEARNERS WITH AND WITHOUT LANGUAGE IMPAIRMENT

What is Specific Language Impairment?

Specific Language Impairment (SLI) is one of the most common paediatric language disorders, the prevalence of which is estimated at approximately 7% (Leonard, 1998; Tomblin, Records, Buckwalter, Zhang, Smith, O'Brien, 1997) thus constituting a large portion of the caseload of SLP's. SLI is an impairment of language comprehension, language production or both in the presence of normal intelligence (i.e. learners have normal performance IQ), absence of a hearing impairment, no diagnosis of autism and no neurological impairments and primarily affects language and educational outcomes (Leonard, 1998). In short, these children experience typical development in every area but one: learning to speak and use language (Genesee, Paradis & Crago, 2004; Schwartz, 2009). SLI can therefore be defined by exclusionary criteria (Schwartz, 2009). Furthermore, children with SLI display limitations in general auditory and speech perception; limitations in memory, executive functions and attention; deficits in problem solving, mental rotation and mathematics. They also appear to have a high incidence of dyslexia and other more global reading and writing disabilities (Schwartz, 2009). However, there is not yet a fully agreed upon set of characteristics of SLI that could comprise a well-defined set of inclusionary criteria in the expressive and receptive abilities of these children (Hoff, 2005) and therefore the nature of these limitations and their relation to SLI still remain controversial. Much research has been conducted on children who have SLI but researchers still appear uncertain about important aspects for e.g. its cause, range of manifestation, the course of its development and the most effective remediation approaches for it (Schwartz, 2009). There is also still much debate on the current theories for the causes of SLI, thus making it even more difficult for the manifestations of this disorder to be determined and fully understood. Schwartz (2009) stated that many of the theories on the causes of SLI are not sufficiently comprehensive to account for all the deficits associated with SLI, others are too vague and finally some proposals lack

convincing evidence or have been demonstrated not to be true. Some of these theories are briefly described below:

SLI as a result of Impaired Phonological Memory

A deficit in phonological memory has been said to be one of the most reliably appearing features of children with SLI (Tager-Flusberg & Cooper, 1999). Research shows that children with SLI perform more poorly than typically developing children on tasks assessing phonological memory e.g. non word repetition (Dollaghan & Campbell, 1998; Montgomery, 1995; Schwartz, 2009). Furthermore Bishop (2006), found that this deficit has a genetic basis and can be found even in children whose language impairments have been resolved through speech and language therapy. However not all children with SLI (e.g. the grammatical SLI subgroup) appear to have deficiencies in phonological memory (van der Lely, & Howard 1993; van der Lely, 2003).

SLI as a result of deficits in Nonlinguistic Cognition

A recurring explanation of SLI is that it results from deficits in non linguistic cognition. However, research is showing that SLI based on this account is not so specific after all. Children diagnosed as having SLI have shown cognitive deficits in symbolic functioning, mental imagery, hierarchical planning, hypothesis testing and reasoning (Johnston, 1988, 1992, 1997). Marton and Schwartz (2003), also found that the working memory demands of language tasks impacted the performance of learners with SLI compared to their typically developing peers, suggesting that children with SLI have greater processing limitations (Leonard, 2003; Schwartz, 2009; Gathercole & Baddeley, 1990). Furthermore, Leonard (1998), stated that some children with SLI have a more limited general processing capacity and therefore process information more slowly than their typically developing peers. One account of this type of processing limitation is known as the Generalised Slowing Hypothesis (Miller et al., 2001). Such limitations in processing speed are thought to underlie the linguistic development in children with SLI because even though they have been exposed to the target language for the same period of time as their typically developing age matched peers, they require much more time-on-task to process that information and develop linguistically (Paradis, 2007). These processing limitations together with poor phonological memory abilities make it difficult for children with SLI to represent and store enough language data to extract the regularities that lead to linguistic advances (Leonard, 2003).

Specific Impairment in the Language Faculty

These accounts maintain that the difficulties children with SLI experience result from an impairment in some aspects of the grammar acquisition mechanism asserted to be innate in all of us. The missing rule hypothesis proposes that children with language impairment have difficulty learning the implicit linguistic rules that govern the use of grammatical morphology (Gopnik, 1990). Another example of the deficit in the language faculty explanation is the extended optional infinitive (EOI) account. The EOI account proposes that children with SLI extend a period that occurs in typically developing children during which tense is optionally marked on verbs that occur in main clauses. The optional finite stage is part of a normal, language-specific part of development (Rice, 2003; Wexler, 2003). According to this view, the genetic blueprint in children with SLI is different to their typically developing peers in this regard and consequently this stage lasts longer, perhaps indefinitely (Wexler, 2003). This also results in finite verbs being produced without markers such as tense and number (Schwartz, 2009). The Disruption-within-Delay account is another example of a deficit at the level of linguistic representation and argues that children with SLI show overall delay in their language development compared to their typically developing age matched peers, but also show pernicious difficulties with individual linguistic structures that go beyond what their general delay would indicate (Rice, 2003, 2004).

SLI as a result of Temporal Processing Deficits in discriminating and sequencing rapidly presented stimuli

This proposal suggests that in order to process speech, learners need to process rapidly sequenced acoustic stimuli. According to Benasich and Tallal (2002), the ability to distinguish rapid auditory cues in childhood, will predict later language development. Research shows that children with language impairment can process acoustic stimuli (such as tones) separated by more than 0.4 seconds as well as their typically developing peers can (Tallal, 1978). However, they have difficulty in differentiating whether sequences of tones are different or the same when rapidly presented (Tallal, 1978). Therefore, learners that have difficulties in this type of processing will have difficulty conducting the rapid analysis of speech that language acquisition requires (Tallal, 1978).

Each of these hypotheses concerning the underlying cause of SLI has some empirical support but so far these investigations have not succeeded in identifying a single cause of SLI. Therefore, according to Hoff (2005), it is possible that because language development depends on so many underlying abilities, SLI can have many causes. This view is consistent with the evidence that children with SLI actually represent several different subgroups with different disorders (Hoff, 2005). On the other hand, Leonard (1987, 1991) claimed that SLI may have no cause because it does not exist. He argued that children labeled as SLI simply represent the lower end of the normal distribution of language learning ability which may encompass the aptitude for language learning. This study therefore attempts to provide further information on and implications for the theories of SLI by showing whether SLI is a deficit of representation rather than processing or access or that it is perhaps simply slowness in learning.

Characteristics of the Language deficits in monolingual learners with SLI

The various areas of language deficits that characterize SLI may be more prominent in some language domains than in others. These deficits also vary across children with SLI and in certain children, all domains may be affected. These domains are briefly discussed below:

Lexical and Semantic Deficits

The general course and speed of lexical development is said to be delayed in children with SLI (Schwartz, 2009). Compared to their typically developing peers, their first words emerge much later and their word comprehension is also delayed (Clarke & Leonard, 1996). School aged children with SLI have more apparent deficits in vocabulary and they may also have sparse lexical-semantic representations and deficits in semantic category knowledge (McGregor, Friedman &Reilly, 2002; Kail & Leonard, 1986). Some researchers also suggest that children with SLI may have less lexical diversity compared to their age-matched typically developing peers, but it may be similar to their language-matched peers (Goffman & Leonard, 2002; Klee, 1992; Leonard, Miller & Gerber, 1999). Furthermore, some children with SLI have word-finding difficulties (Dockrell & Messer, 2007; German & Newman, 2004). They present with difficulty in naming-on-demand tasks, exhibit pauses and hesitations and use circumlocution (Schwartz, 2009). Overall, children with SLI exhibit limited vocabularies (verbs appear to be particularly

problematic), they appear to have underspecified phonological representations of words, their elaboration of the semantic information underlying words is limited and they have atypical organization or access to their mental lexicon (Schwartz, 2009).

Morphosyntactic Deficits

Morphosyntactic deficits are the most studied language deficits in children with SLI. Children with SLI have difficulty with verb morphology, functional morphemes that mark finiteness and often produce bare stem words without past tense or third person singular endings (Schwartz, 2009). These deficits are prominent in the preschool years, with deficits in finite verb morphology becoming more distinct when MLU reaches 3.50 and continuing to be prominent till eight years of age (Schwartz, 2009). Research shows that measures of finite verb morphology are very sensitive (97% accuracy) in differentiating children with and without language impairment (Schwartz, 2009). Generally, children with SLI perform more poorly and show distinct growth curves in their development of these morphosyntactic markers compared to their aged-matched and language-matched typically developing peers in all regional dialects of English (Schwartz, 2009). Results of studies of verb related morphological forms such as past participles have yielded mixed findings. Some researchers suggest that children with SLI produce participles similarly to their language matched typically developing peers (Redmond & Rice, 2001) whereas other researchers revealed deficits in their production (Leonard et al., 2003). The extent to which these deficits affected noun-related morphology is still unknown and needs to be further researched (Schwartz, 2009). Furthermore, case marking for pronouns in English is also impaired in children with language impairment compared to their language-matched typically developing peers (Loeb & Leonard, 1991). However, not all children with SLI produce these errors and the error rates differ between ‘he and she’ (Pine, Joseph & Conti-Ramsden, 2004). Thus the nature or underlying cause of this deficit remains unknown.

Syntactic Deficits

Children with SLI display persistent difficulty understanding and producing syntactically complex sentences, particularly sentences that involve long- distance dependencies, such as wh-questions (Schwartz, 2009; Deevy & Leonard, 2004; Marinis & van der Lely, 2007; Stavrakaki, 2006) or relative clauses (Friedmann & Novogrodsky, 2004, 2007; Hakansson & Hansson,

2000). Research shows that these children may construct grammars in acquisition where long-distance dependencies are optionally represented (Schwartz, 2009). For e.g. in the sentence 'the zebra that the hippo kissed on the nose ran far away,' the relationship between the zebra and its trace position may not be established. The deficit is specific to a grammatical operation called "move." As children with SLI show difficulty in movement, it can cause difficulty in the assignment of thematic roles (Schwartz, 2009). Other researchers propose that the challenge children with SLI have in comprehending and producing complex syntactic structures, lies in their ability to process these sentences (Schwartz, 2009). Deficits such as working memory (Deevy & Leonard, 2004; Montgomery, 2000, 2003), attention, control of attention and processing speed (Leonard, Weismer et al., 2007) may contribute to this difficulty. Furthermore, there is also evidence of deficits in other structures with complex syntax such as passives, finite complement clauses and argument structure that affect comprehension and production (Leonard et al., 2006; Marinis & van der Lely, 2007; Owen & Leonard, 2006; Grela & Leonard, 2000). However studies of these deficits are still limited and further research needs to be conducted.

Pragmatic Deficits

One of the challenges in the study of pragmatic deficits in children with language impairment is that pragmatics combines social behaviour with aspects of language that are truly structural (Schwartz, 2009). Initially, researchers focused on investigating the communicative functions of children's utterances. It was found that children with SLI performed similarly to their language-matched peers in the communication functions expressed but did so less efficiently or appropriately (Leonard, 1986; Brinton, Fujiki & Sonnenberg, 1988). These deficits are now said to be indications of deficits in structural language rather than a lack of pragmatic knowledge (Craig, 1985). Children with SLI have also been shown to have deficits in conversation that may reflect either social or structural language deficits. Studies have shown that they produced fewer utterances in response to adult requests for information (Bishop, Chan, Adams, Hartley & Weir, 2000). Those children who provided no response (not even non verbal) to such requests were defined as having pragmatic SLI because a child who does not acknowledge the obligation to respond clearly has a more general deficit with social interaction and turn taking compared to a child who provides an inadequate response perhaps due to a comprehension deficit (Schwartz, 2009). There is also evidence to suggest that children with SLI may have structural deficits in

conversational interaction as it affects the contingency and coherence of successive utterances (Craig & Evans, 1993). However further research is required in this regard. Furthermore, children with SLI have difficulties from early childhood in establishing peer relationships which extends into adolescence (Conti-Ramsden & Botting, 2004). These children show difficulties and deficits in social initiation, participation in social interactions, conflict resolution and with appropriate responses to social bids (Craig & Washington, 1993; Hadley & Rice, 1991; Brinton, Fujiki & McKee, 1998)- aspects that are critical to establishing peer relations. Overall, children with SLI display a broad range of pragmatic deficits which include structural discourse deficits, deficits in the use of language for social interaction and deficient social skills (Schwartz, 2009).

Reading Comprehension Deficits

Reading comprehension is a complex task that draws on many different cognitive skills and processes. In order for a child to construct a coherent representation of the meaning of a story, he/she has to understand, remember and link literal details in the text and be able to generate inferences either by integrating various aspects of the story or by incorporating general knowledge with story details (Kintsch & Rawson, 2005). Research has shown that children with language impairment experience pervasive problems with story comprehension and reading (Catts, Fey, Tomblin & Zhang, 2002; Bishop & Adams, 1990). These learners perform poorly at answering questions where they are required to integrate various pieces of information that have been explicitly presented in the story and also where the information can/must be inferred from the text (Bishop & Adams, 1992; Botting & Adams, 2005; Norbury & Bishop, 2002). However, due to the nature of the language difficulties in some children with SLI, it is suggested that these learners may have problems more specifically in the area of reading comprehension rather than having difficulties in both decoding and reading comprehension (Kelso, Fletcher & Lee, 2007). Results from the Kelso et al., (2007) study revealed that two subgroups of children with reading comprehension difficulties could be identified amongst children with SLI: one fitting the classic SLI profile, while the other had a poor comprehender reading profile. The two groups differed in terms of their language skills with the poor comprehenders exhibiting significantly stronger phonological skills but significantly weaker oral comprehension abilities at the paragraph level. Furthermore, Nation, Clarke, Marshall and Durand (2004), showed that there is a close relationship between reading comprehension failure and poor oral language abilities, however

not all children who are poor comprehenders have significant language impairments and similarly not all children with SLI have poor reading comprehension (Nation et al., 2004; Bishop & Adams, 1990). These results indicate the need for speech pathologists and teachers to conduct appropriate assessments of children with SLI so as to identify the different types of language difficulties that underpin different types of reading difficulties (Kelso et al., 2007).

Characteristics of the language deficits in bilingual learners with SLI

The incidence of SLI in the monolingual English-speaking population in the USA is 7.4% (Tomblin, Records, Buckwalter, Zhang, Smith, O'Brien, 1997). However, there is very limited information on the incidence of language impairment in bilingual populations because of the lack of typical developmental information, the absence of valid assessment measures and the need for studies that focus on the nature of impairment in bilingual children (Pena & Bedore, 2009). According to Valencia and Suzuki (2001), it is not always possible to verify that exclusionary criteria are met, due to a lack of valid cognitive measures for bilingual children in the USA thus making it particularly difficult to identify language impairment in these learners. Furthermore, in countries such as South Africa where many children are having difficulty learning in English as an additional language, researchers are still unsure how to differentiate between slow to learn EAL learners and those with SLI. This is because EAL learners who receive English only instruction without proper scaffolding and monolingual English learners with SLI, exhibit similar behaviours for e.g. both tend to have poor comprehension, poor vocabulary, slow rates of learning, as well as reading and writing difficulties (Linan-Thompson & Ortiz, 2009). Furthermore, many of the linguistic errors that mark language impairment in monolinguals are also made by typically developing bilingual language learners (Pena & Bedore, 2009). It is thus important that this area be further researched so as to identify markers that distinguish between typically developing bilingual learners and bilingual learners with language impairment in order to minimize the risk of EAL learners being misdiagnosed as having SLI- something this study aimed to do. Some studies with regards to semantics, syntax and morphology in bilingual learners with and without LI have shown potential characteristics of language impairment in bilingual children. These will briefly be discussed below.

Semantics and Lexical Development

Studies of the semantic skills of monolingual children with SLI, show that these learners have word finding difficulties, naming errors and perform below that of their typically developing peers on standardized vocabulary tests during their school age years (Lahey & Edwards, 1999; Windsor, 1999; Van der Lely & Howard, 1993). Data on the semantic performance of bilingual children with language impairment (LI) show that these learners make more naming errors and require more processing time to respond, compared to their typically developing (TD) bilingual peers (Pena & Bedore, 2009). According to McGregor (1997), McGregor, Newman and Reily (2002) and McGregor and Windsor (1996), bilingual children with language impairment appear to have deficits in the retrieval and organizational aspects of semantic use rather than in vocabulary size. These findings are consistent for monolingual children. Dollaghan (1992), suggests that their performance may further be compromised due to lack of breadth in lexical entries, weak links between the lexical entries or limited depth of the lexical entries. Bilingual children with LI like monolingual LI children also demonstrate difficulty in learning new words and learning and using naming strategies (Gray, 2004; Nash & Donaldson, 2005; Pena, Iglesias & Lidz, 2001; Pena, Quinn & Iglesias, 1992). Lastly, bilingual children with LI appear to have weak semantic representations (Simonsen, 2002). Studies have shown that bilingual learners perform more poorly on word finding vocabulary tests compared to their monolingual age matched peers. The bilingual learners with LI scored lower than their TD bilingual peers and furthermore both bilingual and monolingual learners with LI made more semantically related errors (Pena & Bedore, 2009). Thus far the limited data available from bilingual children with LI are consistent with the findings for monolingual LI children.

Morphology and Syntax

Bilingual children with LI have been shown to have morphological error patterns that are similar to those of monolingual children with LI and both progress more slowly than their TD peers (Pena & Bedore, 2009). This is evident from Paradis' (2005) study, in which she compared the performance of EAL children and children with SLI on tests of grammatical morphology. She found that both populations have the same difficulty with grammatical morphemes as was evident in the accuracy rates and error patterns produced by both the EAL learners and their aged matched monolingual peers with SLI (Paradis, 2005). Both groups produced a high number of

errors of omission (where the correct morpheme was left out), compared to errors of commission (where a wrong morpheme was used) for tense and non tense morphemes (Genesee et al., 2004; Paradis, 2005). In addition, Paradis (2005) showed that this error pattern was displayed in more than 90% of the individual learners' results. Salameh, Hakansson and Nettelbladt (2004) followed 4- 7 year old bilingual learners with and without LI. Results from their study suggested that the typically developing bilingual children demonstrated knowledge through the most complex-clausal-level structures i.e. they progressed through all the stages of "processability". These include short words and phrases and ultimately lexical morphology (noun plural or gender), phrase level structures (noun phrase agreement), interphrasal structures (subject verb invasion), and ultimately clause level structure (subordinated clauses). In contrast, the bilingual learners with LI tended to perform at the most basic level, using mainly short words and phrases and lexical morphology (Salameh et al., 2004). Paradis, Crago, Genesee and Rice (2003), documented the performance on tense and non tense bearing morphemes of bilingual children with LI and their monolingual peers. Results from this study were consistent with the predictions of the extended optional infinitive hypotheses (Rice & Wexler, 1996) for the monolingual speakers whereas the bilingual learners with LI omitted tense marking in each of their languages. Results showed that young typically developing children produced these forms correctly or demonstrated knowledge of the rules for regular past tense in overregularizations but the children with SLI overregularized infrequently and more often produced bare stem infinitive forms (Schwartz, 2009).

Overall, the results of studies with bilingual children who have language impairments (regardless of the cause), show patterns that are indicative of delayed rather than deviant communication development and are consistent with the theories of bilingual and second language acquisition (Pena & Bedore, 2009). Time spent hearing and interacting in one language may influence the time available to hear and interact in the other language. The question of 'the amount of exposure' is critical when examining the language abilities of bilinguals and understanding how language impairment may manifest (Schwartz, 2009). However, there are other factors besides length of exposure that contribute to the acquisition of a language and possible language impairment. These are discussed below.

Factors affecting Language Acquisition in Bilingual and Second Language Learners

One of the basic questions when researching second language acquisition specifically the acquisition of English, is what accounts for students' differential success in language learning. Research on the rate of acquisition of an additional language has shown substantial individual variation and no correlation between the length of exposure and scores on language measures has been recorded (Wong- Fillmore, 1979; Genesee et al, 2004). Intrinsic and extrinsic factors that influence language learning have however been widely researched in the past 30 years (Kormos & Safar, 2008). Extrinsic factors such as the socio-economic status of the family, the language input the child receives and the child's measured language abilities all contribute to the way in which he/she will develop language (Goorhuis & Schaerlaekens, 2000; Kohnert, 2007). Kohnert (2007), explained that even though children from families with diverse incomes begin to talk at similar ages, the family income level (presumably correlated with educational and literacy levels) is linked to the amount of input the child receives. This input exerts a significant effect on language development. This can be applied to the South African context as children are exposed to more than one home language from the beginning and many come from an environment of poverty and neglect which are not facilitative of the language acquisition process. These children may demonstrate difficulties with language at school but are not necessarily language impaired.

Intrinsic variables along which language learners differ include affective (motivation, self confidence, language learning anxiety), personality (openness to experience, conscientiousness, extraversion, agreeableness, emotional stability) and cognitive (intelligence, foreign language aptitude and working memory) (Dornyei, 2005; Baker, 1994; Costa & McCrae, 1992; De Bot, Lowie & Verspoor, 2005). The role of intelligence and foreign language aptitude in second language acquisition has been extensively researched. For almost half a century, aptitude has been considered as one of the most important cognitive pre determinants of success in acquiring a second language (Kormos & Safar, 2008; De Bot et al., 2005). According to De Bot et al, (2005), aptitude can be seen as a characteristic similar to that of intelligence, but cannot be altered through training. As different skills are involved in language learning, aptitude then needs to include several factors. In the literature, starting from Carroll (1958), aptitude is usually described as a combination of four factors. These include: the ability to remember sounds of the foreign language, the ability to recognize how words function grammatically in sentences, the

ability to induce grammatical rules from language examples and the ability to recognise and remember words and phrases (de Bot et al., 2005). As a result, a number of tests that incorporated these factors were developed to assess language aptitude, with the most frequently quoted tests being the Modern Language Aptitude Test (MLAT) (Carroll & Sapon, 1959) and the Pimsleur Language Aptitude Battery (PLAB) (Pimsleur, 1966). Both these tests largely overlap, but Pimsleur included intelligence as one aspect of aptitude whereas Carroll claimed that intelligence should be seen as a separate entity from aptitude (De Bot et al., 2005). Over the years, researchers have shown problems with Carroll's (1981) conceptualization of aptitude for language learning. These include: that it is unclear how parts of the test he developed relate to the components of language aptitude, how foreign language aptitude and intelligence interact, and what relevance foreign language aptitude has in different types of acquisition contexts (Sawyer & Ranta, 2001; Robinson, 2005). Several studies have also shown that the MLAT and PLAB show high correlations with intelligence and controlled language production, but low correlations with free oral productions and general communication skills (De Bot et al., 2005). As the latter is important in second language acquisition, the conventional aptitude tests do not tell the whole story of a person's second language learning ability. Recent research on aptitude however, takes into account that aptitude is a dynamic construct that includes other cognitive abilities in addition to it being a good predictor of achievement in classroom second language learning (De Bot et al., 2005; Robinson, 2002). An aspect that is now generally considered as one of the components of aptitude is working memory (WM) (De Bot et al., 2005).

Working memory involves the temporary storage and manipulation of information that may be necessary for a wide range of complex cognitive activities (Baddeley, 2003). Language learning during childhood relies heavily on attention and memory (Gillam, Montgomery & Gillam, 2009). Working memory can be defined as the ability to simultaneously store and process verbal information (Montgomery, 2002). It plays a fundamental role in all forms of complex thinking and is the foundation for reasoning, problem solving, and language comprehension (Just & Carpenter, 1992). Studies suggest that deficits in working memory will affect language acquisition in additional English language learners (Archibald & Gathercole, 2007; Adams & Gathercole, 2000; Baddeley, 2003; Hansen & Bowey, 1994; van Daal, Verhoeven, van Leeuwe, & van Balkom, 2008; McDonald, 2006; & Ardilla, 2003). In addition, McDonald (2006)

provided a viable explanation for poor grammaticality in slow to learn second language learners. He stated that processing difficulties in the basic cognitive process of memory, decoding and speed and stressful processing conditions, such as being instructed in a language that is not the learner's first language, can make it difficult to access and apply relevant grammatical knowledge. It is interesting that research has shown that the significant individual variation in acquisition rates observed in EAL learners (Service, 1992) and the language difficulties of children with SLI (Dollaghan & Campbell, 1998; Linan-Thompson & Ortiz, 2009) have their origin in the same underlying cognitive processing skills i.e working memory and phonological memory. This may explain the difficulty in differentiating between EAL and SLI learners.

In order to understand the relationship between language and working memory, and to understand the difficulties children with language impairment may face, it is important to discuss working memory in more detail. Extensive research over several decades has established that working memory is not a single store, but rather a memory system that is comprised of separable interacting parts (Alloway, Gathercole, & Pickering, 2006). The most widely accepted conceptualization of short term memory today is the Baddeley and Hitch (1974) working memory model and now Baddeley's (2000) model which will be discussed below.

Model of Working Memory

Baddeley's working memory model (1974, 1986, 2000) can be divided into three subsystems. One concerned with verbal and acoustic information, the phonological loop; a second, providing its visual equivalent, the visuo-spatial sketchpad; while both are dependent upon a third attentionally- limited control system, the central executive. A fourth subsystem, the episodic buffer, has recently been introduced which uses multi-dimensional coding, integrates information to form episodes and is in communication with long-term memory (Baddeley, 2003). The basic architecture of the tripartite model, that is, the central executive, the phonological loop (often referred to as phonological short term memory) and the visuo-spatial sketchpad (referred to as visuo-spatial short term memory) seems to be developed by about age 6 (Gathercole, Pickering, Ambridge, & Wearing, 2004). The capacity of each component increases from early childhood into adolescence (Gathercole, 1999; Gathercole et al., 2004). The central executive is significantly linked to both storage devices beginning in early childhood. This finding indicates

that the executive is associated with the coordination of the flow of information throughout working memory (Baddeley, 1996; Gathercole et al., 2004), and different working memory mechanisms develop in an integrated fashion from an early age. Finally, the phonological loop and the visuo-spatial sketchpad appear to develop relatively independently of each other, revealing their domain specificity (Gathercole et al., 2004; Jarvis & Gathercole, 2003). The following diagram shows a visual representation of the model (Baddeley, 2000). Each component is also described in more detail below.

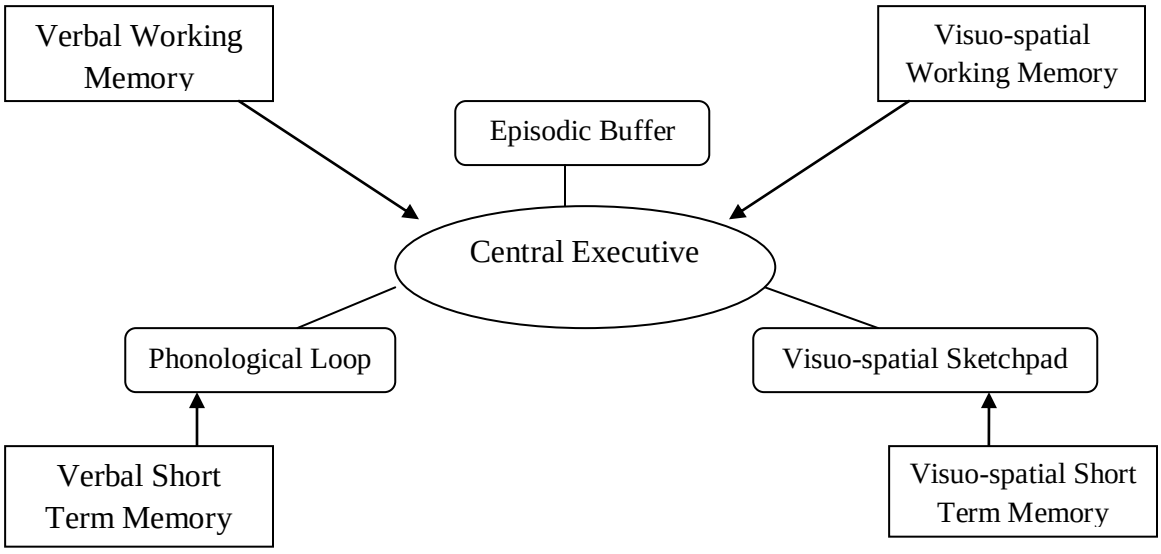

Figure 2: A diagrammatic account of working memory and its relationship to the Automated Working Memory Assessment (Alloway, 2007).

The Central Executive

The central executive is the most important but the least understood component in the working memory model (Baddeley, 2003). The central executive can be considered an attention supervisory system whose purpose is to coordinate the flow of information by activating and retrieving information from long term memory and regulating the overall processing and storage of information (Baddeley, 2003; Vance, 2000). The central executive component is thought to be responsible for selective attention, the coordination of performance on two or more separate tasks and the inhibition of the disruptive effects of competing stimuli (Baddeley, 2003). Children's executive function abilities are often assessed using dual processing tasks, for example, backwards digit span tasks or listening and reading span tasks (Gillam et al., 2009; Kormos & Safar, 2008). These tasks require the child to engage in simultaneous information

processing and storage. Children with language disorders do not perform as well as their non impaired peers on these tasks (Gillam et al., 2009) because they appear to have a reduced attentional capacity (the limited mental energy that is available to a person to perform a cognitive task) and poor inhibitory control compared to their aged matched peers (Montgomery, Magimairaj & Finney, 2010) . Overall, the central executive is imperative for language learning and has grave implications in language impairment as it is an important component involved in auditory comprehension (Schwartz, 2009).

The Phonological Loop

The most widely researched component of the working memory model is the phonological loop (Kormos & Safar, 2008). The phonological loop comprises of a phonological store which holds memory traces for a short period of time and an articulatory rehearsal process, in which sounds are repeated mentally in order to delay decay of the memory traces by keeping the phonological representations active (Baddeley, 2003; Gillam et al., 2009). The rehearsal process is similar to subvocal speech and takes place in real-time, resulting in a limited span of immediate memory (Kormos & Safar, 2008). The articulatory rehearsal process also converts written material into a phonological code which in turn registers it into the phonological store (Baddeley, 2003). Information gained from visual input, such as reading printed text, can be subvocally recoded and transferred to the phonological store. Baddeley (2003) identified four factors which can affect the memory traces. These include:

The unattended speech effect, which is assumed to occur when any spoken material gaining access to the phonological store is corrupted by the presence of irrelevant material (Baddeley, 2003).

The phonological similarity effect is highly robust and is often used as a marker of the phonological loop. This occurs when immediate recall is impaired, because the items heard are similar in sound or auditory characteristics. Baddeley (2003), points out that similar word or sound characteristics are harder to discriminate, leading to a lower level of recall.

The word length effect, where the spoken duration of the words presented, determines memory span. Memory span is considered to represent the number of items that can be uttered in about two seconds. Thus the rate at which an individual speaks or reads affects recall (Baddeley, 2003).

Articulatory suppression occurs when the operation of the phonological loop is disturbed by the overt or covert articulation of an irrelevant item which may be attributed to the irrelevant item dominating the articulatory control process. The conversion of visual material into a phonological code may thus be prevented. Another hypothesis for the articulatory suppression effect is that suppression impairs performance simply because it requires attention (Baddeley, 2003).

Studies have shown the phonological loop has evolved to facilitate the acquisition of languages, particularly vocabulary learning (Baddeley, 2003; Vance 2000). Evidence for this view originated as a result of a patient with a pure phonological loop deficit failing to acquire the vocabulary of a new language despite otherwise normal long term memory (Baddeley, 2003). It was supported by the demonstration that factors that disrupt the phonological loop- such as articulatory suppression, phonological similarity and word length effect, also disrupt the acquisition of foreign vocabulary, but not of learning to associate pairs of unrelated native language words (Gillam et al., 2009; Baddeley, 2003; Montgomery et al., 2010). Phonological loop capacity is often measured by tasks involving immediate serial recall of numbers or words i.e. digit or word span tasks or through the repetition of non words (Montgomery et al., 2010; Archibald & Gathercole, 2006; Baddeley, 2003). Some confusion between the repetition task and the simple span task exists in the developmental literature (Ben-Yehudah & Fiez, in press), although some researchers suggest that that both measures tap the same underlying construct namely phonological working memory (Pappagno & Vallar, 1995). Also, differences in the method used to measure phonological working memory may explain some differences in how useful these tests are in predicting vocabulary size and language development (Cheung, 1996). Some studies have shown that children's performance on digit or word span tasks is in fact correlated with their vocabulary and grammatical development (Adams & Gathercole, 1995; Gathercole, Service, Hitch, Adams, & Martin, 1999; Masoura, Gathercole, & Bablekou, 2004) and the individual variation that directly influences the ease of word learning also accounts for the difficulties that children with language impairment have in learning new words (Archibald & Gathercole, 2006; Montgomery, 2004). Children with language impairment have deficits in phonological representations and also a reduced phonological memory capacity compared to their aged matched peers, which make it difficult for them to learn new words and sentence structures. These deficits are thought to affect both receptive and expressive language skills

(Gillam et al., 2009). The phonological loop's ability to encode, store and recall sequences of sounds thus appears to play an important role in language disorders and can also be said to be a good predictor of the ability of children to learn a second language (Gillam et al., 2009).

The Visuo-spatial Sketchpad

The two domain specific slave systems are the phonological loop and the visuo-spatial sketchpad. The visuo-spatial sketchpad is the visual equivalent of the phonological loop which specializes in the processing and storage of visual information, and of verbal material that is subsequently encoded in the form of imagery (Gathercole & Baddeley, 1993). The sketchpad is showed to be of less relevance to language disorders than the phonological loop (Baddeley, 2003). However, it is likely that the sketchpad is involved in everyday reading tasks, where it may be involved in maintaining a representation of the page and its layout. It also plays a role in acquiring semantic knowledge about the appearance of objects and how to use them, and for understanding complex systems such as machinery, as well as for spatial orientation and geographical knowledge (Baddeley, 2003). Research has also shown that cognitive capacities and the ability to maintain and manipulate information of a visuo-spatial nature is likely to play an important role in language comprehension, at least in the case of certain types of material (Montgomery et al., 2010; Baddeley, 2003). Subsequent research has furthermore found that a good way of learning to associate pairs of words is to form an image of each and to imagine the two interacting. Whether images "exist" or not, instructions to use them appear to have a marked effect on learning, indicating that the visuo-spatial sketchpad does in fact play a role in language learning (Baddeley, 1998).

The Episodic Buffer

The episodic buffer is assumed to be a limited capacity system that heavily depends on executive processing, but which differs from the central executive in that it is principally concerned with the storage of information rather than with attentional control (Baddeley, 2003). The episodic buffer has the capability to integrate inputs from the phonological short term memory and the visuo-spatial sketchpad into a coherent episode or chunk- hence the term 'episodic' (Montgomery et al., 2010; Baddeley, 2003). It is a buffer, as it provides a way of combining information from different modalities i.e. the slave systems and long term memory into a single-

faceted code (Baddeley, 2003). Importantly, the buffer is thought to be central to the processing and retention of large chunks of language material such as connected speech (Montgomery et al., 2010). It is also assumed to underpin the capacity for conscious awareness (Baddeley, 2000). Due to the fact that Baddeley's model (2000) has been supported by research findings in children, it was employed in the current study for the purpose of understanding the relationship between working memory and language.

Finally, though not a mechanism, researchers have begun to examine processing speed as an important property of working memory and a potential factor in defining the capacity limits of Working Memory (Bayliss, Jarrold, Baddeley, Gunn & Leigh, 2005; Towse & Hitch, 1995; Towse, Hitch & Hutton 1998). Interest in processing speed derives from earlier work revealing reliable inter-correlations among processing speed, short-term memory, chronological age, and higher level cognitive abilities. Moreover, researchers show interest in processing speed because of its emerging association with working memory and central focus in the literature of learners with language impairment (Montgomery et al., 2010).

From this model, it can be suggested that if working memory is a temporary storage system that underpins our capacity for thinking and cognitive processing, then it should have implications for language processing and furthermore that deficits in working memory function may impact on language development and processing (Baddeley, 2003). Even though a large amount of processing is largely automatic, deficits within the phonological loop and to a lesser extent other aspects of the working memory model may severely impair language processing. The relationship between working memory and language development and impairment is discussed below.

Working Memory and Language Development

Language learning and functioning differ from many other cognitive processes such as reasoning, as there is a heavier influence of experience or prior knowledge on individual variation in performance (Montgomery & Windsor, 2007). Nevertheless, the ability to understand and produce spoken language requires the coordination of processing speed and working memory, whether these are considered related or independent processes (Montgomery

& Windsor, 2007; Kormos & Safar, 2008). Much developmental work on working memory and language has focused on word learning or lexical development. Most of this work has centered around phonological short term memory which has been argued to function as an important language learning device (Avons, Wragg, Cupples, & Lovegrove, 1998; Gathercole & Baddeley, 1990; Gathercole, Willis, Emslie, & Baddeley, 1992). Robust associations between phonological short term memory and new word learning have been reported for children up to 8 years of age (Jarrold, Thorn & Stephens, 2009; Bowey, 2001; Gathercole, Service, Hitch & Martin, 1997). Research has shown that the ability to hold novel speech material in phonological short term memory, most likely permits children to establish stable, long term representations of new words in long term memory (Montgomery, 2002; Jarrod et al., 2009). As the lexicon grows, word entries become more phonologically refined and better organized (Montgomery et al., 2010).

Over the years, there have been many research studies that have investigated the relationship between phonological short term memory capacity and first language acquisition. Results from these studies indicate that children show considerable variation in both phonological loop capacity and vocabulary knowledge but these two variables are closely related (Kormos & Safar, 2008; Gathercole et al., 1992; Gathercole et al., 1997). Baddeley, Gathercole, and Pappagno's study (1998), found that non-word repetition is more strongly correlated with vocabulary measures than digit span in 3 year olds, whereas for 8 year-olds neither span correlated. They also reported that for 13 year olds, simple digit span is related to vocabulary measures. Gathercole et al., (1992), showed that non word repetition at age 4 was significantly associated with vocabulary level at age 5 whereas vocabulary score at age 4 was not a good predictor of non word repetition at age 5, suggesting that phonological working memory capacity supports the eventual learning of the phonological form of new words. Phonological memory is also related to other aspects of children's competence in their first language, such that children with better phonological memory abilities produce longer and semantically and syntactically richer utterances (Adams & Gathercole, 1995, 1996, 2000). In addition they recall more story information (Adams & Gathercole, 1996) and are better at learning definitions of new words, recalling new names and learning novel words (Gathercole, Hitch, Service & Martin, 1997). Overall, the relationship between non-word repetition and native vocabulary knowledge is particularly strong regardless of nonverbal intelligence (Gathercole, 2006). From these studies it

is evident that the phonological loop plays some role in the learning of new words when acquiring a first language.

Researchers who conducted studies regarding morphological and syntactical development, argued that children initially learn whole phrases and only later discover underlying rules, categories and structures by using the distributional properties of the input (Nelson, 1987; Plunkett & Marchman, 1993; Tomasello, 2000). It is also believed that phonological short term memory serves as the mediating mechanism for this analytic process (Ellis, 1996; Montgomery et al., 2010). Studies regarding the influence of working memory in language comprehension are also beginning to receive attention. Results of these studies show that children with greater working memory capacities demonstrate more accurate comprehension than children with low working memory capacities (Montgomery et al., 2010).

It can be inferred that the demands placed on EAL learners' working memory capacity is enormous, and individuals who have limitations in their working memory may experience great difficulty in coping with the demands of learning an additional language. Not much research has been performed on working memory and EAL learners in South Africa, but international studies show that English additional language learners' success in acquiring the English language in the first three years of training, can be predicted by their ability to repeat English- sounding pseudowords i.e. non word repetition. These findings emphasize the link between phonological short term memory and word learning in a second language (Service, 1992; Service & Kohonen; 1995; Ellis, 1996). Researchers furthermore state that phonological memory is closely linked to second language learning gains in the classroom, school motivation and prior second language skills (French, 2006) and underlies the vocabulary development of the second language (French, 2006; Gupta, 2003; Speciale, Ellis & Bywater, 2004). O'Brien, Segalowitz, Collentine and Freed (2006, 2007), showed that there is also a link between phonological memory and oral production skills. The authors stated that the nature of the relationship between measures of phonological short-term memory and various assessments of oral performance is different between proficient and less-proficient second language speakers. Other researchers claim that phonological short term memory plays a more general role in second language acquisition than just supporting vocabulary acquisition. Ellis (1996) argued that language learning is mostly sequence learning

and even abstract grammatical knowledge is a product of the analysis of sequences. As short-term memory is responsible for remembering sequential information, its role in language learning may be far greater than previously thought (Kormos & Safar, 2008).
Researchers are however unsure of the role of phonological memory in the development of grammatical competence (French & O'Brien, 2008). Juffs (2004, 2005, 2006) did not find any relationship between word span tasks and measures of vocabulary and grammar on a standard test of vocabulary and grammar. Further research is required to determine whether the relationship between phonological memory and grammatical development is dependent on lexical development or whether its association with grammatical abilities is separate from its association with lexical development (French & O'Brien, 2008). It is also unclear whether and to which of the various subdomains of language (vocabulary, morpho-syntax, etc.) phonological working memory is related and for which type of second language learner working memory capacity can make reliable predictions (Juffs, 2004, 2005).

The precise role of the central executive in language development has also been difficult to identify. Central executive functioning is considered to affect tasks that require simultaneous processing and is usually assessed using tasks of backwards digit recall (Vance, 2000). There has been little research to date about the relationship between central executive functioning and language development. Adams, Bourke and Willis (1999), found that children's performance on a task claiming to affect the central executive, significantly impacted their spoken language performance. However, the task utilized was a verbal fluency task that required the retrieval of information from long term memory and relied on existing knowledge, which would also be implicated in language comprehension.

Finally, Baddeley's construct of the episodic buffer shows some promise as a test for the ability to relate long-term knowledge and memory (Juffs, in press). Differences may exist in the ability of learners to recall characteristics that are associated with known words and the ability to construct imaginary situations with those words (Juffs, in press). For example, Baddeley (2000) suggests that when accessing long-term memory, one could imagine an exercise that would require learners to think about how an elephant would perform as an ice-hockey player. This novel situation requires the learners to hold in memory the characteristics of elephants (long

trunk, large) and ice hockey (slippery surface, fast, violent) and then to construct a scenario. For example, an elephant might play well in goal, be slow, and able to 'body-check' effectively. Differences in the ability to access such knowledge and construct these new or imaginary situations with that knowledge might be used to predict language learning outcomes (Juffs, in press). Hence, episodic memory may mediate between visual spatial long-term memory and long-term memory for language. This task proves to be particularly promising, however much research is still required in this area.

From the above information it can be suggested that there is convincing research evidence for a relationship between phonological short term memory and working memory capacity and language acquisition as well as certain aspects of second language learning.

Working Memory and Language Impairment

Clinicians and researchers have long recognized the heterogeneity of children with specific language impairment (SLI). These learners demonstrate normal range-hearing sensitivity and non verbal intelligence and no developmental disability but display marked receptive and or expressive language deficits (Schwartz, 2009; Leonard, Weismer, Miller, Francis, Tomblin & Kail, 2007). Because these children's developmental and medical profiles reveal no obvious obstacles to learning language, it is often assumed that language itself is the problem (Leonard et al., 2007) i.e. these children may simply have difficulty learning the meaning of words, and the rules for using these words correctly in sentences and larger units. However, it is possible that these learners may have difficulty processing the information that is required for them to learn language adequately (Leonard et al., 2007) and therefore the language itself may not be the problem but processing limitations may significantly affect the child's ability to access language from the input and once acquired, use it accurately (Leonard et al., 2007).

Over the past 25 years, researchers have shown that factors apart from language content and form are contributing to the problems experienced by learners with SLI. Evidence has shown that these learners have an array of linguistic and non-linguistic information processing inefficiencies (Montgomery, 2000, 2002; Gillam, Cowan & Marler, 1998; Johnston, 1994; Kail, 1994). One of these inefficiencies is thought to be related to working memory (Montgomery, 1995, 2000; Ellis-Weismer, Tomblin, Zhang, Buckwalter, Chynoweth & Jones, 2000). Ample experimental evidence reveals that children with SLI have deficits in a number of functions in their verbal

short term memory including scanning speed, retrieval and verbal capacity (Gillam et al., 1998; Montgomery, 1995; Gathercole & Baddeley, 1990).

A key issue of debate has been the nature of the relationship between short term memory and/or working memory difficulties and language impairment (Vance, 2000). In particular, researchers are unsure whether short term memory deficits are a cause or consequence of language impairment, or whether short term memory deficits and language impairment both arise as correlated symptoms of some other underlying factors (Vance, 2000). Gathercole & Baddeley (1990) suggested that short term memory deficits have a limiting effect on language learning and play a causal role in language impairment. However, recent work indicates that not all children with poor short term memory skills have language difficulties (Gathercole et al., 2005). Bishop (2006), also argued that since there is no single cause of language impairment, limitations to short term memory in itself may not be sufficient to "cause" language impairment. A third possibility is that some underlying factor will have an impact on language and short term memory development (Vance, 2000). Research literature indicates that the ability to process speech, to recognize what is heard, store information about spoken words and produce speech relatively accurately, will impact on short term and working memory (Vance, 2000).

Within the framework as proposed by Baddeley (2000), research has shown that learners with language impairment have a more limited capacity to process and store phonological information then their aged matched peers and that this deficit plays a causal role in their language impairment (Gathercole & Baddeley, 1990; Archibald & Gathercole, 2006, 2007). Phonological short term memory is usually assessed using digit span tasks, word span tasks, and/or nonword repetition. In the digit and word span tasks, children are presented with increasingly longer lists of items and are required to recall each list in serial order. In nonword repetition, children imitate nonwords varying in length. Regardless of the task, children with SLI generally exhibit a reduced phonological memory capacity relative to their age matched and language matched peers (Montgomery, 1995; Archibald & Gathercole, 2006; Ellis Weismer et al., 2000; Gathercole & Baddeley, 1990; Gillam, Cowan, & Day, 1995; Montgomery, 2004; Montgomery & Evans, 2009). Gathercole and Baddeley (1990) further argued that the poorer nonword repetition of children with SLI was not attributed to poorer perceptual processing, phonological encoding,

verbal rehearsal or speech production. They suggested rather that the capacity limitation of these children might be related to either a difficulty forming adequate phonological representations or faster decaying representations (Montgomery, 2000; Montgomery, 2002). This is because the cognitive complexity of a nonword repetition task overtaxes the general processing resources of children with SLI, thereby hindering their ability to create and thus store accurate phonological representations of unfamiliar input (Leonard et al., 2007). Several studies were conducted to confirm these findings and similar results were found by Montgomery (1995), Dollaghan and Campbell (1998), Ellis-Weismer et al., (2000) and Edwards and Lahey (1998).

However, according to Marton and Schwartz (2003), these studies have not provided direct information regarding working memory performance and everyday language use i.e. language comprehension and production which is critical in understanding the relationship between working memory performance and language impairment. However, recently there is emerging evidence for an apparent link between reduced phonological short term memory capacity and receptive language difficulties of children with SLI (Montgomery & Windsor, 2007). For example, poorer lexical and morphological learning as well as poorer sentence comprehension may be attributed to a reduced phonological short term memory capacity (Gray, 2004; Montgomery, 2004; Ellis-Weismer & Thordardottir, 2002). Whether there is a positive association between phonological short term memory capacity and expressive language in children with SLI, is still unknown, as this issue has not been further explored (Montgomery & Windsor, 2007). Furthermore, the issue of whether non word repetition is facilitated by language knowledge or whether it represents an independent predictor of language performance in children still remains unclear (Munson, Kurtz & Windsor, 2005; Edwards, Beckman & Munson, 2004).

Research on whether children with SLI show a developmental increase in short term memory capacity has also been minimally conducted (Montgomery et al., 2010). Gray (2004) reported an increase in memory capacity between 3 and 6 years. However, according to results from a longitudinal study conducted by Conti-Ramsden and Durkin (2007), short term memory capacity may level off by about 11 years of age. Their findings are inconsistent with the developmental literature which shows that phonological short term memory capacity does not stop developing

until about 14–15 years of age in typically developing children (Gathercole, 1999; Gathercole et al., 2004). Finally, there is evidence to suggest that the short term memory deficit of children with SLI may be confined to the verbal modality, as children with SLI and their age matched peers tend to perform similarly on visuo-spatial short term memory tasks (Alloway & Archibald, 2008; Archibald & Gathercole, 2006, 2007).

Recently researchers have begun to study the central executive in the context of working memory in children with language impairment (Montgomery et al., 2010). Aspects that have been assessed include attentional capacity, attentional control and sustained attention. Attentional capacity refers to the limited mental energy available to a person to perform a cognitive task (Just & Carpenter, 1992). Children with SLI show reduced performance on tasks (verbal or non linguistic) that assess this, relative to their age matched peers (Montgomery et al., 2010). Archibald and Gathercole (2006, 2007), and Windsor, Kohnert, Loxtercamp and Kan (2008), have extended these findings and interpretation to the non linguistic domain. Im- Bolter, Johnson and Pascaul-Leone (2006), evaluated three attentional control functions in children with SLI. They assessed shifting, updating, and inhibitory control. Shifting is the ability to divide attention between two different levels of a task. For example, the processing and storage parts of a working memory task (Im-Bolter et al., 2006). Updating is the ability to maintain focus at a given level of a task and add new content to the focus of attention. For example, adding to a list of to-be remembered items in storage in a working memory task (Montgomery et al., 2010). Inhibition refers to preventing irrelevant stimuli from entering working memory or focus of attention (Montgomery et al., 2010). Three key findings from this study emerged. Children with SLI exhibited comparable shifting, poorer updating of working memory, and poorer inhibitory control relative to their age matched peers (Montgomery et al., 2010). These findings advance literature on SLI in two important ways. First, they offer independent evidence that children with SLI have reduced attentional capacity, poor inhibitory control but not poor allocation and second, children with SLI have trouble updating the contents of working memory (Montgomery et al., 2010). Sustained attention (which is the ability to maintain attention over time to identify a target in the midst of a stream of non targets) (Awh, Vogel & Oh, 2006) has begun to be studied in SLI. Emerging data indicates that many children with SLI have trouble sustaining attention (Montgomery, 2008; Montgomery, Evans, & Gillam, 2009; Spaulding, Plante, & Vance, 2008).

Developmental research however suggests that children's attentional resource capacity and or ability to allocate these resources improves through adolescence (Montgomery & Evans, 2009).

According to Ferguson and Bowey (2005), global processing speed is also directly related to memory span and language impairment. Information in working memory decays if it is not acted upon and the rate of memory decay is thought to be functionally related to processing speed, in that the faster the material in phonological memory is processed, the less likely it is to decay (Schwartz, 2009). Processing speed has more recently been studied from a cognitive slowing perspective (Kail, 1994; Miller, Kail, Leonard & Tomblin, 2001). This account suggests that children with SLI are slower at all mental processes, including perceptual, cognitive and linguistic compared to their age matched peers, irrespective of the nature and modality of the task (Kail, 1994; Leonard et al., 2007; Miller et al., 2001). The concept of processing speed emphasizes the amount of cognitive processing that can be completed in a given unit of time (Montgomery & Windsor, 2007). The assumption is that if information is not processed with sufficient speed, it is vulnerable to decay and/or interference (Montgomery et al., 2010). Miller et al., (2001), found that children with language impairment were slower to respond to both linguistic and non-linguistic tasks than typically developing children. The study showed that the children with SLI were able to learn new words as well as their typically developing peers, but only when these words were presented at a slower rate. The children with SLI also provided fewer new words than their age matched peers and to younger children who were matched for receptive vocabulary when the words had initially been presented at a faster rate (Miller et al., 2001). Although many children with SLI are slower processors than their age matched peers through adolescence, they do appear to show developmental improvement in linguistic and/or nonlinguistic processing speed between 6 and 11 years of age (Montgomery, 2005).

Archibald and Gathercole (2007) further examined whether limitations in processing speed and short term memory were related to the working memory deficit in SLI. Children with SLI were compared to their age matched peers and to younger children who were matched for receptive vocabulary. These children completed separate verbal and visuo-spatial tasks relating to storage, processing speed, and working memory capacity (Montgomery et al., 2010). Results from this study suggested that the limited working memory capacity of children with SLI was due to a

combination of a verbal-specific storage deficit and slower domain-general processing, relative to their aged matched peers (Montgomery et al., 2010). Importantly, they suggested that it is likely that the deficits in the executive attention mechanisms also had a negative impact on the working memory capacity of the children with SLI- for example, sustained attention (Montgomery, 2008), inhibitory control (Im-Bolter et al., 2006) and updating (Im-Bolter et al., 2006). These findings concluded that children with language impairment are less able to process language rapidly, and that their processing is facilitated by slower presentation of language (Miller et al, 2001).

Finally, as mentioned earlier, reading comprehension deficits in children with SLI may be attributed to poor language skills that are required for comprehension (Nation et al., 2004) and as working memory skills have been shown to impact on language learning it can thus be suggested that poor working memory abilities may contribute to poor reading comprehension abilities in learners with SLI. In order to comprehend text, a reader must simultaneously extract and decode words, interpret the meaning of individual words, integrate the meaning of words already read and use this information to make inferences about the text and then lastly, self monitor meanings already allocated and correct those meanings that are incongruent with the text (Nation et al., 2004; Vukovic & Siegel, 2006). However, in order to carry out this process, the reader must exhibit good short term memory and working memory skills as these are essential for storing of the intermediate computations in the process as well as the final product and thus for comprehending the text (Baddeley, Wilson & Watts, 1995; Just & Carpenter, 1992; Vukovic & Siegel, 2006). However research to support how working memory is actually involved in reading comprehension is limited (Vukovic & Siegel, 2006). Results from Cain, Oakhill and Bryant's (2000) study conducted on 7 to 8 years-olds showed that verbal working memory demands accounted for 14% of the variance in reading comprehension, when factors such as age, intelligence scores, vocabulary and word recognition were controlled. Cain, Oakhill and Bryant (2004) later conducted another study and found that a composite verbal and numerical working memory variable accounted for 69% of the variance in 7 year-olds, 55% of the variance in 8 year-olds and 52% of the variance in 10 year-olds in reading comprehension, over and above other variables such as vocabulary, verbal ability and word recognition. Vukovic and Siegel (2006) in their longitudinal study reproduced these findings and also extended the previous

findings by demonstrating that working memory plays an important role in reading comprehension in children aged 7 to 11 years even after controlling for phonological awareness and rapid naming. Furthermore research results reveal that reading comprehension is strongly related to verbal working memory measures whereas a reliable relationship between visuo-spatial working memory and reading comprehension has not yet been established (Vukovic & Siegel, 2006). However, shared variance between linguistic and visuo-spatial working memory has been found to be predictive of comprehension indicating that language skills alone may not fully account for the relationship between reading comprehension and working memory. Therefore, these studies confirm a relationship between working memory and reading comprehension however, the nature of this relationship is still unclear. Investigations to clarify whether the relationship between reading comprehension and working memory reflects a language-based system or a more general system needs to be further researched.
This study aimed to add clarity to the debate on whether reading comprehension difficulties relate to verbal memory deficits or whether other components of working memory are implicated. Evidence found could support either a domain-specific and/or domain-general working memory system in reading comprehension which in turn can provide more insight into the nature and functional organisation of the working memory system.

The information presented in the previous paragraphs discusses working memory in monolingual children with SLI. However, as this study is concerned with children who are acquiring English as an additional language, it is also important to discuss working memory in children who are bilingual. Most of the research conducted on working memory and bilingualism has been conducted on bilingual adults. Results from these studies revealed that performance on tests of working memory may be affected by the speakers' proficiency, language preference and the nature of the task (Gutierrez-Clellon, Calderon & Ellis-Weismer, 2004) and furthermore that cross linguistic differences in verbal working memory in bilingual speakers may also be revealed depending on the listening conditions and tasks used (Daro & Fabbro, 1994; Ardila, Rosselli, Ostrosky-Solis, Marcos, Granda & Soto, 2000). Some researchers have studied bilingualism from a cognitive-linguistic perspective. These studies emphasized the role of the central executive and the presence of significant associations between language processing and fluency in a second language (Gutierrez-Clellon et al., 2004) but have revealed inconclusive results for a

processing advantage or disadvantage in bilingual children (Bialystok, 1992, 2001). Although there have not been many studies on working memory and bilingual learners with language impairment, there is indication that performance on working memory tasks can help predict second language proficiency in young children (Masoura & Gathercole, 1999; Service, 1992). A study conducted by Gutierrez et al., (2004), however revealed no significant differences between fluent bilingual learners and those with proficiency in only one language and, furthermore, the results do not support the idea that bilinguals display enhanced or reduced control of processing. This study will investigate slow to acquire EAL learners in order to establish whether they have limitations in their working memory and phonological memory capacity so as to determine whether they can be identified as having SLI based on their performance on the cognitive processing measures.

The Assessment of Learners with Language Impairment

The assessment of children with SLI, especially children who are bi-/multilingual and have a language impairment has also been cause for debate. Researchers show that there are very limited tests that accurately determine the performance of bilingual children with and without language impairment and also limited data on which to base effective interventions for bilingual children (Pena & Bedore, 2009). Ideally, all children should be assessed in their home language. However, in South Africa this may prove difficult as there is insufficient information on the normal language developmental pattern of most of the languages in South Africa and consequently there are few valid and reliable assessment measures available to assess children in these languages. SLI is usually clinically assessed by using standardized tests of syntax, morphosyntax, semantics, vocabulary and phonology (Paradis & Crago, 2000). These are supplemented by tests of cognition, including performance IQ and working memory (Marton & Schwartz, 2003; Schwartz, 2009). However, these standardized tests have limitations in sensitivity, specificity, reliability and validity and furthermore are not amenable to examinations of contextual language or of language processing (Schwartz, 2009). Thus, therapy planning becomes difficult as these tests do not provide enough information (Schwartz, 2009). Researchers especially have difficulty in assessing SLI in children who are bilingual because of the similar difficulties in language use and production (as outlined above) that these learners exhibit. Windsor & Kohnert (2009), stated that if the goal of the assessment is to identify

learners who are at risk for deficits in spoken language or reading performance due to cognitive constraints, then assessment measures that deemphasize the role of experience are required. As experience interacts with cognitive functioning from early childhood, a truly experience-independent behavioural task cannot be created. However, tasks that consider the learners current state of accumulated language and other cognitive knowledge can be created (Windsor & Kohnert, 2009). With an increasingly culturally and linguistically diverse population in South Africa as well as in other countries around the world, there is a clear need for the role of experience in distinguishing language disorders from differences to be determined (Kan & Kohnert, 2005; Kohnert, 2007).

Various authors have therefore suggested that a combination of interdependent and independent approaches be utilized (Pena & Bedore, 2009). An interdependence approach focuses on the identification and the remediation of inefficient cognitive functions that may give rise to difficulty learning and using language (Kohnert & Windsor, 2004; Pena & Gillam, 2000; Tomasello, 2003). An independence approach focuses on specific linguistic structures that might be identified as potential markers of impairment in the target language (Pena & Bedore, 2009). In order to assess the slow to learn EAL learners in this study, a combination of these approaches which incorporates processing based measures as well as language based measures was utilized. Processing-dependent measures are said to be an unbiased method for diagnosing language disorders whilst traditional norm-referenced language assessment tools rely heavily on a child's world knowledge or previous language experiences (Kohnert, 2007). In the culturally and linguistically diverse population of South Africa, any assessment tool that is reliant on the child's existing store of knowledge runs the risk of confusing language 'disorder' with language 'difference' and therefore poor performance on these processing based measures may reflect basic deficits in the ability to represent and manipulate linguistic information, rather than indicate a more fundamental deficit. The working memory assessment measures from the Automated Working Memory Assessment (AWMA) test (Alloway, 2007) and the non-word repetition task (Dollaghan & Campbell, 1998) as well as a sentence repetition test (Redmond, 2005), which evaluates phonological working memory, were the cognitive processing measures employed in this study. The AWMA can provide results on each aspect of Baddeley's (2000) multi-component model as well as the overall short-term memory and working memory systems

as it assesses how information is maintained and processed through the interplay of the phonological loop, the visuo-spatial sketchpad, the central executive and the episodic buffer (Alloway, 2007). The AWMA differs from other assessment tools developed such as the Working Memory Test Battery for children (WMTB-C) (Pickering & Gathercole, 2001) as it includes subtests designed specifically to assess the verbal and visual components of short term and working memory as opposed to only assessing verbal working memory (Alloway, 2007). The AWMA test materials were designed to be unfamiliar to all participants so that no child can benefit from previously acquired knowledge and as the test is relatively free of bias and socioeconomic influences (Alloway, 2007; Engel, Santos & Gathercole, 2008) working memory findings from this research can be applied to the South African and international context. These processing dependent measures are further discussed in detail in chapter four.

It is important to note that some researchers suggest that the notion that processing-based measures are useful in reducing bias in assessment (Campbell, Dollaghan, Needleman & Janosky 1997) needs to be further evaluated (Gutierrez et al., 2004). Evidence for this claim comes from MacDonald and Christiansen's (2002) study, which showed that a substantial amount of individual differences in verbal working memory task performance is due to variation in language experience which significantly impacts on processing efficiency. They also suggested that greater language experience is assumed to have effects not only on vocabulary but also on the ability to develop expertise in syntactic structures and in constraints that govern language comprehension (MacDonald & Christiansen, 2002). These results were confirmed by the Gutierrez et al., (2004) study which suggested that performance on verbal working memory tasks is not independent of language skill. Furthermore, evidence suggests that even very subtle language variation, such as that shown by highly sophisticated bilingual children in one or more of their languages can affect their performance on processing measures (Windsor & Kohnert, 2009). This implies that processing measures such as non word repetition, which have been proposed as a nonbiased assessment tool, may in fact not reduce the role of language experience adequately to be valid measures of language ability (Windsor & Kohnert, 2009). Even though performance on a non word repetition task may identify English-only speaking children as having either typical development or language impairment, the likelihood ratios indicate that the task has low specificity with bilingual learners (Kohnert, Windsor & Yim, 2006). This indicates

that the role of processing over experience in assessment measures can be emphasized, but it may not completely separate processing from language knowledge and experience (Windsor & Kohnert, 2009). Therefore tools that further reduce the experiential bias when assessing a learners underlying cognitive-linguistic processing integrity, need to be created.

One available test, able to provide information for distinguishing dialect features from SLI patterns is the Diagnostic Evaluation of Language Variation (DELV) (Seymour, Roeper & de Villiers, 2003). The DELV holds the potential to assess the processes underlying language more comprehensively in English language learners (Seymour, Roeper & de Villiers, 2003). As students advance through grades, they are expected to be able to use language in more cognitively demanding and context-reduced circumstances that differ from everyday communicative interactions (Cummins, 2000). The DELV examines the underlying skills needed to successfully cope with the increasing lexical and conceptual demands presented in the educational setting and is specifically designed to assess the language skills required for the first few grades in school (de Villiers, 2004). It does this firstly, by assessing semantic processing skills such as the acquisition of novel words using syntactic cues, lexical organisation and retrieval, as well as how a child copes with a cognitively demanding aspect of semantics (i.e. the comprehension of quantifiers). Secondly, with regard to syntactic complexity, the DELV assesses the ability to comprehend complex questions and passives, and the ability to specify referents using articles (Pearson, 2004). Thirdly, the DELV tests the increasingly decontextualised and cognitively demanding aspects of discourse. It looks at a child's ability to take on another person's perspective, to ask for missing information, to relate a cohesive narrative to a person who has no contextual reference to the story (i.e. being able to use linguistic devices to create, sustain, and differentiate between characters and express causal and temporal links among events) as well as assessing the cognitive skill of 'theory of mind' (Pearson, 2004). The conceptual basis of the DELV lies in three areas of research, (1) the investigation into universal grammar and its attainment within theoretical linguistics; (2) the study of African American English (AAE) syntax, semantics, pragmatics, and phonology within theoretical linguistics; and (3) the exploration of specific language impairment (SLI) across various languages (Pearson, 2004). The DELV has been shown to be able to accurately identify language impairment in all varieties of English by examining the underlying linguistic knowledge of

typically developing (TD) children (Seymour, Roeper & de Villiers, 2003). The DELV is thus one of the assessment tools that will be employed in this study to differentiate between slow to learn EAL learners and those learners with SLI. Also, correlations obtained in this study between cognitive processing measures and language proficiency will provide evidence for the wider use of these measures, as opposed to more biased standardized tests, to assess additional language learners.

Kohnert & Medina (2009), reviewed empirical literature that directly investigated performance of bilingual learners over the past decade. According to this review, most of the research conducted compared typically developing (TD) bilingual learners to language impaired (LI) monolingual learners as well as bilingual children with LI on measures of grammar, pragmatics, learning and processing (Kohnert & Medina, 2009). The picture emerging from these studies proves to be a complex one. From the combined studies, it appears that, the typological features of the language to be learned affect the grammatical and structural aspects that are vulnerable to both limited experience (as is the case with EAL learners) and processing constraints (as is evident in children with LI) (Kohnert & Medina, 2009). Overall, TD bilingual speakers with various levels of proficiency in their second language could not be distinguished from their monolingual peers with LI on either grammar measures or language based processing measures. However, performance on grammar, pragmatic, learning and language processing measures all separated bilingual learners with LI from their typically developing peers (Kohnert & Medina, 2009). These results demonstrate the importance of linguistically and culturally matched peer-based comparisons for diagnostic purposes and furthermore indicates the future potential of general information processing measures as complementary to language assessments for the identification of LI among linguistically diverse learners.

In accordance with the above discussion, a need was recognized for further research in second language learning and Specific Language Impairment to be conducted, specifically within a South African context as the majority of the learners come from linguistically and culturally diverse backgrounds. Jordaan (2009) tracked the development of language for academic purposes in grade 1- 3 English Additional Language and English First Language learners attending English only programs in Gauteng over a period of three years. These learners attended

schools where the language of learning and teaching (LOLT) is English from grade 1. These schools fell into two categories offering different contexts as discussed in Chapter two. In context one, both the learners and the teachers were from a variety of multilingual backgrounds and were thus learning and teaching English as an additional language respectively. In context two, EAL learners and EFL learners were integrated into one classroom where the teacher was also English speaking. The learners' academic language proficiency skills were assessed using the DELV-CR test (Seymour, Roeper & de Villiers, 2003), a reading comprehension test (GORT-4) (Wiederholt & Bryant, 2001), a sentence repetition test (Redmond, 2005) and a working memory test (AWMA) (Alloway, 2007). Results from this study revealed that some EAL and EFL learners appeared to be slow in the development of their academic language abilities (as no progress was evident over the period of three years), relative to their peers, which suggests that these learners may have a language impairment. A further need was thus recognized to conduct research on whether these EAL learners were merely "slow to learn" or whether they in fact have a language impairment so that some of the fundamental yet unsolved theoretical issues concerning SLI and second language learning, specifically in acquiring English as a second language within a South African context may be explained. As this study formed part of the larger study conducted by Jordaan (2009), the researcher investigated in detail whether these previously identified learners did in fact have a language impairment or were they merely "slow to learn". The rationale for further conducting this study stems from some of the unanswered questions posed in the literature review.

Rationale for the Study based on Review of the Literature

As evident from the literature presented, researchers are still unsure of the answers to the fundamental questions regarding the nature of SLI because there appears to be limited knowledge of the characteristics that definitively mark language impairment and there is also a lack of agreement between researchers on what the underlying mechanisms of SLI are (Schwartz, 2009). While there has been a great deal of research differentiating typically developing monolingual learners from their peers with SLI, much less research has been conducted on differentiating the language of children with SLI from typically developing learners who are learning a second language for example, English. Thus teasing apart the differences between SLI and second language development is crucial to isolating the

characteristics of impaired language development. This study therefore compared and contrasted the processing and language assessment results in typically developing EAL learners, EAL learners with suspected SLI and monolingual learners with SLI so as to isolate the unique characteristics of "impaired language".

One aspect (as discussed in the literature review) that can help distinguish between normal language learning and impaired language lies in the ability to determine the underlying mechanisms of SLI. Some researchers have shown that SLI may be caused by cognitive and perceptual processing deficits thus making it difficult for these learners to take in linguistic input or access the linguistic knowledge they have and may also have effects in nonlinguistic cognition (Ellis- Weismer, Evans & Hesketh, 1999; Kohnert & Windsor, 2004; Miller, Kail, Leonard & Tomblin, 1991). Other researchers say that learners with SLI have deficits at the level of linguistic representation itself and therefore cannot acquire or learn the same linguistic knowledge that their typically developing peers can (Rice, 2003, Wexler 2003, van der Lely, 2003; Jakubowics & Nash, 2001). Although the hypothesized areas of the deficits varies between accounts, they all share the assumption that these deficits can be explained in terms of domain-specific linguistic complexity alone and need not be derived from extra-linguistic, domain-general cognition and perception (Paradis, 2007). According to Paradis (2007), the processing and representational accounts contrast not only in their predictions for dual language development in children with SLI, but also in their approach to explaining uneven linguistic profiles displayed by all children with SLI. This study therefore also investigated whether typically developing EAL learners and EAL learners with suspected SLI, had deficits in representation or processing and furthermore determined what these deficits were, so as to aid in the discussion of the nature of specific language impairment and what sets it apart from the language profiles of typically developing EAL learners.

Finally, as the erroneous diagnosis of language impairment in children learning English as an additional language within a South African context is a huge risk factor, SLP's require more information about the characteristics of typical EAL learners' development and access to assessment resources for use with EAL children. This study therefore aimed to investigate the performance of typically developing EAL learners and slow to learn EAL learners with

suspected SLI on cognitive processing measures (e.g. working memory, non word repetition, sentence repetition) and language proficiency based measures (e.g. reading comprehension and standardized language tests), discussed in detail in the literature review, so as to determine which of the assessment measures could be more appropriate for use in the assessment of EAL learners' language abilities.

Based on the rationale and literature presented above, the current study aimed to answer the following questions:

1. Can EAL children with specific language impairment (SLI) be identified amongst those EAL children who demonstrated slow development of language skills and if so, how does SLI manifest in the additional language, in this case English?
2. Is there a relationship between the learners' performance on the language proficiency measures and the cognitive processing measures?
3. How is the manifestation of language impairment in these EAL learners with suspected SLI similar and/or different to that of their age matched EFL peers?
4. Do these EAL learners with suspected SLI have deficits in representation or processing and what are these deficits?
5. What are the implications of these findings for theories of SLI?

CHAPTER 4

METHODOLOGY

AIM:

The primary purpose of this study was to investigate in detail previously identified English Additional Language (EAL) learners in the foundation phase, who demonstrated slow development in their academic language skills over three years, in order to determine whether they could be characterised as language impaired and furthermore to describe the manifestations of this language impairment.

RESEARCH DESIGN

A longitudinal, descriptive quantitative design, involving both correlational and comparative components was used.

Longitudinal research strategies essentially measure changes in behaviour or characteristics of people over time to examine the influence of development (Schiavetti & Metz, 2006). Jordaan (2009), utilized this method of research to obtain an accurate reflection of the academic language abilities of foundation phase EAL and EFL learners by examining their rate and process of language acquisition over a period of three years. As these learners were selected from two different educational contexts, where there is a marked heterogeneity in the linguistic backgrounds of both the learners and teachers (as previously discussed) this sample appeared appropriate for this study as it was fairly representative of the learning contexts in Gauteng, allowing for greater generalization of findings. As this study formed part of the larger longitudinal study, the information obtained by Jordaan (2009), allowed the researcher to analyse and investigate in depth the pattern of language development of the EAL and the EFL learners with suspected SLI in the two educational contexts in comparison to their typically developing peers in order to determine whether they in fact have a language impairment or were merely "slow to learn".

This study is also descriptive because there was no experimental manipulation of variables. Descriptive research is used to study group differences, developmental trends and relationships among variables (Pannbacker, Lass & Middleton, 1993). This design therefore allowed for the

relationship between the language proficiency assessment measures and the cognitive processing assessment measures utilized in the study to be explored. Furthermore, a quantitative research design, although not truly culturally reduced, is thought to be more culturally reduced than many other designs (Murphy & Davidschofer, 2001). Quantitative research is defined as 'measurement data' in which the results of the research are obtained from any sort of measurement (Howell, 1999, p. 8). Consequently, it seemed to be an effective design to use when considering the complex South African setting and the cultural diversity of the learners in the study.

The comparative component described the differences in performance between the English Additional Language (EAL) learners' and the English First Language (EFL) learners. Furthermore, the results obtained from the participants, were used to determine how South African learners from various education systems would compare to each other so as to provide information regarding the use of these tests in different populations, as several of the tests used in this study were normed on learners from American or British education systems. The correlation component used within this specific design allowed for the strength of the relationship between each of the assessment measures to be determined (Schiavetti & Metz, 2006), as each learner was assessed on all five of the assessment measures utilized in the study. By determining whether a relationship exists between the results of these measures (both the language proficiency and the cognitive processing), the correlation indicates whether predictions of values of one measure can be made with knowledge of the values of other measures.

Additionally, a descriptive, questionnaire-based survey design was utilized. Questionnaires were given to the teachers of the EAL and EFL learners with suspected SLI so as to obtain further information regarding their academic performance in the classroom. Survey research is commonly used as a means of acquiring information about certain characteristics or attitudes present in an individual or a group of people in order for it to be used for descriptive purposes (Leedy & Ormrod, 2005; Maxwell & Satake, 2006).

PARTICIPANTS

Criteria for Selection

Spaulding, Plante & Farinella (2006), reviewed articles published in journals by the American Speech- language Hearing Association (ASHA) and found that the majority of researchers selected participants with SLI based on a language score set anywhere between 1 SD and 1.5 SD below the normative mean on one or more tests of language. However, to receive a diagnosis in the Internal Classification of Diseases and Related Health problems (ICD-10), it is required that there is a score on an expressive or receptive language test that is 2 standard deviations (SD) or more below the population mean (Bishop & MacDonald, 2009). Thus, as the aim of this study was to investigate in detail EAL learners with suspected SLI, only the learners who obtained scores 1SD or 2SD below the mean of their peer group as reflected in their performance on the DELV-CR test when assessed by Jordaan (2009) were candidates for this research (Appendix F). The learners chosen also did not present with autism, developmental delay (no visual or hearing impairments) or any gross neurological impairment.

Sampling

This study employed nonprobability, purposive sampling, as the study precluded random selection (Sarantakos, 1998; Singleton, Straits & Straits, 1993). One characteristic feature of non- probability sampling is that subjective decision making is an important part of the sample selection (Henry, 1990). Purposive sampling is a variation of non probability sampling and refers to a sample that is selected for a particular attribute (McBurney, 2001). This sampling technique is applicable to this study as the researcher attempted to investigate in detail a specific group of children i.e. those previously identified EAL learners in the foundation phase, who demonstrated slow development in their academic language skills over three years.

Jordaan (2009) assessed 51 EFL learners and 118 EAL learners over a period of three years on various standardized language measures and cognitive processing measures. It was noted that 65 of these EAL learners and 30 of the EFL learners performed 1 or 2 standard deviations below the mean as reflected in their performance on the DELV-CR test (Seymour, Roeper & deVilliers,

2003) at the end of their grade one year. However, as most of these learners performed below the mean on only one of three subtests of the DELV-CR i.e. semantics or syntax or pragmatics, research suggests that not all of them will have a language impairment and may just be "slow to learn." Out of the 65 EAL children and 30 EFL children identified in grade 1 as "slow to learn", 41 of these EAL learners and 16 of the EFL learners demonstrated slow or no development in their language ability from grade one to grade two as reflected in their performance on the DELV-CR test (Seymour et al., 2003). The participants of this study were therefore these previously identified "slow to develop" learners in grade 1 who did not improve in their performance on the DELV-CR from grade one to grade two. However, only the learners who obtained scores 1 or 2 standard deviations below the group mean on any **two or more** of the DELV-CR subtests at the end of their grade two year (Appendix F) were included as it is evident that these learners are experiencing great difficulty in acquiring academic language concepts even with an additional year of English instruction and are more likely to be "language impaired" than just being "language different." A total of sixteen EAL learners and five EFL learners with suspected SLI were selected from the original sample.

Description of Participants

Table 1 below provides a brief description of the participants in the original sample (Jordaan, 2009) and table 2 provides a description of the EAL and EFL learners with suspected SLI who were selected from the original sample to participate in this study.

Table 1: Description of the EAL and EFL learners in the two different contexts at the end of their grade one year

	Context 1	Context 2
Number of Schools	1	3
Composition of Classes	Only L2 (EAL) Learners	L1 (EFL) and L2 (EAL) Learners integrated into same class
Languages spoken by the teachers	School A	School B
	Class 1: Zulu, Xhosa, Sotho, English	Class 1: English
	Class 2: Tswana, Zulu, English	Class 2: English
	Class 3: Sotho, Zulu, English	Class 3: English
		Class 4: English
		School C
		English
		School D
		English
Number of Learners speaking each Primary Home Language	Zulu (30) Tswana (14) Venda (3) Xhosa (5) Sepedi (8) Southern Sotho (1) French (2) Sotho (4) Siswati (1)	EAL: Zulu (17) Xhosa (1) Sotho (6) Shona(1) Spanish (1) French (1) Italian (1) Bemba (1) Russian (1) Tswana (4) Northern Sotho (2) French (1) Afrikaans (4) SiSwati (1) Venda(1) Southern Sotho (2) Chinese (1) Portuguese (1) EFL: English (51)
Total Number of Learners	70 (38 males and 32 females)	48 EAL learners (19 males, 29 females) 51 EFL learners (25 males, 26 females)

Table 2: Description of the EAL and EFL learners with suspected SLI at the end of their grade two year

	EAL context 1	EAL context 2	EFL
Number of Participants	10	6	5
Percentage of total number of participants assessed by Jordaan (2009) in grade 1	14.28%	12.50%	9.80%
Age Range of Participants	7.7- 9.7	8.1- 8.11	8.1- 8.8
Mean Age	8.13	8.35	8.52
Home Language of Participants	Zulu (4) Xhosa (1) Tswana (1) Tsonga (1) N. Sotho (2) Sepedi (1)	Zulu (3) Tswana (1) Sotho (1) Russian (1)	English (5)
Gender	5 Males 5 Females	0 Males 6 Females	3 Males 2 Females

RESEARCH INSTRUMENTS

Data collected on these learners were obtained from the longitudinal study by Jordaan (2009). A total of six instruments were used to obtain the necessary data. These instruments were administered in English to all the participants. The measures utilized are briefly described below.

Educator Questionnaire

Teachers play a vital role in identifying children with Language Impairment (LI). Teachers are a valuable source of raw data on classroom performance when they know what to observe and measure (Owens, 2004). The educators were therefore questioned regarding the participants' performance in school with regards to their receptive and expressive language development, vocabulary development, participation in class, interactions with others, attention and memory as well as their overall academic performance and any concerns they may have surrounding this aspect. The questionnaire consisted of: (*i*) open-ended questions, which required the teachers to provide their own responses; and (*ii*) a checklist, which required the teachers to tick the box that indicated the specific aspects of language (in the various domains) the participant presented difficulty with. This checklist was adapted from (Owens, 2004). This questionnaire may be viewed in appendix B.

Teacher Rating Scales

A teacher's rating scale was designed by the researcher and included elements of communication skills, reading comprehension as well as writing skills of the child. These three domains are in line with the Outcomes Based Education (OBE) assessment guidelines for the language and literacy learning area in the foundation phase (Spady, 1994). These skills are an integral part of the curriculum, from a young age. The grade 1 teachers were asked to rate the learners' language between 1 and 5 on a visual analogue scale by putting a cross on a 5cm line where the teacher felt the learner was best described. The teacher ratings of language proficiency included the following information:

- The learner's ability to communicate orally in English
- The learner's reading comprehension (how well the learner understands what he/she has read)

- The learner's written language (the ability to construct English sentences or paragraphs).

The teacher was encouraged to use any point on the line between the numbers if necessary. The following guidelines were provided:

1 – weak

2 – below average

3 – average

4 – above average

5 – strong

Language Processing Measure

The Diagnostic Evaluation of Language Variation (DELV- CR) test (Seymour, Roeper & De Villiers, 2003) was used as one of the assessment tools in this study. For reasons outlined in the introduction, this test is considered to be a good measure of academic language. This test is comprised of three subtests briefly described below:

Syntax Subtest

This subtest consists of three components, namely: *wh*-questions, passives and articles. The critical principles underlying these subtests are directly related to academic language (Seymour et al., 2003) and incorporates many of the underlying features that are used in the everyday language of the classroom (Roeper, 2004). A child's performance on this subtest enables the examiner to discern whether or not the child is operating with a complete grammar relative to his or her age (Seymour et al., 2003). Each of the components of this subtest is briefly described below:

Wh- questions subtest

The wh-question items assess three major aspects: whether the participant understands the logical requirements for answers to double wh-questions (Seymour et al., 2003); whether the child takes multiple clauses into account when interpreting questions with embedded clauses (Seymour et al., 2003) and whether the participant recognizes when the wh- question words move out of clauses and when they are blocked by relative clauses, purpose clauses or component clauses i.e barrier questions (Seymour et al, 2003). For every item, the participant is

presented with one- two pictures and then read a short story of one to five sentences. The participant is then required to answer a wh- question (Seymour et al., 2003).

Double Wh- Questions

The double wh- questions are reliant on a paired exhaustive (Seymour et al., 2003). A paired exhaustive requires that all the characters in the incident are stated and linked in the correct ordered relationship (Roeper, 2004). In other words, the *who* element is accurately coupled with the *what* element, for example in the question "There are two people eating, who ate what?" The appropriate reply would involve "The father ate an apple and the baby ate a banana" (Seymour et al., 2003).

Embedded Clause Questions

In the embedded clause questions, the wh- word in the question refers to an omitted piece of information that one communicative partner needs to know from another (Seymour et al., 2003). For example, when the participant is asked "what did the man eat?", he or she has to determine what component the wh- word replaces or where in the sentence the wh- word comes from (e.g. object, subject) (Seymour et al., 2003). In a more complex sentence, such as those with two clauses, finding the position that the wh- word originates from proves to be more difficult (Seymour et al., 2003). For example, in the question "what did Johnny say he drank?" the wh-word signifying the object of "drank" has changed places by crossing over two clauses (Seymour et al., 2003). The appropriate response to this question necessitates the consideration of both verbs "say" and "drank." To only answer with what "he drank" is inadequate as in this question the wh- word pertains to not what "he drank" but to what Johnny said he drank (Seymour et al, 2003). To interpret the question correctly the participant has to realise that the one clause is embedded in the other. According to Seymour et al, (2003) and Roeper (2004), in order to recognize where the clause is embedded, one should have an understanding of wh-movement as well as its inherent relationships.

Barrier Questions

In the barrier set of questions, the questions contain barriers to the movement of certain components and restrict the question word to a single word answer (Seymour et al., 2003). This area is assessed by using a second question word in the middle of the sentence as well as adjunct clauses (including relative and purposive clauses) (Seymour et al., 2003). When the second question in the middle of the sentence is used, the participant is required to provide the short

distance answer, i.e. the answer that is associated with the closest verb (Seymour et al., 2003). Any long distance answer (i.e. when the wh-question word is linked to the verb that is farthest from it in a sentence) would be inappropriate, as it is obstructed by the second question word (Seymour et al., 2003). For example in the question, "when did Mary say how the vase broke?" an appropriate short distance answer would be "a week ago" whereas a possible long distance answer would be "it dropped and shattered" (Seymour et al., 2003). However, the long distance answer would be incorrect, as the second question forms a barrier to this response (Seymour et al., 2003). Two types of adjunct clauses are utilized: relative and purposive. Adjuncts are not directly associated with the verb like a subject or object, but they are add-ons and generally provide adverbial or adjectival information (Seymour et al., 2003). It is not feasible to ask a *wh*-question in which the *wh*-word has been transferred from within the relative or any other adjunct clause. For example, the sentence "The dog that chased the thief ran away" comprises of two clauses (two verbs). The first verb (chased) as well as the object of that verb (the thief) is contained within the relative clause, which is connected to the subject noun (the dog). One cannot pose the question "Who did the dog that chased ran away?" as it is impossible to interpret (Seymour et al., 2003).

Passives subtest

This subtest assesses the participants' knowledge of movement as well as inherent associations (Seymour et al., 2003). For each item, the child is provided with three pictures and is requested to point to the picture the examiner is talking about. The passive items are classified into three groups:

Movement of elements

This is the most significant feature of passives (Roeper, 2004; Seymour et al., 2003) where the object is placed in the subject position and is treated like the subject (Seymour et al., 2003). This component assesses the participant's knowledge of movement in creating simple passive sentences (Seymour et al., 2003).

Hidden properties

Children do not adequately comprehend the meaning exhibited by passive sentences, until they have become familiar with the hidden characteristics in these grammatical constructions.

These hidden characteristics refer to the information that is not explicitly stated in a sentence lexically or grammatically, but needs to be implied from the syntax of the sentence (Seymour et al., 2003). The hidden features contain:

a) hidden agents i.e. the person completing the action is inferred rather than directly expressed, for example "the umbrella was opened" implies that someone opened the umbrella (Seymour et al., 2003).

b) the difference between an action and the result refers to the ability to distinguish between "the house is being built" (action is continuous) and "the house is built" (action is completed) (Seymour et al., 2003).

c) disjoint reference i.e. the agent of the activity is separate from the receiver of the activity, for example in the sentence "the bear was being washed," the participant needs to be able to distinguish that another person is performing the washing and not the bear himself (Seymour et al., 2003).

Alternate by-phrase meanings

This component examines the participants' ability to recognise that it is in fact the structure of the verb that signifies a passive sentence and not the more distinctive by-phrase which can be an optional feature of the passive sentence (Seymour et al., 2003). For example, in the sentence "The ball is rolling by the boy" the passive construction of "the ball was rolled by the boy" closely approximates. Therefore, if the child overlooks the verb ending (-ing and -ed) and concentrates on the by phrase, (as if it depicted the agent rather than the location) s/he would point to the picture of the boy rolling the ball. This ability to disregard the by- phrase and concentrate on the verb structure is indicative of the deeper understanding of the demands of the passive construction (Seymour et al., 2003).

Articles Subtest

This subtest assesses the participants' ability to utilize the suitable article and is based on the skill of cohesion and discourse linking (Roeper, 2004). In order for the participant to correctly state the appropriate article, s/he was required to focus on the manner in which the article is explained in previous utterances as well as use what s/he assumes about the object (Seymour et al., 2003). The appropriate interpretation in English for the correct use of 'the' and 'a' is a prominent difficulty for English second language learners (Seymour et al., 2003). The participant

is required to listen to a one to three sentence story and then provide a response (using singular nouns) to a question. These items are presented without any pictures so as to assess the participants' awareness of new versus old information (Seymour et al., 2003). When a picture is displayed to both the child and the administrator, the very existence of the picture, even prior to it being mentioned, may cause the pictured items to be "old" information to the child and therefore affects which article is used (Seymour et al., 2003). Two types of definite articles are assessed in this subtest: firstly, familiar 'the,' which is used when referring to an object that has been named beforehand. For example "a tiger and a monkey were sitting in the jungle. They were friends. One of them climbed up a tree. Guess which?" and secondly, part 'the' that as its name implies, refers to part of an object that has been used beforehand. For example "Thabo wanted to eat an orange but first he had to take something off it. What did he take off?" (Seymour et al., 2003). In addition, three types of indefinite articles are also assessed: firstly, specific 'a' which refers to a particular object that is only familiar to the speaker. For example "I am sure you have something hanging on the wall of your classroom;" secondly, non- referential 'a' which refers to a non specific object but where the answer is derived from the circumstance. For example "Sipho wants to go to sleep but he is cold and wants something to cover himself. What does he need?" and thirdly, predictional 'a' which is used before a noun in response to a question containing the word "have." For example "Think about a fireman. What does he have?" (Seymour et al., 2003).

Semantics Subtest

The semantics subtest of the DELV has been shown to reduce the prejudicial nature of acquired vocabulary tests which tend to be culturally dependent (Seymour et al., 2003). This subtest has three components namely verb and preposition contrast items, quantifier items and fast mapping items. Each of the components is briefly described below:

Verb and Preposition Contrast Items

The verb and preposition contrast items essentially examine how a child organizes and retrieves his or her vocabulary (Seymour et al., 2003). This skill is important because no matter how different the child's experiences and resulting vocabulary are, his or her lexicon must be

organized in a hierarchical pattern in order to efficiently retrieve words when needed (Seymour et al., 2003).

1.1 Verb Contrast Items

The verb contrast items assess the child's competency in using suitable contrasts at the appropriate hierarchical level in naming actions in flexible ways. The overall classifications of verbs examined included motion, grooming, breaking, corresponding, and dressing (Seymour et al., 2003). A picture is shown to the child and he or she is required to provide verbs to finish the sentence about the picture. The letter of the response option chosen is then circled and a score of one is provided for each correct answer. Zero points are awarded for an incorrect answer (Seymour et al., 2003).

1.2 Preposition Contrast Items

The preposition contrast items utilize the same structure as that of the verb contrast items. The purpose of this subtest is to examine the child's skills in producing spatial and grammatical prepositions that are contrastive to the ones used in the prompts (Seymour et al., 2003). The child is once again shown a picture, and is thereafter required to finish two sentences about the pictures using prepositions. The letter of the response option chosen is circled and one point is awarded for a correct answer (Seymour et al., 2003).

Quantifier Items

This sub-test utilises the quantifier 'every', as it is one of the most frequently occurring quantifiers. Quantification is found in the language of mathematics and double Wh- questions (Seymour et al., 2003). These items are capable of detecting very subtle problems such as whether the child knows what range of structures within and across sentences the word "every" applies to (Seymour et al., 2003) and thus the manner in which a child uses quantifiers, provides insight into how well his/her developing grammar can manage the complex constructions that are used in everyday discourse (Seymour et al., 2003). This sub-test consists of eight components, three of which analyse the child's acquisition of the meaning of the quantifier 'every', as well as the understanding of the syntactic constraints that govern its production; another three items which examine the child's understanding that 'every' only affects the noun that follows it; and two which analyse the child's understanding of the syntactic constraints that regulate the production of 'every' across sentences (Seymour et al., 2003). The child is initially shown one

picture, and is asked a question about it. Thereafter, he or she is shown two pictures, and is asked to point to the picture that was being spoken about (Seymour et al., 2003). The letter of the response option that matched the child response is circled, and a point is awarded for each correct answer.

Fast-mapping Items

This component of the semantic sub-test examines the child's ability to extract and learn the meaning of novel verbs based on sentence context after just a few exposures and is important for vocabulary learning (Seymour et al., 2003). The child is first taught the task through the use of real verbs in the prompt and thereafter novel verbs are utilized. For each item, the child is provided with a series of three pictured episodes, while the administrator expressed an action (eg. "The boy is pouring juice"). The child is then expected to respond to questions about the characters, and objects in the series of the three pictured episodes, by pointing to one of four smaller pictures, placed on the right of the pictured episode. These smaller pictures are related to the characters or objects depicted in the initial set of pictures. The original set of three pictures, provides the child with information concerning the succession of events, but does not provide the child with the material needed to respond correctly (Seymour et al., 2003). The child is required to use what he/she understands about word order and word endings, in order to arrive at the correct answer. The verbs used in this component consist of three variations: transitive verbs, transfer verbs, and complement (Seymour et al., 2003). The child's response letter is circled, and one point is awarded for each correct answer.

Pragmatics Subtest

This subtest has three components namely question- answer planning, communicative role taking and narratives. This subtest assesses several functional language abilities that are essential for classroom communication and critical for all children's success in the beginning stages of their formal education as well as for the attainment of literacy skills (Seymour et al., 2003). In addition, all the components and procedures in this sub-test have several key properties. Firstly, they supply a certain referential base and pragmatic encouragement for the language structures and information to be expressed, which increases the probability that these structures are tested (Seymour et al., 2003). Secondly, by limiting the range of correct responses, scoring of the

child's expressions is easier than that required for an open-ended spontaneous sample. This is achieved while still maintaining a large degree of communicative naturalness (de Villiers, 2004). Thirdly, all of the tasks assess the relationship between syntax, semantics, and pragmatics, as it is impossible to totally separate the one language domain from the other (de Villiers, 2004). Each of the components of the subtests is briefly described below:

Question-answer planning

Questions can satisfy various intentions such as, asking for clarification or asking politely for an activity to be performed. However, the most important objective of questions is in acquiring information. For a child starting school, being able to identify what information he/she is required to know, so that he/she may ask the correct question from the teacher, is a profoundly important skill to develop. This expressive *wh*-question task corresponds with the comprehension *wh*-question task in the syntax sub-test, and as in the comprehension task it also includes a double *wh*-question (Seymour et al., 2003). The participants are required to ask different questions (who, what, where, when why and how) in order to find out missing information. In each of these items, the participant is shown a picture with a missing element, and after the child asks the appropriate question, s/he is shown the complete picture (Seymour et al., 2003). For all the items in this subtest, the child has two chances to ask the correct question and his questions are scored for pragmatic and semantic appropriateness i.e. his/her ability to recognize what must be said to get the information needed (Seymour et al., 2003).

Communicative role taking

The participants are required to talk about a communication act or event that takes place in two pictured events in order for their ability to take on another's perspective to be assessed (Seymour et al., 2003). For this to be done successfully, the participant is required to understand what the character (i.e. the speaker) in the pictures wants to accomplish in his or her utterance. In other words, the participant has to recognize what speech act the speaker was producing i.e. did he want to obtain some information, report something or prevent an action from occurring (Seymour et al., 2003). For example, the examiner shows the picture of a young girl discovering a lovely cake in the refrigerator (Seymour et al., 2003). A picture of the little girl pulling at her mother's shirt and saying something to her mother is then presented (Seymour et al., 2003). The

examiner then asks the participant "what is the girl *asking* her mom?" As a result of the use of the word "asking" by the examiner, the appropriate speech act to be used by the participant is restricted to either a direct or indirect question (Seymour et al., 2003). A suitable response is, "May I have a piece of cake" or "She is asking if she can have a piece of cake" (Seymour et al., 2003). A statement such as, "I found cake in the fridge" or "She found a cake in the fridge" would be incorrect (Seymour et al., 2003). The participants are not scored on particular morpho-syntactic structures but rather their ability to demonstrate an awareness of the appropriate pragmatic form (Seymour et al., 2003).

Narrative Items

The participants look at six sequenced pictures which the examiner is unable to see and are required to tell a story about the pictures. As the participant is telling the story, the examiner evaluates the story for use of contrastive reference and temporal features i.e. are the participants able to provide the necessary information for the examiner to understand the story without looking at the pictures (Seymour et al., 2003). When the participant completes his/her story, the examiner asks two follow up questions. These responses are judged for mental state references i.e. did the participant understand what the character wanted or what the character was thinking and for the participant's awareness of the character's false belief (Seymour et al., 2003). The pictures forming the basis of the story have three key characteristics which increase the pragmatic motivation for the production of linguistic cohesion and the language relating to the mental states of the characters. First, there are two same-sex characters who need to be distinguished and merely utilising pronouns would not be enough. Second, there are important time relations among the pictured events that occur both within and across the pictures, which need to be told in a coherent manner. This allows for evidence of the participants' ability to identify characters contrastively through adjectives, labels, prepositional phrases or relative clauses to be judged. Furthermore, the participants' story also shows how he/she links events in time using a short phrase or a clause (Seymour et al., 2003). Third, the pictures are adapted from the typical tests of theory of mind in which the desired object is transferred from one place to another without the knowledge of the major character. A 'thought balloon' is also included in this test to illustrate the mental state of the main character. The participant is required to express the

mental state of this character, as well as provide an explanation for this character's false belief (i.e. why the character searches for the object in the incorrect location) (de Villiers, 2004).

Scoring on the DELV

A score of 1 or 2 is given for a correct response and 0 for an incorrect or 'no response'. Once all the items are scored, the sub-total is calculated for each section of items within every sub-test (e.g. *wh*-question items sub-total in the syntax domain). Subsequently, after each sub-total is determined, a total score for the particular domain is calculated (e.g. sub-total for wh-question items + sub-total passives items + sub-total for article items = syntax domain total score) (Seymour et al., 2003). On the basis of the total score, the child is placed in the categories of either weakness, low average, average or strength for each domain (Seymour et al., 2003). However for the purposes of this study only the raw scores were utilized and the "slow to learn" EAL learners were compared to their South African peer group and not the DELV-CR normative sample data so as to yield less biased results.

Reading Comprehension Measure

The Gray Oral Reading Test (GORT-4) (Wiederholt & Bryant, 2001) was employed to measure the participants' oral reading accuracy and comprehension abilities because children with SLI have been shown to have associated difficulties in reading decoding and reading comprehension (Mackie & Dockrell, 2004). Even though the GORT-4 was developed in the USA, it was normed on and can be used to assess children from various age, ethnic and cultural backgrounds as well as children with learning difficulties and disabilities and may thus be appropriate to use within a South African context (Wiederholt & Bryant, 2001). The GORT-4 can be used to assess individuals aged 6 years through 18 years, 11 months. The test consists of two parallel forms, each containing 14 developmentally sequenced reading passages with five comprehension questions following each passage (Wiederholt & Bryant, 2001). The nature of the questions asked in assessing reading comprehension has been the key point for many researchers. The GORT-4 (Wiederholt & Bryant, 2001) utilizes questions designed to tap explicitly stated information within the text. Literal, inferential, critical and affective questions are used and answers to these questions are passage dependent. In addition, the questions have few or no nouns, verbs or modifiers in common with the vocabulary used in the story thereby ensuring that

the test is not a task of matching similar text features but of reading comprehension (Wiederholt & Bryant, 2001). Furthermore, the vocabulary utilized in each question is controlled for so as to ensure that the vocabulary would not be more difficult than that used in the stories (Wiederholt & Bryant, 2001). The participants are provided with multiple choice questions and have to select the correct answer from four given choices. The participants are not allowed to return to the passage to scan for the answers to the questions and are tested until the ceiling is reached i.e. when s/he misses at least three of five comprehension questions for any one story or until the final story is read. The scores per story are then added up and a total raw score obtained (Wiederholt & Bryant, 2001).

Working Memory Measure (AWMA)

The Automated Working Memory Assessment (AWMA) (Alloway, 2007) is a computer-based assessment of working memory skills in children aged 4 to 11 years. The administration and scoring on the AWMA is fully automated. The testing sequence is pre-set, test scores are calculated by the computer program and an interpretation of how the child's working memory scores will affect their learning is provided (Alloway, 2007). The participants' verbal short term memory and working memory as well as their visuo-spatial short term memory and working memory were assessed using the short form of this test. A brief description of the subtests utilized from the AWMA is provided.

Verbal Short Term Memory

These measures assess the function of the phonological loop. The digit recall subtest was administered. In this subtest the participant was required to recall a sequence of digits in the same order that it was presented (Alloway, 2007).

Verbal Working Memory

These measures assess the function of the verbal central executive. The listening recall task subtest was utilized. In the listening recall subtest, the participants were presented with a series of spoken sentences and were required to judge the sentence by stating whether it was true or false. The participants were also required to recall the final word for each sentence provided in sequence (Alloway, 2007).

Visuo- spatial Short Term Memory

These measures assess the function of the visuo-spatial sketchpad. The Dot Matrix subtest was utilized. In this subtest, the participant was shown the position of a red dot in a series of four-by-four matrices and was required to recall this position by tapping the square on the computer screen (Alloway, 2007).

Visuo-spatial Working Memory

These measures assess the function of the visuo-spatial central executive. The spatial recall subtest was administered. In this subtest the participant was required to view two shapes, where the shape on the right had a red dot on it. The participant had to identify whether the shape on the right was the same or opposite of the shape on the left. The shape with the red dot could be rotated through 360˚. Furthermore, at the end of the trial the participant had to recall the location of each red dot on the shape in sequence, by pointing to a picture with three compass points (Alloway, 2007).

Once testing was completed, a computer generated report provided a summary of the performance of the participant. A graph and learner's profile was also supplied. Learners scores were compared to the means and standard deviations obtained from their typically developing aged matched peer group as well as the summary scores automatically generated.

Phonological Memory Measures

The Non Word Repetition Test

The non word repetition task developed by Dolloghan and Campbell (1998) was employed to assess phonological memory in this study. This measure is designed to be equally familiar to all children regardless of their language knowledge and thus appropriate for use with EAL children in detecting language impairment. This task was designed so that the syllables comprising the non- words do not correspond to lexical items, the predictability of phonemes is minimized and the phonemes are developed early so that poor performance does not reflect articulation deficits. The phonemes are acoustically salient and the non- words are presented at a consistent rate with consistent accuracy and intonation (Dolloghan & Campbell, 1998). Each child's score on the non word repetition test was calculated on the basis of the % of syllables correctly obtained. The number of syllables in each non word was first counted and then added together to provide an

overall score. As the child produced each of the non words, the syllables correctly stated per word were scored and added together to provide a total score which was then converted into a percentage.

Sentence Repetition Test

Vance (2000), proposed that sentence recall highlights the interaction between short-term memory skills and the language processing system. The analysis of sentence recall errors reflects this relationship. Short-term memory errors include word order errors, where meaning is intact, whereas when meaning is altered, or if a sentence is produced that is grammatically or semantically incorrect, then limited language knowledge is implicated (Vance, 2000). Alloway, Gathercole, Willis and Adams (2004) also refer to the value of sentence recall tasks, as they demonstrate the function of the episodic buffer which involves the integration of information from short-term memory subsystems with the language processing system. As the AWMA did not assess episodic buffer function, a separate sentence recall test was included in the study. The sentence recall probes developed by Redmond (2005) were utilized in this study (Appendix C) because in other standardized measures of sentence recall, the children's responses are recorded as either 'correct' or 'incorrect' and a ceiling procedure is used to discontinue item administration (Redmond, 2005). Redmond's sentence recall probes ensured an equal number of items across groups and that examined more closely the errors children produced. This probe consisted of 16 sentences composed of 10 words (10- 14 syllables), with an even number of active and passive sentences. This particular stimuli length and these specific sentence types were chosen to ensure that children in the typically developing group would produce enough errors during the task to permit group comparisons (Redmond, 2005). Thus in order to ensure that reliable sentence repetition results were obtained, the participants were also required to repeat these sentences. The Redmond study had previously shown that these sentences reliably differentiate SLI and typically developing groups as they utilized a graded scoring system rather than correct/incorrect, whilst ensuring that performance of the typically developing group was not at ceiling (Stokes, Wong, Fletcher & Leonard, 2006). The sentences were presented in fixed order and scored as: 2(correct), 1(three or fewer errors), or 0 (more than 4 errors or no response). The scores were then added together to provide a total score which was then converted into a percentage.

Summary of instruments utilized

Table 3 below provides a summary of the instruments utilized by Jordaan (2009) to assess the language and cognitive processing abilities of all the EAL and EFL learners over the period of three years. As the participants of this study i.e. the EAL learners with suspected SLI were selected from the Jordaan (2009) study, all the participants were already assessed on these measures. The educator questionnaire was however unique to this study and only provided to the teachers of the participants of the current study.

Table 3: A summary of the instruments utilized by Jordaan (2009) to assess the language and cognitive processing abilities of all the EAL learners and EFL learners in grade one, two and three

	Aspects assessed	Grade 1	Grade 2	Grade 3
1. Teacher Ratings				
- Oral Communication	Educators ratings of the learners' performance in these three areas	✓		
- Written Language		✓		
- Reading Comprehension		✓		
2. Language Proficiency Measures				
Diagnostic Evaluation of Language Fundamentals (DELV)				
- Syntax Domain				
Wh- questions (comprehension and production)	Knowledge of syntactic variables, syntactic barriers to movement and embedded clauses.	✓	✓	✓
Passives	Knowledge of movement rules and implied agents	✓	✓	✓
Articles	Understanding of varieties of meaning expressed by articles in English	✓	✓	✓
- Semantics Domain				
Verb and Preposition Contrast Items	Organisation of the child's verb and preposition lexicon into contrasting words and levels of meaning	✓	✓	✓
Quantifier Items	Understanding the meaning and scope of the quantifier "every"	✓	✓	✓
Fast Mapping	Fast mapping of meaning of unknown verbs from their argument structure	✓	✓	✓
- Pragmatics Domain				
Question answer planning	Asking the right question to discover missing information	✓	✓	✓
Communicative Role taking	Understanding the viewpoint of speakers and the speech acts they are producing	✓	✓	✓
Narratives	Reference specification, expressions of temporal relationships between events, and theory of mind	✓	✓	✓

Gray Oral Reading Test 4th Edition (GORT- 4)				
- Reading Comprehension	The participants ability to comprehend text		✓	✓
3. Cognitive Processing Measures				
Automated Working Memory Assessment (AWMA)				
- Digital Repetition	Verbal Short Term Memory		✓	
- Dot Matrix	Visuo-spatial Short Term Memory		✓	
- Listening Recall	Verbal Working Memory		✓	
- Spatial Recall	Visuo-spatial Working Memory		✓	
Non Word Repetition Test				
- Dollaghan & Campbell (1998)	Phonological Memory		✓	
Sentence Repetition Test (Redmond, 2005)				
- Recall Probes	Phonological Memory		✓	

ETHICAL CONSIDERATIONS

According to O'Leary (2004), ethics is an integral part of each and every research, and ethical approval must be fulfilled in order to ensure the credibility of the data gathered. Ethical approval is required in order to safeguard the mental, emotional, and physical interests of the participants. Thus, whenever contact with human participants is involved in conducting research, it is expected that ethical approval be obtained (O'Leary, 2004). Approval from the Ethics committee of the University of Witwatersrand (protocol number: H080503) and the Gauteng Department of Education (GDE) in order to conduct the study was previously obtained when the participants were initially assessed (Jordaan, 2009) and thus further approval was not necessary as the same participants were used for this study. Informed consent was obtained by Jordaan (2009), from the principals of the specified schools as well as the school teachers so that testing could be conducted on the participants (Appendix A). Additional informed consent was obtained by the principals so that the educator questionnaires could be provided to the teachers of the participants in this study. Furthermore, due to the fact that the participants were under the legal age of eighteen, informed consent was obtained from their parents/legal guardians as well as assent from the participants themselves (Appendix A). The children, parents, teachers and the principal were provided with information sheets and consent forms including details regarding the general purpose of the study and reasons for the testing. Confidentiality of responses was assured, and participants were informed that if any questions or queries arise, the researcher would gladly respond to them.

One of the difficulties in this research was the fact that intervention could not be withheld from the children who were identified as language impaired and thus the researcher ensured that mechanisms for appropriate referral were in place.

DATA COLLECTION

All the participants were tested individually in a quiet area of the school at a time designated by the teacher and that did not interfere with their school work at the end of their grade one, two and three years on all the above mentioned instruments by (Jordaan, 2009) with the exception of the educator questionnaire which was provided to the teachers of only the participants of this study. The tests were administered by the researcher and one other research assistant, familiar with test procedures, so as to ensure a degree of reliability in the results obtained. These tests were administered and scored according to the instructions in the relevant manuals and where necessary raw scores were converted into percentages for ease of comparison.

DATA ANALYSIS

Descriptive statistics, correlational statistics and inferential statistics were used to analyse all the data obtained for this study.

The purpose of descriptive statistics is to illustrate the properties of a sample (Mertens, 2005). It also provides an overview of the data collected (Baxter & Babbie, 2004). In essence, descriptive statistics consist of two kinds of measures i.e. measures of central tendency (mean) and measures of variability (range and standard deviation) (Mertens, 2005). The mean is a brief description of a group of numbers with regard to centrality and the range provides the highest and lowest values in a data group (Mertens, 2005). Means, standard deviations and ranges were calculated for all the language proficiency assessment measures and the cognitive processing assessment measures as well as the teacher rating scale to establish individual variation in all scores on all the measures of assessment. This also allowed for the results obtained from the EAL learners with suspected SLI to be compared to the EFL learners with suspected SLI so as to aid in the discussion on the manifestations of SLI in these learners.

Correlational statistics aim to illustrate the strength and direction of the relationship between two or more variables (Mertens, 2005). Pearson's correlation coefficient was used to establish whether there was a positive relationship between the results obtained on the different subtests of the DELV-CR with the working memory measures, phonological memory measures and the teacher rating scales in order to provide information regarding these tests as assessment measures on EAL learners as well as to further enhance the validity of this study. Data correlations were also performed between the DELV-CR and the GORT-4 to establish whether there was a relationship between the oral and literate measures of academic language proficiency. For the purpose of this study, a significance level of 5% (0.05) was used. Thus, a p-value of less than 0.05 can be considered to be significant.

Inferential statistics allows the researcher to make inferences, from the results obtained from the sample, to a larger population (Baxter & Babbie, 2004) and essentially measures differences amongst groups (Mertens, 2005). An Independent sample t-test was used to determine whether there were any significant differences between the EAL and EFL learners' performance on all three subtests of the DELV-CR test in grade one, two and three in order to provide information as to whether bilingual learners with language impairment are more impaired than monolingual learners with language impairment in the acquisition of academic language. Independent sample t-tests were also used to determine if there were significant differences between the EAL-SLI learners and their typically developing age matched EAL peers to provide further information regarding the use of sentence repetition tests in differentiating "slow to learn" EAL learners from learners with language impairment.

Lastly, in terms of the qualitative component, the data obtained from the educator questionnaire was analysed using content analysis. Content analysis is the method through which a set of categories or themes are identified and the researcher then counts the number of instances that fall into each category (Silverman, 2000). Likewise, Rosenthal and Rosnow (1991) state that content analysis is the objective, systematic strategy of decomposing messages, and then evaluating their contents in order to reveal specific characteristics. Therefore, the data from the questionnaires were examined for common themes and categories regarding the language difficulties these EAL and EFL learners with suspected SLI display in the classroom.

CHAPTER 5

RESULTS AND DISCUSSION

This study aimed to investigate in detail previously identified EAL learners in the foundation phase who demonstrated slow development in their academic language skills over three years, in order to determine whether they could be characterized as language impaired and furthermore to describe the manifestations of this language impairment. An analysis of the data obtained from 16 EAL learners and 5 EFL learners assessed on the DELV-CR test, a reading comprehension test, a non word repetition test, sentence repetition test and working memory assessments as well as the teacher rating scales and educator questionnaires yielded the following results that will be presented and discussed in accordance with the research questions the study aimed to answer.

Based on the results obtained from the Jordaan (2009) study, it was proposed that the EAL learners from the different contexts be treated as separate groups. Jordaan (2009) examined whether the EFL learners and the EAL learners in the two different contexts differed significantly with regards to their scores on the DELV-CR test. This was conducted using a one factor ANOVA test. Results revealed that there were significant differences between the EAL learners in context 1 and context 2 and also between the EAL learners and the EFL learners on the subtests of the DELV-CR test in grade one [syntax: $F(2, 166)$, $=78.39$, $p< 0.0001$; pragmatics: $F(2, 166)= 36.93$, $p<0.0001$; semantics: $F(2, 166)= 54.74$, $p<0.0001$] and grade two [syntax: $F(2, 143)=31.50$, $p< 0.0001$; pragmatics: $F(2, 143)= 12.24$, $p<0.0001$; semantics: $F(2, 143)= 33.13$, $p<0.0001$]. The statistical results can be viewed in Appendix D. Independent sample t- tests were then conducted to locate the significant differences between these groups on the various measures. Results revealed significant differences between the EFL learners and the EAL learners in context 1 on each of the different sections of the syntax, pragmatics and semantics measures in grades one and two. Results revealed significant differences between the EFL learners and the EAL learners in context 2 on only the articles section of the syntax subtest in grades one and two [$t= 2.86$, $p< 0.0086$; $t=2.71$, $p< 0.0081$], on the narratives section in grades one and two [$t=1.99$, $p< 0.0491$, $t=2.85$, $p< 0.0054$] and the role taking section of the pragmatics subtest in grade one [$t= 2.25$, $p< 0.0267$] and all sections of the semantics subtest except for the fast mapping of novel words. Finally, significant differences were found between

the EAL learners in context 1 and EAL learners in context 2 on all syntax measures, pragmatic measures and semantic measures with the exception of fast mapping of novel words. The statistical results can be viewed in Appendix D. This therefore provided support for comparing the EAL learners with suspected SLI (here after referred to as EAL-SLI) to their specific peer groups in each context.

In addition, within the same study, no significant differences were found to exist between the different genders (Jordaan, 2009), and thus the need to take gender differences into account was disregarded in the current study. The statistical results can be viewed in Appendix E.

Do the EAL learners who demonstrated slow development in their language skills have SLI and if so, how does the SLI manifest in the second language and how is this manifestation similar and different to the language impairments of EFL learners with SLI?

The DSM-IV-TR criteria for a specific language disorder (American Psychiatric Association, 2000) and the equivalent criteria in ICD-10 (World Health Organization, 1993) place importance on the need for a diagnosis of SLI to be made on standardized individually administered measures of both receptive and expressive language (Bishop & MacDonald, 2009). Thus in order for the researcher to determine whether these slow to learn EAL learners do in fact have a language impairment, their performance on the DELV-CR test (Seymour et al., 2003) is analysed in detail below. Traditionally, performance on standardized language tests is critically dependant on a child's opportunities or experiences with the test language (Kohnert, Windsor & Yim, 2006). These measures are usually effective in identifying language impairment in children from the dominant culture who are monolingual speakers of the dialect and therefore well represented in the normative data (Kohnert et al., 2006) but less sensitive to the underlying differences between typically developing children and children with language impairment who are culturally and linguistically diverse (Paradis & Crago, 2000; Dollaghan & Campbell, 1998) and therefore the assessment of EAL learners on the DELV may have yielded less biased language scores compared to other standardized language measures as this test is able to provide information for distinguishing dialect features from SLI and unlike other standardized language measures, examines the underlying skills needed to successfully cope with the increasing lexical and conceptual demands presented in the educational setting and is specifically designed to assess the language skills required for the first few grades in school (de Villiers, 2004). Furthermore, the

participants' performance was compared against their typically developing peer groups and not against the normative data provided in the DELV-CR. The participants' performance on each of the subtests is discussed in detail below.

SYNTAX

The items on this sub-test focus on those syntactic aspects of language which are essential for success in early schooling and literacy development (Roeper, 2004). A large degree of individual variation is evident from the broad range of scores obtained by the EAL- SLI learners for the total syntax subtest, which suggests that they are not a homogenous group. The results from table 4 indicate that the majority of these EAL- SLI learners improved minimally in their performance from grade 1 to grade 2 on the various sections of the syntax subtest as is evident from the mean scores obtained. One learner however, (participant number 4) demonstrated a great improvement in his understanding of Wh- questions. Furthermore, some EAL learners also appear to have performed more poorly in grade two despite the additional year of English instruction. For example, participant number 6 performed more poorly in grade two than in grade one on all three sections of the syntax subtest. The relationship between language and cognition may however provide evidence for why these learners' ability to learn fluctuates and/or changes over time. According to Botting (2005) there is a dramatic fall in non verbal IQ of learners with a history of SLI that continues until 14 years of age. However, as this fall is not universal across children, the pattern of IQ development must be related at least in some ways to linguistic progress (Botting, 2005). Therefore, even though the participants in this study may have had identical IQs to begin with, these learners' language appears to be developing differently which provides evidence for this interactive process between language and cognition (Botting, 2005). Whilst this interaction might not be 'visible' in typically developing learners where development of language and cognition follows a predicted pattern, atypical groups for e.g. learners with SLI, might show larger variations over time depending on the progress of specific cognitive and linguistic abilities (Botting, 2005). With regards to the EFL- SLI learners, minimal improvement from grade one to grade two is also evident and like the EAL learners, some of the EFL learners performed more poorly in grade two than in grade one on various sections of the syntax subtest. Results on each of the sections of the syntax subtests are discussed below.

Table 4: Raw scores obtained by each of the sixteen EAL-SLI learners and the five EFL-SLI learners on the syntax subtest of the DELV-CR (from Jordaan (2009)) as well as the mean, standard deviations and range of scores obtained by the groups.

		Wh Questions			Passives			Articles			Total Syntax Score		
EAL Cont 1	Child	**Grd 1**	**Grd 2**	**Grd 3**	**Grd 1**	**Grd 2**	**Grd 3**	**Grd 1**	**Grd 2**	**Grd 3**	**Grd 1**	**Grd 2**	**Grd 3**
	1	8	10	8	4	4	7	3	4	4	15	18	19
	2	8	10	10	3	5	6	3	4	4	14	19	20
	3	4	6	10	2	3	5	2	1	5	8	10	20
	4	2	10	12	4	3	8	2	3	2	8	16	22
	5	12	10	-	3	3	-	4	1	-	19	14	-
	6	10	8	8	4	2	3	1	4	3	15	14	14
	7	10	8	12	4	8	5	1	5	2	15	21	19
	8	4	10	12	5	3	6	4	5	4	13	18	22
	9	8	10	10	5	5	4	3	5	7	16	20	21
	10	8	10	10	4	4	2	5	5	4	17	19	16
	Mean	7.40	9.20	10.22	3.80	4.00	5.11	2.80	3.70	3.89	14.00	16.90	19.22
	Std Dev	3.13	1.40	1.56	0.92	1.70	1.90	1.32	1.57	1.54	3.56	3.38	2.68
	Range	10	4	4	2	6	6	3	4	5	11	7	8
EAL Cont 2	11	10	8	8	3	4	5	3	3	4	16	15	17
	12	2	12	10	5	6	4	3	4	6	10	22	20
	13	12	14	12	5	5	6	0	4	4	17	23	22
	14	8	12	12	5	5	8	4	7	8	17	24	28
	15	8	14	10	4	9	5	0	5	5	12	28	20
	16	12	14	14	8	5	5	0	6	6	20	25	25
	Mean	8.67	12.33	11.00	5.00	5.67	5.50	1.67	4.83	5.50	15.33	22.83	22.00
	Std Dev	3.72	2.34	2.10	1.67	1.75	1.38	1.86	1.47	1.52	3.67	4.36	3.95
	Range	10	6	6	5	5	4	4	4	4	8	13	11
EFL	17	14	12	12	5	7	8	7	7	8	26	26	28
	18	12	12	14	5	5	10	6	7	8	23	24	32
	19	14	10	14	6	5	5	8	6	8	28	21	27
	20	10	12	10	4	7	8	4	5	7	18	24	25
	21	14	12	14	8	8	9	8	6	7	30	26	30
	Mean	12.80	11.60	12.80	5.60	6.40	8.00	6.60	6.20	7.60	25.00	24.20	28.40
	Std Dev	1.79	0.89	1.79	1.52	1.34	1.87	1.67	0.84	0.55	4.69	2.05	2.70
	Range	4	2	4	4	3	5	4	2	1	12	5	7

Wh-Questions

According to Owens (2004), learners require knowledge and understanding of wh-questions because in the classroom, the majority of teacher-child interactions involve the teacher asking questions that require accurate responses from the learner. However, the question form that the teacher utilizes can cause difficulty for some children (Owens, 2004). This may be attributed to the fact that some question forms require statement of the fact, whilst others require that the child analyse and justify actions, thereby utilizing the learners' inductive or deductive reasoning abilities (Owens, 2004). It is thus essential that children understand the requirements of different question forms. Three types of Wh-questions were assessed in this section. These included double-wh questions, embedded clause questions and barrier questions. Out of a total possible score of 14 for the Wh- questions subtest, three of the sixteen EAL-SLI learners obtained 100% with the other EAL learners obtaining scores between 42.86% and 100% at the end of their grade two year. The majority of these learners demonstrated an improvement in their knowledge and understanding of how to correctly respond to various Wh-questions from grade one to grade two but did not improve further from grade two to grade three as is evident from the scores obtained. However, although these learners are improving, the EAL-SLI learners in context 1 still appear to be weak when compared to their age matched peers. These EAL-SLI learners obtained a mean score of 9.20/14 at the end of their grade two year whereas their age matched EAL peers in context 2 obtained a mean score of 11.1/14 in grade two. The EAL-SLI learners in context 2 obtained a mean score of 12.33/14 which is similar to the mean score of 12.8/14 obtained by their age matched EAL peers which suggests that these learners do not have particular difficulty with Wh – questions. (The mean scores obtained by the peer group can be viewed in Appendix F). With regards to the EFL-SLI learners, the highest score obtained was 85.71% with the other learners obtaining scores between 71.42% and 85.71%. These learners did not show improvement in their performance on this task from grade one to grade two and in fact regressed as is evident in the mean scores obtained. The EFL-SLI learners obtained a mean score of 12.80 in grade one and 11.60 in grade two which is lower than the mean scores of 13.3 and 13.6 obtained by their age matched EFL peers in grade one and two respectively. This suggests that the EFL-SLI learners like the EAL-SLI learners do not understand how to correctly respond to various wh-questions. Overall however, the EFL-SLI learners still performed better than the EAL-SLI learners in context one and two at the end of their grade three year which suggests that

bilingual learners with language impairment are slower than monolingual learners with language impairment in learning how to correctly respond to various wh questions.

Passives

According to Cummins (2000), as children advance through the grades the complexity of the language they are required to understand increases for e.g. passives are used more than active sentences. In a passive sentence, the grammar of the sentence conveys the message/information whereas in an active sentence, the information is stated very explicitly (Roeper, 2004) and thus for learners to succeed in understanding passive constructions, they need to learn to utilize more non-linguistic clues. If learners still utilize linguistic cues (word order) to comprehend complex sentences, it may result in these types of oral or written sentences being misinterpreted (Paul, 1995). Three components of passive sentences were assessed in this section. These included the movement of elements, hidden properties and the alternate by phrase. Out of a total possible score of 10 for the passives section, one EAL-SLI learner obtained 90% with the other EAL- SLI learners obtaining scores between 20% and 90% at the end of their grade two year. This suggests that the majority of EAL-SLI learners are having difficulty in utilizing non linguistic cues to correctly interpret passives. Overall, the EAL-SLI learners demonstrated minimal improvement from grade one to grade two as is evident from the mean scores obtained. In comparison to their age matched peers, the EAL-SLI learners obtained mean scores of 4.00 and 5.67/10 at the end of their grade two year in context one and two respectively which is lower than the mean scores of 5.7 and 7.4/10 obtained by their age matched peers in the respective contexts. The EFL-SLI learners obtained scores between 50% and 80% on this subtest. Even though the EFL-SLI learners demonstrated improvement from grade one to grade two, they still appear to be weak when compared to their age matched peers. They obtained mean scores of 5.60 and 6.40/10 in grade one and two respectively which is lower than the mean scores of 6.90 and 7.90/10 obtained by their age matched EFL peers. This suggests that like the EAL-SLI learners, the EFL- SLI learners are having particular difficulty understanding passive sentences. Overall however, the EFL-SLI learners still performed better than the EAL-SLI learners in context one and two at the end of their grade three year which suggests that bilingual learners with language impairment are slower than monolingual learners with language impairment in developing an understanding of passive sentences.

Articles

According to Roeper (2004), articles play a key role in discourse linking (i.e. cohesion) and thus involve the learner's understanding of context and presupposition (de Villiers, 2005). It is therefore important for learners to have a good understanding of articles in order to connect the ideas the teacher communicates orally in class as well as for the linking of information conveyed in written language. Out of a total possible score of 8 for the articles section, the highest score obtained was 87.5% with the other EAL-SLI learners obtaining scores between 12.5% and 87.5%. The majority of the EAL-SLI learners thus have difficulty in utilizing articles correctly. However, it is not unusual that learners acquiring English as an additional language frequently leave articles out (Brown, 1973). This has been noted to occur in the Zulu language (Suzman, 1991) and therefore learners who speak Zulu and other African languages may find it difficult to acquire articles. Furthermore according to Roeper (2004) and Seymour et al, (2003), these generally poor results can be expected as the article system in English is particularly complicated, and EAL learners find this aspect of syntax especially problematic. However, the mean scores of 3.7 and 4.83/8 obtained by the EAL-SLI learners at the end of their grade 2 year in context one and two respectively, is still lower than the means of 4.7 and 6.1/8 obtained by their age matched peers in grade 2, which suggests that they are having more difficulty in utilizing the correct articles than their peers. This implies that language impairment makes the acquisition of articles more difficult for EAL learners. With regards to the EFL-SLI participants, the highest score obtained was 87.5% with the other learners obtaining a range of scores between 62.5% and 87.5%. Even though the EFL-SLI learners demonstrated no improvement in their use of articles from grade one to grade two and obtained a mean score of 6.20 at the end of their grade two year, their typically developing age matched EFL peers obtained a mean score of 6.90 which suggests that the EFL-SLI learners are performing similarly to their age matched peers. Overall, the EFL-SLI learners appear to understand and utilize articles better than the EAL-SLI learners and therefore the development and use of articles does not appear to be a particular weakness in EFL-SLI learners as it is in EAL-SLI learners.

Finally, the results of the overall syntax section show that the EAL-SLI learners performed more poorly than the EFL-SLI learners. At the end of grade two, the EAL-SLI learners in context one obtained a mean score of 16.90/32 whereas the EFL-SLI learners obtained a mean score of

24.20/ 32. In grade three, the EAL-SLI learners obtained mean scores of 19.22 and 22.00/32 in context one and two respectively whereas the EFL-SLI learners obtained a mean score of 28.40. It can thus be suggested that bilingual learners with language impairment are slower and may experience more difficulty than monolingual learners with language impairment with regards to the acquisition of syntactic structures required for academic language and furthermore the educational context that these learners come from may also impact on the degree of language impairment they present with.

PRAGMATICS

The pragmatic aspects assessed in this subtest are important for young children's academic success and early literacy acquisition i.e. adopting the perspective of another speaker, asking the correct question to attain specific information and providing a cohesive narrative (de Villiers, 2004). The results from table 5 indicate that the EAL-SLI learners in both contexts demonstrated no or minimal improvement on their performance from grade one to grade two on the various sections of the pragmatics subtest. In fact, many of the learners stayed the same or regressed in their performance. The mean scores on each section in grade 3 also indicate that no significant improvement has been made with further exposure to English with the exception of the question-answer planning where the learners improved at the end of their grade three year. The range of scores obtained on this subtest (by the EAL- SLI learners in context one) was much smaller than the range of scores obtained on the syntax subtest suggesting that there is less heterogeneity in the rate of acquisition on pragmatic aspects. The EFL learners also demonstrated no or minimal improvement on the various sections from year to year as is evident from the mean scores obtained. Each of the sections of the pragmatics subtest is discussed in further detail below.

Table 5: Raw scores obtained by each of the sixteen EAL-SLI learners and the five EFL-SLI learners on the pragmatics subtest of the DELV-CR (from Jordaan (2009)) test as well as the mean, standard deviation and range of scores obtained by the group.

		Role Taking			Narratives			Question- Answer Planning			Total Pragmatics Score		
EAL Cont 1	**Child**	**Grd 1**	**Grd 2**	**Grd 3**	**Grd 1**	**Grd 2**	**Grd 3**	**Grd 1**	**Grd 2**	**Grd 3**	**Grd 1**	**Grd 2**	**Grd 3**
	1	4	4	8	5	5	4	0	0	4	9	9	16
	2	4	4	4	1	2	3	0	0	3	5	6	10
	3	2	4	8	2	3	3	0	0	7	4	7	18
	4	6	6	4	2	0	4	0	0	5	8	6	13
	5	4	4	-	4	5	-	0	0	-	8	9	-
	6	2	8	2	3	3	5	0	9	7	5	20	14
	7	4	4	6	2	5	5	0	7	7	6	16	18
	8	4	2	8	1	3	5	0	5	0	5	10	13
	9	6	8	2	4	5	6	5	0	7	15	13	15
	10	2	6	4	3	2	2	0	5	9	5	13	15
	Mean	3.80	5.00	5.11	2.70	3.30	4.11	0.50	2.60	5.44	7.00	10.90	14.67
	Std Dev	1.48	1.94	2.47	1.34	1.70	1.27	1.58	3.53	2.74	3.27	4.58	2.55
	Range	4	6	6	4	5	3	5	9	9	11	14	5
EAL Cont 2	11	2	2	4	3	0	2	1	2	4	6	4	10
	12	4	6	8	4	5	5	0	5	6	8	16	19
	13	2	2	8	2	1	7	5	7	7	9	10	22
	14	8	8	6	2	7	4	0	8	7	10	23	17
	15	6	6	6	4	5	5	6	6	7	16	17	18
	16	8	4	8	3	4	6	6	9	7	17	17	21
	Mean	5.00	4.67	6.67	3.00	3.67	4.83	3.00	6.17	6.33	11.00	14.50	17.83
	Std Dev	2.76	2.42	1.63	0.89	2.66	1.72	2.97	2.48	1.21	4.47	6.60	4.26
	Range	6	6	2	2	7	5	6	7	3	11	19	12
EFL	17	8	8	8	5	6	7	8	9	8	21	23	23
	18	8	8	8	3	2	6	9	7	9	20	17	23
	19	4	4	8	5	5	5	9	8	8	18	17	21
	20	4	6	8	4	6	6	2	8	5	10	20	19
	21	8	6	8	4	3	5	0	9	8	12	18	21
	Mean	6.40	6.40	8.00	4.20	4.40	5.80	5.60	8.20	7.60	16.20	19.00	21.40
	Std Dev	2.19	1.67	0.00	0.84	1.82	0.84	4.28	0.84	1.52	4.92	2.55	1.67
	Range	4	4	8	2	4	2	9	2	4	11	6	4

Communicative Role Taking

According to Haynes and Shulman (1998), it is essential for learners to gain competence in utilizing language not only to meet their social needs but also to perform adequately on the academic tasks expected by the school. Many of these academic tasks however move beyond what is readily apparent for e.g. the use of language to anticipate the thoughts and feelings of others, which cannot be seen and therefore must be deduced (Haynes & Shulman, 1998). These items therefore assessed the learners' ability to take another person's point of view into account, and to comprehend what the speaker wanted to achieve with his/her utterance (de Villiers, 2004; Seymour et al., 2003). Seymour et al, (2003), state that some but not all of the adult speech acts are apparent in a child's conversational skills by 4 years of age and the child should also be able to comprehend what speech acts a person is utilizing in certain circumstances. Out of a total possible score of 8 for the role taking section, only 3 EAL-SLI learners obtained a score of 100% with the other EAL-SLI learners obtaining scores between 25% and 100% at the end of their grade two year. The majority of the EAL-SLI learners are thus having difficulty in comprehending what speech acts are being utilized and/or having difficulty in taking another person's perspective. Overall, minimal improvement was demonstrated by the EAL-SLI learners in context one from grade one to grade two but no improvement was demonstrated by the EAL-SLI learners in context two with some learners having regressed in their performance. The mean scores of 5.0 and 4.67/8 obtained by the EAL-SLI learners at the end of grade two in context one and two respectively is lower than the mean scores of 6.5 and 7.0/8 obtained by their age matched peers. The language impaired EAL learners are therefore having particular difficulty in comprehending speech acts. The EFL-SLI learners demonstrated no improvement from grade one to grade two as is evident from the mean scores obtained but demonstrated great improvement from grade two to grade three as all 5 learners obtained 100% on this task at the end of their grade three year. This suggests that the EFL-SLI learners caught up to their typically developing EFL peers and thus this area may not be a particular weakness in EFL-SLI learners, but rather a slow – to- develop skill. However, the EAL-SLI learners still appeared to experience difficulty at the end of their grade three year compared to the EFL-SLI learners. The EAL-SLI learners obtained a mean score of 5.11 and 6.67/8 in context one and two respectively which is lower than the mean score of 8 obtained by the EFL-SLI learners. Once again, this suggests that

bilingual learners with language impairment are slower than monolingual learners with language impairment in comprehending speech acts.

Narratives

Narratives are 'decontextualized monologues' that require a logical structure, good temporal and causal sequencing, cohesion, and presuppositional abilities (Long & Long, 1994). The understanding and correct use of narratives are especially important in the success of early schooling as most of the texts utilized in nursery school through to the third grade are structured in narrative form (Haynes & Shulman, 1998). According to Long and Long (1994), in order to correctly relate a narrative, the speaker must be aware of the listener's need for adequate information because rarely is the information about the content of the narrative already known to the listener (Long & Long, 1994). The DELV thus assesses the two aspects most important to a narrative: linguistic cohesion and theory of mind. With regards to linguistic cohesion the learners' ability to clearly differentiate between referents (referent contrast) and their ability to connect events in time (temporal links) was assessed (de Villiers, 2004). These two forms of cohesion are important because as a child progresses through grades, they are exposed to text that has a larger diversity of adverbs, adverbial clauses, relative clauses and conjunctions and also require an increase in the specificity of pronominal references (Haynes & Shulman, 1998). The theory of mind item assesses the learners' ability to express the mental states of the character (i.e. his desires or thoughts) and the ability to justify the character's mistaken response (i.e. expressing the character's false belief) (Seymour et al., 2003). Out of a total possible score of 7 for the narratives section, only one EAL-SLI learner obtained a score of 100% with the other EAL-SLI learners obtaining scores between 0% and 100%. This suggests that the majority of the EAL learners are experiencing difficulty with cohesion and/or theory of mind thus impacting on their narrative discourse abilities. Overall, the EAL-SLI learners demonstrated minimal improvement from grade one to grade two and obtained a mean score of 3.3 and 3.67/7 in context one and two respectively at the end of grade two which is lower than the mean of 4.5 and 4.6/7 obtained by their age matched peers. Two EFL-SLI learners obtained the highest score of 85.71% with the other EFL-SLI learners obtaining scores between 28.57% and 85.71%. The EFL-SLI learners also demonstrated minimal improvement from grade one to grade two and obtained a mean score of 4.40/7 which is lower than the mean score of 5.40/7 obtained by the

typically developing EFL group in grade two. This suggests that the EFL-SLI learners like the EAL-SLI learners are experiencing difficulty with cohesion and/or theory of mind. Overall however, the EFL-SLI learners still performed better than the EAL-SLI learners in context one and two at the end of their grade three year, providing further support for the conclusion that bilingual learners with language impairment are slower than monolingual learners with language impairment at learning how to express theory of mind and cohesion.

Question- Answer Planning

As a learner progresses through the grades, they need to develop competency in being able to ask questions and provide information in the classroom (Owens, 2004) as the type of question that is asked will differ according to the kind of information required. Owens (2004), states that as children develop, they learn to recognise what information is required in order to formulate a correct question i.e. their awareness of the significance of information specificity increases. This task assessed the ability to identify missing information, and to ask a suitable question to attain the information (Seymour et al., 2003). In the syntax sub-test, the children are required to ***answer*** *wh*-questions but in this sub-test they are required to ***ask*** the *wh*-questions (Seymour et al., 2003). Out of a total possible score of 9 for this section, two of the EAL-SLI learners obtained 100% with the other learners obtaining a range of scores between 0% and 100% at the end of their grade two year. This suggests that the majority of the EAL-SLI learners are having difficulty in correctly producing wh- questions. Therefore, it appears that although they have a relatively good understanding of *wh*-questions they are unable to correctly express them. The mean scores of 2.60 and 6.17/8 obtained by the EAL-SLI learners at the end of their grade two year in context one and two respectively is lower than the means of 6.1 and 7.6/9 obtained by their age matched peers in grade two. Although the EAL-SLI learners in context one improved from grade one to grade three, they still appear to have performed more poorly than the EFL-SLI learners. The EFL-SLI learners obtained a range of scores between 77.77% and 100% in grade two and obtained a mean score of 8.20/9 which suggests that they are able to correctly ask wh-questions. However, the EFL learners appear to have regressed in their performance in grade 3 and obtained a mean score of 7.60/9, but this is still higher than the mean score obtained by the EAL-SLI learners. Again, this suggests that bilingual learners with language impairment are

slower compared to monolingual learners with language impairment at learning how to correctly produce wh- questions.

Finally, the results of these learners' performance on the overall pragmatics section show that the EAL-SLI learners performed more poorly than the EFL-SLI learners. At the end of grade two, the EAL-SLI learners in context one obtained a mean score of 10.90/24 whereas the EFL-SLI learners obtained a mean score of 19.00/24. In grade three, the EAL-SLI learners obtained mean scores of 14.67 and 17.83/24 in context 1 and 2 respectively whereas the EFL-SLI learners obtained a mean score of 21.40/24. It can thus be concluded that bilingual learners with language impairment experience more difficulty than monolingual earners with language impairment in the acquisition of pragmatic aspects required for academic language and furthermore the educational context that these learners come from may also impact on the degree of difficulty.

SEMANTICS

According to Seymour et al. (2003), our vocabularies are not just a muddle of words but are flexible and organized in many different ways for efficient retrieval. Words can be organized in hierarchies of increasing specificity, usually going from the general to the specific e.g. animal-dog- food. Words can also be organized as oppositions to each other (e.g. hot/cold) and as synonyms or related words (e.g. big/tall) (Rijhumal, 2008). Children start to organize their vocabulary at around 3 years of age and their ability to relate words flexibly is a developmental process that continues into the school-age years (Aitchison, 1987; Anglin, 1970 as cited in Seymour et al., 2003). This subtest thus examined the processes of vocabulary learning with regards to content words and in other fields such as quantifiers (de Villiers, 2004) and also looked at how the learners organize their vocabulary (de Villiers, 2004). From table 6 it is evident that the majority of the EAL learners demonstrated minimal improvement on their performance from grade one to two on the various sections of the semantics subtest. Many of the learners also regressed or stayed the same. A degree of individual variation is also evident from the broad range of scores obtained by the EAL learners for the total semantics subtest, which suggests that there is heterogeneity in the rate of acquisition. Each of the sections is discussed in further detail below.

Table 6: Raw scores obtained by each of the sixteen EAL-SLI learners and the five EFL-SLI learners on the semantics subtest of the DELV-CR test (from Jordaan (2009)) as well as the mean, standard deviation and range of scores obtained by the group

	Verb Contrasts			Preposition Contrasts			Quantifiers			Fast Mapping: RV			Fast Mapping: NW			Total Semantics Score		
Child	**Grd 1**	**Grd 2**	**Grd 3**	**Grd 1**	**Grd 2**	**Grd 3**	**Grd 1**	**Grd 2**	**Grd 3**	**Grd 1**	**Grd 2**	**Grd 3**	**Grd 1**	**Grd 2**	**Grd 3**	**Grd 1**	**Grd 2**	**Grd 3**
1	3	3	6	4	5	6	6	5	7	3	1	3	3	3	7	19	17	29
2	1	3	4	3	2	2	6	4	6	3	4	2	4	4	5	17	17	19
3	0	3	8	0	2	3	2	4	7	3	2	1	6	3	3	11	14	22
4	4	4	6	3	3	4	5	7	8	6	5	6	3	3	10	21	22	34
5	1	3	-	4	3	-	4	6	-	6	3	-	5	5	-	20	20	-
6	2	4	7	3	6	4	5	7	6	3	5	4	4	2	7	17	24	28
7	1	4	7	2	4	4	5	7	8	3	7	6	3	3	6	14	25	31
8	4	4	6	2	5	3	5	7	7	4	6	2	3	1	2	18	23	20
9	2	4	3	0	6	4	6	6	7	5	2	6	5	6	5	18	24	25
10	1	1	4	1	3	3	5	5	5	4	4	6	4	7	7	15	20	25
Mean	1.90	3.30	5.67	2.20	3.90	3.67	4.90	5.80	6.78	4.00	3.90	4.00	4.00	3.70	5.78	17.00	20.60	25.9
Std Dev	1.37	0.95	1.66	1.48	1.52	1.12	1.20	1.23	0.97	1.25	1.91	2.06	1.05	1.83	2.39	2.98	3.66	5.06
Range	4	3	5	4	4	3	4	3	3	3	6	5	3	6	7	10	11	15
11	4	3	7	3	2	1	6	6	7	3	3	4	2	3	4	18	17	23
12	6	6	5	3	4	5	6	4	7	2	3	2	0	4	5	17	21	24
13	5	5	7	4	5	5	6	5	8	4	5	4	7	9	11	26	29	35
14	2	4	7	5	6	4	6	5	7	4	8	7	3	7	8	20	30	33
15	5	6	6	2	5	4	5	8	8	3	7	6	1	4	8	16	30	32
16	7	9	8	1	6	5	6	7	8	4	8	6	7	3	4	25	33	31
Mean	4.83	5.50	6.67	3.00	4.67	4.00	5.83	5.83	7.50	3.33	5.67	4.83	3.33	5.00	6.67	20.33	26.67	29.7
Std Dev	1.72	2.07	1.03	1.41	1.51	1.55	0.41	1.47	0.55	0.82	2.34	1.83	3.01	2.45	2.80	4.23	6.22	4.97
Range	5	6	3	4	4	4	1	4	1	2	5	5	7	6	7	10	16	12
17	9	8	8	6	5	6	8	6	8	5	7	6	6	1	6	34	27	34
18	8	9	10	6	5	6	3	5	9	3	6	7	4	5	8	24	30	40
19	9	8	9	6	3	5	8	7	7	7	7	9	6	5	6	36	30	36
20	6	7	9	5	2	3	6	8	5	5	6	7	9	6	5	31	29	29
21	8	9	10	6	4	6	9	8	8	7	7	7	10	9	6	40	37	37
Mean	8.00	8.20	9.20	5.80	3.80	5.20	6.80	6.80	7.40	5.40	6.60	7.20	7.00	5.20	6.20	33.00	30.60	35.2
Std Dev	1.22	0.84	0.84	0.45	1.30	1.30	2.39	1.30	1.52	1.67	0.55	1.10	2.45	2.86	1.10	6.00	3.78	4.09
Range	3	2	2	1	1	3	6	3	4	4	1	3	6	8	3	16	10	11

Verb and Preposition Contrast

The verb and preposition contrast items specifically assess how the learner organizes and retrieves his or her vocabulary. This is important because no matter how different the child's experiences and resulting vocabulary are, his or her lexicon must be organized in a hierarchical pattern in order to efficiently retrieve words when needed (Seymour et al., 2003). It is these strong semantic connections that aid word retrieval (Capone & McGregor, 2005) and the categorical organization of semantic networks that enable language users to be more efficient (Owens, Haas, & Metz, 2003).

Verb Contrast

This section examines the learner's ability to provide an appropriate verb for the action represented in the picture. The verb provided has to be different from the one provided in the prompt, and at the appropriate level in the hierarchy (de Villiers, 2004; Seymour et al., 2003). Out of a total possible score of 10 for this section, one EAL-SLI learner obtained 90% with the other EAL learners obtaining scores between 30% and 90% at the end of their grade two year. This suggests that the EAL-SLI learners' verb vocabulary has not increased with further exposure to English and their vocabulary does not appear to be organized structurally within their lexicon to allow for efficient retrieval (de Villiers, 2004). The mean score obtained by the EAL-SLI learners at the end of their grade two year was 3.30 and 5.50/10 in context one and two respectively which is lower than the mean scores of 5.6 and 7.4/10 obtained by their EAL age matched peers. The EFL-SLI participants demonstrated minimal improvement from grade one to grade two and obtained a mean score of 8.20/10 at the end of their grade two year. Their typically developing age matched EFL peers obtained a mean score of 8.60/10 which suggests that the EFL-SLI learners are performing similarly to their age matched peers. Further improvement was demonstrated by the EFL-SLI learners from grade two to grade three as they obtained a mean score of 9.20/10. Thus the EFL-SLI learners have less difficulty with verb contrasts than the EAL-SLI learners. Overall, the EFL-SLI learners performed better than the EAL-SLI learners in context 1 and 2 at the end of grade three year which suggests that bilingual learners with language impairment are slower than monolingual learners with language impairment at learning new verbs and have more poorly organized lexicons.

Preposition Contrast

In order to succeed in this subtest of the DELV, de Villiers (2004) maintains that children need to understand how the language uses prepositions in both concrete and abstract ways. Out of a total possible score of 6 for this section, 4 EAL-SLI learners obtained a score of 100% with the other EAL-SLI learners obtaining between 33.33% and 100%. Therefore, only a few of the EAL-SLI learners were able to distinguish the subtle differences between prepositions. Overall, the EAL-SLI learners demonstrated minimal improvement from grade one to grade two on this task. The mean scores obtained by these EAL-SLI learners at the end of their grade two year was 3.90 and 4.67/6 in context one and two respectively which is lower than the mean scores of 4.5 and 5.2/6 obtained by their EAL age matched peers in their respective contexts. Thus the EAL-SLI learners are experiencing more difficulty in understanding and learning prepositions than their typically developing EAL peers. The EFL-SLI participants obtained scores between 33.33% and 83.33% in grade two, demonstrating no improvement in their performance from grade one to two, with some learners regressing. They obtained mean scores of 5.80 in grade one and 3.80/6 in grade two which is also lower than the mean of 5.40 obtained by their typically developing EFL peers in grade two. However, an improvement in their performance was evident from grade two to grade three as these EFL-SLI learners caught up to their typically developing EFL peers. The use and understanding of prepositions may therefore not be a particular weakness in EFL-SLI learners but rather a slow-to-develop skill. However, the EAL-SLI learners still appeared to experience difficulty at the end of their grade three year compared to the EFL-SLI learners. The EAL-SLI learners obtained mean scores of 3.67 and 4.00/6 in context 1 and 2 respectively which is lower than the mean score of 5.20/6 obtained by the EFL-SLI learners, placing them at a disadvantage relative to the monolingual learners with language impairment at learning and understanding prepositions.

Quantifiers

According to Seymour et al. (2003), quantification is found throughout all languages but most prominently in the language of mathematics. Terms such as “every,” “all,” “each,” “some,” are found in mathematical word problems and utilized in everyday conversations (Rijhumal, 2008). Quantification is also implicitly present in double wh- questions such as “who bought what?”

Children who have difficulty in interpreting wh- questions correctly often fail to understand quantification (Seymour et al., 2003). How a child understands quantifiers provides insight into how well his or her developing grammar can interpret this kind of unexpected complexity in everyday sentences (Rijhumal, 2008). Thus this section of the semantic subtest of the DELV examined the way in which semantics operates within a sentence (de Villiers, 2004). Out of a total possible score of 9 for this section, the EAL-SLI learners obtained scores between 44.44% and 77.77%. Some of the EAL-SLI children in this study thus know the range of structures within which the word 'every' applies (Seymour et al., 2003). The mean score obtained by the EAL-SLI learners at the end of their grade two year was 5.80 and 5.83/9 in context one and two respectively which is lower than the mean scores of 6.5 and 7.2/9 obtained by their age matched EAL peers in the respective contexts, suggesting that they are experiencing more difficulty with quantifiers than their age matched peers. Overall, the EAL-SLI learners in context one and two improved in their performance from grade one to grade three. The EFL-SLI participants demonstrated no improvement from grade one to two on this task, obtaining scores between 55.55% and 88.88% in grade two. Overall, the mean score of 6.80/9 obtained by the EFL-SLI learners in grade two is still lower than the mean score of 7.50/9 obtained by their typically developing EFL peers which suggests that like the EAL-SLL learners, some of the EFL-SLI learners do not know the range of structures within which the word 'every' applies. Overall however, the EFL-SLI learners performed better than the EAL-SLI learners in context one and two at the end of grade three which suggests that bilingual learners with language impairment are slower than monolingual learners with language impairment in the development and understanding of quantification.

Fast Mapping

'Fast mapping' refers to one's ability to guess the likely meaning of a new word after just a couple of exposures to the word (de Villiers, 2004). According to Seymour et al. (2003), this is a language skill found in typically developing children, regardless of their cultural or linguistic background. When learning verbs a child must rely less on an association between a word and its referent than when learning nouns (Seymour et al., 2003). Fast mapping enables a child to 'map' only a small portion of the available information into semantic memory by using contextual and episodic clues to form preliminary associations (Nelson, 1998). This is an essential skill in the

school environment as learners depend less and less on explicit concrete contexts and begin to rely on contextual cues to ascertain the meanings of unfamiliar words (Haynes & Shulman, 1998). The items included in this domain thus examined the learners' ability to acquire a new word from the context it was presented in (de Villiers, 2004). The real verbs are tested before the novel verbs, in order to teach the child the task, and to allow for the examiner to evaluate if the actual question causes difficulty in terms of the grammar and morphology (de Villiers, 2004).

Fast Mapping: Real Verbs

Out of a total possible score of 9 for this section, the EAL-SLI learners obtained scores between 11.11% and 88.88%. This suggests that some EAL-SLI learners are having difficulty with this task. The EAL-SLI learners demonstrated minimal improvement from grade one to grade two and obtained mean scores of 3.9 and 5.67/9 at the end of grade two in context one and two respectively. This is lower than the mean scores of 4.6 and 6.3/9 obtained by their age matched typically developing EAL peers in grade two. Thus with further exposure to English, the learners' ability to learn words based on context has not improved. The EFL-SLI participants obtained scores between 66.66% and 77.78%, and although they demonstrated no improvement in their ability to fast map real verbs from grade one to grade two, they obtained a mean score of 6.60/9 at the end of grade two, and their typically developing age matched EFL peers obtained a mean score of 6.80/9. Thus the EFL-SLI learners are performing similarly to their age matched peers and appear to have less difficulty with fast mapping, compared to EAL-SLI learners. Overall, the EFL-SLI learners performed better than the EAL-SLI learners in context one and two at the end of grade three confirming their difficulty in abstracting the meaning of the word from the syntactic context of a sentence when compared to monolingual learners with language impairment. Ultimately this has implications for their academic achievement, as an inability to fast-map new words effectively may hinder their ability to learn academic concepts (Rijhumal, 2008).

Fast mapping: Novel Words

The ability to fast-map novel words is particularly important for EAL learners academically. Because they are continually being exposed to new words that relate to academic concepts, these words must be mastered fast and efficiently in order for them to achieve academically (Rijhumal, 2008). Out of a total possible score of 12 for this section, the EAL-SLI learners obtained scores between 8.33% and 75% in grade two. This suggests that some of these learners are not able to

use what they know about the word order and the word endings to learn the meaning of unfamiliar words (Seymour et al., 2003). The mean score obtained by the EAL-SLI learners at the end of grade two 3.70 and 5.00/12 in context one and two respectively which is lower than the mean scores of 5.9 and 6.5/12 obtained by their age matched typically developing EAL peers in both these contexts. The EFL-SLI participants also obtained scores between 8.33% and 75% in grade two. Overall, the EFL-SLI learners demonstrated no improvement in their performance from grade one to two and in fact many learners regressed. The mean score of 5.20/12 obtained by the EFL-SLI learners at the end of grade two is lower than the mean score of 7.4/12 obtained by their typically developing EFL peers. Thus the EFL-SLI learners like the EAL-SLI learners have difficulty in fast mapping novel words. Overall, the EAL-SLI learners in context two performed better than the EAL-SLI learners in context one as well as the EFL-SLI learners at the end of grade three as is evident from the mean scores obtained. This suggests that fast mapping of novel words is a particular weakness for all learners with language impairment.

Finally, the results of these learners' performance on the overall semantics section show that the EAL-SLI learners performed more poorly than the EFL-SLI learners. At the end of grade two, the EAL-SLI learners in context one obtained a mean score of 20.60/46 whereas the EFL-SLI learners obtained a mean score of 30.60/46. In grade three, the EAL-SLI learners obtained mean scores of 25.89 and 29.67/46 in context one and two respectively whereas the EFL-SLI learners obtained a mean score of 35.20/46. Thus the bilingual learners with language impairment experience more difficulty than monolingual learners with language impairment and the educational context may also impact on the degree of difficulty with the semantic domain of language.

SUMMARY of DELV Results

As the majority of the language impaired participants selected for this study performed poorly on all three sections of the syntax subtest, on all five sections of the semantics subtest and all three sections of the pragmatics subtest; demonstrated minimal improvement from grade one to grade two and grade two to grade three and have lower scores than their typically developing age matched peers, they are experiencing much difficulty in acquiring academic language in English. As numerous educators are unsure as to what academic language entails (Uys, van der Walt, van

den Berg & Botha, 2007) these learners' language skills may be weak because these aspects of academic language are not being directly or adequately addressed in the classroom. Literature states that 5% - 7% of school-going children have SLI (Paul 2001; Tomblin et al., 1997). However, 13.56% of the EAL learners in this study i.e. (16 out of the total number 70 grade 1 EAL learners in context one and 48 in context two) displayed language impairment profiles. This high percentage of weak performance does raise concern regarding the EAL learners' academic language proficiency in English and thus these learners' poor language abilities need to be urgently addressed. However, even though there appears to be a higher percentage of learners with language impairment, possibly due to poor academic language instruction, the results obtained are still consistent with learners who present with SLI because their performance was compared to their South African peer groups to reduce any bias in this study. Jordaan (2009) found that when comparing all the EAL learners in the two different educational contexts to the DELV-CR normative data at the end of their grade two year, the majority of the learners performed in the 'weak' category on two or more subtests. According to Seymour and Pearson (2004), the criteria for identifying impairment on the DELV-CR takes into consideration that only a small minority of children (i.e. approximately 4% in the developmental milestone research) will score in the failing (or ''weakness'') category in all domains, and thus a weakness in two domains is suggestive of a language impairment. However as the majority of the EAL learners in the Jordaan (2009) study performed in the 'weak' category on two or more subtests in grade two, and not all the learners in fact have a language impairment, utilizing the DELV normative sample data may not be able to distinguish between "slow to learn" and language impaired EAL learners within a South African setting and thus should be used with caution.

Furthermore, from the DELV results obtained, it is evident that the EAL-SLI learners in both context one and two performed more poorly than the EFL-SLI learners on all three subtests. An independent sample t-test was thus performed to determine whether the differences between the EAL-SLI learners in context one and two and the EFL-SLI learners on the various subtests of the DELV-CR were statistically significant. Results revealed significant differences between the EAL context one learners and the EFL learners in grade one on all sections of the DELV-CR test except the quantifier and fast mapping of real verbs sections (Please see statistics in Appendix G); in grade two on the verb contrast section [$t= 10.21$, $p=0.0000< (0.05)$], fast mapping of real

verbs [t= 4.13, p=0.0016 < (0.05)], total semantics section [t= -4.88, p=0.0012< (0.05)], wh-questions section [t= -4.02, p=0.0017 < (0.05)], passives [t= -2.97, p=0.0138 < (0.05)], articles [t= -4.02, p=0.0014 < (0.05)], total syntax section [t= -5.18, p=0.0002 < (0.05)], the question answer planning section [t= -4.75, p=0.0006 < (0.05)] and the total pragmatics section [t= -4.393, p=0.0007 < (0.05)] and in grades three on all sections of the DELV-CR test except the quantifiers section and fast mapping of novel verbs (See statistics in Appendix G). Significant differences were also found between the EAL learners in context two and the EFL learners in grade one on all measures except the quantifiers, passives, role taking, question answer planning and total pragmatics section (See statistics in Appendix G); in grade two on the verb contrast [t=2.91, p=0.0224 < (0.05)] and in grade three on the verb contrast [t= -4.49, p=0.0015 < (0.05)], fast mapping of real verbs [t= 2.644, p=0.0295 <(0.05)], passives [t= 2.479, p=0.0422 < (0.05)], articles [t= 3.15, p= 0.0197 < (0.05)] and the total syntax section [t= -3.17, p=0.0112 < (0.05)]. These results strongly imply that bilingual learners with SLI, who acquire a second language sequentially, are more impaired than monolingual learners with SLI. These findings are in accordance with Crutchley, Botting and Conti-Ramsden's (1997) study and Crutchley's (1999) study comparing the language achievement of monolingual learners with SLI and bilingual learners with SLI who were learning English as a first and second language respectively. Results indicated that the bilingual children had scored lower than the monolingual children on standardized language assessment measures in the domains of vocabulary and grammar. However, as there were only five EFL learners analyzed in this study, this implication requires further investigation in order for conclusive results to be drawn.

Finally, as these learners were identified as being "slow to learn" in grade **one,** but only scored below the mean on two or more subtests at the end of their grade **two** year, the DELV may not have diagnosed these learners as language impaired at that stage. According to Seymour and Pearson (2004), it is not unusual for a child to exhibit a score in the weakness category on one domain as 20% of the DELV research sample showed this pattern and in fact many children who fail one domain, obtain normal or above average scores on the other domains and therefore will not warrant cause for concern (Seymour & Pearson, 2004). Such was the case with the EAL and EFL learners who were identified as "slow to learn" in the Jordaan (2009) study. These learners performed poorly on one domain of language but scored age appropriately against the South

African peer group on the other domains in grade one. Since delayed identification of a language impairment has serious consequences, the use of alternate measures that have the potential to differentiate between language difference and language disorder such as dynamic assessment and cognitive processing measures (Roseberry-McKibbin & O'Hanlon, 2005) should be explored. These measures may complement the results obtained from the DELV and may help to identify learners as language impaired earlier. For this reason, the study investigated the performance of the EAL- and EFL-SLI learners on various cognitive processing measures to determine whether they have processing deficits and if so, to describe the nature of such deficits.

Before these learners' performance on the cognitive processing measures is discussed, the researcher felt it would be important to evaluate the effect of language impairment on these learners' reading comprehension abilities as determined by their performance on the GORT-4 (Wiederholt & Bryant, 2001) as well as to then show how the teachers rated these learners' performance in the classroom in order to determine whether they found these EAL-SLI and EFL-SLI learners to be performing more poorly than their typically developing peers so as to confirm or dispute the findings obtained on the DELV-CR test and the GORT-4 tests.

READING COMPREHENSION

Reading comprehension is a complex task that draws on many different cognitive skills and processes. Research has shown that reading comprehension deficits in children with SLI may be attributed to poor language skills (Nation et al., 2004). In order for a child to construct a coherent representation of the meaning of a story, he/she has to understand, remember and link literal details in the text and be able to generate inferences either by integrating various aspects of the story or by incorporating general knowledge with story details (Kintsch & Rawson, 2005), skills that require good short term memory and working memory abilities as these are essential for storing of the intermediate computations in the process as well as the final product and thus for comprehending the text (Baddeley, Wilson & Watts, 1995; Just & Carpenter, 1992; Vukovic & Siegel, 2006). According to Bishop and Adams (1992), the difficulties learners with SLI experience with reading comprehension are not restricted to the verbal domain but they are also poorer than their age matched peers at answering questions about the content of stories presented

visually as a sequence of pictures. Table 7 below shows the performance of the EAL-SLI and the EFL-SLI learners on the reading comprehension task.

Table 7: Reading comprehension scores for each of the sixteen EAL-SLI learners and the five EFL-SLI learners (from Jordaan (2009)) as well as the mean, standard deviation and range of scores obtained by the group

Reading Comprehension		Grade 2	Grade 3
EAL cont 1	1	5	2
	2	0	1
	3	7	1
	4	2	2
	5	1	0
	6	4	2
	7	15	6
	8	4	1
	9	1	4
	10	12	1
	Group Mean	5.10	2.00
	Std Dev	4.95	1.76
	Range	15	6
EAL Cont 2	11	1	0
	12	0	14
	13	12	28
	14	0	11
	15	3	16
	16	10	7
	Group Mean	4.33	12.67
	Std Dev	5.32	9.42
	Range	12	28
EFL	17	2	13
	18	4	29
	19	0	1
	20	13	13
	21	14	25
	Group Mean	6.60	16.20
	Std Dev	6.47	11.10
	Range	14	28

Out of a total possible score of 70 for this task, the EAL-SLI learners obtained scores between 0% and 21.43% in grade two which suggests that all the EAL-SLI learners appear to have had difficulty with this task. The mean scores obtained by the age matched typically developing EAL

learners at the end of grade two was 7.05 and 9.02 in context one and two respectively (Appendix H). In relation to the peer group, participants 7, 12, 13 and 16 performed better than the mean but participants 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 14, 15, the majority, all performed below the mean at the end of grade two. However, as the standard deviation for the peer group is large (6.70 and 8.36), only 3 of the 16 EAL-SLI learners obtained scores 1SD below the mean. This suggests great heterogeneity amongst the EAL learners on reading comprehension. In grade three, the mean scores obtained by the age matched EAL learners was 7.53 and 16.58 in context one and two respectively (Appendix H). None of the EAL-SLI learners in context one demonstrated an improvement in their reading comprehension abilities from grade two to three and even though the majority of the EAL-SLI learners in context two did, they still appear weak when compared to their age matched typically developing EAL peers. In relation to the peer group, all EAL-SLI learners in context one and participants 11, 12, 14, 15 and 16 in context two performed below the mean. Only participant 13 obtained a score higher than the mean. The highest score obtained by the EFL-SLI learners in grade two was 20% with scores falling between 0% and 20%. The mean score obtained by the age matched EFL learners was 12.93. In relation to the peer group participants 17, 18 and 19 performed below the mean and participants 20 and 21 performed only slightly better than the mean achieving scores of 13 and 14 respectively. In grade three, the mean score obtained by the age matched EFL learners was 18.59. Even though the EFL-SLI learners demonstrated improvement in their reading comprehension ability from grade two to three, their performance still appears weak when compared to their age matched typically developing peers. In relation to the peer group participants 18 and 21 performed better than the mean but participants 17, 19 and 20 performed below the mean at the end of their grade three year.

The overall performance of the EAL-SLI and the EFL-SLI learners depicts the great difficulty learners with language impairments have on reading comprehension tasks therefore impacting on their literacy skills. Researchers however suggest that other factors may also be influencing the performance of these learners on this task for e.g. verbal working memory abilities (Vukovic & Siegel, 2006). Interestingly, the same learners who obtained poor reading comprehension scores also obtained poor verbal working memory scores (discussed below). However as no significant correlations were obtained in this study between the reading comprehension task and any of the

working memory measures (Appendix L), the SLI learners poor performance must be attributed to the poor language skills they display. This is evident from the positive correlations obtained between the reading comprehension test and the subtests of the DELV-CR test in grade three (see table 8).

Table 8: Results of Pearsons-Rho Correlation Coefficients calculated between the reading comprehension measure and the different subtests of the DELV-CR test

	Reading Comprehension (Grade 2)		Reading Comprehension (Grade 3)	
	r =	**Pr> t (rounded to 4 decimals)**	**r =**	**Pr > t (rounded to 4 decimals)**
Verb Contrasts	0.06	0.4077	0.16	0.2807
Preposition Contrasts	0.08	0.3892	0.48	0.0337
Quantifiers	0.13	0.3133	0.49	0.0315
Fast Mapping: RV	0.27	0.1561	0.17	0.2746
Fast Mapping: NV	0.16	0.2797	0.56	0.0147
Semantics Total	0.24	0.1847	0.58	0.0116
Wh-Questions	0.02	0.4735	0.33	0.1117
Passives	0.20	0.2254	0.12	0.3319
Articles	0.16	0.2812	0.25	0.1866
Total Syntax	0.13	0.3193	0.36	0.0971
Role Taking	(0.31)	0.8793	0.40	0.0680
Narratives	(0.12)	0.6796	0.64	0.0048
Question-Answer	0.42	0.0509	0.33	0.1118
Total Pragmatics	0.11	0.3393	0.73	0.0011
Reading Comprehension	1.00		1.00	
Sentence Repetition	0.31	0.1207	0.32	0.1201

Correlations were performed at an alpha (significance) level of 0.05 i.e. 5% with 14 degrees of freedom, with a one tailed significance value of 0.426. No positive correlations were found between the reading comprehension measures and the subtests of the DELV-CR test in grade two but positive significant correlations were found between these two measures in grade three. Reading comprehension positively correlated with the preposition contrasts section [r = 0.48; p= 0.034 < (0.05)], the quantifiers section [r= 0.49; p=0.032 < (0.05)], fast mapping of novel words [r= 0.56; p= 0.015 < (0.05)], the total semantics subtest score [r= 0.58; p=0.012 < (0.05)], the narratives section [r= 0.64; p= 0.005 < (0.05)] and the total pragmatics subtest score [r= 0.73; p=0.001< (0.05)]. These positive significant correlations provide further evidence for the fact

that these learners' poor reading comprehension abilities are related to their poor language abilities.

TEACHER QUESTIONNAIRES AND RATINGS

The teachers of the SLI learners were provided with a questionnaire regarding their performance in class and overall academics. With regards to the EAL-SLI learners in both contexts, a total of seven questionnaires were provided, but only six were returned. From the questionnaires returned it was evident that there were patterns and trends in the difficulties these learners experienced in class. All six teachers reported that they felt the learner may be "slower" at learning language compared to his/her peers. For e.g. Participants 1, 2, 3 and 11 were reported to have poor numeracy skills and difficulty in grasping new concepts with regards to numeracy. In terms of receptive language abilities, participants 2, 3, 4, 11 and 12 were reported to have poor reading comprehension abilities and difficulty answering questions that required reasoning and more abstract thinking and all 6 participants were reported to have difficulty comprehending new words and concepts. In terms of expressive language abilities, participants 1, 2, 3, 4, 11 and 12 were reported to have difficulty in relating stories or occurrences in an organized manner; participants 1, 2, 3, 4 and 11 were reported to have difficulty with sentence construction and utilized "immature" sentence construction as well as had difficulty in answering questions appropriately. In terms of reading and writing abilities, participants 1, 2, 3 and 4 demonstrated poor spelling abilities and difficulty in writing stories but most participants appeared to be improving in their reading abilities. All 6 participants required instructions to be repeated again. The teachers thus appeared to have insight into the areas of academic language these EAL-SLI learners have difficulty with. All three questionnaires on the EFL-SLI learners were returned, and all three teachers reported that they felt the learners were **not** "slower" at learning language compared to his/her peers. Participant 18 was reported to be one of the "brighter" pupils who learnt new concepts quickly and easily and did not experience any specific difficulties in the classroom. Participants 17 and 19 were however reported to have difficulty learning new numeracy and literacy concepts such as plurals and spelling rules. Participants 17 and 19 were also reported to have difficulty in following instructions and required instructions to be repeated. Both participants were reported to interact well with their classmates and peers and have improved in their academic performance from the beginning of the year. The teachers then rated

these learners' overall oral communication, reading comprehension and written language abilities. Table 9 below shows how the teachers rated each of the learners on the various components.

Table 9: Teacher Rating scores for each of the sixteen EAL-SLI learners and the five EFL-SLI learners (from Jordaan (2009)) as well as the mean, standard deviations and range of scores obtained by the group

		Oral Communication	Reading Comprehension	Written Language
EAL Cont 1	**Child**	**Grade 1**	**Grade 1**	**Grade 1**
	1	2	1.5	1
	2	1	1	1
	3	1	1	1
	4	2	1.6	1
	5	1.1	1.2	1.8
	6	2	1.5	1
	7	2	1.8	1.1
	8	1.5	1.2	1.2
	9	2	1.8	1.2
	10	2	1.8	1.2
	Group Mean	1.66	1.44	1.15
	Std Dev	0.46	0.32	0.25
	Range	1	0.8	0.8
EAL Cont 2	11	2	1	1
	12	2.5	2.5	2
	13	4	4	4
	14	3	3	2.5
	15	2	1.5	1.5
	16	2	2	2
	Group Mean	2.58	2.33	2.17
	Std Dev	0.80	1.08	1.03
	Range	2	3	3
EFL	17	3	3	3
	18	5	5	5
	19	3	3	2
	20	3	4	3
	21	4	3	3
	Group Mean	3.60	3.60	3.20
	Std Dev	0.89	0.89	1.10
	Range	2	2	3

Out of a total possible score of 5, the highest rating obtained by the EAL-SLI learners for the oral communication, reading comprehension and written language components was 4/5 with ratings falling between 1 and 4 for each category. This high rating was obtained by participant 13 across all three categories. The EAL-SLI learners obtained mean ratings of 1.66 and 2.58 on the oral communication component in context 1 and 2 respectively which is lower than the mean ratings of 2.35 and 3.24 obtained by their age matched peers. They also obtained mean ratings of 1.44 and 2.33 in context one and two respectively on the reading comprehension component which is lower than the mean ratings of 1.91 and 2.89 obtained by their age matched peers, but not that much lower. Thus all EAL learners are rated as have difficulty with reading comprehension. In terms of the written language component, the EAL-SLI learners obtained a mean rating of 1.15 and 2.17 in context one and two respectively which is lower than the mean rating of 1.35 and 2.79 obtained by their age matched peers. The range of ratings obtained by these EAL learners is small which suggests that they are all performing similarly according to their teachers. The EFL-SLI learners were rated between 2 and 5 on the oral communication, reading comprehension and written language components. The highest rating was obtained by participant 18 who was also reported to not be "slower" at learning compared to his peers. The EFL-SLI learners obtained a mean rating of 3.60 on the oral communication component which is lower than the mean rating of 4.02 obtained by their age matched peers. They also obtained a mean rating of 3.60 on the reading comprehension component which is only slightly lower than that (3.84) obtained by their age matched peers. Thus all the EFL learners are rated similarly for reading comprehension. On the written language component, the EAL-SLI learners obtained a mean rating of 3.20 which is also slightly lower than that (3.74) obtained by their age matched peers.

From these results it is evident that both the EAL-SLI and EFL-SLI learners are rated below their age matched peers, specifically on oral communication. Overall however, the EFL-SLI learners appear to be rated better than the EAL-SLI learners, specifically the EAL learners in context 1. Correlations were then performed to determine whether there was a significant relationship between the teacher ratings and the results obtained by these EAL-SLI learners at the end of their grade one year on the various sections of the DELV-CR test. Table 10 below highlights the areas of positive correlation (in green).

Table 10: Results of Pearsons-Rho Correlation Coefficients calculated between the teacher ratings and the different subtests of the DELV-CR test in grade one

DELV-CR	Teacher Ratings					
	Oral Communication		Reading Comprehension		Written Language	
	r =	Pr> t	r =	Pr> t	r =	Pr> t
Verb Contrast	0.43	0.0486	0.38	0.0754	0.47	0.0343
Preposition Contrast	0.50	0.0251	0.36	0.0839	0.35	0.0923
Quantifiers	0.49	0.0278	0.43	0.0494	0.36	0.0857
Fast Mapping: RV	0.07	0.4026	0.01	0.4785	(0.02)	0.5268
Fast Mapping: NV	0.07	0.3947	0.19	0.2394	0.29	0.1350
Total Semantics	0.63	0.0047	0.57	0.0101	0.64	0.0037
Wh- Questions	0.29	0.1346	0.19	0.2417	0.27	0.1574
Passives	0.42	0.0519	0.51	0.0229	0.48	0.0294
Articles	(0.25)	0.8244	(0.26)	0.8327	(0.34)	0.9038
Total Syntax	0.32	0.1118	0.25	0.1730	0.28	0.1476
Role Taking	0.08	0.3802	0.17	0.2702	0.12	0.3256
Narratives	0.12	0.3329	(0.03)	0.5492	(0.12)	0.6744
Question- Answer Planning	0.34	0.0983	0.34	0.0963	0.46	0.0353
Total Pragmatics	0.28	0.1503	0.28	0.1502	0.30	0.1287
Oral Communication	1.00		0.93	0.0000	0.87	0.0000
Reading Comprehension	0.93	0.0000	1.00		0.94	0.0000
Written Language	0.87	0.0000	0.94	0.0000	1.00	

Correlations were performed at an alpha (significance) level of 0.05 i.e. 5% with 14 degrees of freedom, with a one tailed significance value of 0.426. The results (in green) indicated a positive significant correlation between the oral communication component [r =0.43; p= 0.0486 < (0.05)] and the written language component [r = 0.47; p= 0.0343 < (0.05)] of the teacher ratings with the verb contrast section of the DELV-CR, a positive correlation between the oral communication component and the preposition contrast section of the DELV-CR [r= 0.50; p= 0.025 < (0.05)], positive correlations between the oral communication component [r= 0.63; p= 0.005 < (0.05)], reading comprehension component [r= 0.57; p= 0.010 < (0.05)] and written language component [r= 0.64; p= 0.004< (0.05)] with the total semantics section of the DELV-CR test, positive correlations between the reading comprehension component [r= 0.51; p= 0.023 < (0.05)] and written language component [r= 0.48; p= 0.03 < (0.05)] with the passives section of the DELV-CR test and finally a positive significant correlation between the written language component of the teacher ratings with the question-answer planning section of the DELV-CR test [r= 0.46; p= 0.035 <(0.05)]. Furthermore strong significant positive correlations were obtained between the

teacher rating components (as is evident from the table above) and between the different sections of the DELV-CR test. As poor performance on the various sections of the DELV-CR test can impact on overall academic performance in the classroom, one would expect learners to therefore have poor oral communication, written language and reading comprehension abilities. More specifically, as the verb contrast section looks at how the learner organizes and retrieves his/her vocabulary and the passives section looks at how the learners understand and use passive sentences, poor performance on these subtests will impact on a learners' oral as well as written language. The results obtained therefore suggest that the teachers are able to correctly predict which learners are having difficulty in acquiring these academic language concepts. These findings are in accordance with the results from Gutierrez-Clellen and Kreiter's (2003) study on bilingual children, which found that the teachers' proficiency ratings were significantly related to the children's grammatical performance in both the first and second languages.

Overall, the above mentioned results confirm that these EAL and EFL learners with SLI have deficits in linguistic representation and processing and that these deficits are impacting on their reading comprehension and overall literacy abilities. However, as the DELV-CR only identified these learners with SLI at the end of their grade two year, the researcher felt it necessary to determine whether these EAL-SLI and EFL-SLI learners present with cognitive processing deficits so as to determine whether and which cognitive processing measures have the potential to help identify learners with SLI earlier. The learners' performance on the cognitive processing measures is thus discussed in detail below.

Do these EAL and EFL learners with SLI have deficits in cognitive processing and what are these deficits?

WORKING MEMORY

As research has shown a relation between working memory and language learning specifically in children with SLI, the learners were assessed on various working memory measures to determine the extent to which they have cognitive processing deficits. According to Montgomery et al. (2010), children with SLI exhibit significant working memory deficits relative to their age matched peers and thus the learners' performance on these tests provided information on whether

working memory assessments identify language impairment in EAL learners, whether all of the EAL learners identified as having SLI displayed working memory deficits and finally the results obtained also contributed to demonstrating how SLI manifests in EAL learners. As these measures have also been shown to be less biased than traditional standardized language test measures (Laing & Kamhi, 2003), the results obtained also provided information regarding the use of these cognitive processing measures in the assessment of EAL learners.

Once again, the EAL learners from the different contexts and the EFL learners were treated as separate individual groups. Jordaan (2009) examined whether the EAL learners in context one and two and the EFL learners differed significantly in their performance on the AWMA test (Alloway, 2007). T-tests were thus calculated to locate the significant differences for each of these groups on the different working memory measures. Results showed significant differences between the EFL and EAL learners in context one on the Digit Repetition task [$t=2.64$; $p< 0.01$], the dot matrix task [$t= 5.05$; $p< 0.0001$], the listening recall task [$t= 3.69$; $p< 0.001$], the spatial recall task [$t=2.84$; $p<0.005$], the processing spatial recall task [$t= 7.05$; $p< 0.001$] and the processing listening recall task [$t= 4.68$; $p< 0.001$]. Significant differences were also found between the EFL and EAL learners in context two on the dot matrix task [$t= 2.53$; $p< 0.015$] and between the EAL learners in context one and two on the digit repetition task [$t= -2.36$, $p< 0.021$], the dot matrix [$t= -2.36$; $p<0.043$] and the listening recall task [$t= -2.68$; $p< 0.009$]. These statistics can be viewed in Appendix I. This therefore provided justification for comparing the EFL-SLI learners and the EAL-SLI learners in context one and two to their specific peer groups on each of the working memory measures. The significant differences between the EFL and EAL learners in context one also suggest that working memory measures may not be unbiased in the assessment of learners from various linguistic and cultural backgrounds. A one factor ANOVA was calculated to determine if there were any significant differences between the genders on each of the measures. No significant differences were found and therefore, the need to take gender differences into account was disregarded.

The performance of each of the sixteen EAL-SLI learners and the five EFL-SLI learners on the AWMA (Alloway, 2007), the non word repetition test (Dollaghan & Campbell, 1998) and the sentence repetition test (Redmond, 2005) is discussed in detail below.

Table 11: Raw scores for each of the sixteen EAL-SLI learners and the five EFL-SLI learners on the AWMA, NWR test and sentence repetition test (from Jordaan (2009)) as well as the mean, standard deviation and range of scores obtained by the group in grade two

		Digit Rep	Dot Matrix	Listening Recall: Final Word	Processing Listening Recall: T/F	Spatial Recall	Processing Spatial Recall	Non Word Repetition	Sentence Repetition
EAL Cont 1	1	25	22	7	11	18	33	97.50%	17
	2	17	15	8	9	14	19	97%	3
	3	18	12	1	3	15	32	85.73%	4
	4	23	16	10	15	7	9	90%	13
	5	24	18	7	10	16	31	95.25%	-
	6	25	20	5	9	14	27	97.50%	18
	7	26	15	5	9	8	7	97.50%	14
	8	28	19	3	4	11	18	92.29%	16
	9	20	12	5	11	8	8	82.81%	9
	10	22	19	4	8	1	1	75.83%	9
	Mean	22.80	16.80	5.50	8.90	11.20	18.50	0.91	11.44
	Std Dev	3.55	3.36	2.59	3.45	5.18	11.83	0.08	5.50
	Range	11	10	9	12	17	32	0.2167	15
EAL Cont 2	11	22	15	7	13	5	8	92.20%	6
	12	19	18	3	6	17	34	90.63%	0
	13	26	17	9	15	11	13	100.00%	20
	14	26	13	7	17	14	18	100.00%	19
	15	23	15	8	17	10	17	87.50%	15
	16	25	18	4	10	16	27	100.00%	14
	Mean	23.50	16.00	6.33	13.00	12.17	19.50	0.95	12.33
	Std Dev	2.74	2.00	2.34	4.34	4.45	9.48	0.06	7.81
	Range	7	5	6	11	12	26	0.125	20
EFL	17	23	17	10	25	10	23	100%	25
	18	25	22	9	18	16	42	96.90%	27
	19	21	16	6	14	10	22	95.31%	19
	20	-	-	-	-	-	-	-	22
	21	-	-	-	-	-	-	-	31
	Mean	23	18.33	19	12	8.33	29	0.97	24.8
	Std Dev	2	3.21	5.57	3.46	2.08	11.27	0.02	4.6
	Range	4	6	4	11	6	20	0.05	12

AUTOMATED WORKING MEMORY ASSESSMENT (AWMA)

Digit Recall

The digit recall subtest assessed the learners' verbal short term memory skills as a function of the phonological loop. Verbal short term memory is the ability to hold information in mind for a short period of time, for example when attempting to remember a new telephone number (Alloway, 2007). According to Alloway (2007), verbal short term memory plays a crucial role in learning the sound patterns of new words in both first and second language acquisition and thus learners with poor verbal short term memory skills will have difficulty in learning the phonological structures of new vocabulary items and will acquire new vocabulary items at a much slower rate. The highest score obtained by the EAL- SLI learners for this subtest was 28 with scores falling between 17 and 28. The mean score obtained by the age matched typically developing EAL learners on this subtest was 23.28 and 25.79 in contexts one and two respectively (Please refer to Appendix J). In relation to the peer group, participants 1, 5, 6, 7, 8, 13 and 14 performed above the mean and participants 2, 3, 4, 9, 10, 11, 12, 15 and 16 performed slightly below the mean achieving scores between 17 and 25. Only participants 2, 3 and 12 performed 2SD below the mean.

With regards to the EFL-SLI learners, the highest score obtained was 25 with scores falling between 21 and 25. The mean score obtained by the age matched, typically developing EFL learners on this subtest was 25.66. In relation to the peer group, all three participants performed below the mean. Even though research shows that children with SLI generally exhibit a reduced phonological memory capacity relative to their age matched and language matched peers (Montgomery, 1995; Archibald & Gathercole, 2006; Ellis Weismer et al., 2000; Montgomery, 2004; Montgomery & Evans, 2009), the results from this study show otherwise as not all the learners presented with a reduced phonological working memory capacity. However, the nine out of the sixteen EAL-SLI learners who performed below the mean when compared to their age matched peers, can be said to have verbal short term memory deficits (Alloway, 2007). The findings are consistent with the proposal that an impairment of short-term memory may be only one contributing factor to the vocabulary learning difficulties in SLI (Gathercole & Baddeley 1990; Baddeley et al., 1998). These learners also performed poorly on the non word repetition and sentence repetition test- all of which assess verbal short term memory skills. Positive correlations were also found between these three measures (as discussed below).

Dot Matrix

The dot matrix subtest assessed the learners' visuo-spatial short term memory abilities as a function of the visuo-spatial sketchpad. Visuo-spatial short term memory is the ability to hold in mind visuo-spatial information such as images, pictures and information about locations and is also linked to the ability to learn mental arithmetic and science (Alloway, 2007). In order to recall the physical characteristics and locations of objects in a picture when it is no longer in view, one would need to rely on visuo-spatial short term memory skills (Alloway, 2007). As visuo-spatial short term memory is located in the right hemisphere of the brain and is very different from verbal short term memory, any individual who is good at storing verbal material will not necessarily have good visuo-spatial storage abilities and vice versa (Alloway, 2007). The highest score obtained by the EAL- SLI learners on this subtest was 22 with scores ranging from 12 to 22. The mean score obtained by the age matched typically developing peer group on this subtest was 15.91 and 17.75 in context one and two respectively (Appendix J). In relation to the peer group, participants 1, 4, 5, 6, 8, 10, 12 and 16 achieved scores above the mean and participants 2, 3, 7, 9, 11, 13, 14 and 15 performed slightly below the mean. Only participants 3 and 14 obtained scores 2SD below the mean.

With regard to the EFL-SLI learners, the highest score obtained was 22 with scores ranging between 16 and 22. The mean score obtained by the age matched typically developing EFL learners on this subtest was 19.95 and thus two of the three learners obtained scores lower than their age matched peers. Research suggests that learners with SLI will perform as well as their age matched peers on visuo-spatial tasks (Alloway, 2007; Archibald & Gathercole, 2006). However, the results obtained from this study do not agree with the above mentioned findings. Eight of the sixteen EAL-SLI learners and two of the three EFL-SLI learners presented with visuo-spatial short term memory skills below the mean of their age matched peers. Therefore it can be suggested that some EAL- SLI children may present differently to EFL learners with SLI on visuo-spatial tasks and this should be further investigated. Since only three EFL-SLI learners were investigated in this study, no conclusive results can be drawn regarding their visuo-spatial deficits.

Listening Recall

The listening recall subtest assessed the learners' verbal working memory skills as a function of the verbal central executive. Verbal working memory is the capacity to hold in mind and manipulate verbal information over short intervals of time (Alloway, 2007). Verbal working memory abilities are associated with mental activities that involve coordinating both storage and mental processing for example, literacy and mathematics tasks and thus learners who have difficulties in these areas will probably have working memory impairments (Alloway, 2007). The listening recall subtest had two components, the first where the learner was required to repeat the final word of the recalled sentence and second where the learner was required to state whether the sentence was true or false- this was termed processing listening recall.

Final Word Recall

In terms of the final word recall subtest, the highest score obtained by the EAL- SLI learners was 10 with scores falling between 1 and 10. The mean score obtained by the age matched peer group was 6.36 and 8.71 in context one and two respectively. In relation to the peer group, participants 1, 2, 4, 5 and 13 performed above the mean but participants 3, 6, 7, 8, 9, 10, 11, 12, 14, 15 and 16 performed below the mean where they achieved scores between 1 and 8 in both contexts. Only participants 3, 8, 12 and 16 obtained scores 2SD below the mean. With regards to the EFL-SLI learners, the highest score obtained was 10 with scores falling between 6 and 10. The mean score obtained by their age matched peer group was 9.19 and thus two of the three learners appear to have performed below the mean. Even though some learners did not perform much poorer than their age matched peers, the scores suggest that these learners may have difficulty storing the verbal information they process.

Processing Listening Recall

In terms of the processing listening recall subtest, the highest score obtained by the EAL- SLI learners on this task was 17 with scores ranging from 3 to 17. The mean score obtained by the age matched peer group was 9.69 and 19.63 in context one and two respectively. In relation to the peer group, participants 1, 4, 5, 9 performed better than the mean but participants 2, 3, 6, 7, 8, 10 and all the EAL context 2 learners performed below the mean. Only participants 3 and 8 obtained scores 2SD below the mean. With regards to the EFL-SLI learners, the highest score obtained was 25 with scores falling between 14 and 25. The mean score obtained by the age matched peer group was 20.71 and thus participants 18 and 19 obtained scores below the mean.

Overall, as research indicates that learners with SLI have deficits in verbal working memory (Alloway, 2007; Montgomery 2000a, 2000b; Ellis-Weismer et al., 1999; Archibald & Gathercole, 2006), the results obtained from this study agree somewhat with these findings as 11 of the 16 EAL learners performed below the mean on the listening recall task and 13 of the 16 learners performed below the mean on the processing listening recall task which suggests that these learners have verbal working memory deficits. However, according to Archibald and Joannisse (2009), children with SLI represent a heterogenous population not only with regard to the linguistic deficits they exhibit but also whether they have working memory limitations. Not all children with SLI display working memory deficits and this is borne out by the results of the EAL-SLI learners in this study.

Spatial Recall

The spatial recall task assessed the learners' visuo-spatial working memory abilities as a function of the visuo-spatial central executive. Visuo-spatial working memory, like verbal working memory is associated with mental activities that involve coordinating both storage and mental processing for example, literacy and mathematics tasks and thus learners who have difficulties in these areas will probably have working memory impairments as such tasks depend on the central executive and either one or both of the short-term memory components (Alloway, 2007). The spatial recall task also had two components, the first where the learner was required to recall the position of a dot in sequence and second where the learner was required to identify whether the shape with the red dot was the same as or the opposite of the shape on the left - this was termed processing spatial recall.

Spatial Recall

In terms of the spatial recall subtest, the highest score obtained by the EAL- SLI learners was 18 with scores falling between 1 and 18. The mean score obtained by the age matched EAL learners was 12.05 and 14.25 in context one and two respectively. In relation to the peer group, participants 1, 2, 3, 5, 6, 12 and 16 performed above the mean but participants 4, 7, 8, 9, 10, 11, 13, 14, 15 performed below the mean. Participants 4 and 11 obtained scores 2SD below the mean. With regards to the EFL-SLI learners, the highest score obtained was 16 with scores falling between 10 and 16. The mean score obtained by the typically developing age matched EFL learners was 15 and thus two of the three participants performed below the mean.

Processing Spatial Recall

In terms of the processing spatial recall task, the highest score obtained by the EAL- SLI learners was 34 with scores ranging from 1 to 34. The mean score obtained by the age matched peer group was 22.63 and 28.50 in context one and two respectively. In relation to the peer group, participants 1, 3, 5, 6 and 12 performed above the mean but participants 2, 4, 7, 8, 9, 10, 11, 13, 14, 15, 16 performed below the mean. Participants 4, 7, 9, 10 and 11 obtained scores 2SD below the mean. With regards to the EFL-SLI learners, the highest score obtained was 42 with scores falling between 22 and 42. The mean score obtained by the typically developing age matched EFL learners was 37.09 and thus two of the three participants performed below the mean. As research has shown that learners with SLI perform similarly to their age matched typically developing peers on visuo-spatial working memory tasks (Alloway, 2007), it is interesting that the majority of these learners are performing poorly when compared to their age matched peers. According to van Daal, Verhoeven, van Leeuwe and van Balkom (2008), the image that emerges with regards to the weak visual working memory abilities of children with language impairment, is not clear. Tomkins (2000) and Hoffman and Gillam (2004) showed that children with SLI have problems with the visual sketchpad. However, Adams and Gathercole (2000) found inconsistent patterns of relations between performance on visual-spatial short-term memory tasks and language performance. Due to the differences in the various research results obtained, further research and investigation is required.

Even though the AWMA (Alloway, 2007) was normed on a British population, the researcher felt it would be interesting to further investigate how these EAL-SLI and EFL-SLI learners performed in comparison to the AWMA normative sample. As cognitive processing measures are said to be less biased in the assessment of EAL learners' language abilities, the results obtained should not be different to that of the results obtained when the learners' performance was compared to their age matched peers. Table 12 and 13 below present the summary scores obtained by the EAL-SLI and EFL-SLI learners when compared to their age matched peers and against the AWMA normative sample data respectively.

Table 12: Summary scores obtained by the EAL-SLI and EFL-SLI learners on the different AWMA subtests when compared to their age matched typically developing peers in grade two

Participant	Digit Rep	Dot Matrix	Listening Recall: Final Word	Processing Listening Recall: T/F	Spatial Recall	Processing Spatial Recall
1	25	22	7	11	18	33
2	17	15	8	9	14	19
3	18	12	1	3	15	32
4	23	16	10	15	7	9
5	24	18	7	10	16	31
6	25	20	5	9	14	27
7	26	15	5	9	8	7
8	28	19	3	4	11	18
9	20	12	5	11	8	8
10	22	19	4	8	1	1
11	22	15	7	13	5	8
12	19	18	3	6	17	34
13	26	17	9	15	11	13
14	26	13	7	17	14	18
15	23	15	8	17	10	17
16	25	18	4	10	16	27
17	23	17	10	25	10	23
18	25	22	9	18	16	42
19	21	16	6	14	10	22

= Average/Above Average = 1SD below the mean = 2SD below the mean

Table 13: Summary scores obtained by the EAL-SLI and EFL-SLI learners on the different AWMA subtests when compared to the AWMA normative sample data in grade two

Participant	Verbal STM (Digit Repetition)	Verbal WM (Listening Recall & Proc Listening Recall)	Visp STM (Dot Matrix)	Visp WM (Spatial Recall and Proc Spatial Recall)
1	Low Average	Low Average	High Average	High Average
2	Below Average	Low Average	Below Average	Low Average
3	Below Average	Below Average	Below Average	High Average
4	Low Average	High Average	Low Average	High Average
5	Low Average	Low Average	Low Average	High Average
6	Low Average	Low Average	High Average	High Average
7	Low Average	Below Average	Below Average	Below Average
8	High Average	Below Average	High Average	Low Average
9	Below Average	Below Average	Below Average	Below Average
10	Low Average	Below Average	High Average	Low Average
11	Below Average	Low Average	Below Average	Below Average
12	Below Average	Below Average	Low Average	High Average
13	High Average	High Average	Low Average	Low Average
14	Low Average	Low Average	Below Average	High Average
15	Low Average	Low Average	Below Average	Low Average
16	Low Average	Below Average	Low Average	High Average
17	Low Average	Low Average	Low Average	Low Average
18	Low Average	Low Average	High Average	High Average
19	Below Average	Below Average	Low Average	Low Average

Verbal Short Term Memory (Digit Repetition)

When comparing these learners to the AWMA normative sample data, only five EAL-SLI learners (participants 2, 3, 9, 11 and 12) and 1 EFL-SLI learner (participant 19) were identified as having performed below average. As only five of the nine EAL-SLI learners and one of the three EFL-SLI learners were identified as having verbal short term memory difficulties based on the summary scores provided by the AWMA, utilizing the AWMA normative test data provides contradictory results as not all of the learners were identified when comparing them to their age matched peer group. Furthermore, the AWMA normative sample data identified participants 2, 3 and 12 (who performed 2SD below the mean when compared to their age matched peers) as having performed below average on this task, and only identified participants 9 and 11 as having performed below average but not participants 10, 14, 15 and 16 who all performed 1SD below

the mean when compared to their age matched peers. Investigations into why the AWMA only picked up these specific learners thus needs to be conducted, but since digit recall is not a linguistically loaded task, it is possible that the AWMA results are more reliable and that for this task, EAL learners need not be compared to the peer group.

Verbal Working Memory (Listening Recall and Processing Listening Recall)

When comparing these learners to the AWMA normative sample data, only seven EAL-SLI learners (participants 3, 7, 8, 9, 10, 12 and 16) and one EFL-SLI learners (participant 19) were identified as having performed below average. This may have been attributed to the fact that the AWMA calculates a score based on the learners' performance on the listening recall task and the processing listening recall task together and does not consider the separate individual components. However, when looking at the processing spatial recall subtest as only seven of the twelve EAL-SLI learners and one of the three EFL-SLI learners were identified as having verbal working memory difficulties based on the summary scores provided by the AWMA, utilizing the AWMA normative test data may provide contradictory results as not all of the same learners were identified. For e.g. participants 2, 6, 11, 14, 15 and 18 who performed below the mean when compared to their age matched peers, were not identified as having performed below average based on the AWMA normative sample data and therefore further investigations in this regard is required. Interestingly also, the summary scores provided by the AWMA identified twenty EAL learners in context one and five EAL learners in context two with below average working memory deficits. Out of the twenty EAL learners in context one, only four of these learners obtained scores 2SD below the mean on two or more subtests and only one learner obtained a score 1SD below the mean on one subtest at the end of their grade one year. Out of the five learners in context two, only three learners obtained scores 2SD below the mean on two or more subtests and thus the use of the verbal working memory subtest of the AWMA may also be over identifying learners who are "at risk" for language impairment and may not be useful in identifying language impairment earlier in EAL learners within a South African context.

Visuo-spatial Short Term Memory (Dot Matrix)

When comparing these learners to the AWMA normative sample data, only seven of the EAL-SLI learners (participants 2, 3, 7, 9, 11, 14 and 15) and none of the EFL-SLI learner were

identified as having performed below average. Again the AWMA appears to provide contradictory results as only seven of the eight EAL-SLI learners and none of the EFL-SLI learners were identified as having visuo-spatial short term memory difficulties based on the summary scores provided by the AWMA. For e.g. participants 13, 17 and 19 who performed below the mean when compared to their age matched peers were not identified as having performed below average by the AWMA normative sample data. One again, investigations into why the AWMA only picked up these specific learners thus needs to be conducted in future research, but it is possible that the same explanation applies as in the digit recall task.

Visuo-spatial Working Memory (Spatial Recall and Processing Spatial Recall)

Overall, when comparing these learners to the AWMA normative sample data only 3 EAL-SLI learners (participants 7, 9 and 11) and no EFL-SLI learners were identified as having performed below average. This may have been attributed to the fact that the AWMA calculates a score based on the learners' performance on the spatial recall task and the processing spatial recall task together and does not consider the separate individual components. However, when looking at the processing spatial recall subtest, as only three of the eleven EAL-SLI learners and zero of the two EFL-SLI learners were identified as having visuo-spatial working memory difficulties based on the summary scores provided by the AWMA, utilizing the AWMA normative test data may provide contradictory results as not all of the same learners were identified.

AWMA Overall Results

Overall, the AWMA results suggest that the majority of these learners have deficits in their visuo-spatial and verbal memory abilities. However, when comparing the learners to the AWMA normative sample data, the results obtained were contradictory because not all the same learners were identified as having performed below average as they were when compared to their age matched typically developing peer group and therefore it can be suggested that the AWMA should be used with caution when assessing EAL learners with language impairment in South Africa. With regards to bilingual learners, MacDonald and Christiansen (2002) showed that a substantial amount of individual differences in verbal working memory task performance is due to variation in language experience which significantly impacts on processing efficiency. They also suggested that greater language experience is assumed to have effects not only on

vocabulary but also on the ability to develop expertise in syntactic structures and in constraints that govern language comprehension (MacDonald & Christiansen, 2002). These results were confirmed by Gutierrez et al., (2004) who suggested that performance on verbal working memory tasks is not independent of language skill. As the analysis of the results of these learners' performance on the AWMA have shown that the EFL-SLI learners obtained overall mean scores higher than the EAL-SLI learners; not all of the EAL-SLI learners have verbal short term and working memory deficits and there is a wide range of scores evident on the various working memory measures, the notion that processing-based measures is useful in reducing bias in assessment (Campbell, Dollaghan, Needleman & Janosky 1997) needs to be further evaluated (Gutierrez et al., 2004).

Furthermore some researchers have suggested that memory deficits have a negative effect on language acquisition and play a causal role in language impairment (Gathercole et al., 2005). However the results obtained on this study have shown that not all of the EAL-SLI learners have working memory deficits and therefore it is most likely that working memory impairments do not cause the language impairment but rather may occur as a consequence of language impairment. This therefore has implications for the theories of SLI and should be further investigated.

NON WORD REPETITION

The non word repetition test was used as a measure of the learners' phonological working memory skills as a function of the phonological loop. The phonological loop plays an important role in supporting vocabulary acquisition and is closely associated with verbal short term memory skills (Avons, Wragg, Cupples & Loegrove, 1998); Baddeley, Gathercole & papagno, 1998; Gathervole et al., 1997; Majerus, Poncelet, Greffe & Van der Linden, 2006; Service & Kohonen, 1995). Research has shown that non word repetition ability is an extremely good predictor of a child's capacity to acquire a foreign vocabulary (Service & Kohonen, 1995). Scores on this particular task often identify a child's language status with a high degree of accuracy (Dollaghan and Campbell 1998). As is evident from the non word repetition scores, there is a large degree of individual variation in the range of scores obtained specifically by the EAL- SLI learners. The highest score obtained was 100% with scores falling between 75.83%

and 100%. The mean total score obtained by the age matched peer group was 89% and 97.78% in context one and two respectively (Appendix J). In relation to the peer group, participants 1, 2, 4, 5, 6, 7, 8, 10, 13, 14 and 16 performed above the mean but participants 3, 9, 11, 12 and 15 performed below the mean. Interestingly participants 3, 9, 11, 12 and 15 also performed below average on the digit repetition subtest of the AWMA which is also a function of the phonological loop. Research suggests that word-learning, immediate serial recall and nonword repetition are a related triad of abilities that draw on the mechanisms of verbal short-term memory fairly directly (e.g., Baddeley et al., 1998; Brown & Hulme, 1996; Gathercole et al., 1999) and therefore one could expect reliable correlations between digit span, non word repetition ability and vocabulary achievement (Gathercole, Service, Hitch, Adams, & Martin, 1999; Gathercole, Willis, Emslie, & Baddeley, 1992). This suggests that as these specific participants performed below the mean on both tasks that assess the phonological loop, they are likely to have phonological short term memory deficits. With regards to the EFL-SLI learners, the highest score obtained was 100% with scores falling between 95.31% and 100%. The mean total score obtained by the age matched EFL learners was 95% and thus all three participants obtained scores above the mean.

Since only 5 of the 16 EAL-SLI learners showed difficulties in this area, non word repetition may not be a definitive marker for SLI in EAL learners. Recent research for e.g. (Ellis-Weismer et al., 2000) also found that non word repetition may be a reliable but not sufficient marker of SLI. Furthermore, Kohnert, Windsor and Yim (2006), proposed that the use of non word repetition tasks in bilingual learners may have low specificity. The results obtained in this study agree with these findings. Interestingly, when looking at the overall number of learners who performed poorly on the non word repetition test from the peer group, out of the ten EAL learners in context one who obtained non word repetition scores below the mean, only three of these learners obtained scores 1SD below the mean on two or more subtests of the DELV-CR test and out of the nine EAL learners in context 2 who obtained non word repetition scores below the mean (three of which obtained scores of 0.78 below the mean), four of these learners obtained scores 1SD below the mean on two or more of the subtests on the DELV-CR, which furthermore suggests that non word repetition may be a more definitive marker of memory impairments than language impairments in SLI. It can thus be suggested that the linguistic deficits present in SLI constrain the performance of these learners on non word repetition tasks

and possibly all verbally mediated memory tasks (MacDonald & Christiansen, 2002) rather than the poor performance on non word repetition tasks reflecting a core memory deficit in SLI that limits language learning as suggested by Gathercole and Baddeley (1990).

SENTENCE REPETITION

The sentence repetition task involved the immediate repetition of auditorily presented sentences. Vance (2008) proposed that sentence recall/sentence repetition highlights the interaction between short-term memory skills and the language processing system. The analysis of sentence recall errors reflects this relationship. Short-term memory errors include word order errors, where meaning is intact, whereas when meaning is altered, or if a sentence is produced that is grammatically or semantically incorrect, then limited language knowledge is implicated (Vance, 2008). Alloway, Gathercole, Willis and Adams (2004) also refer to the value of sentence recall tasks, as they demonstrate the function of the episodic buffer which involves the integration of information from short-term memory subsystems with the language processing system. The highest score obtained by the EAL-SLI learners was 18 with scores falling between 3 and 18. The mean scores obtained by the age matched EAL learners were 16.87 and 23.33 in context one and two respectively (Appendix J). In relation to the peer group, two EAL context 1 learners i.e. participants 1 and 6 performed above the mean obtaining scores of 17 and 18 respectively but the rest of the participants performed below the mean. Even though these two EAL-SLI learners obtained scores above the mean of their age matched peers, their scores are still within normal variation (SD= 6.83). Interestingly, these participants also obtained scores above the mean for the non word repetition test and the digit repetition test- all of which assess short term memory skills. It can therefore be suggested that these learners do not have short term memory deficits. With regards to the EFL-SLI learners, the highest score obtained was 31 with scores falling between 19 and 31. The mean score obtained by the age matched EFL learners was 26.51. Participants 18 and 21 scored above the mean with scores of 27 and 31 respectively and participants 17, 19 and 20 scored below the mean.

Furthermore, learners who were identified by the researcher in grade one as being “slow to learn” by scoring 1 or 2 standard deviations below the mean on only one subtest of the DELV-CR test, obtained sentence repetition scores equivalent to or above the mean if they improved in

their performance from grade two to grade three and obtained sentence repetition scores below the mean if they had not improved in their performance from grade two to grade three. (These learners' performances are highlighted in Appendix K). This observation suggests that sentence repetition tests have the potential to differentiate between "slow to learn" EAL learners and EAL learners with SLI as a number of studies have reported poor sentence repetition performance in learners with SLI compared to typically developing groups (e.g., Briscoe, Bishop, & Norbury, 2001; Eadie, Fey, Douglas, & Parsons, 2002; Laws & Bishop, 2003; Norbury, Bishop, & Briscoe, 2001; Redmond, 2003). An independent sample t-test was thus performed to determine whether the differences between the EAL-SLI learners in context one and two and their typically developing age matched EAL learners in context one and two were statistically significant. T-tests were also conducted to determine if there was a statistically significant difference between the EAL-SLI learners and those EAL learners in context one and two who obtained scores 1SD or 2SD below the mean on only one subtest of the DELV-CR test in grade one but improved in their language ability from grade two to grade three. Results revealed significant differences between the EAL-SLI learners in context one and their typically developing age matched EAL peers [t= -2.63, p= 0.0207 < (0.05)] as well as between the EAL-SLI learners and those learners who obtained scores 1SD or 2SD below the mean on only one subtest of the DELV-CR test in grade one but who improved in their performance from grade two to grade three [t= -3.86, p= 0.0017 < (0.05)] (Please see statistics in Appendix K). Significant differences were also found between the EAL-SLI learners in context two and their typically developing age matched EAL peers [t= -3.23, p= 0.0180 < (0.05)] as well as between the EAL-SLI learners in context two and those learners who obtained scores 1SD or 2SD below the mean on only one subtest of the DELV-CR test in grade one but who improved in their performance from grade two to grade three [t= -3.66, p= 0.0146 < (0.05)]. These results provide evidence for the use of sentence repetition in differentiating between "slow to learn" EAL learners and EAL learners with SLI. Furthermore positive correlations were found between the sentence repetition test and the subtests of the DELV-CR (these will be discussed later on) which also adds to the value of this test as an assessment tool in EAL learners.

Overall, the above mentioned results suggest that participants 1, 2, 4, 5, 6, 7, 8, 10, 13, 14 and 16 do not have non word repetition deficits but the majority of these learners (i.e. 14 of the 16

participants) have sentence repetition deficits. Sentence Repetition tasks may thus be used a potential tool to distinguish between slow to learn EAL learners and EAL learners with SLI and can furthermore supplement the results obtained on the DELV-CR in order to identify language impairment earlier.

Is there a relationship between the learners' performance on the language proficiency measures and cognitive processing measures?

The researcher was interested to determine whether there were any significant relationships between the different assessment measures so as to determine if the performance of these learners on one measure (such as either of the language proficiency measures) could predict the performance on other measures (such as the cognitive processing measures). Pearson's correlation coefficient was thus calculated to determine these relationships. As all sixteen EAL learners presented with SLI, and all performed more poorly than the EFL-SLI learners, the researcher combined the scores of the EAL-SLI learners in both contexts to provide correlation results for the EAL-SLI group as a whole. Correlations were performed to determine whether there was a significant relationship between the EAL learners' performance at the end of their grade two year on the various sections of the DELV-CR test, with the reading comprehension measure as well as with all three cognitive processing measures i.e. the various subtests of the AWMA, the non word repetition test and the sentence repetition test (These correlations can be viewed in appendix L).

Pearsons- rho was also calculated for the EFL-SLI learners, but as there were only 5 EFL learners with SLI of which two participants were not assessed on the working memory measures and therefore had to be excluded, the correlations obtained between these measures may just be spurious. Even though the significance levels obtained are high (please see Appendix L) there is a possibility that the correlations are in fact not significant because according to Hill & Lewicki (2007), if there are very few observations, then there are also respectively few possible combinations of the values of the variables and thus, the probability of obtaining by chance a combination of those values indicative of a strong relation is relatively high. These correlations will thus not be discussed but can be viewed in Appendix L.

Table 14: Results of Pearsons Correlation Coefficients calculated between the language proficiency measures and the cognitive processing measures for the EAL-SLI learners in grade two

		AWMA: Working Memory						Phono Memory	
	Reading Comprehension r =	Digit Rep r =	Dot Matrix r =	Listening Recall r =	Spatial Recall r =	Processing Listening Recall r =	Processing Spatial Recall r =	NWR r =	Sentence Repetition r =
Verb Contrasts	0.06	0.20	0.01	(0.04)	0.40	0.18	0.30	0.41	0.17
Preposition Contrasts	0.08	0.58	0.19	(0.03)	0.25	0.28	0.10	0.31	0.69
Quantifiers	0.13	0.58	0.12	0.20	(0.28)	0.32	(0.28)	0.08	0.53
Fast Mapping: RV	0.27	0.55	(0.09)	0.13	(0.09)	0.36	(0.24)	0.38	0.52
Fast Mapping: NV	0.16	(0.04)	(0.24)	0.32	(0.22)	0.45	(0.33)	(0.11)	0.14
Semantics Total	0.24	0.56	(0.04)	0.20	0.02	0.52	(0.16)	0.34	0.63
Wh-Questions	0.02	0.26	0.15	0.36	0.16	0.53	0.02	0.24	0.34
Passives	0.20	(0.03)	(0.30)	0.14	(0.10)	0.35	(0.22)	0.02	(0.02)
Articles	0.16	0.39	0.01	0.02	(0.14)	0.32	(0.33)	0.15	0.47
Total Syntax	0.13	0.23	(0.03)	0.23	0.01	0.49	(0.17)	0.17	0.28
Role Taking	(0.31)	(0.17)	(0.19)	(0.02)	(0.01)	0.23	(0.02)	(0.26)	0.05
Narratives	(0.12)	0.16	(0.07)	(0.26)	0.49	0.02	0.40	0.16	0.18
Question-Answer	0.42	0.56	0.20	(0.15)	0.01	0.16	(0.06)	0.35	0.52
Total Pragmatics	0.11	0.36	0.03	(0.20)	0.18	0.19	0.10	0.19	0.41
Reading Comprehension	1.00	0.36	0.18	(0.22)	(0.28)	(0.16)	(0.29)	0.00	0.31
Digit Repetition	0.36	1.00	0.43	0.17	(0.01)	0.28	(0.10)	0.47	0.89
Dot Matrix	0.18	0.43	1.00	0.00	0.22	(0.19)	0.31	0.21	0.31
Listening Recall	(0.22)	0.17	0.00	1.00	(0.15)	0.84	(0.31)	0.33	0.37
Spatial Recall	(0.28)	(0.01)	0.22	(0.15)	1.00	(0.20)	0.94	0.59	0.04
Processing Listening Recall	(0.16)	0.28	(0.19)	0.84	(0.20)	1.00	(0.35)	0.25	0.49
Processing Spatial Recall	(0.29)	(0.10)	0.31	(0.31)	0.94	(0.35)	1.00	0.38	(0.11)
NWR	0.00	0.47	0.21	0.33	0.59	0.25	0.38	1.00	0.46
Sentence Repetition	0.31	0.89	0.31	0.37	0.04	0.49	(0.11)	0.46	1.00

Correlations were performed at an alpha (significance) level of 0.05 with 14 degrees of freedom, with a one tailed significance value of 0.426. The results obtained (in green) indicated positive significant correlations between the various subtests of the AWMA with each other (as is evident from the table above). No correlation was found between the reading comprehension measure and any of the other assessment measures utilized in the study even though research shows that

reading and listening comprehension abilities are closely related to working memory capacity (Cain, 2006; Daneman & Merikle, 1996; Leather & Henry, 1994).

However results indicated positive significant correlations (as seen in green) between the digit repetition subtest of the AWMA with the preposition contrasts [r= 0.58; p=0.0097< (0.05)], the quantifiers section [r= 0.58; p= 0.0098 < (0.05)], the fast mapping of real verbs [r= 0.56; p=0.0141 < (0.05)] and the total semantics section of the DELV-CR test [r= 0.56; p= 0.0121< (0.05)] as well as the question-answer planning section [r=0.56; p=0.0117< (0.05)]. These sections of the DELV-CR test fall under the semantics domain, which primarily looks at how a learner organizes and retrieves his/her vocabulary as well as how they understand verbs of the same meaning type, prepositions, the meaning of "every" and what it modifies in sentence contexts and also looks at the ability of the child to extract new meanings from sentence context (Seymour et al., 2003). Overall the semantics domain of the DELV-CR test is concerned with vocabulary learning. Studies have shown that children's performance on digit or word span tasks is in fact correlated with their vocabulary and grammatical development (Adams & Gathercole, 1995; Gathercole, Service, Hitch, Adams, & Martin, 1999; Masoura, Gathercole, & Bablekou, 2004) and the individual variation that directly influences the ease of word learning also accounts for the difficulties that children with language impairment have in learning new words (Archibald & Gathercole, 2006; Montgomery, 2004). Such correlations can therefore be expected as many of the EAL-SLI learners performed poorly on the digit repetition task as well as on the semantics domain of the DELV-CR test.

Positive significant correlations were also found between the digit repetition subtest with the non word repetition test [r = 0.47; p=0.0325< (0.05)] and the sentence repetition subtest [r= 0.89; p=0.0000< (0.05)]. As these three measures are different measures of the function of the phonological loop- these correlations add to the validity of the study. As evident from the scores obtained, there is a stronger correlation between the digit repetition test and the sentence repetition test, than between the digit repetition test and the non word repetition test. This is because the sentence repetition test also positively correlated with different sections of the DELV-CR test like the digit repetition test. Positive significant correlations were found between the sentence repetition test with the preposition contrast section [r=0.69; p=0.0016< (0.05)], the

quantifiers section [r= 0.53; p=0.0174<(0.05)], the fast mapping of real verbs [r= 0.52; p=0.0201< (0.05)], the total semantics section of the DELV-CR test [r= 0.63; p=0.0047< (0.05)] and furthermore with the articles [r=0.47; p= 0.0322< (0.05)] and question-answer planning sections [r= 0.52; p= 0.0191<(0.05)]. Sentence repetition also positively, significantly correlated with the non word repetition test [r= 0.46; p= 0.0353< (0.05)]. According to Alloway et al. (2004) and Conti- Ramsden et al. (2001), sentence repetition ability has been found to be associated with measures of verbal short-term memory such as non word repetition. This finding is consistent with the view that sentence repetition taps the episodic buffer (e.g., Baddeley & Wilson, 2002) which according to the Baddeley (2000) model, is responsible for integrating phonological information from temporary stores with lexical and semantic information from long-term memory systems (Alloway & Gathercole, 2005). According to Alloway and Gathercole (2005), as sentence recall involves integrating semantic information with structural aspects of a sentence such as word order and inflectional markers, it has been suggested that it taps both short-term and long-term memory. Alloway and Gathercole (2005) thus conducted a study to investigate whether the association between performance on sentence recall tasks and learning is unique or a reflection of shared resources with short-term memory and working memory. Results indicated that sentence recall is uniquely linked with language skills and therefore has important implications for learning (Alloway & Gathercole, 2005). In particular, the interface between knowledge representations in long-term memory and phonological and semantic information in short-term memory is crucial to academic progress (Alloway and Gathercole, 2005). The correlation obtained between the sentence repetition test with the various sections of the DELV-CR test in this study, have also demonstrated these findings as is evident in the mean language scores obtained by the EAL learners with SLI.

The results also indicated that the processing listening recall subtest positively, significantly correlated with the fast mapping of novel words [r= 0.45; p=0.0399< (0.05)], the total semantics section of the DELV-CR test [r= 0.52; p=0.0186< (0.05)], the wh-questions section [r= 0.53; p=0.0180< (0.05)] and the total syntax section of the DELV-CR test [r= 0.49; p=0.0273< (0.05)]. Positive significant correlations were also found between the processing listening recall subtest with the sentence repetition subtest [r= 0.49; p=0.0265< (0.05)]. As the processing listening recall subtest assessed the function of verbal working memory abilities, the correlations obtained

between the language measures and this subtest can be expected. Research shows that verbal working memory is correlated to vocabulary acquisition (Gathercole & Baddeley, 1990), language competence (Just & Carpenter, 1992), and syntactic processing (King & Just, 1992). As 13 of the 16 EAL-SLI learners had poor verbal working memory abilities, the results obtained on this study somewhat correlate with these findings. Furthermore, performance on complex memory tasks such as the processing listening recall subtest is believed to tap both the phonological loop (for storage), and the more flexible processing resources of the central executive (Baddeley & Logie 1999; Duff & Logie 2001; Lobley et al., 2005). The central executive is linked with a variety of control processes including the temporary activation of long-term memory (Baddeley 1998). As sentence repetition tasks also tap long term memory abilities, the correlation obtained between these two variables can be expected.

The spatial recall subtest also positively, significantly correlated with the narratives section of the DELV-CR [r= 0.49; p= 0.0260< (0.05)] and the non word repetition test [r= 0.59; p= 0.0078< (0.05)]. These correlations obtained are very difficult to explain and may just be spurious.

What are the implications for the theories of SLI?

The literature review presented various theories for the causes of SLI. These theories however differ in their proposal of whether the impairment arises from more general cognitive processing deficits or whether the deficit is specific to language (Marshall, Denmark & Morgan, 2006). These theories raise important issues: firstly regarding the specificity of the deficit i.e. whether it affects areas of cognition other than language and secondly its origin i.e. whether it originates from a generalized processing impairment or from an impairment within the linguistic system (Marshall, Denmark & Morgan, 2006). The specificity and the underlying causes of SLI need to be considered against the backdrop of considerable heterogeneity in SLI as it is possible that different subtypes of SLI do exist, with variable specificity and different underlying causes (Van der Lely, 2005). Different theories proposed included a) the difficulties children with SLI experience in comprehending and using certain grammatical material e.g. inflections and function words are caused by deficits that are specific to language (Rice & Wexler, 1996; Ullman & Gopnik, 1999; van der Lely & Ullman, 2001), b) learners with SLI have a slower

general processing capacity (Kail, 1994) and c) the Auditory Processing Deficit (APD) Hypothesis (Tallal, 2003; Tallal & Piercy, 1973) claims that the language deficit in SLI stems from difficulties in processing the rapid temporal changes that characterize speech. Unfortunately these theories could not be investigated in this study. One other theory i.e. SLI as a result of impaired phonological short term memory abilities (Gathercole & Baddeley, 1990) was investigated.

With regards to the phonological memory abilities of learners with SLI, the results obtained on this study demonstrated that a large majority of the learners obtained poor digit repetition scores but only a few learners performed poorly on the non word repetition test. However, the majority of the learners performed poorly on the sentence repetition test which taps both phonological memory and long term memory abilities and thus these learners may have phonological short term memory deficits. However, the results indicate that poor phonological memory abilities may not be the sole of cause of language impairment as not all the learners presented with pure phonological short term memory deficits.

Furthermore, it is evident from the results obtained that the EAL-learners with SLI have deficits in their visuospatial short term and working memory abilities even though research shows otherwise (Alloway, 2007) and some of the EAL-SLI learners also demonstrated poor verbal working memory abilities. In summary, these learners are definitely showing deficits in their cognitive processing abilities. The results indicate that both cognitive and language abilities are affected in these learners. As the other theories were not investigated in this study, no conclusive findings can be extracted but due to the fact that not all the learners presented with poor verbal short term and working memory abilities it may be that the deficit is specific to language with poor cognitive processing abilities playing a contributing rather than causal role in SLI or both could be due to an underlying deficit such as speed of processing.

CHAPTER 6

CONCLUSION

This study aimed to investigate in detail previously identified English Additional Language learners who did not improve in their academic language abilities over three years in order to determine whether they are merely "slow to learn" or whether they have a language impairment. The majority of the research on SLI so far, has been conducted on monolingual learners with SLI and thus the findings obtained from this study may expand on and enhance our knowledge and understanding of the manifestations of language impairment in bilingual learners. This is important as bilingualism has become the rule rather than the exception in most countries (Brown & Attardo, 2005) and according to the National Institutes of Health (1999), differentiating between second language learning and SLI should be a priority in future research. One of the strengths of this study is that learners were assessed on a variety of linguistic and processing measures which provided a clearer picture of the manifestations of SLI in EAL learners.

Participants were chosen based on their performance on the DELV-CR test. These learners obtained scores 1SD or 2SD below the mean on two or more subtests of the DELV-CR test at the end of their grade two year. Analysis of the results obtained by these learners on the various subtests of the DELV-CR revealed that all sixteen EAL learners presented with language impairment and were not merely "slow to learn" as their performance was compared to their typically developing age matched peers and not the DELV normative sample data in order to reduce the bias in the study. Interestingly, Jordaan (2009) found that when comparing all 118 EAL learners in the two different educational contexts to the DELV-CR normative data, the majority of the EAL learners in context 1 and various EAL learners in context 2 performed in the 'weak' category on two or more subtests over the three years, but not all the learners had a language impairment. This suggests that the DELV may not be able to distinguish between "slow to learn" EAL learners and EAL learners with language impairment within a South African setting and thus this test should be used with caution. Even though the participants in this study spoke a variety of different languages at home and were selected from two different learning contexts that were fairly representative of the Gauteng schools, this finding may not be

generalized to all EAL learners in South Africa as little is known regarding the learning contexts in other provinces of South Africa and thus future research regarding the use of this test in other EAL populations needs to be conducted.

Furthermore, when comparing these EAL-SLI learners' performance on the DELV-CR test to the performance of the EFL-SLI learners, the EAL-SLI learners as a group appeared to have performed more poorly than the EFL-SLI learners on all three subtests. As significant differences were found between the EAL learners in context one and two and the EFL learners on the various subtests of the DELV-CR test in grades one, two and three, these results imply that bilingual learners with SLI, who acquire a second language sequentially, are more impaired than monolingual learners with SLI. This finding is in accordance with the findings obtained by Crutchley, Botting and Conti-Ramsden (1997) and Crutchley (1999) who showed that the language performance in the second language of bilingual learners with SLI (Bi-SLI) is worse than the language performance in that same language of monolingual learners with SLI (Mon-SLI) and furthermore the language difficulties experienced by Bilingual-SLI learners are more complex and persistent than the language problems of Monolingual-SLI learners.

The question however remains as to whether these EAL-SLI learners can be seen as additionally disadvantaged. As this study compared monolingual learners with and without language impairment to bilingual learners with and without language impairment, the results obtained from this study could possibly answer this question. At the end of the grade three year, many of the EFL-SLI learners had caught up to their typically developing aged matched peers and performed similarly on many of the sections of the DELV-CR test. These included, the articles section, the communicative role taking section, the verb and preposition contrasts sections and the fast mapping of real verbs. It can thus be concluded that an additional disadvantage was shown for the EAL-SLI learners on these specific sections as they still appeared to have difficulty with these tasks even after two years of additional exposure to the English Language. However, whether bilingual learners with SLI can be seen as additionally disadvantaged in their ability to acquire two languages needs to be further investigated as this study only looked at their ability to acquire academic language concepts in their second language. Future investigations must include assessment in the first language.

Overall, the EAL-SLI learners in both contexts performed poorly on the reading comprehension test, were rated lower in their oral communication, written language and reading comprehension abilities than their aged matched peers on the teacher rating scales and also scored weaker on all the subtests of the DELV-CR test demonstrating particular difficulty with articles, passives, communicative role taking, narratives, question-answer planning, quantifiers, verb contrast and fast mapping of real and novel words when compared to their typically developing aged matched EAL learners. However, the results obtained showed patterns that are indicative of delayed rather than deviant communication development which is consistent with the theories of bilingual and second language acquisition. The results also showed that the typically developing EAL learners performed similarly to the monolingual learners with SLI on a few subtests of the DELV-CR test. This is in accordance with literature which shows that children learning a second language display similar language difficulties to their monolingual speaking peers with SLI (Rice & Wexler, 1996; Paradis, 2005; Genesee, Paradis & Crago, 2004). However, as the typically developing EAL learners obtained results that showed patterns of delayed language development when compared to the monolingual learners with SLI and the EAL learners with SLI obtained results that showed patterns of delayed language development when compared to the typically developing EAL learners, the results suggest that SLI may simply be a slowness in learning. These findings are in accordance with the argument produced by Leonard (1987, 1991) who stated that children labeled as SLI simply represent the lower end of the normal distribution of language learning ability. Further evidence of this implication stems from the fact that not all the learners in this study presented with verbal short term and/or verbal working memory deficits and therefore it can be suggested that SLI is not always related to a deficit in cognitive processing. This implication impacts on the theory of the causes of SLI which future research needs to investigate.

As 13.56% i.e. 16 of the 118 EAL learners assessed in grade one (70 in context one and 48 in context two) were found to have a language impairment and research has shown that only 5%-7% of learners have SLI (Paul 2001; Tomblin et al., 1997) this high percentage of weak performance raises concern regarding the EAL learners' academic language proficiency in English because the typically developing EAL learners also appeared to be performing more poorly than the typically developing EFL learners. However, this is where the role of the SLP is

important within a school setting. SLPs are 'language focused' and are able to explain the effects of language on learning, and therefore they could provide curriculum guidelines for all content areas in terms of the language skills required for listening, speaking, reading and writing (Wadle, 1991). SLPs can also assist teachers to become more aware of language difficulties and how to adapt their language to meet the learners' needs (Cirrin & Penner, 1995; Brice & Brice, 2000). Such adaptations include using redundancy techniques, using the context to support meaning i.e. context "embeddedness" and ensuring the learners have the necessary language skills to perform the task at hand by utilizing explicit and predictable task sequences (Wong-Fillmore, 1985). Furthermore, SLPs can also ensure carryover of speech and language skills learnt in the classroom as well as provide the teacher with information and support to facilitate communicative competence and promote academic success (Lewis, 2004; Wadle, 1991). As positive correlations were obtained between the teacher ratings of the EAL-SLI learners and the subtests of the DELV-CR test, it is evident that teachers are aware of the difficulties these learners are experiencing in the classroom and thus providing them with the necessary support is crucial in order to ensure the success of these learners academically.

For children and practitioners in multilingual settings, the problem of "mistaken identity" and "missed identity" is well known. The erroneous diagnosis of a language impairment in children learning English as an additional language within a South African context is a huge risk factor, because of the absence or limited variety of assessment tools available for this population. Even though the learners were identified on the DELV-CR test as having a language impairment, the DELV only picked up these learners at the end of their grade two year. It was for this reason that the researcher investigated these learners' performance on the cognitive processing measures because researchers have suggested that by determining the underlying mechanisms of SLI, one would be able to distinguish between normal language learning and impaired language. Results indicated that not all the learners presented with verbal short term and verbal working memory deficits even though recent research has shown that SLI may be caused by cognitive and perceptual processing deficits thus making it difficult for these learners to take in linguistic input and access the linguistic knowledge they have (Ellis- Weismer, Evans & Hesketh, 1999; Kohnert & Windsor, 2004; Miller, Kail, Leonard & Tomblin, 1991). Furthermore, although the majority of the learners performed poorly on these subtests when compared to their aged matched peers,

when comparing these learners to the AWMA normative sample data, the results obtained were contradictory. In fact the verbal working memory subtest over identified learners who were "at risk" for language impairment. This therefore suggests that the AWMA should be used with caution in the assessment of EAL learners with language impairment and furthermore raises questions regarding the use of these cognitive processing measures as assessment tools in EAL-SLI learners in South Africa. Also, as the EFL learners performed better than the EAL learners in context one and two on the AWMA and significant differences were found between these groups, the notion that processing based assessments may be less biased than linguistic based measures needs to be further evaluated.

However the results indicated that a learners' performance on a sentence repetition task supplemented with the use of DELV-CR test has the potential to differentiate between the "slow to learn" EAL learners and the EAL learners with language impairment thus minimizing the problem of "missed" and "mistaken" identity in this population. As the majority of these learners performed poorly on the sentence repetition task and significant correlations were found between the sentence repetition test and various sections of the DELV-CR test, the results obtained provide further evidence for the value of this test as an assessment tool in EAL learners. However as the sentence repetition test was only administered in grade two, further investigation is required as to whether the same results would be obtained if the sentence repetition test was administered in grade one so as to differentiate between "slow to learn" and language impaired children earlier. Future research into the use of sentence repetition tasks on EAL learners in South Africa may also provide further evidence for the use of this test in the assessment of all EAL learners. Furthermore, as the results have also indicated that the teachers of the EAL-SLI learners are able to correctly identify learners who are performing more poorly then their aged matched peers, the collaboration between teachers and SLP's in the identification of learners with SLI is of vital importance.

Finally, the overall results of this study indicated that bilingual language impaired learners' language ability fluctuates over time with some learners making more progress than others as is evident from the total scores obtained per year on each subtest. It can thus be suggested that with early identification and appropriate treatment, these learners' language abilities may improve. As

bilingual learners with language impairment progress in a similar yet more delayed pattern as their typically developing EAL peers, these learners have the ability to catch up to their typically developing peers. Therefore, regardless of whether the problem is due to slow EAL learning or language impairment, intervention is critical since ‘language is not everything in education, but without language, everything in education is nothing’ (Wolff, in Alidou, Boly, Brock-Utne, Dallio, Heugh & Wolff, 2006, p. 9).

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APPENDIX A

Principal Information Sheet / Consent Form

Dear Principle

My name is Heila Jordaan and I am conducting research for a PhD in Speech Pathology at the University of the Witwatersrand. I am studying the language acquisition abilities of children learning in English in a longitudinal project from grades 1 to 3. The project is entitles: *DELVing into the acquisition of language for academic purposes by foundation phase English language learners*. I would like to invite your school to participate in this study.

If you grant me permission to conduct the study at your school, the grade 2 teachers will be provided with information and consent forms regarding the research. The teachers will also be required to complete a short questionnaire on their own language backgrounds and language teaching strategies.

The parents of learners who are currently in grade 2 will be given information sheets and consent forms, and will be asked to complete a questionnaire on the languages they speak and on their child's language development. The children who participate in the study will be given a simplified description of the study and their verbal consent will also be requested.

If the parents allow their children to participate and the child gives consent, the child will be tested on three short language tests, requiring him/her to look at some pictures and answer short questions verbally. Some of the children who speak languages other than English will be asked to do the test in their home language as well. Each child will also be required to complete a memory test by looking at some pictures on a computer screen. These two tests will be done at different times to avoid fatigue. It is estimated that the total testing time per child is 45minutes. Finally, I will be asking the teachers to provide me with brief information on each child's reading and writing abilities. These assessments will be repeated when the children are in grade 3 at which stage the grade 3 teachers will again be invited to participate and complete the questionnaire on language background. At each stage of the project, the teachers will be asked about the children's reading and writing skills.

If any child is identified as having a language problem, I will communicate with the parents to discuss possible solutions to the problem. It is anticipated that the results of the study will have implications for teaching practice to facilitate language acquisition in the foundation phase.

Participation in this study is completely voluntary. Children are free to refuse to participate and to withdraw at any time during the study. They will not be penalised or disadvantaged in any way. Furthermore, all responses are strictly confidential and anonymity is assumed.

If there are any queries please do not hesitate to contact me.

Your cooperation would be greatly appreciated.

Yours faithfully,

Heila Jordan

(PhD student)

(011) 717 4580

0823238016

Fax: 011 717 4572

Prof. Claire Penn

Supervisor

PROJECT: *"DELVing into the acquisition of language for academic purposes by foundation phase English language learners"*

I hereby give permission to the researcher to conduct the above-mentioned study at this school .....(name of school).

Principal: ..... (name) Signature: .....

Date: .....

Parent/Guardian Information Sheet / Consent Form

Dear Parent/Guardian

My name is Heila Jordaan and I am conducting research for a PhD in Speech Pathology at the University of the Witwatersrand. I am studying the language acquisition abilities of children learning in English in a longitudinal project from grades 1 to 3. I would like to invite you to allow your child to participate in my research.

The study involves your child doing three oral language tests in English, in which he/she looks at pictures and answers some questions. He/she will also be required to do a memory test in which pictures are represented on a computer screen, and questions are then asked. These two tests will take approximately 45mintues during school time nut will be done on separate occasions to avoid fatigue. Your child's teacher will also be asked to give me a brief assessment of his/her reading and writing skills. All testing will be conducted during school hours. I will discuss suitable times with the principal and teachers so that your child's academic programme is not disrupted in any way. These procedures will be repeated again when your child is in grades 2 and 3. If your child is identified as having a language problem, I will communicate with you to discuss possible solutions to the problem. It is anticipated that the results of this study will have implications for teaching practice to facilitate language development in the foundation phase.

If you and your child decide to participate, kindly fill in the formal consent. I would also be grateful if you would complete the attached questionnaire on your family language background and your child's communication development.

Participation in this study is completely voluntary. You are not under any obligation to allow your child to participate. If you decide not to participate, or wish to withdraw your child at any time during the study, you and your child will not be penalised or disadvantaged in any way. In addition, all the test results will remain strictly confidential. Your child's identity will only be known to me.

Should you have any queries you can pass them on to the principal, who will then contact me. I will gladly respond to your questions to the best of my ability. Your participation and contribution to this study would be greatly appreciated.

Please return the consent form below, indicating whether or not you agree to allow your child to participate.

Heila Jordan (PhD student) Prof. Claire Penn (Supervisor)

PROJECT: *"DELVing into the acquisition of language for academic purposes by foundation phase English language learners"*

I, ... (name and surname) hereby consent to allow my child ..... (name) to participate in this study. Furthermore, I give the researcher, Heila Jordaan permission to use the responses in the write up of the study and in any further publications or presentations.

I understand that I am free to refuse to participate, or withdraw my child and discontinue participation in the study at any time, without it being held against me or my child in any way.

I understand that privacy will be maintained and that any responses will remain strictly confidential and anonymous. I am also aware that if I have any questions at any time, they will be answered by the researcher.

Signature: _____

Date: _____

Principal: ..... (name) Signature: .....

Date: .....

Teacher Information Sheet/Consent Form

Dear Teacher

My name is Heila Jordaan and I am conducting research for a PhD in Speech Pathology at the University of the Witwatersrand. I am studying the language acquisition abilities of children learning in English in a longitudinal project from grades 1 to 3. The study is entitled: *"DELVing into the acquisition of language for academic purposes by foundation phase English language learners".* I would like to invite you to participate in this study.

If you agree to participate you will be requested to complete a brief questionnaire on your own language background and language teaching strategies. The parents of the learners who are currently in your grade 1 class will be given information sheets and consent forms. The children who participate in the study will be given a simplified description of the study and their verbal consent to participate will also be requested.

If the parents allow their child to participate and the child gives consent, the child will be tested on three short language tests, requiring him/her to look at some pictures and answer questions verbally. The child will also be required to complete a memory test by looking at some pictures on a computer screen and thereafter answering questions. Finally, I will be asking you to provide me with a brief assessment of the learners' reading and writing abilities. Since the testing will be done during school hours, I would like to assure you that I will try to ensure that there is minimal disruption to the academic programme by discussing suitable times with you.

These assessments will be repeated when the children are in grade 3 at which stage the grade 3 teachers will again be invited to participate and complete the questionnaire on language background. At each stage of the project, the teachers will be asked for assessments of the children's language abilities.

Participation in this study is completely voluntary. You are free to refuse to participate and to withdraw at any time during the study. You will not be penalised or disadvantaged in anyway. Furthermore, all responses are strictly confidential and anonymity is assured.

If there are any queries please do not hesitate to contact me through your principal. Your cooperation would be greatly appreciated.

Thank you.

Yours faithfully,

Heila Jordaan (PhD student) Prof. Claire Penn (Supervisor)

PROJECT: *"DELVing into the acquisition of language for academic purposes by foundation phase English language learners"*

I, ... (name and surname) hereby consent to participate in this study. Furthermore, I give the researcher, Heila Jordaan permission to use my responses to the questionnaire in the write up of the study, and in further publications or presentations.

I understand that I am free to refuse to participate or withdraw from participation in this study at any time, without it being held against me in any way.

I understand that privacy will be maintained and that my responses will remain strictly confidential and anonymous. I am also aware that if I have any questions at any time, they will be answered by the researcher.

Signature: _____

Date: _____

Child Assent Form

PROJECT: *"DELVing into the acquisition of language for academic purposes by foundation phase English language learners"*

Hello, my name is Heila. I am studying at university and I am working on this big project. I would like you to be part of my project. The project is about children who speak another language, other than English, just like you do. We are going to look at some pictures in a book and answer some questions. Then we are going to look at some pictures on the computer and answer some questions. I would also like you to write a story for me when I show you some photographs and to write down some answers to questions after I have read a story. When you are in grade 3 I am going to ask you to do these things again. None of this is for marks and if you don't want to do the activities you don't have to. If at any time you do not want to do the activities anymore, just tell me and I will stop. You will not get into trouble if you decide to stop.

Will you help me with this project?

YES

My name is _____

The date today is _____

APPENDIX B

TEACHER QUESTIONNAIRE

Name of Learner: **Name of Teacher:**

Age: **Grade:**

School: **Date:**

Questions about the Learner

What is the learners' home language?

_____

Do you feel that this learner may be "slower" at learning language compared to his age matched classroom peers?

_____
_____
_____

How quickly is this learner able to learn new skills as compared to his other classmates?

_____
_____
_____

What are some of the specific difficulties this learner is experiencing in the classroom?

_____
_____
_____

How is this learner performing academically overall? Has there been progress in his performance since last year?

_____
_____

Please tick the appropriate items that apply to this learner and feel free to comment and expand on where necessary:

Speech and Articulation	
The learner mispronounces sounds and words	
The learners' speech is more hesitant and jerky than a peer of the same age	
Expressive Language	

The learner uses an immature vocabulary (not age appropriate) overuses words such as 'one' and 'thing' or seems to have difficulty recalling or finding the right word	
The learner asks inaccurate or vague questions	
The learners' questions are often poorly formed and difficult to understand	
The learner has difficulty answering questions appropriately	
The learners' sentence structure seems immature	
The learners question and/or negative sentence style is immature or not age appropriate	
The learner has difficulty relating stories or occurrences in an organized and sequenced manner	
Reading and Writing	
The learner has difficulty with reading and writing	
The learner has difficulty with spelling	
Receptive Language	
The learner has difficulty comprehending new words and concepts	
The learner has difficulty understanding what he has just read	
The learner has difficulty understanding what was read to him	
Auditory Processing	
The learner has difficulty following instructions	
It's as if the child is searching for a response or is confused when asked a question or provided an instruction	
The learner appears to be attending to communication but remembers little of what is said	
Instructions often have to be repeated in order for the learner to understand	
The learner does not remember information presented orally	
Social Skills and Use of Language in the Classroom	
The learner interacts with his classmates and peers	

(Obtained and Adapted from Owens, R.E. (2004).Language Disorders- A functional Approach to Assessment and Intervention. Pg 355)

APPENDIX C

SENTENCE REPETITION: REDMOND (2005) STUDY

Name: **Grade:**

Date of testing: **Age:**

EFL/EAL Leaner: **School:**

Scoring

Please write down exactly what participant stated and then score participants response with
2: Correct
1: Three or fewer errors
0: More than four errors or no response
There is **NO ceiling for this test**- and therefore entire test has to completed!

Introducing Scenario

'Listen, I am going to say some sentences. After I have finished, I want you to say exactly what I have said. Say the same thing. Let's try a sentence. Are you ready?
Tom and his brother like to eat all the candy'.

Sentence Recall Probes	**Score**
1. The big football player washed the car with the hose.	
2. All of the pictures were coloured by his little sister.	
3. The rose bushes were planted yesterday by the girl scouts.	
4. The happy little girl kicked the ball over the fence.	
5. His little brother cleaned the dirty dishes and cups.	
6. A special cage was made to hold the dangerous animals.	
7. Everybody in my school coloured Easter eggs for the picnic.	
8. A new hole was dug for the kid's swimming pool.	
9. Only the first graders made a birdhouse for their parents.	

10. My little sister's dog caught the ball on the first bounce.	
11. The soccer ball was kicked into the school's parking lot.	
12. The lion's teeth were cleaned with a giant toothbrush.	
13. Some of the kids dug holes in the sand two feet deep.	
14. The little white mouse was caught by our neighbour's cat.	
15. The second grade students planted coconuts in the garden.	
16. The dirty clothes were washed with soap one more time.	

Total Score:

APPENDIX D

ANOVA Results of comparison between groups (EFL and EAL contexts 1 and 2) in Grades 1 and 2 on syntax, pragmatics and semantics subtests

	Grade 1		Grade 2	
	F value	**Pr>F**	**F value**	**Pr>F**
Wh questions	37.41	<.0001**	13.26	<.0001**
Passives	43.76	<.0001**	25.01	<.0001**
Articles	33.20	<.0001**	24.58	<.0001**
Total Syntax score	78.39	<.0001**	31.50	<.0001**
	Grade 1		**Grade 2**	
	F value	**Pr>F**	**F value**	**Pr>F**
Role Taking	8.41	0.0004**	4.84	0.0092**
Narratives	14.96	<.0001**	5.51	0.0050**
Question Asking	35.47	<.0001**	11.4	<.0001**
Total Pragmatics score	36.93	<.0001**	12.24	<.0001**
	Grade 1		**Grade 2**	
	F value	**Pr>F**	**F value**	**Pr>F**
Verb Contrasts	58.5	<.0001**	36.63	<.0001**
Preposition Contrasts	61.87	<.0001**	9.65	<.0001**
Quantifiers	17.63	<.0001**	6.74	0.0016**
Fast mapping Real Verbs	30.81	<.0001**	36.3	<.0001**
Fast Mapping Non Verbs	2.68	0.0721	4.65	0.0111*
Semantic Total Score	54.74	<.0001**	33.13	<.0001**

** Significant at 1% level

Table: T-tests comparing the EFL group and EAL group in context 1 on syntax subtests in Grades 1 and 2.

	Grade 1		Grade 2	
	t value	**pr>t**	**t value**	**pr>t**
Wh questions	8.3	<.0001**	5.11	<.0001**
Passives	9.19	<.0001**	6.82	<.0001**
Articles	11.2	<.0001**	6.86	<.0001**
Total Syntax score	13.06	<.0001**	8.66	<.0001**

** Significant at 1% level

Table: T-tests comparing the EFL group and EAL group in context 2 on syntax subtests in grades 1 and 2

	Grade 1		Grade 2	
	t- value	**pr>t**	**t value**	**Pr>t**
Wh questions	1.94	0.0551	2.98	0.0037
Passives	0.55	0.5839	1.63	0.1068
Articles	2.68	0.0086**	2.71	0.0081**
Total Syntax score	2.66	0.0093**	7.91	<.0001**

**Significant at 1% level

Table: T-tests comparing EAL groups in contexts 1 and 2 on syntax subtests in Grades 1 and 2

	Grade 1		Grade 2	
	t- value	**pr>t**	**t value**	**Pr>t**
Wh questions	-5.34	<.0001**	-2.32	0.0224*
Passives	-7.53	<.0001**	-4.66	<.0001**
Articles	-6.69	<.0001**	-4.00	<.0001**
Total Syntax score	-8.49	<.0001**	-0.80	0.4278

**Significant at the 1% level

Table: T-tests comparing the EFL group and EAL group in context 1 on Pragmatic subtests in grades 1 and 2.

	Grade 1		Grade 2	
	t value	**pr>t**	**t value**	**pr>t**
Role Taking	5.22	<.0001**	3.16	0.0021**
Narratives	6.25	<.0001**	3.16	0.0021**
Question Asking	9.60	<.0001**	4.22	<.0001**
Total Pragmatics score	9.82	<.0001**	5.19	<.0001**

** Significant at 1% level

Table: T-tests comparing the EFL group and EAL group in context 2 on Pragmatic subtests in grades 1 and 2

	Grade 1		Grade 2	
	t- value	**pr>t**	**t value**	**Pr>t**
Role Taking	2.25	0.0267*	1.75	0.0831
Narratives	1.99	0.0491*	2.85	0.0054**
Question Asking	1.49	0.1387	1.45	0.1492
Total Pragmatics score	2.49	0.0144*	-0.92	0.3588

** Significant at 1% level

Table: T-tests comparing EAL groups in contexts 1 and 2 on Pragmatic subtests in grades 1and 2

	Grade 1		Grade 2	
	t- value	**pr>t**	**t value**	**Pr>t**
Role Taking	-2.38	0.0191*	-1.33	0.1866
Narratives	-3.95	0.0001**	0.05	0.9575
Question Asking	-7.05	<.0001**	-2.98	0.0036**
Total Pragmatics score	-6.23	<.0001**	-4.19	<.0001**

**Significant at the 1% level

Table: T-tests comparing the EFL group and EAL group in context 1 on semantic subtests in Grades 1 and 2

	Grade 1		Grade 2	
	t value	**pr>t**	**t value**	**pr>t**
Verb Contrasts	12.08	0.0001**	8.51	0.0001**
Preposition Contrasts	12.38	0.0001**	3.99	0.0001**
Quantifiers	4.82	0.0001**	3.56	0.0006**
Fast mapping Real Verbs	7.69	0.0001**	7.95	0.0001**
Fast Mapping Novel Verbs	2.24	0.0270*	2.92	0.0043**
Semantic Total Score	11.88	0.0001**		

** Significant at 1% level * Significant at 5% level

Table: T-tests comparing the EFL group and EAL group in context 2 on semantic subtests in grades 1 and 2

	Grade 1		Grade 2	
	t- value	**pr>t**	**t value**	**Pr>t**
Verb Contrasts	3.88	0.0002**	3.81	0.0003*
Preposition Contrasts	3.76	0.0003**	1.28	0.2037
Quantifiers	3.41	0.0009**	0.91	0.3649
Fast mapping Real Verbs	2.62	0.0101*	1.85	0.0671
Fast Mapping Novel Verbs	0.29	0.7741	1.94	0.0556
Semantic Total Score	3.78	0.0003**	3.41	0.0010**

Table: T-tests comparing EAL groups in contexts 1 and 2 on semantic subtests in Grades 1 and 2

	Grade 1		Grade 2	
	t- value	**pr>t**	**t value**	**Pr>t**
Verb Contrasts	-6.87	<.0001**	-4.51	0.0001**
Preposition Contrasts	-6.84	<.0001**	-2.89	0.0047**
Quantifiers	-1.84	0.0682	-2.51	0.0138*
Fast mapping Real Verbs	-4.57	<.0001**	-6.09	0.0001**
Fast Mapping Non Verbs	-1.96	0.0527	-1.09	0.2801
Semantic Total Score	-6.56	</0001**	-5.39	0.0001**

**Significant at the 1% level

APPENDIX E

Table: ANOVA results of comparison between males and females on DELV scores in Grade 1

	EFL		EAL Cont 1		EAL cont 2	
	F value	**Pr>F**	**F value**	**Pr>F**	**F value**	**Pr>F**
Wh Questions	1.61	0.2099	0.08	0.7833	0.88	0.3225
Passives	0.22	0.6413	0.11	0.443	0.18	0.6733
Articles	0.20	0.6597	0.00	0.9883	0.49	0.4866
Total Syntax score	0.97	0.3291	0.00	0.9560	0.87	0.3560
Role Taking	0.06	0.8099	0.18	0.6752	0.00	0.9632
Narratives	2.5	0.1202	0.00	0.9896	1.00	0.3231
Question Asking	0.14	0.7143	0.33	0.5674	2.26	0.1404
Total Pragmatics Score	0.14	0.7093	0.03	0.8697	1.33	0.2551
Verb Contrasts	0.04	0.8453	1.02	0.3165	0.03	0.8531
Preposition Contrasts	0.79	0.3784	0.17	0.6729	0.00	0.9763
Quantifiers	0.00	0.9587	0.02	0.9004	0.00	0.9751
Fast Mapping: RV	3.05	0.0870	0.22	0.6405	4.51	0.0399*
Fast Mapping NV	2.03	0.1602	0.08	0.7807	0.46	0.5036
Total Semantics Score	1.38	0.2458	0.38	0.5485	0.06	\0.8032

Table: ANOVA results of comparison between males and females on DELV scores in Grade 2

	EFL		EAL Cont 1		EAL cont 2	
	F value	**Pr>F**	**F value**	**Pr>F**	**F value**	**Pr>F**
Wh Questions	1.26	0.2682	0.07	0.7931	1.05	0.3107
Passives	1.18	0.2823	0.00	0.9525	0.05	0.8268
Articles	1.36	0.2504	0.24	0.6784	0.00	0.9837
Total Syntax score	0.54	0.4666	0.13	0.7160	1.36	0.2468
Role Taking	2.26	0.1398	0.87	0.3538	0.30	0.5848
Narratives	5.36	0.0254*	0.04	0.8358	0.05	0.8239
Question Asking	3.51	0.0676	0.00	0.9841	1.19	0.2812
Total Pragmatics score	0.18	0.6738	0.11	0.7397	1.56	0.2188
Verb Contrast	0.05	0.8225	0.34	0.5651	0.44	0.5109
Preposition Contrast	0.31	0.5784	0.31	0.5799	7.47	0.0090*
Quantifiers	0/.11	0.7391	0.02	0.8936	0.10	0.7510
Fast Mapping: RV	0.84	0.3632	0.04	0.8434	1.14	0.2919
Fast Mapping: NV	1.46	0.2330	1.80	0.1857	0.79	0.3797
Total Semantics Score	0.80	0.3746	3.15	0.2885	0.03	0.8655

APPENDIX F

Means and Range of scores obtained by the typically developing age matched EAL learners on each section of the syntax, semantics and pragmatics subtests of the DELV-CR in grades 1 and 2

Subtest	Max Possible Score	EAL (Context 1)				EAL (Context 2)				EFL			
		Mean		Range		Mean		Range		Mean		Range	
		Gr 1	Gr 2	Gr 1	Gr 2	Gr 1	Gr 2	Gr 1	Gr 2	Gr 1	Gr 2	Gr 1	Gr 2
SYNTAX													
Wh-questions	14	9.4	11.9	2-14	6- 14	12.4	12.8	2-14	8- 14	13.3	13.6	6- 14	10-14
Passives	10	4.2	5.7	0-8	2- 9	6.7	7.4	3- 10	3- 10	6.9	7.9	5- 10	5- 10
Articles	8	2.8	4.7	0-8	0- 7	5.4	6.1	0- 8	3- 8	6.5	6.9	1-8	4- 8
TOTAL	32	16.6	22.4	3-27	10-30	24.7	26.4	10-32	15-32	26.8	28.5	14-30	21-32
SEMANTICS													
Verb Contrast	10	3.7	5.6	0-9	1- 9	6.6	7.4	2- 10	3-10	8	8.6	4- 10	5- 10
Preposition Contrast	6	2.9	4.5	0-6	2- 6	4.7	5.2	1- 6	2- 6	5.5	5.4	3- 6	2- 6
Quantifiers	9	5.87	6.5	2-9	3- 9	6.6	7.2	4- 9	4- 9	7.5	7.5	3 -9	4- 9
Fast Mapping: RV	9	4.18	4.6	1-9	1- 7	5.5	6.3	2- 8	3- 9	6.2	6.8	3- 9	3- 9
Fast Mapping: NV	12	5.18	5.9	0-11	0- 10	6.1	6.5	0- 10	2- 11	6.3	7.4	1-11	1- 11
TOTAL	46	21.8	27.18	7- 34	14-36	29.1	32.61	16-37	17-40	33.3	35.78	24-41	26-44
PRAGMATICS													
Role Taking	8	5.1	6.5	2- 8	2- 8	6.0	7.0	2- 8	2- 8	6.9	7.5	2- 8	2- 8
Narratives	7	3.5	4.5	0- 7	0- 7	4.6	4.6	2- 6	0- 7	5.1	5.4	2- 7	2- 7
Question Answer	9	2.5	6.1	0- 8	0- 9	6.3	7.6	0- 9	0- 9	7.1	8.0	0-9	5- 9
TOTAL	24	11.31	17.2	4- 21	6- 24	17	19.7	5- 23	4- 24	19.1	21	14-23	15-24

Mean raw scores, standard deviations and raw scores corresponding to 1 and 2 standard deviations below the mean (rounded off to nearest whole number) obtained by each of the typically developing EAL and EFL learners on each DELV-CR domain in each grade.

DELV-CR	Statistics	EFL			EAL Cont 1			EAL Cont 2		
		Grd 1 n=51	Grd 2 n= 46	Grd 3 n=41	Grd 1 n=70	Grd 2 n=55	Grd 3 n=53	Grd 1 n= 48	Grd 2 n= 45	Grd 3 n= 40
Syntax	Mean Raw Score	26.8	28.5	29.5	16.6	22.4	24.7	24.7	26.3	27.4
	Standard Dev	3.39	2.37	2.06	4.68	4.3	4.24	5.27	3.54	3.79
	1 SD< mean	23.4	26.22	27.44	11.92	18.1	20.46	19.43	22.89	23.60
	Rounded off	23	26	27	12	18	20	19	23	23
	2SD< mean	20.02	23.85	25.38	7.24	13.80	16.22	14.16	19.35	19.82
	Rounded off	20	24	25	7	14	16	14	19	20
Pragmatics	Mean Raw Score	19.2	21	21.7	11.3	17.2	19.1	17	19.7	21.02
	Standard Dev	3.42	2.08	1.51	5.02	4.51	3.11	5.02	3.73	2.41
	1SD< mean	15.78	18.92	20.19	6.28	12.7	15.99	11.98	15.44	18.61
	Rounded off	16	19	20	6	13	16	12	15	19
	2SD< mean	12.36	16.84	18.68	1.26	8.24	12.88	6.96	11.71	16.20
	Rounded off	12	17	19	1	8	13	7	11	16
Semantics	Mean Raw Score	33.3	35.78	38	21.9	27.18	30.4	29.15	32.61	35.4
	Standard Dev	4.86	4.47	3.62	5.60	5.48	5.99	6.33	4.46	4.63
	1SD< mean	28.44	31.31	34.38	16.30	21.7	24.41	22.82	28.15	30.7
	Rounded off	28	31	34	16	22	24	23	29	31
	2SD< mean	23.58	26.84	30.76	10.07	16.22	18.42	16.49	23.69	26.14
	Rounded off	24	27	31	10	16	18	17	24	26

APPENDIX G

Table: T test calculations to locate the significant differences between the EAL learners in context one and the EFL learners on the different subtests of the DELV-CR test in grade one

Wh Questions	**Variable 1**	**Variable 2**
Mean	7.4	12.8
Variance	9.82222222	3.2
Observations	10	5
Hypothesized Mean Difference	0	
df	13	
t Stat	-4.2397338	
P(T<=t) one-tail	0.00048272	
t Critical one-tail	1.77093338	
P(T<=t) two-tail	0.00096545	
t Critical two-tail	2.16036865	

Passives	**Variable 1**	**Variable 2**
Mean	3.8	5.6
Variance	0.844444444	2.3
Observations	10	5
Hypothesized Mean Difference	0	
df	6	
t Stat	-2.439471338	
P(T<=t) one-tail	0.025253982	
t Critical one-tail	1.943180274	
P(T<=t) two-tail	0.050507965	
t Critical two-tail	2.446911846	

Articles	**Variable 1**	**Variable 2**
Mean	2.8	6.6
Variance	1.73333333	2.8
Observations	10	5
Hypothesized Mean Difference	0	
df	7	
t Stat	-4.437444	
P(T<=t) one-tail	0.0015085	
t Critical one-tail	1.8945786	
P(T<=t) two-tail	0.003017	
t Critical two-tail	2.36462425	

Total Syntax	**Variable 1**	**Variable 2**
Mean	14	25
Variance	12.66666667	22
Observations	10	5
Hypothesized Mean Difference	0	
df	6	
t Stat	-4.620924277	
P(T<=t) one-tail	0.001805928	
t Critical one-tail	1.943180274	
P(T<=t) two-tail	0.003611855	
t Critical two-tail	2.446911846	

Role Taking	**Variable 1**	**Variable 2**
Mean	3.8	6.4
Variance	2.17777778	4.8
Observations	10	5
Hypothesized Mean Difference	0	
df	6	
t Stat	-2.395751	

Narratives	**Variable 1**	**Variable 2**
Mean	2.7	4.2
Variance	1.788888889	0.7
Observations	10	5
Hypothesized Mean Difference	0	
df	12	
t Stat	-	

P(T<=t) one-tail	0.02680218	
t Critical one-tail	1.94318027	
P(T<=t) two-tail	0.05360436	
t Critical two-tail	2.44691185	

	2.656266012	
P(T<=t) one-tail	0.010467667	
t Critical one-tail	1.782287548	
P(T<=t) two-tail	0.020935335	
t Critical two-tail	2.178812827	

Question Answer planning	**Variable 1**	**Variable 2**
Mean	0.5	5.6
Variance	2.5	18.3
Observations	10	5
Hypothesized Mean Difference	0	
df	5	
t Stat	-2.5791809	
P(T<=t) one-tail	0.02474061	
t Critical one-tail	2.01504837	
P(T<=t) two-tail	0.04948122	
t Critical two-tail	2.57058183	

Total Pragmatics	**Variable 1**	**Variable 2**
Mean	7	16.2
Variance	10.66666667	24.2
Observations	10	5
Hypothesized Mean Difference	0	
df	6	
t Stat	-3.785441996	
P(T<=t) one-tail	0.004560984	
t Critical one-tail	1.943180274	
P(T<=t) two-tail	0.009121969	
t Critical two-tail	2.446911846	

Fast Mapping: Novel Words	**Variable 1**	**Variable 2**
Mean	4	7
Variance	1.11111111	6
Observations	10	5
Hypothesized Mean Difference	0	
df	5	
t Stat	-2.6200013	
P(T<=t) one-tail	0.02354884	
t Critical one-tail	2.01504837	
P(T<=t) two-tail	0.04709769	
t Critical two-tail	2.57058183	

Preposition Contrasts	**Variable 1**	**Variable 2**
Mean	2.2	5.8
Variance	2.177777778	0.2
Observations	10	5
Hypothesized Mean Difference	0	
df	12	
t Stat	-7.090547374	
P(T<=t) one-tail	6.32091E-06	
t Critical one-tail	1.782287548	
P(T<=t) two-tail	1.26418E-05	
t Critical two-tail	2.178812827	

Total Semantics	**Variable 1**	**Variable 2**
Mean	17	33
Variance	8.88888889	36
Observations	10	5
Hypothesized Mean Difference	0	
df	5	
t Stat	-5.6256868	
P(T<=t) one-tail	0.00122905	

Verb Contrasts	**Variable 1**	**Variable 2**
Mean	1.900000000	8
Variance	1.877777778	1.5
Observations	10.000000000	5
Hypothesized Mean Difference	0.000000000	
df	9.000000000	
t Stat	-8.734113466	
P(T<=t) one-tail	0.000005452	

t Critical one-tail	2.01504837		t Critical one-tail	1.833112923	
P(T<=t) two-tail	0.00245809		P(T<=t) two-tail	0.000010905	
t Critical two-tail	2.57058183		t Critical two-tail	2.262157158	

Table: T test calculations to locate the significant differences between the EAL learners in context one and two on the different subtests of the DELV-CR test in grade two

Verb Contrast	**Variable 1**	**Variable 2**
Mean	3.3	5.5
Variance	0.9	4.3
Observations	10	6
Hypothesized Mean Difference	0	
df	6	
	-	
t Stat	2.449489743	
P(T<=t) one-tail	0.024912631	
t Critical one-tail	1.943180274	
P(T<=t) two-tail	0.049825262	
t Critical two-tail	2.446911846	

Total Semantics	**Variable 1**	**Variable 2**
Mean	20.6	26.666667
Variance	13.37777778	38.666667
Observations	10	6
Hypothesized Mean Difference	0	
df	7	
	-	
t Stat	2.174694816	
P(T<=t) one-tail	0.033078432	
t Critical one-tail	1.894578604	
P(T<=t) two-tail	0.066156864	
t Critical two-tail	2.364624251	

Wh Questions	**Variable 1**	**Variable 2**
Mean	9.2	12.333333
Variance	1.955555556	5.4666667
Observations	10	6
Hypothesized Mean Difference	0	
df	7	
	-	
t Stat	2.978503977	
P(T<=t) one-tail	0.0102792	
t Critical one-tail	1.894578604	
P(T<=t) two-tail	0.0205584	
t Critical two-tail	2.364624251	

Passives	**Variable 1**	**Variable 2**
Mean	4	5.6666667
Variance	2.888888889	3.0666667
Observations	10	6
Hypothesized Mean Difference	0	
df	10	
	-	
t Stat	1.863389981	
P(T<=t) one-tail	0.046000769	
t Critical one-tail	1.812461102	
P(T<=t) two-tail	0.092001539	
t Critical two-tail	2.228138842	

Total Syntax	**Variable 1**	**Variable 2**
Mean	16.9	23
Variance	11.43333333	18.8
Observations	10	6
Hypothesized Mean Difference	0	

Question Answer	**Variable 1**	**Variable 2**
Mean	2.6	6.1666667
Variance	12.48888889	6.1666667
Observations	10	6
Hypothesized Mean Difference	0	

df	9	
t Stat	-2.949695151	
P(T<=t) one-tail	0.008114484	
t Critical one-tail	1.833112923	
P(T<=t) two-tail	0.016228968	
t Critical two-tail	2.262157158	

df	13	
t Stat	-2.363811268	
P(T<=t) one-tail	0.017165134	
t Critical one-tail	1.770933383	
P(T<=t) two-tail	0.034330269	
t Critical two-tail	2.160368652	

Table: T test calculations to locate the significant differences between the EAL learners in context one and the EFL learners on the different subtests of the DELV-CR test in grade two

Verb Contrast	**Variable 1**	**Variable 2**
Mean	3.30000000	8.20000000
Variance	0.90000000	0.70000000
Observations	10.00000000	5.00000000
Hypothesized Mean Difference	0.00000000	
df	9.00000000	
t Stat	-10.21720629	
P(T<=t) one-tail	0.00000150	
t Critical one-tail	1.83311292	
P(T<=t) two-tail	0.00000299	
t Critical two-tail	2.26215716	

Fast mapping: RV	**Variable 1**	**Variable 2**
Mean	3.9	6.6
Variance	3.65555556	0.3
Observations	10	5
Hypothesized Mean Difference	0	
df	11	
t Stat	-4.13890666	
P(T<=t) one-tail	0.00082354	
t Critical one-tail	1.79588481	
P(T<=t) two-tail	0.00164709	
t Critical two-tail	2.20098516	

Total Semantics	**Variable 1**	**Variable 2**
Mean	20.6	30.6
Variance	13.3777778	14.3
Observations	10	5
Hypothesized Mean Difference	0	
df	8	
t Stat	-4.8807918	
P(T<=t) one-tail	0.00061157	
t Critical one-tail	1.85954803	
P(T<=t) two-tail	0.00122313	
t Critical two-tail	2.30600413	

Wh Questions	**Variable 1**	**Variable 2**
Mean	9.2	11.6
Variance	1.9555556	0.8
Observations	10	5
Hypothesized Mean Difference	0	
df	12	
t Stat	-4.024922	
P(T<=t) one-tail	0.0008422	
t Critical one-tail	1.7822875	
P(T<=t) two-tail	0.0016845	
t Critical two-tail	2.1788128	

Passives	**Variable 1**	**Variable 2**
Mean	4	6.4
Variance	2.88888889	1.8

Articles	**Variable 1**	**Variable 2**
Mean	3.7	6.2
Variance	2.4555556	0.7

Observations	10	5
Hypothesized Mean Difference	0	
df	10	
t Stat	-2.9793812	
P(T<=t) one-tail	0.00691115	
t Critical one-tail	1.8124611	
P(T<=t) two-tail	0.0138223	
t Critical two-tail	2.22813884	

Observations	10	5
Hypothesized Mean Difference	0	
df	13	
t Stat	-4.026211	
P(T<=t) one-tail	0.0007197	
t Critical one-tail	1.7709334	
P(T<=t) two-tail	0.0014393	
t Critical two-tail	2.1603687	

Total Syntax	**Variable 1**	**Variable 2**
Mean	16.9	24.2
Variance	11.4333333	4.2
Observations	10	5
Hypothesized Mean Difference	0	
df	12	
t Stat	-5.1835227	
P(T<=t) one-tail	0.000114	
t Critical one-tail	1.78228755	
P(T<=t) two-tail	0.00022801	
t Critical two-tail	2.17881283	

Question Answer Planning	**Variable 1**	**Variable 2**
Mean	2.6	8.2
Variance	12.488889	0.7
Observations	10	5
Hypothesized Mean Difference	0	
df	11	
t Stat	-4.751758	
P(T<=t) one-tail	0.000299	
t Critical one-tail	1.7958848	
P(T<=t) two-tail	0.000598	
t Critical two-tail	2.2009852	

Total Pragmatics	**Variable 1**	**Variable 2**
Mean	10.9	19
Variance	20.9888889	6.5
Observations	10	5
Hypothesized Mean Difference	0	
df	13	
t Stat	-4.3935597	
P(T<=t) one-tail	0.00036311	
t Critical one-tail	1.77093338	
P(T<=t) two-tail	0.00072623	
t Critical two-tail	2.16036865	

Table: T test calculations to locate the significant differences between the EAL learners in context two and the EFL learners on the different subtests of the DELV-CR test in grade two

Verb Contrast	**Variable 1**	**Variable 2**
Mean	5.5	8.2
Variance	4.3	0.7
Observations	6	5
Hypothesized Mean Difference	0	
df	7	
	-	
t Stat	2.917143745	
P(T<=t) one-tail	0.011215539	
t Critical one-tail	1.894578604	
P(T<=t) two-tail	0.022431079	
t Critical two-tail	2.364624251	

Articles	**Variable 1**	**Variable 2**
Mean	4.833333333	6.2
Variance	2.166666667	0.7
Observations	6	5
Hypothesized Mean Difference	0	
df	8	
	-	
t Stat	1.930614598	
P(T<=t) one-tail	0.044817803	
t Critical one-tail	1.859548033	
P(T<=t) two-tail	0.089635606	
t Critical two-tail	2.306004133	

Table: T test calculations to locate the significant differences between the EAL learners in context one and two on the different subtests of the DELV-CR test in grade three

Quantifiers	**Variable 1**	**Variable 2**
Mean	6.777777778	7.5
Variance	0.944444444	0.3
Observations	9	6
Hypothesized Mean Difference	0	
df	13	
t Stat	-1.83481167	
P(T<=t) one-tail	0.044756466	
t Critical one-tail	1.770933383	
P(T<=t) two-tail	0.089512931	
t Critical two-tail	2.160368652	

Articles	**Variable 1**	**Variable 2**
Mean	3.888888889	5.5
Variance	2.361111111	2.3
Observations	9	6
Hypothesized Mean Difference	0	
df	11	
	-	
t Stat	2.005012838	
P(T<=t) one-tail	0.035099143	
t Critical one-tail	1.795884814	
P(T<=t) two-tail	0.070198287	
t Critical two-tail	2.200985159	

Table: T test calculations to locate the significant differences between the EAL learners in context one and the EFL learners on the different subtests of the DELV-CR test in grade three

Verb Contrast	**Variable 1**	**Variable 2**
Mean	5.66666667	9.2
Variance	2.75	0.7
Observations	9	5
Hypothesized Mean Difference	0	
df	12	
t Stat	-5.2933874	
P(T<=t) one-tail	0.00009519	
t Critical one-tail	1.78228755	
P(T<=t) two-tail	0.00019039	
t Critical two-tail	2.17881283	

Preposition Contrast	**Variable 1**	**Variable 2**
Mean	3.66666667	5.2
Variance	1.25	1.7
Observations	9	5
Hypothesized Mean Difference	0	
df	7	
t Stat	-2.21574203	
P(T<=t) one-tail	0.03113365	
t Critical one-tail	1.8945786	
P(T<=t) two-tail	0.06226731	
t Critical two-tail	2.36462425	

Fast Mapping: Reavl Verbs	**Variable 1**	**Variable 2**
Mean	4	7.2
Variance	4.25	1.2
Observations	9	5
Hypothesized Mean Difference	0	
df	12	
t Stat	-3.791772	
P(T<=t) one-tail	0.00128398	
t Critical one-tail	1.78228755	
P(T<=t) two-tail	0.00256796	
t Critical two-tail	2.17881283	

Total Semantics	**Variable 1**	**Variable 2**
Mean	25.88888889	35.2
Variance	25.61111111	16.7
Observations	9	5
Hypothesized Mean Difference	0	
df	10	
t Stat	-3.74375844	
P(T<=t) one-tail	0.00191142	
t Critical one-tail	1.8124611	
P(T<=t) two-tail	0.00382284	
t Critical two-tail	2.22813884	

Wh Questions	**Variable 1**	**Variable 2**
Mean	10.2222222	12.8
Variance	2.44444444	3.2
Observations	9	5
Hypothesized Mean Difference	0	
df	7	
t Stat	-2.6998656	
P(T<=t) one-tail	0.01532249	
t Critical one-tail	1.8945786	
P(T<=t) two-tail	0.03064499	
t Critical two-tail	2.36462425	

Passives	**Variable 1**	**Variable 2**
Mean	5.11111111	8
Variance	3.61111111	3.5
Observations	9	5
Hypothesized Mean Difference	0	
df	9	
t Stat	-2.75290307	
P(T<=t) one-tail	0.01118516	
t Critical one-tail	1.83311292	
P(T<=t) two-tail	0.02237033	
t Critical two-tail	2.26215716	

Articles	**Variable 1**	**Variable 2**
Mean	3.88888889	7.6

Total Syntax	**Variable 1**	**Variable 2**
Mean	19.22222222	28.4

Variance	2.36111111	0.3
Observations	9	5
Hypothesized Mean Difference	0	
df	11	
t Stat	-6.5364664	
P(T<=t) one-tail	0.00002106	
t Critical one-tail	1.79588481	
P(T<=t) two-tail	0.00004212	
t Critical two-tail	2.20098516	

Variance	7.194444444	7.3
Observations	9	5
Hypothesized Mean Difference	0	
df	8	
t Stat	-6.10580088	
P(T<=t) one-tail	0.000143814	
t Critical one-tail	1.859548033	
P(T<=t) two-tail	0.000287627	
t Critical two-tail	2.306004133	

Role Taking	**Variable 1**	**Variable 2**
Mean	5.11111111	8
Variance	6.11111111	0
Observations	9	5
Hypothesized Mean Difference	0	
df	8	
t Stat	-3.5058393	
P(T<=t) one-tail	0.00400513	
t Critical one-tail	1.85954803	
P(T<=t) two-tail	0.00801025	
t Critical two-tail	2.30600413	

Narratives	**Variable 1**	**Variable 2**
Mean	4.111111111	5.8
Variance	1.611111111	0.7
Observations	9	5
Hypothesized Mean Difference	0	
df	11	
t Stat	-2.99018001	
P(T<=t) one-tail	0.006146871	
t Critical one-tail	1.795884814	
P(T<=t) two-tail	0.012293741	
t Critical two-tail	2.200985159	

Question Answer Planning	**Variable 1**	**Variable 2**
Mean	5.44444444	7.6
Variance	7.52777778	2.3
Observations	9	5
Hypothesized Mean Difference	0	
df	12	
t Stat	-1.893156	
P(T<=t) one-tail	0.04134865	
t Critical one-tail	1.78228755	
P(T<=t) two-tail	0.08269731	
t Critical two-tail	2.17881283	

Total Pragmatics	**Variable 1**	**Variable 2**
Mean	14.66666667	21.4
Variance	6.5	2.8
Observations	9	5
Hypothesized Mean Difference	0	
df	11	
t Stat	-5.94632258	
P(T<=t) one-tail	0.000048	
t Critical one-tail	1.795884814	
P(T<=t) two-tail	0.000096	
t Critical two-tail	2.200985159	

Table: T test calculations to locate the significant differences between the EAL learners in context two and the EFL learners on the different subtests of the DELV-CR test in grade three

Verb Contrast	**Variable 1**	**Variable 2**
Mean	6.666666667	9.2
Variance	1.066666667	0.7
Observations	6	5
Hypothesized Mean Difference	0	
df	9	
t Stat	-4.49397421	
P(T<=t) one-tail	0.000750953	
t Critical one-tail	1.833112923	
P(T<=t) two-tail	0.001501907	
t Critical two-tail	2.262157158	

Fast Mapping: Real Verbs	**Variable 1**	**Variable 2**
Mean	4.833333333	7.2
Variance	3.366666667	1.2
Observations	6	5
Hypothesized Mean Difference	0	
df	8	
t Stat	2.644178176	
P(T<=t) one-tail	0.014760642	
t Critical one-tail	1.859548033	
P(T<=t) two-tail	0.029521284	
t Critical two-tail	2.306004133	

Total Semantics	**Variable 1**	**Variable 2**
Mean	29.66666667	35.2
Variance	24.66666667	16.7
Observations	6	5
Hypothesized Mean Difference	0	
df	9	
t Stat	-2.02710532	
P(T<=t) one-tail	0.036638155	
t Critical one-tail	1.833112923	
P(T<=t) two-tail	0.07327631	
t Critical two-tail	2.262157158	

Passives	**Variable 1**	**Variable 2**
Mean	5.5	8
Variance	1.9	3.5
Observations	6	5
Hypothesized Mean Difference	0	
df	7	
t Stat	2.479423518	
P(T<=t) one-tail	0.021122884	
t Critical one-tail	1.894578604	
P(T<=t) two-tail	0.042245768	
t Critical two-tail	2.364624251	

Articles	**Variable 1**	**Variable 2**
Mean	5.5	7.6
Variance	2.3	0.3
Observations	6	5
Hypothesized Mean Difference	0	
df	6	
t Stat	3.153944898	
P(T<=t) one-tail	0.009857904	
t Critical one-tail	1.943180274	
P(T<=t) two-tail	0.019715807	
t Critical two-tail	2.446911846	

Total Syntax	**Variable 1**	**Variable 2**
Mean	22	28.4
Variance	15.6	7.3
Observations	6	5
Hypothesized Mean Difference	0	
df	9	
t Stat	3.176266669	
P(T<=t) one-tail	0.005626038	
t Critical one-tail	1.833112923	
P(T<=t) two-tail	0.011252075	
t Critical two-tail	2.262157158	

APPENDIX H

Table: Mean, Standard Deviation and Range of scores obtained for the Reading Comprehension Test for the typically developing aged matched EAL and EFL learners in grade two and three

Reading Comprehension		
	Grade 2	**Grade 3**
EAL Cont 1		
Group mean	7.05	7.53
Standard deviation	6.70	7.63
Range	0- 26	0- 27
EAL Cont 2		
Group mean	9.02	16.58
Standard Deviation	8.36	10.46
Range	0- 28	0-37
EFL		
Group Mean	12.93	18.59
Standard Deviation	9.39	11.28
Range	1- 27	1- 36

Table: Mean, Standard Deviation and Range of scores obtained from the Teacher Ratings for the typically developing aged matched EAL and EFL learners in grade one

Subtest	**Max possible Score**	**EAL (Context 1)**			**EAL (Context 2)**			**EFL**		
		Mean	**Range**	**SD**	**Mean**	**Range**	**SD**	**Mean**	**Range**	**SD**
Oral Communication	**5**	2.35	1- 4	0.90	3.24	2-5	0.94	4.02	3- 5	0.88
Reading Comprehension	**5**	1.91	1- 2.8	0.72	2.89	1-5	1.20	3.84	1- 5	1.04
Written Language	**5**	1.35	1- 2.5	0.44	2.79	1-5	1.21	3.74	1.3- 5	1.09

APPENDIX I

Table: ANOVA results of comparison between males and females on Working Memory Scores in Grade 2

	EFL		EAL cont 1		EAL cont 2	
	F value	**Pr>F**	**F value**	**Pr>F**	**F value**	**Pr>F**
Digit Repetition	1.62	0.2189	1.53	0.2221	0.34	0.5660
Dot matrix	0.00	0.9479	8.51	0.0052**	0.51	0.4825
Listening Recall	0.94	0.3439	2.96	0.0911	0.12	0.7364
Sentence Recall	0.97	0.3374	0.36	0.5492	4.93	0.0374*
Processing Sentence Recall	1.70	0.2076	3.32	0.0742	1.60	0.2197
Processing Listening	0.20	0.6566	2.47	0.1223	0.23	0.6381

Table: T-tests comparing the different language groups on the Working Memory Measures in Grade 2

	EFL and EAL cont 1		EFL and EAL cont 2		EAL cont 1 and 2	
	T value	**Pr>t**	**T value**	**Pr>t**	**T value**	**Pr>t**
Digit Repetition	2.64	0.0100**	0.26	0.7986	-2.36	0.0211*
Dot matrix	5.05	<.0001**	2.53	0.0154*	-2.06	0.0432*
Listening Recall	3.69	0.0004**	0.60	0.5534	-2.68	0.0090**
Sentence Recall	2.84	0.0058**	0.65	*0.5170*	-1.68	0.0969
Processing Sentence Recall	7.05	<.0001**	*0.34*	*0.7383*	-5.45	<.0001
Processing Listening	4.68	<0.0001**	*2.85*	*0.0112*	-1.15	0.2556

APPENDIX J

Table: Mean and Range of scores obtained for each subtest of the AWMA, Non-word Repetition Test and Sentence Repetition for the typically developing age matched EFL and EAL learners in grade two

Subtest	Maximum Possible Score	EFL		EAL (Context 1)		EAL (Context 2)	
		Mean	Range	Mean	Range	Mean	Range
AWMA							
Digit Repetition	-	25.66	21-32	23.28	16 – 29	25.79	19-35
Dot Matrix	-	19.95	15-24	15.91	10 – 23	17.75	12-25
Listening Recall	-	9.19	2 – 14	6.36	1 – 14	8.71	2-16
Processing Listening Recall	-	20.71	5 – 44	9.69	1 – 22	19.63	5-53
Spatial Recall	-	15	10 – 21	12.05	1 – 20	14.54	5-25
Processing Spatial Recall	-	37.09	16 – 60	22.63	1 – 54	28.5	8-76
NON WORD REPETITION							
1 syllable	100%	100%	100%	98%	75-100%	100%	100%
2 syllables	100%	100%	100%	97%	62.5-100%	99%	88-100%
3 syllables	100%	95%	50-100%	89%	25-100%	99.5%	100%
4 syllables	100%	83.2%	44-100%	89.7%	26.4-100%	92%	63-100%
TOTAL	100%	95%	75-100%	89%	56-100%	97.78%	87.5-100%
SENTENCE REPETITION							
Sentence Recall Probes Total	32	26.51	17- 32	16.87	0- 30	23.325	0- 32

APPENDIX K

Table: Sentence Repetition Scores of the EAL-SLI learners in context one and two and the EAL learners in context one and two who performed 1SD or 2SD below the mean on one or more of the various DELV-CR subtests in grade one

		Learners	Sentence Recall Score
EAL Context 1	Learners who obtained scores 1SD or 2SD below the mean on two or more subtests in grade one but did not improve from grade one to two or grade two to three (EAL-SLI learners)	1	3
		2	13
		3	4
		4	-
		5	17
		6	18
		7	14
		8	16
		9	9
		10	9
	Learners who obtained scores 1SD or 2SD below the mean on one subtest in grade one but improved from grade two to grade three	11	19
		12	24
		13	17
		14	16
		15	23
		16	18
		17	25
	Learners who obtained scores 1SD or 2SD below the mean on one subtest in grade one but did not improve from grade two to grade three	18	7
		19	-
		20	14
		21	10
		22	14
		23	16
EAL Context 2	Learners who obtained scores 1SD or 2SD below the mean on two or more subtests in grade one but did not improve from grade one to two or grade two to three (EAL-SLI learners)	24	0
		25	6
		26	20
		27	19
		28	15

		29	14
	Learners who obtained scores 1SD or 2SD below the mean on one subtest in grade one but improved from grade two to grade three	30	24
		31	24
		32	24
	Learners who obtained scores 1SD or 2SD below the mean on one subtest in grade one but did not improve from grade two to grade three	33	-
		34	18
		35	6
		36	21
		37	-
		38	30

= Learners who obtained SR scores below the mean of their aged matched peers

Table: T test calculations to determine whether there were significant differences between the EAL-SLI learners performance in context one and the typically developing age matched EAL learners in context one

	Variable 1	*Variable 2*
Mean	11.4444444444444	16.8679245283019
Variance	30.2777777777778	46.6168359941945
Observations	9	53
Hypothesized Mean Difference	0	
df	13	
t Stat	-2.63270754406389	
P(T<=t) one-tail	0.0103403568631368	
t Critical one-tail	1.77093338264828	
P(T<=t) two-tail	0.0206807137262737	
t Critical two-tail	2.16036865224854	

Table: T test calculations to determine whether there were significant differences between the EAL-SLI learners in context one and those EAL learners who performed 1SD or 2SD below the mean on the DELV-CR test in grade one but improved from grade two to grade three

	Variable 1	*Variable 2*
Mean	11.4444444444444	20.2857142857143
Variance	30.2777777777778	13.2380952380953
Observations	9	7
Hypothesized Mean Difference	0	
df	14	
t Stat	-3.85668046732598	
P(T<=t) one-tail	0.000872211305662107	
t Critical one-tail	1.76131011506196	
P(T<=t) two-tail	0.00174442261132421	
t Critical two-tail	2.14478668128208	

Table: T test calculations to determine whether there were any significant differences between the EAL-SLI learners performance in context two and the typically developing age matched EAL learners in context two in grade two

	Variable 1	*Variable 2*
Mean	12.3333333333333	23.325
Variance	61.0666666666667	57.3019230769231
Observations	6	40
Hypothesized Mean Difference	0	
df	6	
t Stat	-3.2258290239849	
P(T<=t) one-tail	0.00900233270558126	
t Critical one-tail	1.94318027429198	
P(T<=t) two-tail	0.0180046654111625	
t Critical two-tail	2.44691184643268	

Table: T test calculations to determine whether there were significant differences between the EAL-SLI learners in context two and those EAL learners who performed 1SD or 2SD below the mean on the DELV-CR test in grade one but improved from grade two to grade three

	Variable 1	*Variable 2*
Mean	12.3333333333333	24
Variance	61.0666666666667	0
Observations	6	3
Hypothesized Mean Difference	0	
df	5	
t Stat	-3.65696082087501	
P(T<=t) one-tail	0.00732066169353289	
t Critical one-tail	2.01504837208812	
P(T<=t) two-tail	0.0146413233870658	
t Critical two-tail	2.57058183469754	