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Delving into the development of academic language by foundation phase English language learners.

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CHAPTER 1

INTRODUCTION

Language and knowledge about language are no longer a central focus of the educational process. It is time for critical pedagogy to take seriously and to heart issues of language, since not doing so will continue to lead to a flawed understanding of oppression in and the liberating potential of education (Reagan, 2009, p. viii).

Following the euphoria and excitement of the transition to democracy in 1994, language issues and educational reform have been at the forefront of considerable debate, policy-making and controversy in South Africa.

This thesis deals with the critical role of language in the early stages of education and demonstrates by means of a longitudinal and large scale study that there is substantial cause for concern. The study has important implications for policy and practice as South Africa moves towards its third decade of democracy and grapples with the challenges of producing well-educated, literate citizens.

This project is the culmination of more than 25 years of teaching and clinical experience in child language development and disorders. It draws on a body of my own research on language in education, which I shall refer to in the relevant sections of this thesis. The study also stems from my personal experiences as a child learning in English as a second language and a firm belief in the cognitive, educational and social advantages of bi-/multilingualism.

With its 11 official languages, South Africa provides the ideal context for developing multilingualism and truly exploiting these advantages, but this has not happened. Instead we are currently confronted with significant and complex educational challenges (Fleisch, 2008; Webb, Lafon & Pare, 2010; Alexander, 2010). A number of recent large scale national and international research projects has unequivocally shown that the majority of South African children have very low literacy and numeracy levels (Department of Education, 2005a; Reddy, 2005; Moloi & Strauss, 2005; Howie, Venter, van Staden, Zimmerman, Long, Scherman & Archer, 2008; Taylor & Yu, 2008).The most recent national systemic evaluation of literacy and numeracy in some 9 million grade 3 and 6 pupils, revealed that in Gauteng, where the present study was conducted, nearly 70% of grade 3 pupils cannot read or count (Mtshali & Smillie, 2011). In short, the state of primary school education is dismal.

Although the problems in education are exacerbated by conditions of poverty, ill health (e.g., HIV/AIDS) and poor teaching quality (Fleisch, 2008), which are explored in detail in later chapters, many educational researchers are convinced that the main reason for the poor performance of South African school children is that the majority are learning English, which is their second or third language (Heugh, 2009; Brock-Utne & Skattum, 2009; Alexander, 2010). While it is true that English is dominant in South Africa, both in the public domain and in education, the effects of language-in-education practices are not straightforward. There is a complex interaction of factors causing the poor achievement of South African children, and the existing research has yielded inconsistent results.

For example, one of my research projects (Morrow, Jordaan & Fridjhon, 2005) provided evidence for the complexity of the effects of language-in-education practices. This study is described in more detail in chapter 3, but in summary it showed that grade 5 urban children who had received instruction in English did significantly better on a test of conceptual understanding than children who had received instruction in both isiZulu and English in rural and township schools.

1.1. WHAT ARE THE REASONS FOR THE POOR ACHIEVEMENT OF SOUTH AFRICAN SCHOOLCHILDREN?

The central argument in this study is that the disturbingly low literacy and numeracy levels are due in large part to a lack of acknowledgement of the critical role of language in education. Within a multilingual context such as South Africa, where it is not only desirable but inevitable that children will learn, and learn in a number of different languages, educators cannot afford to neglect the fundamental importance of educational linguistics. This oversight manifests on a number of levels and has serious consequences and implications, which need to be addressed as a matter of urgency. Failure to do so will in all likelihood result in the persistence of the current low achievement levels. I propose the following main reasons for the current crisis in education.

1.1.1. Lack of awareness of the psycholinguistic processes underlying academic language development

First and most importantly, educators seem to be unaware of the psycholinguistic mechanisms underlying the development of language and literacy. This results in limited language awareness, inadequate teacher education and ineffective teaching methods to facilitate this development. In particular, the theoretical constructs that should inform language-in-education practices are not well

understood. The notion of a distinct academic language register (Cummins, 2008; Scarcella, 2011) is not recognised in the national curriculum and theories and practices that promote academic language learning are not applied. In addition, there seems to be insufficient appreciation of the importance of *oral language* as opposed to *literacy* development, particularly in the foundation phase.

Because of the emphasis on outcomes-based education, the existing research on educational achievement focuses on the results of reading and numeracy tests but does not reveal the real generative mechanisms underlying the poor results. The assessments continue to reflect poor outcomes but because the real causes are not identified, interventions are not constructive or helpful. In my opinion, effective teaching strategies are far more likely to emerge from relevant investigations on *how* children acquire or have difficulties in acquiring the linguistic competence that underpins their learning.

The current study thus assessed the psycholinguistic processes underlying the development of the vocabulary, complex syntax, and discourse functions of academic language in the foundation phase. At this stage, children are making the transition between using language for social, communicative purposes and using language as an instrument of learning. It is thus particularly important for teachers to ensure that they develop the oral language skills necessary to support the acquisition of literacy, not only in terms of decoding print but also for comprehension of text. The expository text that learners will encounter in lessons and textbooks as they progress through the foundation phase into the higher grades depends on the ability to understand academic language. Appropriate teaching of academic language in the first three grades will enable them to make better use of learning opportunities in the higher grades when they are confronted with increasing conceptual and linguistic complexity.

1.1.2. Lack of utilisation of appropriate language practitioners in the education system

Second, educational authorities are not utilising the appropriate specialized personnel to develop language curricula and teaching methods. In a multilingual context, all teachers need to become good language teachers, and must be able to apply theoretical constructs and principles of language learning and teaching across the curriculum. However, this is not a simple matter and most teachers will need considerable training and support to do so. The employment of appropriately qualified language practitioners in the education system has become critical, not only to work collaboratively with teachers but also to develop linguistically appropriate materials.

I am suggesting that one of the professional groups capable of performing both these tasks is speech-language therapists (SLTs) and one of the ultimate goals of this study is to promote their role in the education system. When state schools were opened to all race groups in 1990, many teachers were confronted for the first time with children who spoke home languages other than English and there was widespread concern over their ability to cope with English as the medium of instruction. At that stage I conducted a study on the effects of language intervention to facilitate the acquisition of English as a second language by pre-school children (Jordaan, 1994). The results of this study provided convincing evidence for the value of the structured facilitation techniques used by SLTs in developing vocabulary and syntax in young language learners. I have become increasingly aware of the need for SLTs to broaden their scope of practice and become more involved in mainstream education. For reasons to be outlined later, I believe that they are well positioned to work collaboratively with teachers in addressing the language learning and literacy needs of all children, not only those with communication impairments.

1.1.3. Lack of support for the development and use of African languages in education

Third, for a number of reasons, to be explored in more detail later in the thesis, the development and role of the African languages in education have not received adequate attention. In multilingual contexts it is essential to support the development of the learners' L1, and in South Africa this means an investment in the local African languages. My position is based on theoretical and research evidence for the cognitive interdependence of language acquisition and representation, the need to be sensitive to the effects of language-in-education practices on the construction of personal identity and social reality, and the sociolinguistic value of promoting multilingualism for purposes of political and economic stability. Having said that, I am also of the opinion that widespread implementation of home language instruction is not necessarily the solution to the poor academic achievement of South African children at present. My view is that one of the primary goals of education is to develop academic language, so that learners may engage meaningfully with the content and subject matter across the curriculum at all stages of the process. Whether the medium of instruction or subject of teaching is English or an African language, language teaching practices must be sharply honed, particularly in the foundation phase when the process is initiated and shaped for the future. My study thus has implications for language teaching practices irrespective of the medium of instruction.

1.1.4. Inequality in educational contexts

This study also explores another dimension to the crisis in education, namely inequality in different contexts of education. The focus is on English language learners in two contexts within the education system. For the purpose of this study, English language learners are defined as children learning in English as the medium of instruction. The definition includes children who speak English as a first language (hereafter referred to as L1 learners) and children who speak English as an additional language (hereafter referred to as EAL learners). The term 'additional language' in contrast to 'second language' is used, since many South African children are exposed to more than one language in the home and community in addition to and often prior to learning English. According to Johnstone (2010) this is also an increasing international trend, but since most of the literature refers to second language acquisition (SLA) the terms 'additional' and 'second' language (L2) are used interchangeably when the discussion is general rather than specific to the participants of this study. In addition the assumption is that the EAL children are emergent bilinguals and thus this term is also used.

The choice of the two educational contexts is based on the following background information and rationale.

The results of research on the achievement of South African school children reveals substantial inequality in different contexts of education (Taylor & Yu, 2008; Fleisch, 2008), and according to Fleisch (2008,p.1) suggests that South Africa probably has two education systems, which mirror the two parallel economies described by former president Mbeki in ANC Today, 3 (45), November 14-20, 2003:

> *"The first economy is modern, produces the bulk of our country's wealth, and is integrated within the global economy. The second ….is characterized by underdevelopment, contributes little to the GDP, contains a big percentage of our population, incorporates the poorest of our rural and urban poor, is structurally disconnected from both the first and the global economy, and is incapable of self-generated growth and development."*

In line with this description, the first education system is well-resourced, consisting mainly of former "model-C" schools (Webb et al, 2010, p.276) and a smaller number of independent schools (Fleisch, 2008). According to Webb et al (2010), the model-C system was introduced in 1992, during the transition to democracy, when former white state schools were opened to all races. These schools were offered a choice of four models based on different funding formulae. One of these was the model-C school, in

which state funding would be provided for 75% of expenses, and the remaining 25% would be raised through school fees and donations. This system became predominant with 95% of schools adopting the model and although the education structure was unified after 1994, and the proportion of state and parent funding was rescinded, these schools continue to be referred to as "ex-model-C schools." Two types of schools have evolved from the model-C system, and are referred to as "upper and lower ex-model-C schools" respectively (Webb et al, 2010, p.276). The current study was conducted in these two contexts.

The upper ex-model-C schools are claimed to be attended by middle class children and the fees are decided by governing bodies depending on the socio-economic status of the communities served by a particular school (Webb et al., 2010). The higher the fees, the better the facilities in terms of maintenance of libraries, laboratories and sports grounds, and the more additional teachers can be appointed, leading to more favourable teacher: learner ratios (Pampallis, 2008). These schools are multi-racial and are comprised of white, black, mixed-race and Indian learners in varying proportions (Webb et al, 2010). Three schools of this type participated in the current study.

The lower ex-model-C schools have fewer facilities and resources because the fees are lower, and many parents reportedly do not pay fees at all. As a result of urbanization and migration within the urban population (Sekete, Shilubane, & Moila, 2001; Chisholm, 2008), these schools are also demographically different to the upper ex-model-C schools in that they are attended by predominantly or only black learners. White and Indian parents have either moved away from the areas or have enrolled their children elsewhere (Chisholm, 2008; Webb et al., 2010). The teachers at these schools may be white or Indian but increasingly they are also black, as in the case of the lower ex-model-C school participating in this study. According to Meier (2005), some of the reasons why white and Indian parents moved their children out of these schools include perceptions of teacher incompetence; lack of a culture of learning and discipline in black learners; an unconditional pass system; Africanisation of curriculum content and overcrowding in classrooms.

In addition to the ex-model-C schools, there are rural and township schools, which are typically former Department of Education and Training schools attended by black learners (Webb et al, 2010). These schools comprise the second system, described by Fleisch (2008). They generally have very little funding and are poorly resourced in terms of libraries, electricity, water etc. According to the minister of education in 2005, 101 schools in the Kwa-Zulu Natal province and 74 schools in Limpopo did not even

have the necessary buildings and children were taught “under trees” (in Webb et al., 2010, p.277). This system enrols the majority of working class and poor children.

In all the research on educational outcomes there is an achievement gap between learners in the two education systems resulting in a bi-modal frequency distribution, where the majority of children, who are black and in the second system perform in the lower range and a smaller number of children of all races, those in the first system, perform in the upper range (Fleisch, 2008; Taylor & Yu, 2008), attaining literacy and numeracy outcomes comparable to those of middle class children anywhere else in the world (Fleisch, 2008).

However, I believe that this dichotomy may be an oversimplification of the reality of the South African situation. The ex-model-C schools are also increasingly affected by factors related to lower socio-economic status (Stoffels, 2004; Chisholm, 2008) since not all the children attending these schools are from middle class backgrounds. Many also come from working class and poor families who reside in the inner city areas, townships and informal settlements around the cities and send their children to schools in the suburbs, which are perceived to be better schools and most importantly, offer instruction in English. As Baloyi (2002, p.3) observes: “ It is clear that people from disadvantaged socio-economic backgrounds who acquire English to empower themselves are the very people who can hardly afford their day-to-day basic requirements such as food, shelter, water, transport and electricity.”

The current investigation was conducted in four ex-model-C schools located in Johannesburg, Gauteng, where there is considerable diversity in the language backgrounds of teachers and learners (Webb et al., 2010), and English is inevitably adopted as the medium of instruction. The main difference between the two contexts is that in the first (hereafter referred to as context 1 (EAL only)), the classes are comprised of EAL learners only and the teachers speak one or more African languages, with English as an additional language while in the second (hereafter referred to as the integrated context (context 2)), L1 and EAL learners are integrated and taught by English-speaking teachers. The two contexts offer the opportunity for comparative description of language learning when EAL and L1 children are integrated vs. separated, and when EAL children are taught by EAL vs. L1 teachers. Each of these conditions has potential advantages and disadvantages for the children’s language learning.

In context 1(EAL only), I was interested in assessing the effects of what I consider to be advantages for the children’s language learning. These benefits include the fact that the children and teachers are

culturally and linguistically matched. Thus the teachers, who are themselves EAL speakers, would presumably have an understanding of the language needs of the children (Cook, 2007). They would have realistic expectations of the learners' language proficiency, would not compare the EAL children to a monolingual norm and importantly, would be able to use the African languages to support the learners' development of English. A possible disadvantage would be the absence of L1 models.

While Webb et al (2010, p. 279) claim that the choice of English as the medium of instruction in the "upper ex-model-C " or integrated (context 2) schools is not as problematic as in other schools, because the learners have "reasonably adequate" English proficiency, research has shown that in these contexts, there is often an achievement gap between L1 and EAL learners (Jooste, 2003; Broom, 2004; Howie, 2005a; Reddy, Kanjee, Diederiks & Winnaar,2006; van Rooyen & Jordaan, 2009; Meirim, Jordaan, Kallenbach & Rijhumal, 2010). There are also reports of teachers' difficulties in adapting to cultural diversity in the classroom (Meier, 2005) and the different levels of English proficiency of the learners (Du Plessis & Naude, 2003; O'Connor, 2003; Du Plessis & Louw, 2008; O' Connor & Geiger, 2009).The teachers do not speak the EAL learners' home languages and most of these studies suggest that the complexity of the English used by the teachers demands high levels of auditory processing and short-term memory by the learners. This can lead to attention problems (Brice & Brice, 2000) and academic difficulties. In addition the EAL children are competing with their monolingual peers and this may also affect their self-confidence and motivation (Thomas & Collier, 2002), particularly if the teachers have unrealistic expectations of their language proficiency.

The advantage of this context is that the EAL children are exposed to first language models by their peers and teachers and according to Scarcella (2011) children learn the language of those with whom they associate. There is also research to show that young children learn language from each other and that it may be beneficial for EAL and L1 children to be taught together (Genesee, Lindholm-Leary, Saunders & Christian, 2005).

Questions can thus be raised about the language learning processes in both model-C contexts and in fact, research on university students who come from these schools (Pienaar, 2009; Potgieter, 2010) and my teaching experiences as well as those of my colleagues, suggest that language problems are perpetuated at this level. There is growing concern among academics that many students, regardless of educational background and whether they are first or second language speakers of the language of instruction at the university, enter the tertiary level with weak language and literacy skills and are ill-

equipped to deal with the demands of academic language in the various disciplines. This is particularly reflected in their writing skills. The main concern is thus whether South African children attain the language proficiency and consequent literacy skills required for the increasing conceptual demands of the curriculum in the higher grades and beyond.

1.2. THE FOCUS ON ENGLISH

There are many educationalists who believe that the use of English as the medium of instruction is undermining the academic achievement of the very children who need to be empowered through education (Brock-Utne & Skattum, 2009; Webb et al., 2010). This position is made very clear in the following statement by Alexander (2005, p. 3):

> *"….being able to use the language(s) one has the best command of in any situation is an empowering factor and conversely, not being able to do so is necessarily disempowering. The self-esteem, self- confidence, potential creativity and spontaneity that come with being able to use the language(s) that have shaped one from early childhood …is the foundation of all democratic policies and institutions. To be denied the use of this language is the very meaning of oppression."*

Thus Alexander (2005), in no uncertain terms, places a high priority on the use of African languages in education from the learners' perspective.

However, the South African education system must be viewed against the complex linguistic background and socio-political history of the country. During colonial and apartheid times, language-in-education policies consistently played a major role in promoting political ideologies. When South Africa became a democracy in 1994, exemplary and progressive language policies were formulated to protect linguistic diversity, promote language equity and to develop the historically marginalised African languages. The language-in-education policy was finalised in 1997. It stipulates the right to education in the language of choice and promotes multilingualism within a framework of additive bilingualism, in which the home language is maintained while providing access to and the effective acquisition of additional languages (Bengu, 1997). This policy was based on both national and international research showing the advantages of home language instruction and/or bilingual education in ensuring overall academic achievement.

Despite this, there has been slow and limited implementation of these policies both in the broader public domain and in education and English continues to be the dominant language in South Africa at the expense and marginalisation of the other official languages. Beukes (2009) attributes this incongruence between policy and practice to three main factors: the hegemonic position of English, the government's lack of political will and negative attitudes to the African languages. These factors are explored further in Chapter 3.

Currently, English has both perceived and real value as an avenue to social, economic and educational opportunity and success and although language-in-education practices are variable across the different contexts of education, English is used extensively. In most ex-model-C schools, English serves as the medium of instruction from grade 1. In some rural and township schools learners are taught in their home language for 3-4 years, at which point they transition to English as the language of learning.

Many researchers express a strong conviction that the African languages should be developed as instructional media (Webb et al., 2010) and used for as long as possible but certainly beyond the foundation phase (Heugh, 2009). Nevertheless, most agree that it also essential to provide access to English as a global, economically, socially and educationally empowering language (Alexander, 2010).

However, there is controversy as to how this should be achieved. Essentially English may either be used as the medium of instruction or taught as a subject. Alternatively both English and the African language(s) may serve as media of instruction in bilingual programmes. However, for various reasons, to be explored in more detail later, the use of the African languages in education is a highly contested issue (Heugh, 2009).

This study concentrated on two contexts in which foundation phase children are learning in English, as opposed to an African language, since it is my considered opinion that in schools where learners and teachers are from homogenous language backgrounds and where learners are disadvantaged by a limited infrastructure for English and conditions of poverty, such as those in many rural and township schools, the medium of instruction should be the African home language for as long as possible, with English taught as a subject. This argument is based on strong research evidence throughout Africa, for the advantage of extended home language instruction within additive bilingual education programmes (Heugh, 2009; Obondo, 2008). I felt that research focused on the learning of English in these contexts

would convey the inappropriate message of endorsing a language-in-education practice that is not in the best interests of the learners.

1.3. EDUCATIONAL QUALITY AND LANGUAGE-IN-EDUCATION PRACTICES

Fleisch (2008, p.121) considers educational quality to be "the fundamental problem in South African education…….", and there is certainly evidence that teaching quality in South Africa is influenced by limited subject knowledge, low teacher expectations and consequently low cognitive demand in the classroom, irrespective of the language of instruction (Reddy et al., 2006). However, teaching quality is also significantly affected by the extent to which language is used to develop subject knowledge and challenge the learners cognitively. One of the theoretical concepts considered to be central to language-in-education is the notion of a distinct academic language register.

1.3.1. Academic Language

Academic language proficiency is defined as "access to and command of the oral and written academic registers of schooling", and is contrasted with basic, social conversational fluency (Cummins, 2000, p.67). The development of academic language is one of the primary goals of education, since it underlies literacy, mathematics, and meaningful engagement with the subject matter at all stages of education (Scarcella, 2011). However, it is not acquired as naturally as the social-communicative functions of language and develops through formal instruction (Cummins, 2008), which implies that it should be facilitated through curriculum design and teacher intervention. In contrast to Cummins (2000) who argues that it can take up to 5-7 years of instruction for L2 learners to reach commensurate levels of academic language with monolingual children, Scarcella (2011) claims that the actual time frame is related to the quantity and quality of academic language instruction that L2 learners receive. Gersten, Baker, Shanahan, Linan-Thompson, Collins & Scarcella (2007) also maintain that instruction in academic language should begin as early as possible in the primary grades of schooling. This study thus investigated the development of academic language in the foundation phase. The Diagnostic Evaluation of Language Variation-Criterion Referenced Edition (DELV-CR) (Seymour, Roeper & de Villiers, 2003) was used as the assessment instrument. The selection of this measure was based on its strong theoretical

foundations in psycholinguistics and its ability to capture the processes underlying the development of academic language in the early school grades.

1.3.2. The development of academic language

Facilitating the development of academic language requires the application of appropriate teaching practices, particularly but not necessarily only with children learning in English as an additional language. Many L1 children also start school with limited awareness of the de-contextualised and cognitively demanding nature of academic language (Wong-Fillmore & Snow, 2000) and furthermore, all children can benefit from "a language rich diet" (Clegg, 1996, p.12).

For additional language learners, the language used as the medium of instruction becomes both the goal and the means of education (Gibbons, 2007). In the case of English instruction, the children are not only learning English but also learning in it and through it. "For such learners, the classroom and curriculum must allow for the construction of curriculum knowledge to progress hand in hand with the development of the students' L2, in particular in relation to the academic registers of schooling" (Gibbons, 2007. p.701). This involves what is variably referred to as "content-based second language instruction" or "content and language-integrated learning" (CLIL) (Baker, 2006, p.293). Broadly defined, CLIL is instruction in the academic language necessary to accomplish content-area tasks (Sherris, 2008), and it has been shown in research to have a positive impact on learning (Coyle, 2008). Historically, CLIL stems from the position that second language proficiency is facilitated by using the language as a medium for learning rather than studying it as a separate subject (Mohan, 1986; 2002). CLIL has four key principles of practice: planning content and language goals for each lesson; interaction between learners and between teachers and learners to develop specific language and content knowledge and skills; opportunities to develop reading, writing and listening skills within content areas; and assessment of outcomes during lessons (Sherris, 2008).

Gibbons (2002) maintains that in addition to content and language-integrated learning, learners also require comprehensible input, which refers to the complexity of the teacher's language in terms of grammar and vocabulary. It has been suggested that comprehensible input is not a major consideration in the foundation phase of education, because teachers use accessible language as a consequence of their sensitivity to young children. This is an advantage of commencing instruction in the L2 in the early

as opposed to the later elementary grades when teachers use a more complex register and style (Clegg, 1996). Nevertheless, teachers need to be aware of the complexity of the language they use to ensure that it is comprehensible to all learners.

Gibbons (2007) also suggests that "scaffolding" and mediation within Vygotsky's social constructivist approach is an important part of developing language and content knowledge. Scaffolding is achieved, not by simplifying a task, but by identifying a child's current level of understanding and through problem solving and collaborative interaction with peers and teachers, moving the child to a potential level of understanding, referred to as "the zone of proximal development"(Vygotsky, 1978 in Gibbons, 2007, p.722).

Social constructivism as a theory of language learning focuses on the processes through which language learning is mediated (Reagan, 2009), and thus provides an appropriate framework for the teaching of academic language. Although the outcomes-based education (OBE) system, adopted in South Africa, claims to be constructivist (Heugh, 2009), it is essentially positivist in its application, since it emphasises performance and outcomes (Balfour, 2007). Consequently, one of the most disabling effects of this system has been that language and literacy skills are not taught explicitly (Heugh, 2009), which means that learners do not receive the necessary scaffolding to develop these skills. Teacher training programmes have similarly de-emphasised direct teaching because they have had to work within the OBE framework due to the substantial financial investment in its introduction and implementation (Heugh, 2009). However, social constructivism is entirely compatible with direct instruction, and although it is learner-centred, the content and skills of the learning process must be provided by the teacher (Reagan, 2009).

Because the OBE system was developed in western countries, its application has been problematic in the South African context (Heugh, 2009). Many teachers have misinterpreted some of the central concepts such as learner-centeredness, whole language, communicative language teaching and critical and social literacy (Heugh, 2009). Although there have been various attempts to remedy the situation from time to time, e.g., The Foundations for Learning Campaign (Tyobeka, 2008), and the minister of basic education's recent announcement of changes to the OBE system (Motshega, 2010), teachers' language awareness and consequently the power of language in education remains limited. The practice of content and language-integrated instruction is virtually non-existent, because subject teachers regard language teaching as the responsibility of the language teachers and do not know that they can simultaneously

teach both the language and content of subject areas (Uys, van der Walt, Botha and van den Bergh, 2007). In the foundation phase, there are two subject areas (life skills and numeracy) that can be used in addition to the language and literacy learning area to develop academic language.

However, it should be acknowledged that applying and implementing the theoretical constructs discussed thus far, is not a simple task, and teachers need to be trained and supported in doing so.

1.4. THE ROLE OF THE SPEECH-LANGUAGE THERAPIST IN EDUCATION

Despite their extensive knowledge of and skills in developing language, few SLTs are employed by the department of education. Those who are currently in the education sector work within special classes and at full service schools while the large majority of learners in the public sector mainstream classes receive no support. SLTs have traditionally worked with learners who presented with 'speech and hearing deficiencies.' Their interventions were guided by a medical, deficit orientation which resulted in a "pull-out" model where the child rather than the system was the focus of intervention. As a consequence, learners received support on an individual or small group basis which was not cost-effective.

After 1994, the SLTs who were employed in the education system remained as district learning facilitators without rendering professional services. They have thus not been optimally included within an integrated model.

In addition to assisting children with language-learning impairments, speech-language therapists are well positioned to improve the language learning skills of all children in the education sector. This is because social constructivism essentially informs the practice of SLTs who deal with children who do not acquire language naturally. These professionals are well aware that language learning can only be facilitated by indeed, creating authentic contexts as in communicative language teaching, but it is also essential to set explicit language targets and to use selected elicitation techniques and interaction methods that advance the acquisition of language through scaffolding (Owens, 2004). Such techniques and interaction methods (e.g., Owens, 2004; Lewis & Penn, 1989; Jordaan,1994) also overcome the problem of teaching languages directly to younger children who do not yet have access to explicit learning strategies (Mac Whinney, 2005; Paradis, 2004; Ullman, 2001).

The SLT profession can make a contribution to advancing development in South Africa through greater involvement in basic education. In the past the profession served a privileged minority, but the emphasis now needs to shift to how the population as a whole can benefit from SLT services. The role of the profession must also broaden from working within a traditional curative impairment-driven framework to an inclusive one and therefore consider not only those who are impaired but also those who are at-risk for educational failure due to disabling social and educational conditions.

The American Speech and Hearing Association (2010) have indicated that SLTs are well equipped to work with language and literacy within the school system. Hence co-operation between teachers and SLTs has become an increasingly important focus globally (O'Toole & Kirkpatrick, 2007). Most countries have collaborative services within their education systems and have published their successes and challenges (e.g., McCartney, Ellis & Boyle, 2009; Wilson, Nash & Earl, 2010).

The South African Education Department and the South African Speech-Language and Hearing Association may need to consider this paradigm shift and work towards functionally promoting these services in the education system.

However, to be effective, both teachers and SLTs need to be well informed with respect to the processes underlying the development of academic language. Within the South African context, this involves an understanding of how both first and additional language learners of the medium of instruction acquire these processes.

In line with the central tenet of dynamic systems theory (de Bot & Makoni, 2005; Evans, 2009), this study therefore tracked the development of oral academic language from grades 1 to 3 in order to provide a comprehensive understanding of how both L1 and EAL children negotiate the process, to determine the rate and patterns of learning of the different components of language (syntax, semantics, pragmatics) as well as to establish the relationship between oral language development and literacy attainment. This design also revealed which aspects of language may benefit from more explicit instruction, and which are acquired from incidental exposure to early schooling.

To the best of my knowledge, this is one of only two South African longitudinal studies investigating the development of oral language in the first three grades of formal schooling. An earlier study by Jordaan, Penn & Tshule (1995) assessed the acquisition of various oral language skills in foundation phase learners at a time when state schools had recently become racially integrated and there were concerns

over the language abilities of EAL learners. The results were generally very positive and showed that EAL learners acquired English to the same level as their monolingual peers within 18 months. However, an important direction for future research, emanating from this project, was to align the assessment of language to the academic demands of the curriculum and to relate the oral language competence of the learners to literacy achievement. In the interim, the educational scene has also evolved and as discussed, there are now different contexts in which children use English as the language of learning from grade 1.

In the years following this study there has also been significant development in theory and research in the field of second language acquisition but there is still a general paucity of knowledge on additional language acquisition in children, particularly in the EAL school-aged population (Paradis, 2009). Most of the available research focuses on second language acquisition in adults and the learning and teaching of foreign or additional languages as subjects of study (Myles, 2010). In addition, there is more information about literacy attainment than the development of oral language proficiency in child L2 learners (Paradis, 2009).

1.5. LANGUAGE LEARNING IN THE FOUNDATION PHASE OF EDUCATION

Based on the critical period hypothesis (Penfield & Roberts, 1959; Lennenberg, 1967) the popular view regarding the optimal age of L2 acquisition is: 'the earlier the better because children learn languages easily and rapidly'. However, in a synthesis of research findings on the rate of acquisition and ultimate attainment in an additional language, in both foreign language learning and immersion contexts, Marinova-Todd, Marshall & Snow (2000) indicate that younger children (aged 4-8) are slower than older children(aged 8-12) at second language acquisition but achieve higher levels of proficiency in the long term. Possible reasons for this initial tardiness is that younger children are still in the process of acquiring their first language and rely on the same cognitive systems for both L1 and L2 acquisition, whereas older children have consolidated the acquisition of the L1 and have access to a number of additional cognitive resources such as explicit learning strategies (Mac Whinney, 2005; Paradis, 2004; Ullman, 2001). One of the implications of this finding is that it is important to establish how long it takes children to develop proficiency in an additional language so that educators' expectations of them are realistic. Hence this is a primary aim of the current study.

In addition, much of the existing research on second language acquisition in childhood has addressed two questions:

1. Are L2 acquisition patterns and rates similar to those for L1 acquisition?
2. How do L2 learners compare with L1 speakers of the target language their own age? (Paradis, 2009).

The longitudinal design of this study thus aimed to describe the rate and process of additional language acquisition in EAL children and to compare them to an age-matched group of L1 children.

Marinova-Todd et al (2000, p.9) claim that it is also possible that "age differences reflect differences in the learning situation rather than in the capacity to learn" and that the quality of input and instruction have a strong mediating effect. It may be more productive to investigate the factors leading to high levels of additional language proficiency than to dwell on age effects. This study thus compared the rate and process of EAL learning in the two educational contexts described previously.

1.6. CHILDREN WITH LANGUAGE IMPAIRMENT

The longitudinal design of the study allowed for more in-depth investigation of children who did not develop academic language or who did so very slowly in relation to their peer groups, and may thus be at risk for specific language impairment (SLI). This condition is an impairment of language comprehension, language production or both in the presence of normal intelligence (i.e., normal performance IQ), normal hearing, no diagnosis of autism and no neurological impairments (Schwartz, 2009). SLI is difficult to identify in learners who speak the African languages, because of the limited availability of assessment tools and a dearth of knowledge on normal developmental milestones and processes in these languages. Identification of these children in their home languages is further complicated by the fact that SLI is a subtle impairment without overt physical characteristics, and may be overlooked in the pre-school period because parents are more concerned with obvious disabilities and material provision. However, SLI has a significant negative impact on academic achievement and must be identified as early as possible so that appropriate intervention can be initiated. This study aimed to contribute towards an understanding of the manifestations of SLI in EAL learners, and to address one of the unanswered questions in the literature, namely: to what extent do SLI children have the capacity to acquire an

additional language? This question has important implications for the management of such children in terms of the choice of language for intervention and the advice given to parents and educators on how to provide optimal input. While there is some research evidence to suggest that simultaneous bilinguals with language impairment are not disadvantaged in relation to their monolingual peers with language impairment (Paradis, Crago, Genesee & Rice, 2003) there is less conclusive research on the rate and process of additional language development in sequential bilingual children with language impairment. This study aims to provide some indication of the extent to which these EAL children are able to learn in an additional language.

A further problem confounding the identification of language impairment in EAL children is the similarity in the language skills of typical EAL learners and monolingual English speakers with language impairment both in terms of the quality and quantity of errors (Kohnert & Medina, 2009). Such overlap complicates the search for markers that effectively distinguish the clinical from the non-clinical population in multilingual contexts. On a theoretical level such evidence is suggestive of possible language features in English that are vulnerable in both additional language learners and children with language impairment. An analysis of the performance of both typically developing and language impaired EAL learners on a range of language skills in this study, may shed light on language features that may be indicative of impairment when affected.

1.7. LANGUAGE LEARNING APTITUDE AND WORKING MEMORY

It is interesting that the research on individual variation in second language learning and the underlying causes of the language difficulties of children with SLI intersect on the issue of working memory (Linan-Thompson & Ortiz, 2009).There has been a significant focus in second language acquisition research on the substantial individual variation in the rate of development and ultimate proficiency achieved by different learners (Genesee, Paradis & Crago, 2004; Kormos & Safar, 2008). Extrinsic factors such as socio-economic status and the language input the child receives (Goorhuis & Schaerlaekens, 2000; Kohnert, 2007), and intrinsic affective, personality and cognitive variables have all been found to contribute to language learning (Dornyei, 2005; De Bot, Lowie & Verspoor, 2005). Cognitive factors such as intelligence and language aptitude are considered to be important determinants of success in acquiring a second language and reliable predictors of achievement in classroom second language

learning (Kormos & Safar, 2008; De Bot et al., 2005), but aptitude has not been widely researched in children (Alexiou, 2009).

Aptitude has recently been conceptualised as a dynamic construct that includes several cognitive abilities of which working memory is considered the most important (Dornyei & Skehan, 2003; Kormos & Safar, 2008). Working memory involves the temporary storage and processing of both verbal and visuo-spatial information (Baddeley, 2003). Language learning during childhood relies heavily on attention and memory (Gillam, Montgomery & Gillam, 2009) and studies suggest that working memory affects language acquisition in EAL learners (Archibald & Gathercole, 2007; Adams & Gathercole, 2000; Baddeley, 2003; van Daal, Verhoeven, van Leeuwe & van Balkom, 2008; McDonald, 2006) as well as SLI children (Vance, 2008; Montgomery, Magimairaij & Finney, 2010) .

However, although working memory may be a valid cognitive construct, its assessment and measurement is often confounded by dependence on language knowledge and processing (Juffs & Harrington, 2011) and the results are difficult to interpret, particularly if the assessment is administered in a second language.

Despite this, working memory was assessed in this study to determine whether it may constitute a component of aptitude for language learning in young children. Positive correlations between aspects of working memory and language performance would implicate this cognitive construct as a predictor of language learning success, and would provide support for the use of working memory assessment measures in the identification of language learning difficulties. These cognitive processing measures are considered to be less biased than language representation measures in the assessment of linguistically diverse populations, since they rely less on previous language experience (Kohnert & Medina, 2009). However, this claim may not be entirely valid. Although processing measures may reduce task bias they do not completely eliminate it, because the language of the test may affect the understanding of instructions etc. and thus performance. In addition, some working memory measures may simply be assessing language processing (Maimela-Arnold, Evans & Coady, 2008). This study aimed to offer some clarity on these issues.

1.8. SUMMARY OF CHAPTER 1

I have argued in this chapter that although the predominant use of English as the medium of instruction may be problematic, the educational failure of many primary schoolchildren in South Africa can be attributed to the quality of language–in–education practices. Specifically:

- A lack of awareness of the psycholinguistic foundations of language learning in teaching and research,
- limited acknowledgement of the academic language register,
- Inadequate application and misunderstanding of the teaching approaches and methods that facilitate academic language development.

I have suggested that speech-language therapists have an important role in the educational arena because of their experience and skills in facilitating language acquisition and literacy.

I have attempted to justify the investigation into the processes underlying oral language development in the foundation phase on the basis of:

- the importance of oral language development for literacy,
- the fact that the foundation phase is when the process of academic language learning should begin and
- limited available research on the acquisition of academic language in the young school aged population.

I have also explained the particular focus on English and on the two educational contexts in this study which offer the opportunity for comparison of different conditions for language learning in terms of teacher and learner language profiles.

In addition, the identification and description of EAL children with language impairment has been highlighted as a research need and hence a focus of the study.

Finally, I have justified the assessment of working memory in this study on the basis of the following:

- limited working memory capacity is identified as one of the underlying causes of language impairment,
- it may be a component of language learning aptitude and explain the individual variation in language performance amongst EAL learners, and

- the assessment of working memory is controversial and therefore a research aim was to determine its value as a cognitive processing measure in the assessment of linguistically diverse learners.

This thesis will systematically elaborate on these issues. The reader is also referred to the following publications emanating from this work:

Meirim, G., Jordaan, H. Kallenbach, A. & Rijhumal, M. (2010) *Development of semantic processes for academic language in foundation phase EAL learners.* South African Journal of Communication Disorders, 57, 43-50.

Jordaan, H. (in press) *Semantic processing skills of foundation phase English Language Learners*. South African Journal of Education.

Jordaan, H. (in press) *Language teaching is no panacea: a theoretical perspective and critical evaluation of language-in-education within the South African context*. South African Journal of Communication Disorders.

1.9. OUTLINE OF CHAPTERS

The remaining chapters of this thesis are organised as follows:

Chapter 2 provides a theoretical review of language acquisition and impairment in multilingual educational contexts. It defines the central concepts under investigation, explores and reviews the literature on additional language learning in the early school years and explains the nature and effects of language impairment on the acquisition of an additional language.

Chapter 3 contextualises the study and outlines the history of the South African education system in relation to political changes and their effects on language planning, with specific reference to language-in-education policies and practices. In addition, the current status of the South African education system is reviewed and the challenges in primary education are discussed. This chapter ends with the aims and rationale of the study.

Chapter 4 presents the methods employed and describes the design, participants, instruments, procedure for data collection and analysis of data. This chapter also discusses ethical considerations in this study.

Chapter 5 provides a summary of the main findings, and describes and discusses the development of academic language in the three groups of children over the three year period, compares the results obtained by the three groups and compares the results between language domains. The reading accuracy and comprehension scores, and the correlations between the language and reading scores, reflecting the relationship between oral and literate measures of academic language are presented next. Finally, the effects of class, exposure to English in the pre-school period and gender are presented.

Chapter 6 presents the results of the working memory assessments, the relationship between the working memory and language and reading scores and the analysis of the participants identified as language-impaired.

Chapter 7 concludes the study by providing an evaluation of the findings, discussing theoretical and practical implications for policy and practice within the South African education system as well as suggesting directions for future research.

CHAPTER 2

LANGUAGE ACQUISITION AND IMPAIRMENT IN MULTILINGUAL EDUCATIONAL CONTEXTS

Language is central to educational achievement. Language mediates thought, is the most important medium for exchanging information in the classroom, "serves as the mediator for social reality" (Reagan, 2009, p.vii) and forms the foundation for literacy attainment. However, educators may not always "recognize the absolute centrality of language knowledge and use for the educated person" (Reagan, 2009, p.viii).

The purpose of this chapter is to provide a theoretical background to the study and will:

1. Define the central concepts under investigation including: *language, language proficiency*, *academic language, working memory, aptitude and reading comprehension.*
2. Explore the complexities of second/additional language learning in the early school years and review the research findings on this population.
3. Explain the nature and effects of language impairment on the acquisition of an additional language.

2.1. The nature of language, language proficiency and language acquisition

Language is unique to the human species, and is our "premier achievement" (Owens, 2008, p2). It is a complex, abstract, and dynamic system and language acquisition is a dynamic process (de Bot, 2008). Essentially, the question addressed in this section is: what does it mean to know, use and learn a language? A clear conceptualisation of the nature of language representation and processing is necessary to explain language proficiency, to understand how additional languages are acquired or constrained by language impairment, and to develop appropriate assessment, intervention and educational methods and materials.

Historically, both first (e.g., Chomsky, 1965) and second (e.g., Bachman, 1990) language theorists have drawn a formal distinction between "competence", defined as the mental representation of language and "performance" or the actual use of language reflecting outward evidence for underlying competence. Shatz (2009) argues that this distinction has become blurred and is now largely dispensed

with in favour of the notions of language knowledge (or representation) and processing. Dynamic systems theorists (e.g., Evans, 2009, p. 128) also largely disregard the notion of representation by integrating knowledge and performance into real-time processing, and maintain that language is "performance in context."

In the context of multilingual children, Kohnert (2008, p21) defines language proficiency as "…knowledge (consistent form-function mapping) as well as efficient use of this known information (processing during real-time communicative exchanges) at different linguistic levels and in different modalities." The definition thus encompasses both knowledge and processing dimensions. The knowledge component can be subdivided into linguistic levels (phonological, lexical, syntactic, and pragmatic) and modalities (speaking, listening, reading, and writing). The processing component involves efficient access to the knowledge base and control of the system (Kohnert, 2004), and requires both domain-specific or dedicated language processing mechanisms as well as more general cognitive mechanisms such as attention and working memory (Williams, 2010). However, Shatz (2009) and Hulstijn (2007), writing about first and second language acquisition respectively, point out that there is still uncertainty as to the exact nature of language representation and processing and the relationship between these two constructs.

There are several models that explain how cognitive processing in general and specific language processing occurs, but according to Owens (2008) the model that actually applies varies from individual to individual and depends on the task. In general, both thought and language are processed by the brain's information processing system which includes the cognitive processes involved in attention, perception, organisation, memory, concept formation, problem solving and transfer as well as management or executive functions (Groome, 1999). Although the exact nature of these cognitive processes is unknown there is a relationship between measured intelligence and the speed of information processing (Owens, 2008).

The distinctions between the phonological, syntactic, semantic and pragmatic components of language provide useful analytic constructs for the study of language and also form the organisational framework of many language assessment tools, including the measure used in this study. However, these linguistic levels are not autonomous and are divisions of the researcher, not of the child (Shatz, 2009). Increasingly, interactive theories, where one kind of linguistic knowledge can influence or is even crucial to the development of another are proposed. Currently, the best example of this is word learning, where

studies suggest that syntactic, phonological and pragmatic knowledge aid in lexical acquisition (Naigles & Swenson, 2009; Stoel–Gammon & Sosa, 2009; Diesendruck, 2009).

Language acquisition is the emergence of a dynamic system "within a social context through the interactions of cognitive, neurobiological and environmental systems and subsystems across nested timescales" (Kohnert, 2008, p.13). Within this framework language is viewed as an integrated system that is self-organising and re-organising through interaction with the environment, which can influence its development both positively and negatively. Language develops through the interaction of its component parts within specific contexts in which it may be used for different purposes.

Kohnert's (2008) conceptualisation of language acquisition is eclectic and stresses the flexible, transient, dynamic aspects of development, as contained in Dynamic Systems Theory (DST**)** (de Bot & Makoni, 2005; Evans, 2009, Herdina & Jessner, 2002). In DST language development proceeds irregularly through periods of rapid growth followed by slow steady transitions or plateaus. Language growth is usually positive but language may also regress, for example, the subtle loss of a first language for some children learning a second language (Anderson, 2004) or the deterioration in language skills seen in some children with language impairment (Botting, 2005).

Since this study focuses on children learning an additional language in the early years of schooling, attention is now directed specifically at the development of language in this age group and in this context.

2.2. LANGUAGE DEVELOPMENT IN THE EARLY SCHOOL- AGED POPULATION

Influenced by Chomsky's view of language acquisition as a rapid transition from the initial to the final state, and the claim that by 3.6 years of age most children have typically mastered the basic structure of their language, developmental psycholinguistics has focused mainly on pre-school acquisition (Berman, 2009). However, there is a large body of research (for example, Karmiloff-Smith, 1986; Berman & Slobin, 1994; Nippold, 1998) to show that the development of language proficiency is a protracted process and continues well into adolescence and beyond. This growth occurs as a result of both incidental learning, through exposure to learning materials, and direct instruction in specific language skills (Dockrell & Messer, 2004; Cummins & Yee Fun, 2007). There is general agreement that "in the pre-school years,

children learn to talk, but as they move into school, they talk to learn" (Westby, 1994, p.341). A recurring theme in the literature on school-aged language is the distinction between social and academic uses of language (Bailey, 2006; Cazden, 2001; Chamot, 2005; Schrank, Fletcher & Alvarado, 1996).

2.3. ACADEMIC LANGUAGE

Saville-Troike (1984, p.216) introduced the term "academic competence" to refer to the ''qualitative difference between the communicative tactics and skills that children find effective for meeting their social needs and goals and those that are necessary for academic achievement in the classroom." Similarly, a number of theorists have proposed that the language used in the academic context is qualitatively different from that used in everyday conversational contexts (e.g., Bruner's (1975) communicative and analytic competence , Donaldson's (1978) embedded and dis-embedded language, Olson's (1977) utterance and text, Gibbon's (1991) playground and classroom language and Gee's (1990) primary and secondary discourses), but a precise description of academic language is elusive (Wong-Fillmore & Snow, 2000). The definition seems to depend on the particular focus of different professional or research communities (Valdes, 2004).

Although the concept of a distinct academic language register can be applied to any language used for teaching and learning, most of the work in this area has focused on English. For those working with individuals whose first language is English, academic language refers to literature, writing, language arts, and proficiency in oral and written text, also known as "academic discourse" (Valdes, 2004, p. 108). For those working with individuals for whom English is a second language, the definition of academic language varies depending on the perspective of the community of practice. The TESOL profession views academic language as the language used to carry out academic work at the university level as well as the language used by particular disciplines for communication in the field. Within this profession, research has focused on English for Specific Purposes (ESP) and English for Academic Purposes (EAP) (Bhatia, 1997; Johns, 1997; Swales, 1990). In contrast, the ESL profession working with school-aged children defines academic language as the language needed to succeed academically in all content areas, including the English used to interact in the classroom and the English used to obtain process, construct and provide subject matter information in spoken and written form (Valdes, 2004). Two approaches are

adopted in this community: the teaching of English as a preliminary to instruction in subject matter and content-based language teaching.

The bilingual education profession is concerned with the development of academic language in both English and the first language of students, focusing almost exclusively on Cognitive Academic Language Proficiency (CALP) in contrast to Basic Interpersonal Communication Skills (BICS) (Cummins, 1979, 1981, 1984). This distinction was introduced by Cummins to explain research findings on bilingual children who appeared to be fluent conversationalists but were still below grade expectations on verbal academic performance in both languages (Cummins, 2008). The BICS/ CALP distinction formalised the difference between conversational fluency and academic language as two of, but not the only conceptual components of the language proficiency construct (Cummins, 2008). Cummins & Yee-Fun (2007) distinguish three dimensions of language proficiency: conversational fluency, discrete skills and academic language proficiency. Each follows a different developmental trajectory among L1 and L2 children and each responds differently to particular types of instructional practices. Conversational fluency is acquired within 1-2 years in face-to-face conversations, and uses high frequency vocabulary and simple grammatical constructions. Discrete language skills (listening, speaking, reading and writing) involve learning the rule governed aspects of language (phonology, grammar and spelling), and are developed by direct instruction and/or immersion in a language-rich home or school environment. These skills can develop concurrently with conversational fluency (Weber & Longhi-Chirlin, 2001) within two years (Geva, 2000; Lesaux & Siegel, 2003), but there is little transference to academic language proficiency (Kwan & Willows, 1998; Verhoeven, 2000).

According to Cummins (2008), the distinction should caution educators against conflating the conversational and academic dimensions of proficiency, which may create academic difficulties for children because of the difference in the time lines for the acquisition of conversational and academic language. The latter can take between 5-7 years to reach levels commensurate with grade norms in developed contexts (Cummins, 2008), but may take even longer in less developed countries. The implication is that students need support in the acquisition of academic language, and in fact, Scarcella (2011) claims that with adequate teaching and support, academic language can be acquired more rapidly.

Cummins (1981) also elaborated on the BICS/CALP distinction to show how instructional practices could assist learners to catch up academically. Essentially, BICS and CALP could vary along two dimensions:

cognitive demand and contextual support, with the best instructional methods involving context embedded, cognitively demanding tasks (Cummins, 2008). Cummins (2008), Guthrie (2004) and Wong-Fillmore & Snow (2000) suggest that written texts are a reliable source of academic English but need to be presented with instructional support to aid in language development. Hence teachers need to help children acquire the academic language register by discussing not only the content but also the language used in texts. Teachers can transform text into usable input by helping children to make sense of what they read and drawing attention to how language is used in the materials they are reading (Wong-Fillmore, 1997).

Cummins' model has been criticised (Scarcella, 2003; Valdes, 2004; Edelsky 1990; Martin-Jones & Romaine, 1986; Mac Swan, 2000) as an oversimplification of what constitutes contextual support and cognitive demand and for reflecting a "deficit" perspective (Aukerman, 2007) that attributes academic difficulties to low CALP. However, the BICS/CALP distinction can be related to other theoretical distinctions (see Bruner, 1975; Donaldson, 1978; Olson, 1977; Gibbons, 1991; and Gee 1990) and although the terms vary, the basic distinction relates to the extent to which meaning is supported by contextual cues or is primarily linguistic in nature.

Westby (1994) shows how both the rhetorical (who is talked to) and referential (what is talked about) dimensions of communication become less context-embedded in school. Along the rhetorical dimension, children are expected to learn to talk not only to individuals as they did in the pre-school period, but also to groups of people, and to both familiar and unfamiliar listeners. This requires more specificity in vocabulary and syntax, since the child cannot depend on shared knowledge and must learn to take the listener's perspective. Along the referential dimension, children no longer talk only to meet their social needs, but must learn to talk about past and future experiences, and to generalise and theorise about these experiences, which involves increasing distance from contextual cues. According to Westby (1994), narrative language is particularly important for the development of this de-contextualised communication and should be used extensively in the early school years.

Furthermore Wong-Fillmore & Snow (2000) and Cummins & Yee-Fun (2007) maintain that academic language is challenging for both L2 and L1 learners, since few children start school with the ability to interpret text and do not necessarily have the discourse skills required in education.

Within the context of the current study, the following questions arise pertaining to the concept of academic language:

1. Do children acquire academic language in the earliest school years?
2. If so, what constitutes academic language at this stage of education?
3. How do children in the early schools years acquire the academic register in an additional language?

To address the first question, Scarcella (2011) maintains that through scaffolded oral language activities, children in the pre-school to 3rd grade learn the vocabulary and language skills that will build the foundation for academic language in the future. Although precise descriptions are difficult to find, it is generally agreed that academic language involves an increased variety of language functions and discourse styles, increased conceptual and linguistic demand, more abstract and less frequent vocabulary and more complex syntax (Scarcella, 2011; Owens, 2008, Berman, 2009; Hoff, 2005; Cummins, 2000; Cummins & Yee-Fun, 2007; Westby, 1994).

Presumably, the language demands of the curriculum will determine the specific skills learners need to develop in the early school grades, and this in turn will be context-dependent. The foundation phase language curriculum for additional language learners within the South African education system was thus reviewed to identify the skills expected of the children in the first three school grades. The post-apartheid South African education system is outcomes-based, and is comprised of learning area statements, each of which have learning programmes, outcomes and assessment standards (Department of Education, Revised National Curriculum Statement (RNCS), 2005b). The three learning areas in the foundation phase (grades R -3) are Languages, Numeracy, and Life Skills. The languages learning outcomes are broadly aligned with the literature on school-aged language development and the description of academic language, and are described in Table 2.1

Table 2.1 Foundation Phase Learning outcomes and assessment standards for the Languages Learning area (RNCS, 2005, p. 59-75)

Outcome	Description	Assessment standard
Listening	The learner will listen for information and enjoyment, and respond appropriately and critically in a wide range of situations	Understanding instructions, stories, recounts and descriptions, and developing phonic awareness.
Speaking	The learner will be able to communicate confidently and effectively in spoken language in a wide range of situations	Responds to questions, memorises and performs songs, rhymes and poems, uses polite forms, responds appropriately to greetings, talks about pictures, makes requests, recounts experiences, asks for clarification, gives simple instructions, participates in conversation, and describes processes.
Reading and Viewing	The learner will be able to read and view for information and enjoyment and respond critically to the aesthetic, cultural and emotional values in texts	Uses pictures to understand written text, matches words and objects, follows printed instructions, builds up a sight vocabulary, uses visual cues to make meaning, makes meaning out of text and reads with increased speed and accuracy. Recognizes letters and words, develops phonic awareness, reads fiction and non-fiction books, and develops vocabulary.
Writing	The learner will be able to write different kinds of factual and imaginative texts for a wide range of purposes	Mechanics of writing Works with sounds, words and sentences
Thinking and reasoning	The learner will be able to use language to think and reason, as well as to access, process and use information for learning	Understands concepts and vocabulary, uses language for thinking and problem solving, collecting and recording information, understands and uses the language of mathematics, and the concepts and vocabulary related to other learning areas.
Language structure and use	The learner will know and be able to use the sounds, words and grammar of the language to create and interpret texts	Understands question forms, simple sentences, tense, modal verbs, imperatives, plurals, pronouns, prepositions, negative forms, adjectives and adverbs.

Although not fundamentally different, there are varied assessment standards for L1 and additional language speakers, and the standards are graded from the first to the third grade. They are spelled out in detail for educators. For example, the assessment standard: “understands short simple stories” in grade 1, provides the following expectations as an assessment guide for the teacher: “mimes the story, joins in choruses, draws a picture of the story, puts pictures in the right sequence, answers simple literal yes/ no

and open questions with one word answers, says how the story made the learner feel" (RNCS, 2005, p. 58).

Although the South African foundation phase languages curriculum thus reflects the developments described in the literature, it presents a number of problems. First, the assessment standards do not provide information on the complex processes underlying the acquisition of these language skills and can lead to "technicist" approaches to assessment and teaching (Reagan, 2009, p.11), in which the child is judged on displaying superficial behaviours. Since the RNCS does not prescribe methods of teaching and teachers may not know how to facilitate the acquisition of language (O'Connor & Geiger, 2009; Uys, van der Walt, van den Berg & Botha, 2007) this is a very real risk. Second, there is little acknowledgement of the difference between conversational and academic language, apart from mention of the fact that language needs to be used for thinking and reasoning. How this is to be developed is not alluded to. Cummins & Yee-Fun (2007) also argue that although the conceptualisation of discrete language skills (speaking, listening, reading and writing) corresponds to obvious distinctions in how language is used and experienced, it is limited in terms of policy for curriculum design and instruction.

As argued in the introduction, the development of academic language should be one of the primary goals of education, particularly within multilingual contexts and this requires attention to educational linguistics, part of which is an application of the relevant theory on additional language acquisition and learning. After all, the field of second language acquisition (SLA) originated out of the need to understand how additional languages are learnt in different contexts so that those experiences found to be facilitative of the process could be incorporated into language teaching practices (Ellis, 2010).

The following section addresses the theory and research pertaining to additional language learning in the early school-aged population and attempts to answer the third question posed above: How do children acquire academic language in an additional language?

2.4. ADDITIONAL LANGUAGE ACQUISITION IN THE EARLY SCHOOL YEARS: THEORY AND RESEARCH

2.4.1. Implicit and explicit learning

Additional language learning can occur implicitly or explicitly or both, with each of these mechanisms drawing on different cognitive processes (Robinson, 2005). Implicit learning uses automatic, rapid and

simultaneous processing mechanisms, and is not conscious. Explicit learning is a controlled, conscious process in which learners are directing their cognitive resources. It is a slower, more sequential process of learning (Hulstijn,2007; Williams, 2010).

There is a lack of clarity in the literature as to whether young children learn an additional language implicitly, explicitly or both. As discussed, certain authors argue that younger children do not have access to explicit learning strategies and therefore may take longer than older children to acquire an additional language (Mac Whinney, 2005; Paradis, 2004; Ullman, 2001). According to Ivady (2007) explicit learning of language is dependent on a certain level of cognitive development and will therefore not occur in early childhood, until the emergence of the ability to form abstract rules around the ages of 10-14 in Piagetian terms. The implication is that explicit language teaching is not indicated for 7-9 year old EAL children, since they cannot make use of explicit learning processes. However, explicit teaching may not equate to explicit learning, and it is possible that the language learning task and method of teaching will determine whether implicit or explicit learning mechanisms are recruited. According to Williams (2010), more difficult language tasks demand explicit, controlled processing, which draw on more extensive cognitive resources. As the task is practiced and becomes easier, automatic processing, which utilises fewer cognitive resources, occurs. Thus conscious (explicit) learning precedes the development of implicit, automatic processing. According to Ellis (2008, p.8) implicit learning is not sufficient for additional language acquisition because the learner's cortex has already been "tuned to the L1" and the additional language is consequently processed through automatic and implicit L1 mechanisms which may compete or interfere with L2 learning. Thus younger L2 learners may need to be provided with different forms of teaching that facilitate explicit learning.

Based on findings from neuro-imaging studies, Williams (2010) claims that information processing occurs through the activation of various "cortical networks" or brain regions (Williams, 2010, p.49). Language processing and learning require a number of co-ordinated, functional networks, and more demanding language processing requires more elaborate networks. Each network has a "core region" which is essential for a particular type of processing and other regions are recruited as processing demands increase. As processing becomes more automatic, the level of activation in the regions that are less central to the task is reduced. Thus as language processing becomes more automatic less general cognitive resources are recruited and the cortical network becomes more focal and specific to language.

The domain general mechanisms are engaged to support learning until automatic processing emerges with practice.

The task facing additional language learners is to develop fluent, automatized, implicit language processing (Hulstijn, 2007). As mentioned in the introduction, carefully designed activities and elicitation techniques, similar to those used in language intervention by speech-language therapists (e.g., Owens, 2004; Lewis & Penn, 1989; Jordaan, 1994) could be used to overcome the difficulty with explicit learning in young additional language learners. These techniques can develop implicit processing through practice (Segalowitz, 2003; Ellis, 2008).

Furthermore, Hulstijn (2007) argues that since humans have a limited attentional capacity for information processing, the more the processing at lower levels of listening (word recognition) and speaking (word retrieval) is automatized, the more language users can attend to higher levels of integration and organisation. Listening tasks and vocabulary learning should thus be a priority in the curriculum for young L2 learners since this will facilitate the automatic processing of word recognition and retrieval (Hulstijn, 2007). Speech-language therapists are well-versed with the strategies that can be used to develop these skills and could provide valuable assistance to foundation phase teachers in this regard.

2.4.2. Research findings on second language acquisition in the early school years

Second language acquisition is a relatively new field of enquiry (Myles, 2010), and there has been limited research into the acquisition of an additional language in the early school years, particularly in contexts where the additional language is used as the medium of instruction. Existing studies have focused on specific language components or isolated skills, and most studies have not addressed the psycholinguistic mechanisms involved in the acquisition of academic language but have focused on educational outcomes to evaluate different models of education in multilingual contexts. In addition there are very few longitudinal studies reported in the literature.

Research addressing the rates and patterns of L2 acquisition in relation to L1 acquisition, has focused primarily on lexical and morpho-syntactic acquisition. The assumption underlying much of the work on vocabulary learning has been that the L2 learner is more cognitively advanced when the process starts

and has an existing L1 lexicon to draw upon for conceptual-lexical mapping. Therefore it is possible that L2 children learn vocabulary faster than younger L1 learners for the same target language (Paradis, 2009). Winitz, Gillespie & Starcev (1995) studied the acquisition of English vocabulary in a 7 year-old Polish-speaking child and found that she advanced four developmental years in vocabulary knowledge within one year of exposure to English, as assessed on the Peabody Picture Vocabulary test. In contrast, the Edmonton study on ESL development (Paradis, 2005) showed that the children gained 12 months of vocabulary knowledge in 12 months of exposure to English similar to L1 acquisition. However, there were children who showed remarkably rapid vocabulary growth and Paradis (2005) concludes that rapid vocabulary development may be an individual rather than a group phenomenon in L2 learners. Kohnert (2004) suggests that lexical processing develops gradually in both monolingual and L2 learners and is a protracted process extending into adolescence. Vocabulary growth rates are thus consistent for L1 and L2 learners.

Studies on morpho-syntactic acquisition in a number of different L2s have shown that the developmental sequence of morphemes is similar in L1 and L2 learners and the errors made in the L2 are mainly developmental in nature and not due to transference from the L1 (Paradis, 2009). The rate of morpheme development is also similar in L1 and L2 learners (Jia, 2003; Paradis, 2005).

However, the literature also reports on differences between L1 and L2 learners on certain language skills and an important research question has been how long it takes L2 children to reach the same levels of performance as monolingual children particularly on standardised tests. Most studies have found that it takes at least 5 years of exposure to the L2 in an instructed setting for this to occur (Hakuta, Goto, Butler & Witt, 2000; Cobo-Lewis, Pearson, Eilers & Umbel, 2002; Eilers, Pearson & Cobo-Lewis, 2006). However, Paradis (2009) suggests that this may depend on the language component tested. In the Edmonton ESL study, there were distinct differences between grammatical morpheme production, receptive vocabulary and narrative story grammar after 21 months of exposure to English. Only 40% of the children reached commensurate levels of performance with monolingual norms on grammatical morphology, 65% on vocabulary and 90% on narrative production (Paradis, 2005).

However, the comparison of L2 learners to a monolingual norm is controversial, since it disregards the interaction between the two languages of the emergent bilingual and assumes that he/she is two monolinguals in one (Paradis, 2009). It is also doubtful whether a L2 learner can ever achieve the proficiency levels of a native speaker (Cook, 2007). Cook (2007, p. 240) suggests the alternative notion of

"L2 user" which refers to a person who knows and uses a second language at any level. She argues that L2 learners should be regarded as successful when they can carry out language functions appropriate to their anticipated uses, but not necessarily at the same level as an L1 speaker. However, in the case of children learning in the L2, who will be required to pass the same examinations as their monolingual peers, the required level of functioning in the L2 will be close to the monolingual norm. In this case it seems inappropriate and patronising to set lower standards and expectations for L2 learners. The EAL children in this study were thus compared to their L1 peers, not in an attempt to show deficits, but to enhance the learning experience of these children.

The factors that have been found to affect additional language acquisition in the young school-aged child are the focus of the next section.

2.4.3. Factors affecting second language acquisition in the early school years

The factors discussed in this section have been identified in the literature as influencing the development and maintenance of additional languages. All of these factors interact in complex ways at different stages of the SLA process. It would be virtually impossible to account for the complexities of this process in a single research study. Hence this study aimed, in line with an integrated theory, to describe the acquisition of a second /additional language over a period of three years and based on the results, attempt to offer explanations for varied outcomes resulting from contextual and individual variables.

Second language acquisition is a complex task and yet, despite this many people achieve remarkably high levels of bilingual competence, functioning at equivalent and high levels in both their first and second languages. In fact, far from being exceptional, bilingualism and multilingualism are the norm worldwide. In contrast to early views on bilingualism as a burden on the brain, a source of mental confusion, split loyalties, inhibition of the acquisition of the L1, identity conflict, or even schizophrenia, more recent research shows that knowing and using more than one language can be highly beneficial on a number of different levels (Baker, 2006). However, it is important to acknowledge that becoming bilingual has consequences for cognitive development, which may be either positive or negative (Bialystok, 2001). Learning more than one language also has implications for the construction of individual social identity

(Pavlenko, 2003). In the education of young emerging bilinguals it is essential to be sensitive to these issues.

a) Age of acquisition

This study is concerned with the acquisition of a second language during the first three years of formal schooling, focusing on the age range 6 -9 years. The participants are thus defined as "successive bilinguals" (Genesee & Nicoladis, 2009, p.325). This is in contrast to simultaneous or first language bilinguals, where two languages are acquired from birth (de Houwer, 1995). Different cut-off ages have been suggested to differentiate simultaneous from successive bilinguals, but as Genesee and Nicoladis (2009) point out, it is not clear whether acquisition of an additional language within one, two or three years of birth involves fundamentally different processes and outcomes.

However, the age of acquisition is important because it relates to the child's maturational level and stage of communicative development in the first language when regular exposure to the second language begins. On this basis, successive or sequential bilinguals can be further subdivided into those who have input in an additional language in the pre-school years and those whose additional language experience only begins at school entry (Kohnert, 2008). The participants of this study are comparable to the first group in that they were exposed to the first language(s) and English in the home and community in the pre-school period and then used English as the language of learning from the first grade. As discussed in the introduction, younger children may take longer to acquire an additional language than older learners because they do not have access to explicit learning strategies. The aim of this study was thus to examine the rate and process of academic language learning in these sequential EAL learners to determine realistic expectations of their progress in the foundation phase and to identify specific language skills with which they could be assisted.

b) The role of the L1 in the acquisition of additional languages

As alluded to in the discussion on age effects and L2 acquisition, the age of acquisition is important because it relates to the level of development achieved in the L1 when exposure to the L2 begins. To this end, Cummins (2000) outlined the developmental interdependence hypothesis, which claims that a child's competence in the L2 is partly dependent on the level of competence already achieved in the L1. The more developed the L1, the easier it will be to learn the L2. This hypothesis has been supported by a number of researchers (e.g., Huguet, Vila & Llurda, 2000; Oller & Eilers, 2002; Proctor, 2003), and it has

important implications. First, it implies that children who have for whatever reason (e.g., language impairment, low language learning aptitude or lack of early stimulation due to lower socio-economic status) a poorly developed L1, will find it more difficult to learn an L2 and may show slower rates of development in the L2 . It also implies that continued support for the development of the L1 is important in emerging bilingual children.

A further issue related to the role of the L1 is the extent to which it supports and/or interferes with the development of the L2. According to Myles (2010) early SLA researchers, driven by behaviourism, the then dominant learning theory in psychology, regarded the task facing L2 learners as rote learning and practice of new grammatical forms and vocabulary in the target language. To prevent the L1 from interfering with this process, researchers carefully described the pairs of languages being learnt to identify areas that are different and would thus be difficult for L2 learners. In the second half of the 1960's, primarily as a result of Chomsky's theory, the focus shifted to descriptions of what L2 learners were actually producing, especially their errors, and this led to the conclusion that much of their productions were not influenced by the L1. In addition, researchers showed that what is different in two languages is not necessarily difficult, and what is similar is not necessarily easy. Myles (2010) argues that in order to understand L2 acquisition we need to investigate what learners actually do and produce as well as the context in which they learn, rather than focusing only on the source and target languages. However, as suggested by the developmental interdependence hypothesis, the L1 is an important resource for the acquisition of the L2.

The acquisition of a L2 can also have effects on the development of the L1 and consequently for the cognitive development of the learner.

c) Effects of education in an L2 on L1 development

One of the consequences of education in an L2 is that young children may experience loss or attrition of the L1 (Baker, 2006), particularly if the L1 does not enjoy equal status with the L2 and is not valued in the home and community. Early sequential bilinguals are said to be more affected by the relative social status of the two languages because this impacts on the maintenance of the L1. Where both the L1 and L2 have high status, and are spoken in the home and wider community, there is a better chance that the L1 will be maintained and both languages will continue to thrive and develop in what is termed an "additive bilingualism" situation (Genesee, Paradis & Crago, 2004; Baker, 2006). If however, the L1 has

low status in comparison to the L2, it may not be valued and used sufficiently to ensure continued development and is thus vulnerable to regression. It may be replaced by the L2 in a "subtractive bilingualism" context. This can have negative effects on cognitive development since the L2 is still in the process of being acquired and both languages are thus at a lower level of functioning than "the threshold level of linguistic competence" required to support the child's cognitive processing in a particular learning situation (Cummins, 1977, p.10). Similarly, if both languages are at an equally advanced level, above the required threshold, there may be a number of cognitive advantages to becoming bilingual including increased metalinguistic awareness , improved divergent and creative thinking, greater mental flexibility, increased ability to think abstractly and superior concept formation (Baker, 2006; Bialystok, 2001). Bilingual education programmes, where both languages are used as media of instruction are thus considered to be more beneficial than L2 monolingual programmes.

Another consequence of education in the L2 is a gradual dominance shift from the L1 to the L2. This phenomenon has been well documented in studies investigating the emerging L1-L2 profile when children are taught in the L2 (Kohnert & Bates, 2002; Pease-Alvarez, Hakuta & Bailey, 1996). Research also shows that the shift tends to occur faster in younger children (Magiste, 1992; Jia & Aaronson, 2003). As Kohnert (2008, p. 69) observes: "From a dynamic interactive processing perspective, fluctuations in L1 and L2 proficiency are a natural consequence of the child's interactions with changing environmental demands and opportunities."

However, this does not mean that L1 proficiency and maintenance are not important, since a relatively greater proficiency in the L2 does not necessarily imply proficiency levels comparable with L1 monolingual peers.

d) Socio-economic status

Socio-economic status (SES) is a complex, multi-dimensional construct that comprises economic measures such as income, education and occupation, in addition to social factors such as power, prestige and hierarchical social status (Duncan & Magnusan, 2003; Adler & Rehkopf, 2008; Hackman & Farah, 2008). The effects of low SES are pervasive and cumulative, and the mechanisms of association and causality are complex. Hackman & Farah (2008), following a review of the literature on brain development and SES using behavioural, electrophysiological and neuro-imaging methods, conclude that SES is an important predictor of neuro-cognitive functions, particularly as these relate to language and

executive functions in young children. According to these authors, brain development is a prolonged process in which different areas and networks reach maturity at different ages, and the protracted development of the pre-frontal regions render the development of language and executive functions particularly vulnerable to the effects of low SES environments, such as poor cognitive stimulation, malnutrition, non-facilitative parenting styles and chronic stress.

Of significance to this study, are the effects of SES on language development. There is compelling evidence in both first and second language acquisition research to suggest that children from lower SES backgrounds show slower rates of development than those from higher SES groups (Arriaga, Fenson, Cronan & Pethick, 1998; Dollaghan, Campbell, Paradise, Feldman, Janovsky & Pitcairn, 1999; Huttenlocher, Vasilyeva, Cymerman & Levine, 2002; Rescorla & Alley, 2001). These findings are attributed to the nature of the interactions in lower SES mother-child dyads. These mothers have been found to talk less, use a smaller vocabulary, be more directive, and ask fewer questions (Hoff, 2003; Hoff & Tian, 2005; Hart & Risley, 1995), all of which are not facilitative of language development (Hoff & Naigles, 2002; Weizman & Snow, 2001). Research has also shown that socio-economic status affects the oral language development of L2 learners from 2nd to 5th grade (Cobo- Lewis et al , 2002; Eilers et al., 2006; Gathercole, 2002a, 2002b), and that lower SES children do not necessarily experience the positive consequences of bilingualism to the same extent as higher SES children (Hammer, Miccio & Wagstaff, 2003).

Poorer oral language skills in early childhood would certainly explain poorer literacy skills at school, where low levels of achievement are intensified by SES effects such as lack of home support, poor neighbourhood effects e.g., concentrated poverty; within school peer effects e.g., gangsterism, negative attitudes, and under-resourced schools in terms of materials and personnel (Taylor and Yu, 2008). In fact, Taylor and Yu's (2008) analysis of South African data revealed that the effects of low SES home environments are amplified by low SES schools and that the SES of the school attended by a particular child may be more significant than his/her own family background in determining reading level. As will be shown in chapter 3, the characterisation of SES in South Africa is particularly challenging and it is not always possible to draw on the international research in this regard.

e) The language learning context

"There is no context-free language learning" (Watson-Gegeo & Nielsen, 2003, p156), and second language acquisition is both a cognitive and social process. Social context in SLA can be analysed along three dimensions: macro vs. micro; structural vs. interactional; and objective (observable aspects of social context) vs. subjective (individual perceptions of social context) (Siegel, 2003). Macro-analysis and the structural parameter focus on the characteristics of the society and consider the social groups that comprise it in terms of relative size, status and power of the L1 and L2 groups and the domains in which the L1 and L2 are used. Micro-analysis and the interactional dimension consider the behaviour of individuals in particular situations as a result of broader societal factors. It examines the specific activities involving L2 learning and use and the relationships among L1 and L2 speakers. It focuses on the interactions that create the context for the emergence and negotiation of social identity and the learning of language.

In education, a micro-analysis of social context includes the type of educational programme and the nature of the interactions that occur in the classroom.

(i) Educational programmes

There are many typologies of educational programmes, but Siegel (2003) suggests a simple dichotomy between monolingual programmes, where only one language is used as the medium of instruction and bilingual programmes, where two or more languages are used. The focus in this study is on the former, of which there are two types: L1 and L2. In the first type, the L1 is used as the language of teaching and learning and additional languages may be taught as subjects. The L1 children in this study are in this type of programme, where English is used as the medium of instruction and they learn other South African languages (e.g., Afrikaans, isiZulu) as subjects. In L2 monolingual programmes, the L2 is used as the medium of instruction, and other languages are taught as subjects, as in the case of the EAL learners in this study.

One of the variants of L2 monolingual programmes, also practiced in South Africa, is the transitional model. These schools adopt the L1 to teach literacy and academic subjects in the primary school grades for 3 –6 years at which time the learners are transitioned to mainstream classes in which all instruction is provided in the L2. These programmes are considered to be subtractive forms of bilingual education in that the learners' home language is only used to support the acquisition of the L2 (Genesee, 1999).

Learners are expected to be able to use the L2 as the medium of instruction at some time in their schooling.

Bilingual programmes on the other hand are aimed at full bilingual proficiency and grade appropriate standards in academic subjects, and are considered to be additive forms of bilingual education. The second language *and* the home language are used to teach literacy and academic subjects throughout the primary school grades and sometimes through the secondary school grades. There is considerable research evidence in Africa (Obondo, 2008) and in Western countries (Lindholm, 2001; Thomas & Collier, 2002) to suggest that an additive bilingual approach in which the home language is used for as long as possible while the child acquires other languages is superior to monolingual L2 programmes. However, the educational programme in and of itself is unlikely to be of value if language teaching practices and interactions in the classroom are inadequate.

(ii) Interactions in the classroom

As discussed in the introduction, "teaching through the medium of a second language is no panacea" (Cummins & Lee-Fun, 2007, p807) and teachers need to understand and translate into practice a number of theoretical constructs to successfully instruct additional language learners (Gibbons, 2007; Cummins, 2008; Wong-Fillmore & Snow, 2000). However, there is evidence to suggest that many teachers lack these skills, not only in the South African context (Uys, et al, 2007; O'Connor & Geiger, 2009) but also internationally (Wong-Fillmore & Snow, 2000; Mroz, 2006), because they have not had the necessary training in educational linguistics. The results of this study may shed light on what should be included in such training.

(iii) Language experiences outside the classroom

Finally, the language environment outside the classroom, in the home, and experiences in the pre-school period, also contribute to the learning of the L2 (Jia, 2003; Jia & Anderson, 2003; Genesee, Paradis & Crago, 2004). The amount and quality of English EAL children are exposed to in these contexts may be an important predictor of their ability to learn in English when they enter school. The fact that parents and pre-school teachers may also be EAL speakers is an important consideration, since they may not be able to provide the rich and diverse vocabulary children need to build their lexicons (Paradis, 2009). In the Edmonton ESL study (Paradis, 2005) for example, the amount of exposure to English in the home was not positively correlated to English proficiency at the end of the second school year.

In the current study, exposure to English in the pre-school period was determined through parent questionnaires and the participants were classified according to the amount of English spoken in the home and number of years of attendance in an English medium pre-school.

f) Individual Child factors

Individual differences have been studied in much more depth in second than in first language acquisition research, mainly because there is considerably more variation in the rate of learning and ultimate proficiency attained by second language learners. In addition to variations in the context for language learning, individual differences may also be the result of disparities in the range of cognitive processes involved in additional language learning. One process receiving increasing attention is working memory (Juffs & Harrington, 2011).

(i)Working memory

This is defined as the system for temporarily storing and processing information while performing higher order cognitive tasks such as comprehension, learning and reasoning (Baddeley & Logie, 1999). According to Juffs & Harrington (2011) working memory is not memory in the sense that it reflects the capacity to store experience, but is better understood as a system that controls and regulates behaviour. Since first proposed by Baddeley & Hitch (1974), the working memory construct has been extensively researched in cognitive psychology and psycholinguistics and over the past two decades has also attracted the attention of SLA researchers, who have mainly been interested in how individual differences in working memory capacity (WMC) may account for variable success in additional language learning (Juffs, 2004; Felser & Roberts, 2007; O' Brien, Segalowitz, Collentine & Freed, 2006).

Working memory is not a unitary construct and its role in language learning varies depending on the age of the learners, the nature of the task and the linguistic domain (Juffs & Harrington, 2011). The best known and most influential model of working memory is that first proposed by Baddeley & Hitch (1974). This model had three elements: two short-term storage domains consisting of the phonological loop and the visuo-spatial sketchpad, and a central executive controlling the flow of information between these domains and other cognitive processes. The phonological loop handles temporary retention of verbal information while the visuo-spatial sketchpad stores visual and spatial information. Later a fourth element, the episodic buffer was added to the model and is described as the place where various types

of information are temporarily stored and integrated (Baddeley, 2000). Baddeley's model is represented graphically in figure 2.1.

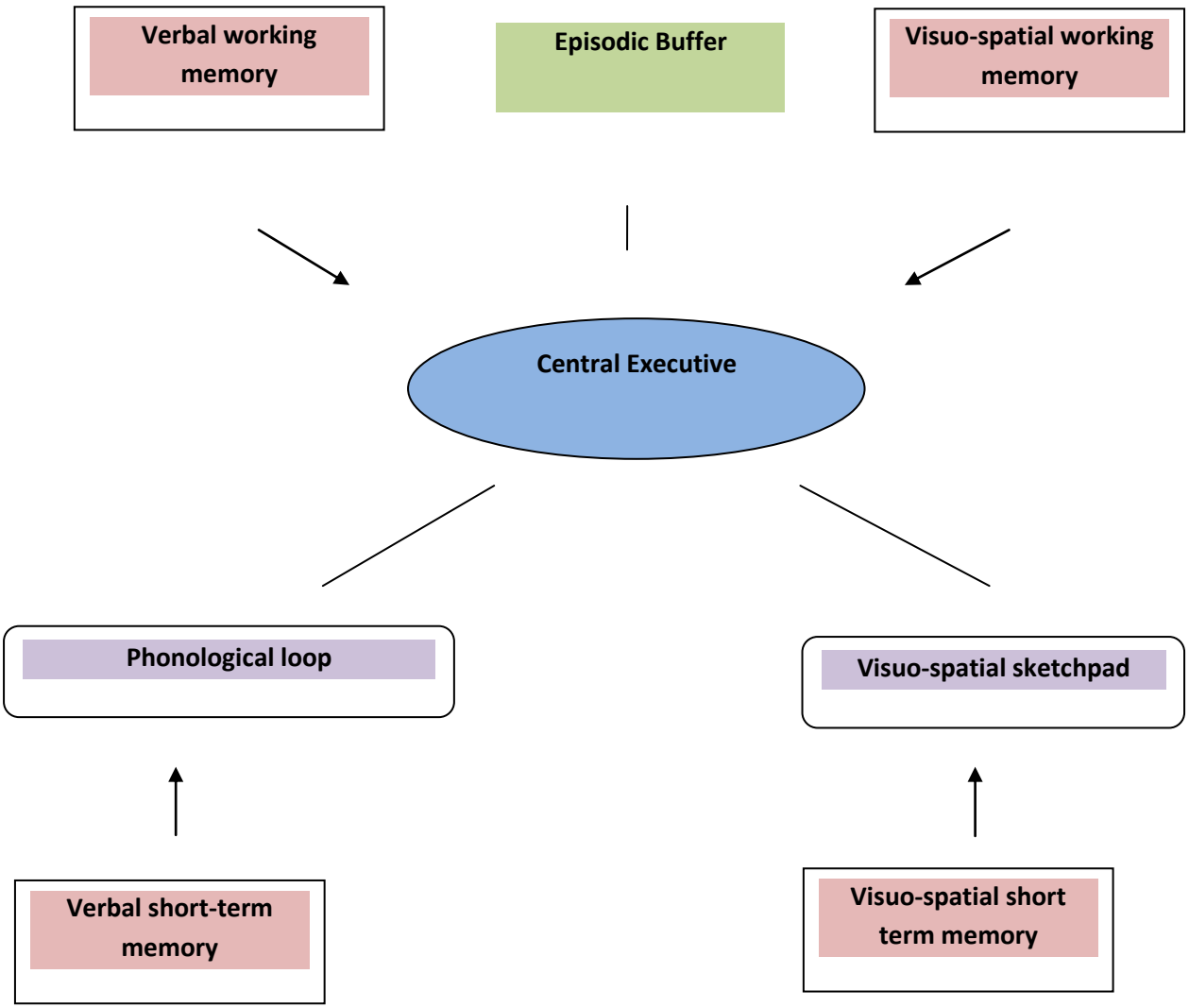


Figure 2.1 Baddeley's Model of Working Memory (2000)

The phonological loop component, responsible for phonological short-term memory, has from the outset received the greatest attention from researchers interested in language learning and processing, because the processing of phonological information is central to language learning and use. The role of phonological memory in the learning of new words has been stressed and the ability to recall non-words is considered to be a reliable predictor of vocabulary development in early childhood (Baddeley,

Gathercole & Papagno, 1998). Adams & Gathercole (1996) found that children with greater phonological memory capacity also produced longer utterances and grammatically and semantically more complex narratives than children with lower phonological memory capacity. The role of phonological memory in learning new sound patterns has been shown to be critical to vocabulary learning in an additional language (Service & Kohonen, 1995; Cheung, 1996; Baddeley et al., 1998; French & O'Brien, 2008). It has also been implicated in the learning of L2 grammar (Speciale, Ellis & Bywater, 2004).

Visual and spatial memory has received less attention from language researchers and to date there has been no research on the possible role of the episodic buffer in additional language learning (Juffs & Harrington, 2011). In this study the function of the episodic buffer was assessed using a sentence recall task since Vance (2008) and Alloway, Gathercole, Willis & Adams (2004) suggest that sentence recall involves the integration of information from short-term memory with the language processing system, which is the function of the episodic buffer.

The central executive is responsible for co-ordinating and controlling the different activities within WM. It has finite attentional resources, including mental energy and capacity. Attentional control is critical and its regulatory functions include allocation of resources to different levels of a task, updating or changing the contents of WM through attention switching, sustained attention or the ability to attend selectively to a stimulus while inhibiting irrelevant stimuli (Baddeley, 1996).

The central executive has received increasing attention from L2 researchers (Engle & Kane, 2004; Cowan, 2005). For some researchers, attentional control is synonymous with working memory (e.g., Engle & Kane, 2004), and Juffs & Harrington (2011) suggest that the tasks assessing WM may in fact be measures of attention.

Indeed, the manner in which working memory is assessed makes it difficult to determine whether the results of working memory assessments reveal WMC or language processing or both. Primarily, the tasks used to assess WMC rely on and are influenced by linguistic factors (Montgomery, Magimairaj & Finney, 2010). Maimela-Arnold and Evans (2005) argue that WMC and linguistic knowledge are not separable constructs. Rather WM capacity reflects the activation of specific representations in long term memory (Cowan, Nugent, Elliott, Ponomarev & Sault, 2005), and limited WMC is a reflection of weak linguistic representations (Maimela-Arnold, Evans & Coady, 2008). The strength, access and retrieval of representations are dependent on the frequency of input (MacDonald & Christiansen, 2002). The

implication is thus that children learning an additional language who have not yet established strong linguistic representations will show limited working memory capacity.

In addition, evidence from neuro-imaging research suggests that one of the primary cortical areas involved in language processing, the left inferior frontal gyrus (Broca's area) is also associated with some working memory processes (Chein, Ravizza & Fiez, 2003). The network for working memory typically includes areas in the pre-frontal cortex and parietal lobes, depending on the type of stimulus used or the task demands (Owen, McMillan, Laird & Bullmore, 2005). In "brain based models" of language processing, working memory is viewed as a general cognitive resource that may or may not be engaged in various language tasks (Williams, 2010, p. 5). As discussed in the section on implicit and explicit learning, larger cortical networks, involving more general cognitive processes are recruited in more demanding language tasks. As processing becomes easier and more automatic, the network becomes more focal and specific to language processing. This explanation confirms that the relationship between working memory and language processing is complex and dynamic and may vary depending on the nature of the task and the level of proficiency of the learner.

Assessment of Working Memory Capacity

WMC is determined by both storage (short-term memory) and processing (working memory) components which can be measured separately or in combination, but the relationship between the two remains unclear, and there is evidence both for and against the notion that both elements tap the same underlying system (Juffs & Harrington, 2011).

Short-term memory capacity is measured using word- or digit-span tests, and in L2 learners who may not be familiar with the words, the effects of previous language knowledge can be lessened by using digits instead (Harrington & Sawyer, 1992). Alternatively, non-words can be used and tests can be constructed to conform to the phonotactic rules of the language or include phonemes that are not in the language and vary in the extent to which they resemble actual words (Gathercole, 2006). A non-word repetition test that includes sounds not in the first language of the child allows for the assessment of the ability to encode new phonological sequences (Juffs & Harrington, 2011). The role of phonological short-term memory, as assessed on non-word repetition tasks, has been widely researched in relation to additional language vocabulary development. In general, the findings indicate that phonological memory is more important in less proficient beginning learners than in more advanced learners, and that the effect of

phonological memory interacts with long term knowledge in the developing system (Juffs & Harrington, 2011). Most of the research has focused on adult or adolescent learners, but French (2006) and French & O'Brien (2008) have studied 8-11 year old children in English immersion programmes in Canada using non-word repetition tasks. They found that WM did not predict vocabulary learning because the children had already acquired vocabulary, but it did predict grammar learning. The effect of WM on individual learner differences may thus change over the course of development.

Complex working memory tests involve both storage and processing. The most widely used format is a listening span test requiring simultaneous recall of the last words in a set of sentences and comprehension through judgment of the semantic sense of the sentences. These tests require knowledge of the language and an alternative format is the backward digit-span task (Kormos & Safar, 2008), but this also requires comprehension of the instructions. In piloting this format as a possible measure for this study, it was found that many EAL children did not understand what was required of them in this task.

Although there is controversy over the nature of working memory, its measurement and its relationship to language processing, working memory was assessed in this study to determine to what extent it accounted for individual variation in academic language proficiency and to describe the relationship between the different components of WMC and language processing in EAL and L1 learners. The main reasons for doing this were to explore working memory assessment in EAL learners and to determine whether WM may be a component of aptitude for language learning.

Working memory and aptitude

The fact that WMC has been found to play a fairly robust role in L2 acquisition has led to research on the relationship between WMC and the aptitude for language learning (Dornyei & Skehan, 2003; Robinson, 2005; Kormos & Safar, 2008).

Aptitude is defined as the strengths individual learners have in the cognitive abilities drawn on in processing information during additional language learning in various contexts and at different stages (Robinson, 2005). Current theory on aptitude assumes that learning contexts, the teaching practices taking place within them and the cognitive processes they implicate all interact with the profile of abilities that different learners possess (Robinson, 2005). Thus some learners may be particularly suited to learning in one context vs. another.

Traditional models of aptitude identify four main components of the construct: phonemic coding ability, which is the capacity to code an unfamiliar sound so that it can be retained long enough for subsequent retrieval; grammatical sensitivity, which refers to the ability to identify the grammatical functions of words in a sentence; inductive language learning ability, or the capacity to extract patterns from language input and use these patterns to formulate new sentences; and associative memory which enables the learner to form connections in memory between L1 and L2 vocabulary (Carroll, 1981).

Aptitude tests constructed within this model, e.g., Pimsleur's Language Aptitude Battery (Pimsleur, 1966) for elementary school children, were developed to predict differences in the rate at which additional language learning takes place in the beginning stages of instructed exposure to the L2 (Skehan, 1998). However, this test did not measure the ability to benefit from incidental exposure in either instructed or natural settings and could not predict success at more advanced stages of acquisition.

Since the development of these measures, considerable research has taken place within the information processing paradigm in cognitive psychology and researchers acknowledged that aptitude theory required a more refined analysis of the learning context and task in terms of the cognitive abilities they draw on (Robinson, 2005). They also argued that the different components of the traditional aptitude construct could be related to stages of cognitive processing (Robinson, 2005; Dornyei & Skehan, 2003).

Later SLA research into the measurement of aptitude has investigated the influence of other individual differences such as phonological working memory (Miyake & Friedman, 1998; Williams & Lovatt, 2003) and it is now suggested that WM measures should be integrated into a battery of aptitude subtests.

In the information processing models proposed by Robinson (2005) and Dornyei & Skehan (2003) some of the cognitive processes involve the various components of WMC. In particular, the phonological loop component of WM is linked to phonemic coding ability which in turn is related to the cognitive processes of noticing relevant qualities in the input and segmenting the input. Similarly, the cognitive processes of controlling attention and perceptual processing are functions of the central executive in models of working memory.

However, working memory is not the only component of aptitude and seems to be regarded as one of the more basic among many abilities contributing to aptitude complexes. Robinson (2005) lists deep semantic processing, metalinguistic skills, memory for contingent speech, pragmatic or interactional

traits, pattern recognition, processing speed, rote memory and lexical inferencing as other important abilities.

Aptitude has not been widely researched in children mainly because young children seem to attain a native-like proficiency of an additional language in the long term, regardless of low or high aptitude and thus this factor has been considered to play no role in early acquisition (Abrahamsson & Hyltenstam, 2008). However, these authors have also identified small but significant aptitude effects in child SLA.

Various other intrinsic cognitive and psychological characteristics have been identified as contributing to L2 acquisition rates and outcomes (Paradis, 2009). Not all of these factors were directly addressed in this study, but are described briefly, since they may be used to explain the findings.

(ii)**Cognitive and Learning style**

Cognitive style refers to a predisposition to process information in a characteristic manner, while learning style is a typical preference for approaching learning in general (Dornyei & Skehan, 2003). Different styles may encompass different strengths and weaknesses and thus may be equally valid in the learning process, but educational programmes can also be adapted for different learning styles. However, Dornyei & Skehan (2003) argue that these concepts suffer from poor definition in the literature and may just refer to variations in patterns of information processing.

(iii) Language Learning Strategies

Strategies refer to the learner's active contribution to enhancing the effectiveness of his/her own learning (O'Malley & Chamot, 1990; Oxford, 1990). This idea is clearly embedded in the emergentist perspective of language learning, since it alludes to the learner as an active participant in the process (Owens, 2008). Included in the definition are: cognitive, memory, metacognitive, compensation, affective and social strategies. Of relevance to this study, is the notion of social strategies, since these are described as interpersonal behaviours aimed at increasing the amount of L2 practice the learner undertakes by initiating interaction with L1 speakers. In one of the educational contexts included in this study, L1 speakers were not available and it is possible that this may have had an effect on the learning of English by learners in this context. Oxford (1996) also points out that there is cross-cultural variation in the use of learner strategies. In the educational psychology literature, the term "self- regulation" has come to be used in place of learning strategies and refers to the degree to which individuals participate

in their own learning (Zimmerman & Reisenberg, 1997). Self- regulation and motivation are clearly related.

(iv) Motivation

Within the field of social psychology, motivation as a determinant of second language learning outcomes has been extensively researched in adults (Gardner, 1985). Motivation is linked to attitudes toward the learning of the L2 (Dornyei & Skehan, 2003; Baker, 2006; Paradis, 2009). Gardner (1985) proposed two types of motivation: integrative, which is a positive disposition towards the L2 community and the desire to become part of it, and instrumental, which refers to an appreciation of the practical value of learning the L2. Pavlenko (2003) claims that attitudes have been largely replaced by ideologies derived from social and cultural factors, and are part of a dynamic scenario in which L2 acquisition has individual, group and societal dimensions. This is certainly true of the South African context, where parents place their children in English-medium schools to access the linguistic resources that these educational establishments are perceived to provide. Although children may not be as affected by attitudinal factors because they have not developed a high level of awareness of intergroup and cultural differences (Genesee & Hamayan, 1980), it is possible that the educational context will determine attitudes and motivation. For example, and in the context of this study, children in an integrated school with both L1 and L2 learners, may experience more integrative motivation while children in an L2 only school will have more instrumental motivation (i.e., learn the language to succeed in school).

It is also possible that in a situation where the L2 is used as the language of instruction, it is difficult to separate general motivation to learn from motivation to learn the language. In fact, Dornyei & Skehan (2003) suggest that a more comprehensive model of academic and social motivation is necessary to explain the relationship between general attitudes to the L2, learner-specific motives such as self - confidence and self-esteem, the social context of the classroom, the teacher's influence on motivation, the motivational characteristics of the curriculum and the learner's self-regulation of motivation.

(v) Personality characteristics

Individuals who are more outgoing and assertive are predicted to experience more frequent and high quality interactions with L1 speakers leading to success in the L2 acquisition process (Paradis, 2009). Wong- Fillmore (1983) argued that this would be true of natural acquisition contexts since she showed that the most successful L2 learners in her study of 48 children had one of two personality types. Highly

social and outgoing learners sought opportunities to speak the L2 in peer interactions , while shy , non-sociable children compensated by demonstrating more attentiveness to the teacher in the classroom. Strong (1983) showed that talkativeness, responsiveness and gregariousness were significantly correlated with higher proficiency levels in grammar, vocabulary and phonology in pre-school children. Again, the interaction of personality traits and availability of L1 speakers is emphasised in these studies.

2.5. READING IN MULTILINGUAL EDUCATIONAL CONTEXTS

According to Kimborough-Oller & Jarmulowitz (2009) learning to read involves a variety of language skills including: phonological awareness, phonological short-term memory, rapid automatic naming (retrieval and production of words) and oral vocabulary knowledge. Reading also involves higher level processing of morphology and syntax and self- regulation.

Literacy development in EAL learners is a central concern in this study, and reading accuracy and comprehension were assessed for two reasons: First, as previously explained, the participants are learning to read in English without or with very little support in their L1. This route to literacy has been questioned since research has shown that children learn to read more efficiently in their home language (August, Calderon, Carlo & Nutall, 2006). However learning to read in a second language is possible through enhanced instruction in the key components of reading, greater oral proficiency in the L2, and when the L1 is used to facilitate literacy development in the L2. Individual differences that contribute to oral L2 acquisition also contribute significantly to literacy development (August & Shanahan, 2006).

Another important finding emerging from research is that word level skills such as decoding and word recognition, if taught well, develop relatively quickly in L2 learners, so that they attain equal levels of performance with their L1 peers. However, this is not the case for reading comprehension (Geva, 2006; Geva & Genesee, 2006). The reason for this disparity is that oral proficiency in the L2 is not as strong a predictor of word level skills as it is of reading comprehension. Specifically, L2 vocabulary knowledge, listening comprehension, syntactic skills and the development of metalinguistic skills are linked to reading comprehension in the same way as they are in L1 learners (August & Shanahan, 2006). This is the second reason for assessing reading in this study: the researcher was interested in the relationship between oral language and reading proficiency in EAL children, and the implications of this for teaching practices.

Children who may not achieve the language proficiency needed for academic success are those with language impairments resulting from developmental disabilities such as autism, intellectual disabilities and specific language impairment (SLI). Of particular interest in this study is SLI. The next section examines this condition, the interface between SLI and EAL learning as well as appropriate assessment and identification of children with SLI in linguistically diverse populations.

2.6. SPECIFIC LANGUAGE IMPAIRMENT

Specific Language Impairment (SLI) is an impairment of language comprehension or production or both in the presence of normal intelligence (i.e., normal performance IQ), absence of a hearing impairment, no diagnosis of autism and no neurological impairments. In short, these children experience typical development in every area but one: learning to speak and use language (Genesee, Paradis & Crago, 2004; Schwartz, 2009). They are thus significant exceptions to the assumption that language acquisition is "a stubbornly robust process" (Pinker, 1984, p. 29). Researchers still appear uncertain about the cause, range of manifestations, course of development and the most effective remediation approaches for SLI (Schwartz, 2009).

2.6.1. Causes of SLI

There are a number of theories of the causes of SLI, but none have been able to account for all the linguistic deficits observed in these children, and since language acquisition depends on so many different cognitive processes, it is possible that there is no single cause of the condition and children identified as SLI represent a heterogeneous group (Hoff, 2005; Bishop, 2006).

There are two general explanatory accounts of the mechanisms causing SLI: cognitive processing perspectives and linguistic representational theories (Paradis, 2007).

One of the cognitive processing explanations of SLI is that many of these children exhibit marked deficits in nearly all working memory mechanisms as well as speed of processing (Montgomery, Magimairaj & Finney, 2010). Specifically, they show significant limitations in short-term memory capacity and Gathercole & Baddeley (1990) proposed that the language impairment in SLI is secondary to a deficit in phonological storage. There is a considerable amount of research evidence to support this hypothesis. Regardless of the task used to assess phonological short-term memory (digit-span, word-span or non-

word repetition) children with SLI exhibit reduced phonological memory relative to their typically developing age-matched peers(Archibald & Gathercole, 2006; Ellis Weismer, Tomblin, Zhang, Buckwater, Chynoweth & Jones, 2000; Montgomery, 2004; Montgomery & Evans, 2009). In addition, Conti-Ramsden & Durkin (2007) showed in a longitudinal study that reduced phonological memory capacity in SLI children is persistent until adolescence.

There is also evidence that short-term memory deficits may be restricted to the verbal modality in children with SLI (Alloway & Archibald, 2008; Archibald & Gathercole, 2006; 2007). 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 appear to have deficits in phonological memory (van der Lely, & Howard 1993; van der Lely, 2003).

Not until recently have SLI researchers begun to study the central executive in working memory. Most of these studies have found that children with SLI show poor attentional capacity, inhibitory control, updating and sustained attention relative to age-matched typically developing peers in both verbal and non-linguistic tasks assessing the function of the central executive (Archibald & Gathercole, 2006; 2007; Marton & Shwartz, 2003; Montgomery & Evans, 2009; Montgomery Evans & Gillam, 2009; Spaulding, Plante & Vance, 2008; Windsor, Kohnert, Loxtercamp & Kan, 2008; Im- Bolter, Johnson & Pascual-Leone, 2006).

In addition, developmental memory researchers regard processing speed as an important property of the WM system and have begun to examine its potential influence in defining the capacity limits of WM in children with SLI (Archibald & Gathercole, 2007). This line of thinking is consistent with existing theories of SLI as a deficit in processing rapidly presented temporal information (Tallal, Miller, Bedi, Byma, Wang & Nagarajan, 1996) or the generalized cognitive slowing perspective (Miller, Kail, Leonard & Tomblin, 2001). The assumption in both these theories is that if information is not processed sufficiently rapidly it is vulnerable to decay or interference. Archibald & Gathercole (2007) found that the limited WMC of children with SLI was due to a combination of a verbal storage deficit and slower processing speed. Deficits in WMC and processing speed have thus been used to explain the various limitations that children with SLI demonstrate in language representation and processing in terms of efficient storage, access and retrieval (Montgomery et al., 2010).

Processing- based accounts of SLI would predict that bilingual children with this condition would be delayed in their acquisition of language relative to monolingual age-matched peers with SLI because the slow processing mechanism would have twice as much language information to deal with in the same amount of exposure time (Paradis, 2007).

Another group of theories of SLI claim that these children have selective deficits in linguistic representation based on domain–specific linguistic complexity (Rice, 2003; van der Lely, 2003; Wexler, 2003). One of these theories, the "disruption-within-delay" account argues that children with SLI show an overall delay in language development compared to typically developing age-matched peers but also have particular difficulty with specific linguistic structures that extend beyond their general delay (Rice, 2009). These disrupted structures require linguistic computations which SLI children are unable to perform (Wexler, 2003). The morphological marker for tense (-ed) or the auxiliary BE in English are considered to be examples of such disrupted structures. Disruptions would be expected to occur in bilingual and monolingual children with SLI because the difficulty with these linguistic structures is internal to linguistic representation and would not be affected by reduced input received in each language. Thus the representation-based account of SLI would predict that bilingual children with the condition are not disadvantaged in relation to monolingual children with SLI.

Paradis and colleagues (2003, 2005, 2006) have found that bilinguals with SLI could acquire grammatical morphology at the same rates and displayed similar patterns to monolinguals with SLI. They claim that their findings are more consistent with predictions of the representational as opposed to processing account of SLI. However, their findings only apply to morphology and further research is needed to determine whether the observed similarities extend to other linguistic domains.

2.6.2. Characteristics of the language deficits in children with SLI

The various 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 more severely affected children, all domains may be affected. In general, the available research findings on bilingual children with LI are consistent with those on monolingual LI children and have also been found in cross-linguistic studies (Bedore &Pena, 2008).

a)Lexical and Semantic Deficits

The general rate 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). They make more naming errors and require more processing time to respond, compared to their typically developing (TD) peers (Pena & Bedore, 2009). According to McGregor (1997), McGregor, Friedman & Reily (2002) and McGregor & Windsor (1996), they appear to have deficits in the retrieval and organisational aspects of semantic use rather than in vocabulary size. They also appear to have weak semantic representations (Simonsen, 2002). Verbs pose a particular problem for these children (Schwartz, 2009).

According to Gathercole & Baddeley (1990) these deficits are due to limited phonological short term memory, which prevents the establishment of long term phonological representations resulting in difficulty learning new words. Gathercole (2006) recently modified this hypothesis and argued that the phonological short-term memory deficit alone was insufficient to cause these problems and that it was a combination of WM deficits that placed the child at risk for language problems.

b) Morpho-syntactic Deficits

Morpho-syntactic deficits are the most studied in children with SLI. They have difficulty with verb morphology, functional morphemes that mark finiteness and often produce bare stem words without word endings (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 morpho-syntactic markers compared to their age - and language-matched typically developing peers (Schwartz, 2009).

c) 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 where long-distance dependencies are optionally represented (Schwartz, 2009). This 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 inability 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 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).

e) Pragmatic Deficits

Children with SLI perform similarly to their age-matched peers in the communication functions expressed but do so less efficiently or appropriately (Leonard, 1986; Brinton, Fujiki & Sonnenberg, 1988). These deficits are said to be indications of structural language problems rather than a lack of pragmatic knowledge (Craig, 1985). 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 thus poor social skills (Schwartz, 2009).

e) Reading Comprehension Deficits

Research has shown that children with language impairment experience pervasive problems with story comprehension and reading (Catts, Fey, Tomblin & Zhang, 2002; Bishop & Adams, 1990). They perform poorly at answering questions when they are required to integrate information that has been explicitly presented in the story and also when 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 children with SLI, it is suggested that they may have problems in 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 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-language therapists 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).

2.6.3. Identifying EAL children with SLI

Typically developing 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 EAL learners (Pena & Bedore, 2009). Paradis and Crago (2000) found that verb morphology in children learning English as a second language was similar to the verb morphology in SLI children who were monolingual speakers of English. In addition, Paradis (2005) showed that EAL children and age-matched monolingual children with SLI have the same difficulty with grammatical morphemes as evident in accuracy rates and error patterns. 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, and in addition this error pattern was displayed in more than 90% of the individual children's results. These findings have been extended to other languages. For example Hakansson & Nettelbladt (1996) compared the productions of typically developing children in the early stages of learning Swedish as their second language, to utterances produced by monolingual Swedish speakers with language impairment. Patterns of development and grammatical errors produced by the two groups were found to be similar. The similarities between typically developing L2 learners and L1 children with SLI, learning the same language, prompted the question as to whether sequential bilinguals and children with SLI were "two of a kind?" (Crago & Paradis,2003). Recently, Paradis (2010) has argued

that despite the similarities bilingualism and SLI are not exactly the same and that there are differences in the error types and timing of acquisition of the auxiliary BE and the tense morpheme in English.
In the present study, the data from typically developing EAL children and monolingual English children with SLI can be compared on a number of different language processes assessed on the DELV-CR. Identifying the processes on which these two groups perform both similarly and differently will minimize the risk of EAL learners being misdiagnosed as language-impaired.
Best practice guidelines dictate that in children acquiring more than one language, language impairment should be identified by assessing the child in all the languages he /she knows (Roseberry Mc Kibbon, 2007; Thordardottir,2010). However, for reasons outlined in the introduction, assessment in the primary L1 may be difficult and because EAL learners may experience a dominance shift to English (Kohnert, 2008) it may be more practical to assess them in English. Nonetheless, there is still a risk that assessment measures are biased and do not differentiate language differences due to limited experience with English from language impairment (Paradis, 2009). According to Pena (2002, p.13):

> *"If you look at the expected incidence of language impairment, bilingual children are generally over-identified or under-identified. Not speaking English well can be interpreted as not having the ability to learn language well. If these children are placed in special education, expectations tend to go down, and the result is that they do not get the education that is consistent with their real abilities".*

Equally important and perhaps even more consequential to over-identifying language impairment in bilingual children is the case of *not* identifying language impairment in genuinely language-impaired children. This often occurs due to the assumption made by educators and speech-language therapists that a child's poor performance in oral English and in language-related academic activities is the result of his/her not being a native English speaker. Thus a "wait and see" approach that extends for many years is adopted in diagnosing bilingual children (Paradis, 2005). By the third or fourth grade they may be so far behind their age-matched, typically developing peers, that they no longer stand a chance at performing well academically.

One of the ways in which assessment bias can be addressed in EAL children, is through the use of processing as opposed to representation-based measures. The former are said to rely less on previous language experience (Campbell, Dollaghan, Needleham, & Janosky, 1997; Ellis Weismer & Evans, 2002;

Ellis Weismer, Tomblin, Zhang, Chynoweth, & Jones, 2000), and are aimed at assessing "the integrity of the system used in servicing language whilst the effects of prior language-specific experience are stripped away as far as possible" (Kohnert & Medina, 2009, p.229). Experience-dependent tasks include language sample analysis and norm-referenced standardised tests. In contrast, processing-dependent measures de-emphasise the role of prior knowledge (Kohnert, 2008). A retrospective review of research conducted in the last 30 years, by Kohnert & Medina (2009) revealed several studies that separated typically developing bilingual children from those with language impairment on basic processing measures.

The DELV-CR may be considered a processing–based measure since it accesses the processes underlying language development and was therefore regarded as more appropriate than other available measures. It was also constructed to tap many of the language processing skills found to be clinical markers of language impairment, such as lexical organisation and retrieval as well as long distance dependencies in Wh- questions and complex passive sentences (Seymour, Roeper & de Villiers, 2003).

Although controversial, the working memory measures used in this study may also be considered to be processing-based measures and the present study may assist in determining whether they can be used to identify language impairment in EAL children.

2.6.4. Can children with SLI learn and/or learn in an additional language?

As indicated in the discussion on theories of causation, there is some controversy as to the extent to which children with SLI are able to acquire more than one language. While attitudes to bilingualism in typically developing children have changed considerably, there are still widespread negative attitudes about children with language impairment learning two languages (Paradis, 2007). Parents are often advised by professionals to limit input to one language if their child is language-impaired. Paradis (2007) argues that such advice is based on the common sense notion that an impaired language faculty cannot cope with learning more than one language rather than on concrete evidence. The research conducted by Paradis and colleagues in Canada with French–English bilinguals suggests that children affected with language impairment can be exposed to more than one language without disadvantaging their grammatical development. However, the children in these studies were all simultaneous bilinguals and had the benefit of extensive bilingualism in the community and at school in a country where both English and French are official languages.

Sequential bilinguals may not enjoy the same benefits, particularly if their L1 is not supported. There is limited research on sequential bilinguals with SLI and the available studies have yielded ambiguous results. Paradis, Goldberg and Crago (2005) examined the grammatical development of two L1 Chinese-L2 English children with SLI and compared them to typically developing Chinese L1 children learning English as well as to English monolingual children with SLI. They found a similar pattern of development for tense morphology in the bilingual and monolingual children with SLI. The bilingual children also "caught up" with the monolinguals with SLI after 3 years of exposure to English. Armon-Lotem (2010) presents data from English-Hebrew and Russian-Hebrew sequential bilinguals with and without SLI supporting the claim that impaired bilinguals achieve levels of morpho-syntactic knowledge similar to impaired monolinguals. Thus the sequential bilinguals with SLI did not display a double delay due to their SLI on the one hand and their L2 status on the other. Based on a study using sentence completion as the assessment method, Armon-Lotem (2010) concurs with Paradis (2007) and Roeper (2009) that learning one language supports the learning of a second. Her findings also suggest that bilingualism can be advantageous for children with SLI, in that bilingual children with SLI are not only as accurate as monolingual children with SLI but sometimes do better. These authors believe that bilingualism may offer compensatory mechanisms for SLI by counteracting the effects of processing limitations or through the dual language representation system. Since bilingualism results in superior executive functions, evidenced in enhanced metalinguistic awareness, Paradis (2010) and Armon-Lotem (2010) speculate that these abilities may compensate for the processing deficits in bilinguals with SLI.

In contrast to these findings, Crago, Belanger and Paradis (2005) found that English L1 children with SLI in a French immersion programme acquired the French definite article very slowly in comparison to monolingual French children with SLI and did not catch up. This study thus suggests that sequential bilinguals with SLI may be at a disadvantage in relation to monolingual children with SLI.

If SLI children can be identified in the current study, their development of various aspects of English as an additional language may provide some indication of whether they are at a disadvantage relative to monolingual children with SLI.

2.7. SUMMARY AND QUESTIONS

Language is a multi-dimensional construct and both first and additional language acquisition are complex, dynamic processes, dependent on a number of cognitive processes, environmental factors and

in the case of young school-aged children, the quality of linguistic input they receive in the classroom. The development of the academic language register is critical in the education of these children and this study aimed to track the development of the psycholinguistic processes underlying the development of academic language in the foundation phase in order to address the following questions:

- What is the rate and process of oral language and literacy acquisition in grade 1-3 English language learners and are there differences between EAL and L1 learners? The answers to these questions will establish realistic expectations of language and literacy acquisition in the foundation phase, and may highlight specific language components and skills that should be addressed in teaching. In addition, there are implications for language-in-education practices with EAL learners.
- Given the research findings on literacy acquisition in L2 learners, what is the relationship between oral academic language proficiency and reading in L1 and EAL children?
- Is there a correlation between language and working memory skills to implicate this cognitive construct as a component of aptitude for language learning in young children?
- Are there other factors (e.g., motivation) that may explain individual variation?
- Are working memory measures unbiased cognitive processing measures that can be used to identify at-risk children from linguistically diverse backgrounds or is there a more complex relationship between language processing and working memory?
- Can EAL children with specific language impairment (SLI) be identified using the measures in this study and if so, what are the manifestations of SLI in English as an additional language?
- Are these manifestations similar or different to those reported for monolingual English language learners with language impairment?
- To what extent are these EAL children with SLI able to acquire and learn in an additional language?
- What are the similarities and differences between typically developing EAL children and monolingual children with language impairment and what are the implications for theories of language impairment?

CHAPTER 3

THE SOUTH AFRICAN EDUCATION SYSTEM

The education system of any country reflects "its political options, its traditions and values, and its conceptions of the future" (Faure, 1972, p170).

The South African education system is complex and a product of the turbulent socio-political history of the country. As an institution of South African society, it is characterised by significant diversity and inequality. Language, because it is an instrument of power (Hartshorne, 1995), plays a central role in both the history of the country and in education.

The purpose of this chapter is to contextualise the study and outline the history of the South African education system in relation to political changes and their effects on language planning, with specific reference to language-in-education policies and practices. In addition, the current status of the South African education system will be reviewed and the challenges in primary education will be discussed.

The diversity in the education system stems from the fact that the population is comprised of different race, ethnic, cultural, religious and language groups. Table 3.1 reflects the mid-year population estimates for South Africa in 2010 by race group (Statistics South Africa, 2010).

Table 3.1. Mid-Year Population Estimates for South Africa (Statistics South Africa, 2010)

Population Group	Number	Percentage of total Population
African	39 682 600	79,4
Mixed race (coloured)*	4 424 100	8,8
Indian/Asian	1 299 900	2,6
White	4 584 700	9,2
Total	49 991 300	100

*In South Africa, people of mixed race descent are referred to as "coloured."

The inhabitants of South Africa speak one or more of the 11 official languages. A number of other languages are also spoken due to immigration and migration from the rest of Africa.

Table 3.2 shows the proportion of speakers of each of the official languages by race group according to the 2001 population census.

Table 3.2. Proportion of speakers of each of the official languages in South Africa by race group.

Home language	Black	Coloured	Indian or Asian	White	Total
Afrikaans	0.7%	79.5%	1.7%	59.1%	13.3%
English	0.5%	18.9%	93.8%	39.3%	8.2%
IsiNdebele	2.0%	0.0%	0.3%	0.1%	1.6%
IsiXhosa	22.3%	0.3%	0.1%	0.1%	17.6%
IsiZulu	30.1%	0.3%	0.2%	0.1%	23.8%
Sepedi	11.9%	0.1%	0.0%	0.0%	9.4%
Sesotho	10.0%	0.2%	0.0%	0.0%	7.9%
Setswana	10.3%	0.4%	0.0%	0.1%	8.2%
SiSwati	3.4%	0.1%	0.0%	0.0%	2.7%
Tshivenda	2.9%	0.0%	0.0%	0.0%	2.3%
Xitsonga	5.6%	0.0%	0.0%	0.0%	4.4%
Other	0.3%	0.2%	3.8%	1.1%	0.5%
Total	100%	100%	100%	100%	100%
	35.42m	3.99m	1.16m	4.29m	44.82m

IsiZulu, isiXhosa, siSwati and isiNdebele are collectively referred to as the Nguni languages, and have many similarities in syntax and grammar. The Sotho languages, Setswana, Sepedi and Sesotho also have much in common (Christie, 1991). Tshivenda and Xitsonga are also similar in that they are southeastern Bantu languages.

The official languages are regionally distributed with some of the 9 provinces having only 2 or 3 main languages represented (e.g., Kwa-Zulu Natal, Western Cape) while others have most of the languages represented (e.g., Gauteng). The linguistic composition of many schools in this province is therefore highly heterogeneous. Table 3.3 provides an indication of the regional distribution of languages.

Table 3.3. Proportional distribution (in %) of dominant home languages across all provinces (Van der Merwe & Van Niekerk, 1994, p.10)

	Northern Province (Limpopo)	North West	Gauteng	Mpumalanga	Northern Cape	Free state	Kwa-Zulu Natal	Eastern cape	Western Cape
IsiZulu	-	-	21.2	40.2	-	9.4	91.1	-	-
Afrikaans	10.6	-	29.4	13.5	95.9	14.2	-	25.9	99.4
Sepedi	53.4	-	22.3	22.3	-	-	-	-	-
English	-	-	2.8	-	-	-	4.5	-	0.3
IsiXhosa	-	-	6.3	-	1.5	2.1	4.4	74.1	0.3
Sesotho	-	-	5.4	-	-	65.0	-	-	-
Xitsonga	5.4	-	-	-	-	-	-	-	-
Setswana	8.9	100	12.7	0.9	2.6	9.3	-	-	-
SiSwati	-	-	-	22.2	-	-	-	-	-
IsiNdebele	-	-	-	22.2	-	-	-	-	-
Tshivenda	21.5	-	-	-	-	-	-	-	-

Inequalities in education arise out of the socio-political history of the country, which is examined in the next section.

3.1 HISTORICAL BACKGROUND

The information in this section has been compiled from various sources (Alexander, 1989, 1997, 2001; Extra & Maartens, 1998; Webb, 1995; Hartshorne, 1995; Heugh, 1995, 2000; Pluddeman, 1999; Reagan, 1986; Rose & Tunmer, 1975) and is organized chronologically into different time periods.

3.1.1. The pre-colonial era

Roughly 20,000 years ago, South Africa was occupied by people known as the Khokhoi and San, who developed their society over thousands of years in isolation, and spoke languages that included unique click consonants (Traill, 1995). Black Africans, whose descendants make up the overwhelming majority of the present-day inhabitants of South Africa, migrated systematically from West Central Africa about 1500 years ago (Christie, 1991). In these pre-colonial African societies, education was part of daily life, and children were educated by adults in the community about adult roles and survival skills through imitation, play and the oral tradition, which occupies a significant part in African education (Reagan,

2000). Language thus featured prominently in traditional African education since the oral tradition "was concerned with helping children to use language creatively and effectively" through proverbs, riddles, word games, puzzles and tongue twisters (Reagan, 2000, p.34).

3.1.2. The colonial era

Jan van Riebeeck arrived at the Cape in 1652 to erect a halfway station for the ships of the *Vereenigde Oostindische Compagnie* (VOC) on the trade route between Europe and Southeast Asia. In the early years, no direct influence was exerted on the languages of the indigenous Khoikhoi and San peoples by the Dutch. Most of the Dutch spoke Hollands, a Dutch dialect from Amsterdam. In 1657, the VOC started settling farmers in the Cape colony and since they required labourers, slaves were imported from present-day Angola, Madagascar, Bengal and Guinea. The *lingua franca* among these people was Portuguese and Malay-Portuguese. To prevent these languages from becoming prevalent at the Cape, the VOC decreed in 1658 that the slaves should learn Dutch. This was the first written language policy in South Africa. Dutch was also the medium of instruction in the earliest mission schools for slave children.

However, in order to communicate with each other, the early Dutch settlers, the indigenous Khoikhoi and the slaves of African and Asian descent developed a common language which later became Afrikaans (Roberge, 1995; Den Besten, 1989; Raidt, 1984).

The English first arrived at the Cape in 1795. By the time of the second British occupation in 1806, a strong Anglicisation policy was underway. British nationalism held that the colonised peoples were privileged to sacrifice their languages and gain English, and Afrikaans became stigmatised as 'kitchen Dutch'. Its use in state schools was prohibited, not only in the classroom but also on the playground. Lord Charles Somerset, governor at the Cape from 1814 to 1826, was responsible for the earliest language planning in South Africa when he tried to replace Dutch with English as the dominant official language of the colony (Reagan, 1986).

As far as the African languages were concerned, the British allowed basic schooling in the relevant indigenous languages for the small percentage of black children who actually went to (mainly mission) schools and provided English-medium instruction in an Anglo-centric curriculum for the small elite. Alexander (1989) points out that the result was that for the colonised people, the English language and culture acquired an economic and social value while their own languages were devalued. However, most of the indigenous languages owe their written forms to the work of dedicated missionaries who translated the Bible into these languages.

Between 1834 and 1840, 15,000 Afrikaans farmers left the Cape Colony in opposition to English dominance. This exodus became known as the "great trek" and in the 1870s led to the formation of two *Boer r*epublics (Transvaal and Orange Free State), in the interior of South Africa. In these, Dutch became the language of state and education, but tension began mounting between those who favoured Dutch and those who favoured Afrikaans. Until then, Dutch and Afrikaans had each occupied their own exclusive domains: the church and the home, respectively.

British efforts between 1870 and 1899 to secure the mineral rights in the two *Boer* republics gave rise to the first Anglo-Boer War in 1899, which the British won eventually in 1902. Immediately, the language of government and education in the two former *Boer* republics became English. Simultaneously, Dutch language rights in the Cape Colony were suspended and Lord Milner rejected the principle of equality of English and Dutch. Afrikaner resistance to the imperialist policies of Lord Milner led directly to the Afrikaans language movements at the turn of the century.

In 1906, the Transvaal and the Free State were given self-rule and limited rights were returned to the Dutch in the Cape Colony. In preparation for the formation of a South African Union, a Union Convention was held in Durban in 1908. Language issues were very much at the centre of negotiations, and the main concern was to reconcile the conflicting interests of the two white groups in relation to English and Dutch/Afrikaans. The language concerns of the indigenous majority of people were given no consideration whatsoever.

3.1.3. Union (1910-1948)

On 31 May 1910, the *Act of Union* was signed. Article 137 of the constitution gave Dutch equal status with English as an official language of the Union. According to the constitution, the two languages had judicial equality. In fulfilment of this law, bilingualism necessarily became an educational principle.

The stipulation of Dutch, and not Afrikaans, in the constitution gave rise to a great deal of conflict. Many parties insisted that 'Dutch' referred to Afrikaans as well. In the Free State the *Education Act* required that all children learn Afrikaans as well as English. This met with a great deal of resistance from the English, who found it demeaning that their children should learn a 'corrupt form of Dutch'. In the Transvaal, all Afrikaans children were required to learn English, but in an effort to pacify the English electorate, it was decided that English children would only be required to learn Dutch if their parents had

no objection. In 1925, Act 137 of the constitution was amended to state explicitly that the reference to 'Dutch' also included Afrikaans. The process of standardisation of Afrikaans began with this official recognition and in the period between 1948 and 1994, the standardisation process was strongly promoted as part of the Afrikaans nationalist ideology.

By default, the language tradition established in the African mission schools in the 19th century continued in the black schools. This meant that in the Cape and in Natal, as well as in the two former *Boer* Republics, the use of English as the medium of instruction beyond the 4th year of schooling in a black child's life was taken for granted.

Between 1924 and 1933, Afrikaner nationalism was on the rise. The practice of teaching Afrikaans as a school subject had become firmly established in the Transvaal and Free State. By 1932, Afrikaans/English relations had deteriorated and the English accused the government of using Afrikaans as a political weapon against them. A crisis was averted by the political coalition between Generals Hertzog and Smuts in 1933. They formed a United Party government, thereby temporarily neutralising Afrikaner nationalism, but this did not prevent Afrikaans from becoming a symbol of exclusivity and separateness, especially in the Transvaal and Free State. Hertzog was a proponent of the policy that the two language groups, English and Afrikaans, should develop separately, each with their own language, way of life and traditions. Eventually, under General Smuts, the pendulum swung back to English as the language of power and Afrikaners had to fight to retain their Afrikaans-medium schools.

By 1938, the great majority of black schools in the country offered mother tongue education up to the fifth year of schooling, after which English became the medium of instruction.

3.1.4. Apartheid (1948- 1990)

In 1948, the National Party under Malan came to power, and introduced the policy of apartheid. Racial segregation was enforced in a number of laws and the 'homeland' policy of locating Africans to their respective rural '*bantustans*' was used to prevent black people from living in the urban areas. They were forced to work as contract migrant workers and were controlled by pass laws and job reservation. Patterns of educational inequality were entrenched by setting up different education departments for different population groups and educational spending was grossly unequal.

The national party adopted the policy of Christian National Education and Afrikaans and English became compulsory subjects up to Senior Certificate level in white education. The medium of instruction could be either English or Afrikaans, depending on the home language of the child.

Article 15 in the 1948 education policy introduced the principle of mother tongue education, the implementation of which was to become so contentious in the apartheid era. Ironically, this principle has strong educational grounds but in black education it was seen as denying black children access to English as the language of prestige, as the *lingua franca* of South Africa and as an international language of wider communication. It was certainly true that the emphasis on mother tongue education was used by the apartheid government to "divide and rule" in its system of separate educational provision for different language groups, even when such provision was unnecessary as in the case of related African languages (Alexander,1997, p. 82).

In 1949, the Eiselen Commission on Native(African) Education recommended that mother tongue instruction should be extended to the full eight years of primary school, that English and Afrikaans were to be compulsory subjects, both languages were to be introduced in the first year of schooling and at senior school level were to be used equally as media of instruction.

These recommendations eventually became law with the passing of the *Bantu Education Act* in 1953. Opposition to the use of African languages as medium of instruction beyond the fourth school year (Grade 4) and the dual-medium policy at secondary school level, was especially strong among African teachers. In the Eastern Cape and on the Witwatersrand, the schools under the Department of Bantu Education were boycotted and attempts were made to set up alternative community school systems. Throughout the 60s and into the 70s, School Boards, the Advisory Board for Bantu Education and the African Teachers Association of South Africa tried to get the department to reconsider its language policy. Confronted with the government's inflexible position on the issue, the department could only grant exemptions from the dual-medium policy at senior school level. Despite this concession, it remained a requirement that both English and Afrikaans had to be passed at matriculation level for certification and entry into tertiary education.

On 31 May 1961, South Africa became a republic under the leadership of Verwoerd. The *Republic of South Africa Act* guaranteed judicial equality for English and, now for the first time, Afrikaans, by name. In the subsequent *Afrikanerisation* of South African society, the rights of the African languages were once again completely disregarded. Alexander (1997) points out that these policies did not result in the kind of resistance and pressure for the development of the African languages that characterized

Afrikaans in the Milner era. Rather, the resistance took the form of opposing Afrikaans in favour of English, so that Afrikaans became the 'language of oppression' and English became the 'language of liberation.'

One of the constructs of apartheid, the policy of separate homelands for different ethnic groups, opened the door for black people to evade the English/Afrikaans language requirements. When the Transkei became an independent homeland in 1963, IsiXhosa became the medium of instruction in Transkei schools for the first four school years, after which English became the only medium of instruction. Within the next ten years, all the independent homelands, except Venda and Qwa-Qwa, had followed suit.

The opposition to the language policy in black schools that began with the *Bantu Education Act* in 1953 finally came to a head in 1975. In 1972, the Bantu Education Advisory Board reported to the Department of Education on an investigation that it had carried out into the issue of medium of instruction. The Board recommended that the initial six years (up to Grade 6) of instruction should be through the medium of the mother tongue and that thereafter instruction should be through the medium of either English or Afrikaans. The government, however, decided to maintain the policy of dual-medium instruction, but from Grade 7 upwards. This meant that the public examination at the end of Grade 7 had to be written in English and Afrikaans instead of in the mother tongue. When it became clear in 1975 that this policy was to be rigorously enforced, protest erupted. The boycotts, strikes and violence that started in higher primary schools (Grades 5–7) lasted throughout 1975 and spread to secondary schools in May 1976. It took the Soweto uprising on 16 June 1976, for the government to agree to the demand for a single medium of instruction. Within two years, 96% of African pupils were receiving their secondary schooling through the medium of English. The *Bantu Education Act* of 1979 finally reduced mother tongue instruction to the first four years of schooling only, to be followed by instruction through the medium of English.

The *De Lange Report* (1981) to the Department of Education and Training (DET) (the former 'Department of Bantu Education') stressed the need for flexibility in language-medium legislation. In 1982, the DET implemented the *De Lange Report* recommendation that schools could choose either:

- the vernacular as medium of instruction during an introductory stage, to be followed by either English or Afrikaans; or
- English or Afrikaans as medium of instruction from the beginning of schooling; or
- mother tongue instruction during the entire school career.

3.1.5. The transitional period (1990 – 1994)

The years after 1990 constituted a period of political negotiation, when various matters had to be debated, among others: the political and constitutional rights of the various African languages as opposed to Afrikaans and English; the need for a *lingua franca*; the choice of languages to be used as medium of instruction and as subjects at school; and the role of English. The ANC position on these issues was spelt out in documents such as the *Freedom Charter*, the *Constitutional Guidelines* and the *Proceedings of the ANC Language Workshop.* Heugh (1995) states that all these documents seem to reflect the dilemma of most African states since the 1960s: on the one hand the reality of language needs, such as the need for a language of national unity (e.g., English), and on the other hand, the need to free the majority of inhabitants from the languages that were part of earlier imperialist political systems by developing the African languages. The latter need, in particular, has been stressed by organisations such as the *National Language Project*. The major contribution from the non-governmental education sector came from the *National Education Policy Investigation* (NEPI) committee in 1992. It spelt out the language options and their implications without choosing a specific solution. Heugh (1995, p. 340) points out that both the ANC and NEPI took a "*laissez-faire* position", making a policy decision but ignoring the necessity of formulating specific implementation planning strategies. In November 1991, the government proposed the *Curriculum Model for Education in South Africa* (CUMSA) which held that in general not more than two languages should be compulsory, one of which should be the medium of instruction. CUMSA specifically recommended that only one language should be compulsory in Grades 1 and 2, but that in Grades 5–7, English or Afrikaans and the regionally dominant African language should be compulsory. The Department of Education, on the other hand, wanted the parents in primary schools to choose from among the options broadly outlined in the *De Lange Report* (1981). Thus, since 1991, parents have a choice in the medium of instruction from the first school year. In practice, an African language is commonly chosen in Grades 1–4, followed by English. Apart from this, one African language, English, and Afrikaans are compulsory subjects for all children until Grade 9, and after that two of these three languages.

3.1.6. 1994- Present

In 1994, the Government of National Unity (the first democratically elected South African government) came into power. The 1993 *Interim Constitution* contained the following language clauses (Clause 3):

1) Afrikaans, English, isiNdebele, SeSotho sa Leboa, SeSotho, siSwati, Xitsonga, Setswana, Tshivenda, isiXhosa and isiZulu shall be the official South African languages at national level, and conditions shall be created for their development and for the promotion of their equal use and enjoyment.

2) Rights relating to language and the status of languages existing at the commencement of this Constitution shall not be diminished, and provision shall be made by an Act of Parliament for rights relating to language and the status of languages existing only at regional level, to be extended nationally.

These two clauses were contradictory in practice and could not be implemented simultaneously. The second clause was therefore not included in the *Constitution of the Republic of South Africa* which was adopted by the Constitutional Assembly on 8 May 1996 and amended on 11 October 1996.

The term 'official language' has a range of interpretations. Fasold (1984, p. 74), for example, argues that a true official language fulfils all or some of the following uses:

- a language of communication for government officials in carrying out their duties at national level;
- written communication between and internal to government agencies at national level;
- the keeping of government records at national level;
- the original formulation of laws and regulations that concern the nation as a whole;
- forms such as tax forms.

Fishman (1971, p. 288) mentions the same uses, but adds to these the use of the language in the schools and courts of the country. The official languages, Afrikaans and English of the 1961 Constitution met all the above criteria. However, of the eleven languages listed as official in the 1996 Constitution, only English meets the criteria at present.

Cooper (1989, p.100) distinguishes among three types of official languages: statutory, working and symbolic official languages. A *statutory* official language is a language that the government has specified as official or declared as appropriate by law. A *working* official language is used by a government for its daily activities whereas a *symbolic* official language is the language which a government uses as the medium for symbolic purposes.

During the period of the 1961 Constitutional dispensation, English and Afrikaans were both statutory and working official languages. Afrikaans also functioned as a symbolic official language. The languages designated as official in terms of the 1996 Constitution, while they are constitutionally recognized, have no *judicial* status; have, except for English, very limited use as *working* official languages; and have no *symbolic* role. Their inclusion in the constitution seems to be the only symbolic act with which they can be associated.

In the final report of the constitutional *Language Plan Task Group* (LANGTAG, 1996), a national language plan for South Africa was outlined. The extensive report deals with a wide range of issues, such as language equity, language development, literacy, heritage languages and the role of language in the economy, education and public services. The language-in-education proposals seek to provide an appropriate balance between the maintenance of cohesion on the one hand and the acceptance of diversity in South Africa on the other. According to LANGTAG (1996, p.124–125), language policy in education should:

a) facilitate access to meaningful education for all South African students;

b) promote multilingualism;

c) promote the use of students' primary languages as languages of learning and teaching in the context of an additive multilingual paradigm and with due regard to the wishes and attitudes of parents, teachers and students;

d) encourage the acquisition by all South African students of at least two but preferably three South African languages, even if at different levels of proficiency, by means of a variety of additive bi- or multilingual strategies; it is strongly recommended that where the student's L1 is either Afrikaans or English, an African language should be the additional language;

e) observe and sustain the legal equality of status of all South African languages;

f) promote the linguistic development and modernisation of the African languages as well as their equality of social status;

g) promote respect for linguistic diversity in the context of a nation building strategy by supporting the teaching and learning of all other languages required by learners or used by communities in South Africa, including languages used for religious purposes, languages which are important for international trade and communication, and Sign Language;

h) help to equip South African students with the language skills needed to participate meaningfully in the political economy of South Africa;

i) harmonise with the intentions of the proposed National Qualifications Framework (NQF) by:

• facilitating the integration of education, training and adult basic education;

• using language and communication skills to promote core competencies such as problem solving and critical thinking.

In accordance with these recommendations the Language-in-Education Policy (LiEP) was formulated and adopted in 1997.

The *Pan South African Language Board* (PANSALB, 1999) was established by the government to monitor the implementation of the constitutional provisions by all organs of state.

3.2. WHAT IS THE CURRENT SITUATION?

At present, the main themes characterising the South African education system are:

- the extremely poor results and low achievement levels in mathematics and literacy attained by South African schoolchildren, which is linked to the existence of a number of different contexts of education (described in Chapter 1) creating an ever deepening divide between advantaged and disadvantaged learners;
- the slow and limited implementation of the policies of multilingualism, including home language instruction within an additive bilingual approach as set out in the Language-in-Education policy .

3.2.1. The crisis in education

The current education system is in crisis and confronted with serious challenges (Fleisch, 2008; Alexander, 2010; Webb et al., 2010). This statement is based on a number of facts and figures as well as the findings of large-scale national and international research projects conducted over recent years. In 2005, for example, 12, 9 % of black South Africans older than 20 years of age had received no education (South African Institute of Race Relations, 2006, p.10 in Webb et al., 2010) and only 21,9% of learners who entered grade 1 in 1994 completed 12 years of formal education (Minister of Education, 2006). The research studies conducted on South African learners in the last decade are summarized in Table 3.4 below.

Table 3. 4. Results of large-scale projects on outcomes achieved by South African learners

1 Date and Source	2 Project and Participants	3 National results	4 Disaggregated results
2005 (Department of Education , 2005b)	Grade 6 systemic evaluation 34 015 learners	Averages of 35% for language and literacy 27% for mathematics 41% for Science	Not available
2005 (Western Cape Education Department , 2006)	Grade 6 learners assessment 34 596 learners	42% of children achieved grade six reading outcomes	86, 9% in former white schools; 4,7% in former black schools, and 35,5% in former Indian and Coloured schools achieve grade 6 reading outcomes
1999 (Strauss and Berger, 2000)	Monitoring Learning Achievement (MLA) Study in African countries 10 400 learners in 400 South African Schools 12 African countries participated	48% for literacy (S.A in lowest 4 countries) 30,2 % for numeracy (S.A results lowest) 47,1 % for life skills (S.A results in lowest 4 countries)	Not available
2003 (Reddy, 2005)	Third International Mathematics and Science Study (TIMSS) 900 Grade 8 learners	Average score of 264 for Mathematics compared to international average of 467	Former black schools average = 227 Former white schools average = 456
2004 (Moloi and Strauss, 2005)	Southern and East African Consortium for Monitoring Educational Quality (SACMEQII) 3163 Grade 6 children 14 countries participated	49,4% could not read for meaning	Majority of black learners achieve 36,25% Majority of white learners achieve 81,25%
2006 (Howie et al., 2008; Taylor and Yu, 2008).	Progress in International Reading Literacy study (PIRLS) 30,000 grade 4 and 5 South African learners participated	South African average reading score= 302 International average = 509 77,8 % of South African children fail to reach the low international benchmark category Lowest out of 40 participating countries , but with the highest variance and standard deviation	Very large differences In reading scores across SES groups, particularly school SES. Students taking the test in an African language obtain average reading score = 200. Children taking test in English/Afrikaans obtain average reading score = 450

The results reflected in the third column of Table 3.4 paint a very bleak general picture of the literacy and numeracy skills of South African children, but the disaggregated results in column 4, although disturbing, suggest a different interpretation (Fleisch, 2008; Taylor and Yu, 2008). These findings reflect an achievement gap between children in the different educational contexts, which according to Fleisch

(2008) and Taylor & Yu (2008) can be attributed to significant differences in socio-economic status (SES) as a result of historical inequalities.

As indicated in chapter 2, SES is a particularly complex issue in this country since it has been constructed on the basis of race through institutionalised apartheid policies restricting inter alia where black, Indian and mixed race(coloured) people could live, their access to education and choice of occupation (Taylor & Yu, 2008). It is thus difficult to separate race and social class. For example, family structure is an area where both race and SES play a significant role, since non- traditional family structures are associated with low SES, and poorer educational outcomes (Anderson, 2000). In South Africa, family structure has a strong racial dimension, as revealed in a 2006 General Household survey (Taylor & Yu, 2008), where 31% of 10-12 year old black children lived in a home with no parent present, 41% lived with a single parent and only 28% lived with both parents, in contrast to 80% and 89% of Indian and white children respectively, who lived with both parents.

In a recent analysis of SES as a determinant of educational achievement in South Africa, Taylor & Yu (2008) applied the Progress in International Reading Literacy Study (PIRLS) (2006) asset- based criteria for determining SES, including access to: a computer, desk, own books, newspaper, own room, own cellular phone, calculator, dictionary, electricity and tap water. They found very large differences in reading scores across SES groups, when compared to international standards, with children from lower SES backgrounds, who were predominantly black and attending former disadvantaged schools, performing significantly poorer than children from middle and higher SES backgrounds, who were predominantly white, Indian and coloured and attending formerly advantaged schools. The term "formerly" is used here because there has been increased equity in educational spending since the political transition in 1994 (Taylor & Yu, 2008).

3.2.2. Limited implementation of language policies

The limited implementation of the progressive and exemplary policies of multilingualism, described in section 3.1.6, can be attributed to three main factors: the hegemonic position of English, the government's lack of political will and negative attitudes to the African languages (Beukes, 2009).

a) Hegemony of English

English is the home language of less than 10% of the South African population, but according to McDermott (1998), it is a commonly expressed attitude and belief in the educational arena that access to English is fundamental to African self-empowerment and that those who lack competence in English are 'linguistically' deprived. Such attitudes contribute to the idea that other languages are inadequate tools in a modern and internationally oriented world.

The hegemony of English, defined as the dominance of English, is thus the result of the colonial history of South Africa (Alexander, 2005), the view that English was the language of liberation during the struggle against apartheid as well as globalisation and economic market forces, related to the political and economic power of the Western world, in particular the US and Britain (Reagan, 2009; Webb, 2009). Sociolinguists (Tollefson, 1991; Phillipson, 1992; Skutnabb –Kangas, 1988) point to greater forces within the English-speaking world, who aim to ensure that there will always be an under-educated working class to provide cheap labour. This can be achieved by educating children in an unfamiliar language, thus limiting their educational potential.

In addition, Pool (1993, p. 31) theorises that "linguistic competition" may be a factor in political success, and those with political power gain control of language and prevent access to the language of power in order to retain power. Pool (1993) further suggests that the more inaccessible the language of power is for the majority, the greater the pressure from below for access to the language. This may explain why English is viewed as the key to self-empowerment, upward mobility, sophistication and learnedness, and why parents want their children to be educated in English (Singh, 2009, Balfour, 2010).

While the status of English as a global, influential language cannot be denied and few would argue that access to and proficiency in English is important, language experts in South Africa maintain that English is over-valued, and that its status should not absolve government of its responsibilities and expressed agenda to protect linguistic diversity, to promote language equity and to develop the historically marginalised African languages (Alexander, 2005; Beukes, 2009; Webb, 2009).

b) Lack of political will

With respect to the government's failure to focus on and manage the implementation of policies, Webb (2009) suggests that there is a lack of understanding of the central role of language in development, a sense that multilingualism is necessarily expensive and the political heritage of apartheid in which

language was used to marginalise and separate groups of people. The political leadership may thus be concerned about the potential divisive impact of the promotion of African languages and has not yet found a way of balancing the tension between creating an integrated, cohesive nation and recognizing difference (Webb, 2010). Webb (2010, p. 164) also posits that the leaders may not truly believe that the African languages can contribute towards "modernity" and democracy.

Furthermore, Beukes (2009, p.44), Webb (2009) and Heugh (2003) maintain that officials do not have the capacity to manage the implementation of policy and these authors are critical of structures such as PANSALB and the National Language Service of the Department of Arts and Culture saying that they do not co-ordinate and integrate their activities, so that they are counterproductive and do not deliver the language development and promotion initiatives with which they were tasked.

Language planning is by definition a top-down process managed through the implementation of laws and policies by a central authority with the aim of regulating language behaviour in public domains (Lafon, 2008; Webb, 2009; Ngcobo, 2009). Such language planning is successful if the government has the necessary power but may not work when politicians do not have the power to counter global and economic forces or when there is a strong need to establish democracy as is the case in South Africa (Webb, 2009). This is when bottom-up planning may be more effective in initiating linguistic transformation (Alexander, 1992; Robinson, 1997; Webb, 2009). Bottom-up planning includes processes such as social activism and establishing organisations to promote the interests of communities, which may in fact be language-based (Webb, 2009). Thus bottom-up language planning would involve social factors such as the communicative needs of the community of speakers (e.g., whether they want their languages to be used in formal contexts), the level of intellectualisation in the community, including the degree to which literature has been developed in the language, and the socio-political needs of the community, which would be determined by the recognition that they are being dominated, marginalised or disempowered (Webb, 2009). Webb (2009; 2010) argues for a form of bottom-up language planning in South Africa which need not necessarily exclude the government, but can be funded and encouraged through co-operation with local communities. However, Webb (2010, p.164) believes that the communities who speak the African languages do not have a sense of "linguistic nationalism", perhaps because nationalism in Africa is based on race and not ethnicity.

In a sense, Ndhlovu (2010, p. 176) explains this lack of linguistic activism, by positing that African language speakers are not "passive subjects of domination", but offer resistance by determining their

own patterns of language use, as a form of "unplanned" language policy. Beukes (2009, p.46) concurs that real language practices (e.g., the preferred use of English) may "display a defiance of South Africa's overt *de jure* language policy."

c) Negative attitudes to the African languages

In addition, negative attitudes to the use of African languages preclude bottom-up language planning. Beukes (2009) claims that language policy in South Africa has been ill-informed and did not consider the linguistic culture of society. In agreement, Webb (2010) points out that language use is determined by the speaker's cultural identity and that there may in fact be a diminishing sense of ethno-linguistic identity and loyalty to the African languages in certain communities.

Negative attitudes also manifest in the "lip-service paid to promoting multilingualism and African languages by the elite black and white" (Alexander, 2003, p.23) who "glorify foreign languages at the expense of their own mother tongues and cultures" (Prah, 2009, p.42). Orman (2008, p.263) claims that the implementation of language policy was not a priority during former president Mbeki's term of office because of the ANC-in-exile concern for English only and the localisation of the present-day elite in "Western-inspired globalisation." Minimal use of African languages by politicians and public figures thus perpetuate negative attitudes to African languages.

Despite the lack of implementation of policies, and the fact that political changes have had very little positive effect on the position of African languages, Balfour (2010) and Lafon (2009) acknowledge that some linguistic transformation has been achieved in various domains. In higher education for instance, there has been development of various indigenous languages for learning in particular disciplines as well as qualifications in multilingual education at a number of universities. Since 2004, the national broadcaster (SABC) has accepted scripts submitted in African languages and this has led to a dramatic increase in the production of serials using only or mostly African languages. Similarly, the SABC has since 2003, broadcast news in all of the eleven official languages. South African children can therefore watch television in their own languages. In addition, a large national bank has made instructions and information available in a number of official languages, not just English and Afrikaans, as was the case in the past and this will enhance the market potential of the African languages (Alexander, 2005).

3.2.3. Limited Implementation of the Language-in-Education Policy

The use of African languages is considered to be important for economic development and sustainability (Webb, 2009; Kamwendo, 2009a). The period 2005-2014 has been declared the United Nations Decade of Education for Sustainable Development. This refers to the use of current resources in ways that will ensure their continued availability for future generations. Education systems are the avenue through which individuals can be developed to create a sustainable future in terms of environmental resources, economic prosperity, and social justice (UNESCO, 2005). The use of former colonial languages (English, French and Portuguese) as mediums of instruction in African schools impacts negatively on educational achievement when these languages are not well known by the learners (Kamwendo, 2009b). Dlodlo (1999) and Bunyi (1999) elaborate on this point by proposing that these languages, which contain words and concepts that bear little relationship to the learners' daily experiences, deprive them of the opportunity to apply what they are learning to what they already know, and this is a fundamental philosophy of learning (Reagan, 2009).

The limited implementation of the language-in-education policy and the widespread preference for English in education is another manifestation of negative attitudes to the African languages (Beukes, 2009; Webb et al., 2010). Table 3.5 below shows the percentage of EAL learners who selected English and the proportion of schools using English as the medium of instruction in certain provinces (Webb et al., 2010).

Table 3.5. Percentage of EAL learners selecting and proportion of schools using English as the medium of instruction in certain provinces (adapted from Webb et al., 2010)

Province	Proportion of EAL learners selecting English as the medium of instruction	Percentage of schools using English as the medium of instruction.
Gauteng	74	74
Eastern Cape	64	67
Western Cape	48	37
Limpopo	79	77
Kwa Zulu Natal	64	64
Northern Cape	n/a	15

In a study by Webb (2005) African language learners rated their proficiency in their home languages as weak and indicated that they do not consider these languages important for formal communication in education or the public domain. They also watched television and listened to the radio more in English than in their home languages and some said that they did not read in their L1. They also tend to communicate more in English with friends and siblings. In summary, African languages have low prestige and market value in education (Webb et al., 2010), and communities continue to choose, and even insist on English education (Nyika, 2009; Balfour, 2010). According to Perry (2004), these demands portray an ignorance of linguistic and cognitive science on the part of parents, which is to an extent excusable, but the government's apparent complacency on the issue is not, and it is time that parents are educated on the value of African languages in education.

a) Reasons for limited implementation of Language-in-Education policy (LiEP)

The main reasons for the dominance of English in education are still considered to be the stigma attached to African languages as a result of Bantu education during apartheid (Nyika, 2009; Webb et al., 2010) and the view that English provides access to social and economic advancement. In addition, Heugh (1999) argues that in the drafting of the outcomes-based curriculum, there was always a covert agenda that all children would ultimately learn in English, evidenced by the fact that language issues were reduced to the language and literacy learning area, as if they were not connected to the other learning areas. Thus development of terminology and materials in all the official languages, and teacher training for multilingual education and the new curriculum were not discussed (Heugh, 1999). The LiEP was announced 4 months after curriculum 2005 was finalised, and Heugh (1999) maintains that the centrality of language in education was disregarded at a critical point in South Africa's history.

Webb et al. (2010) suggest the following additional explanations of the limited support for and non-use of the African languages in education. First, learners have been found to, and also consider themselves to have underdeveloped literacy in their home languages (Webb et al., 2010; Pretorius, 2008; Barkhuizen, 2001). According to Webb et al. (2010), there is a general tendency for African language learners and teachers to over-estimate their proficiency in English, and under-estimate their home language proficiency. Second, the African languages have not been adequately developed and standardised, and although there has been work in this area by the National Languages Bodies under

PANSALB, the standardised varieties have not been widely accepted, are not familiar to L1 speakers and are not used in formal contexts such as classrooms. Essentially, the same factors that determine the non-use of African languages in the public domain (political, social, cultural, economic and educational) influence the acceptance of standard varieties (Webb, 2010). In the development of the standard varieties there has been insufficient attention to "status, prestige, acquisition and usage planning" and they are not seen to have economic or social power (Webb, 2010, p. 162).

The development of technical terms in the African languages is also challenging in that there is considerable difficulty in finding terms for concepts (Singh, 2009). For example, Southern Sotho has only one term: "lebelo" for "speed, velocity and acceleration" (Moji, 1998, p. 258), and in isiZulu there is only one word: "amandla" for "power, force and energy" (Wildsmith-Cromarty & Gordon, 2009, p. 368). Dlodlo (1999, p. 321) attributes this conceptual void to the fact that African languages have not been used in education and consequently a modern scientific vocabulary has not developed. He argues for "giving scientific meaning to generally accessible words that are explanatory of the context, rather than borrowing from European languages…." This approach implies that "acquisition planning" (the actual use of languages) drives "corpus planning" (the development of terminology by language bodies) so that educators do not need to wait for terms to be developed before they can be used in the classroom (Wildsmith-Cromarty & Gordon, 2009, p. 366).

Translation of English terminology is considered problematic in that English and the African languages are non-cognate languages, and there may be a lack of semantic and structural equivalence (Nida, 1975; Catford, 1965); lexical gaps (Fawcett, 1997) and translation shifts (Catford, 1965). These issues are dealt with in detail by authors such as Johanssen (1998), Machniewski (2004), Sajavaara(1996), Halliday & Martin(1993) Fawcett(1997), Hatim and Munday(2004), Widsmith-Cromarty(2008) and Sanders (1993) and will not be elaborated on here.

The third reason for the non-use of African languages in education is the increasing use of urban, code-mixed vernaculars such as Tsotsitaal, Iscamtho and Pretoria SeSotho in Gauteng schools in particular(Lafon, 2005; Cook, 2008). Webb et al. (2010) attribute this practice to the absence of well-developed standard languages, and the rejection of standard varieties by particularly the urban youth (Webb, 2010). This is because new terms, developed by experts on language boards are experienced as contrived (Wildsmith-Cromarty & Young, 2005) and more aligned to rural dialects, which are slower to change than urban dialects, as a result of less contact with and influence from other languages

(Anthonissen & Gough, 1998). An example of this is the tension between urban and rural isiZulu. The rural variety is considered to be the standard, but is virtually a foreign language to urban schoolchildren who do not learn successfully in this form of the language (Webb, 2010).

Webb et al. (2010) contend that the use of urban vernaculars and code switching should be discouraged in classrooms, for two reasons. First they impede the acquisition and development of standard varieties and thus complicate the development of African languages, and second they have a negative effect on the acquisition of formal academic language skills. There is some controversy as to the functions and value of code switching, and in contrast to Webb et al. (2010) there are researchers who argue that code switching by teachers serves valuable purposes, including the introduction of the aims of a lesson, contextualising important concepts (Adendorff, 1996), clarifying, instructing and explaining (Moodley, 2003) and also expressing solidarity with learners and stressing group identity (Adendorff, 1993).

Nevertheless, Webb et al. (2010) consider the development of the African languages into fully fledged standard languages, which are accepted and known by communities, to be essential if they are to be used as languages that mediate learning and understanding. This does not imply that teachers should convey the message that non-standard varieties are inferior to the standard varieties, since this will lead to learners feeling inferior and result in poor academic performance, as was evidenced in the high failure rate of coloured Afrikaans-speaking learners from working class backgrounds in the Western Cape (Davids, 2009 in Webb, 2010). The importance of non-standard varieties in social spheres must be acknowledged (Webb, 2010). Furthermore, some theorists and researchers in bi-dialectics believe that individuals have the ability to acquire both the informal, non-standard varieties and formal, standard varieties of the same language (Siegel, 2003).

Another reason for the lack of implementation of home language instruction may be purely pragmatic. The high proportion of learners choosing English and schools using this as the medium of instruction in Gauteng and the Limpopo province relative to the other provinces (see Table 3.5) may simply be indicative of the heterogeneity in home language backgrounds of the learners in these areas. Actual statistics are reflected in Table 3.6, showing the proportion of home language learners by province (Webb et al., 2010)

Table 3.6. Proportion of home language learners by province (adapted from Webb et al., 2010)

Province	Home Languages	% of learners
Gauteng	English Afrikaans IsiZulu Pedi Sesotho Setswana	13,8 17,2 27,2 12 18,8 11
Limpopo	English Pedi Thsivenda Xitsonga	0,5 56,89 17,98 24,62
Eastern Cape	English IsiXhosa	5,7 94,3
Western Cape	Afrikaans English IsiXhosa	54,1 20,9 25
Kwa- Zulu Natal	English IsiZulu	8,9 91,1

This heterogeneity in the home language backgrounds of learners has been recorded in most studies conducted in Gauteng urban schools (e.g., Jordaan, Penn & Tshule, 1995; Setati, Adler, Reed and Bapoo, 2002; Broom, 2004; Meirim et al., 2010), and is evident in the linguistic backgrounds of learners participating in the current study. In this context, English as the medium of instruction may be the only practical choice, since the complex multilingual composition of schools makes it difficult to select a particular African language.

It should be noted that the figures on the proportion of schools using English as the medium of instruction in Table 3.5, do not reflect a breakdown in terms of educational context, and in some rural and township schools the official policy is to use the home language up to grade 3, with English taught as a subject from grade 1(Motshega, 2010). From grade 4, learners then transition to English as the medium of instruction, but this is not fully implemented in practice (Webb et al., 2010). It seems that in these schools, the home language may be used (LingbeT project in Webb et al., 2010; Brock-Utne & Holmarsdottir, 2003), code switching is common, and urban vernaculars are increasingly used to facilitate understanding and classroom interaction, mainly because the English proficiency of learners and teachers is not adequate (Webb et al., 2010). Despite this, learners are officially assessed only in

English and the fact that they have to demonstrate their knowledge and understanding in a language which is at best their L2 or even L3 is simply not acceptable (Webb, 2004; Lafon, 2008; Webb et al, 2010).

b) Transitional Education vs. Additive Bilingual education

The transitional system, where home language instruction occurs up to the end of grade 3 or 4, followed by a transition to English, was also implemented during the apartheid era, and was largely discredited in the Threshold project by Macdonald (1990) who showed that the learners had not acquired a sufficient vocabulary to use English as the language of learning after 4 years of learning English as an L2. This policy has also been severely criticized by Heugh (2002, 2006, 2009), who argues that home language instruction should be implemented for at least 8 years. Drawing on the research on educational outcomes in Africa commissioned by the UNESCO Institute for Education and the Association for the Development of Education in Africa (ADEA) in 2004, Heugh (2006) maintains that if early home language instruction is to be beneficial, it must continue at least to the end of grade 6 but preferably longer, because the academic language and literacy needed for the whole curriculum, cannot be developed in the first three years. In line with an additive bilingual approach, she recommends that the L2 is developed through subject teaching so that it can become a complementary medium of instruction during the second half of secondary school. A switch from home language to the L2 is not necessarily the best way to ensure high levels of proficiency in the L2. Heugh (2006) argues that although issues of poverty and ill health (e.g., HIV/AIDS) compound the language problem and result in the generally low educational outcomes throughout Africa, the inadequacy of early exit transitional programmes has also been demonstrated in developed countries such as the US and Canada, which are not as affected by such problems (e.g., Thomas & Collier, 2002, cited in Heugh, 2006). Heugh (2002; 2006) and Ramani, Kekana, Modiba & Joseph (2007), in contrast to Webb et al. (2010), believe that African languages can be used as the medium of instruction beyond the third grade. This claim is based on research carried out by Heugh & Mahlalela (2002), showing that considerable work was done on the development of African languages before, during and even after Bantu education. Heugh (2002) thus urges stakeholders to consult these resources in African language departments across the country. Ramani et al. (2007) showed that African languages are sufficiently developed to be used even in tertiary education. These authors describe the implementation of a dual-medium B.A degree in Sepedi and English, in which teachers, students and lexicographers worked together to create terms and concepts to meet their needs.

Heugh (2006) claims that the language problems of children learning in their L2 have the most significant impact on their achievement in mathematics, since they achieve on average 10% less for mathematics than for language. This is also evident in the results of the large-scale projects presented in Table 3.1, showing lower mathematics and numeracy scores in relation to literacy scores.

In addition, Heugh (2009) cites recent evidence from Ethiopia, a much poorer country than South Africa, where children are instructed in their home language (e.g., Amharic) for either 4, 6 or 8 years. Children with eight years of home language instruction have higher scores across the curriculum (in Mathematics, Science and Biology) than children with four or six years of instruction in the home language.

The limited implementation of home language instruction is not unique to South Africa. There are a number of African countries where former colonial languages are used as instructional media (Obondo, 2008). According to Obondo (2008) 22 out of 34 countries use African languages as the medium of instruction at primary level and of these only 3 have extended their use to the secondary level. One of the widely used arguments against bilingual instruction and thus the use of the home language, concerns the perception that such programmes do not provide sufficient exposure to the second language, as instruction time between the L1 and L2 is divided (Obondo, 2008). This is known as the "time on task argument" (Genesee, Paradis & Crago, 2004, p. 168). However, although exposure is necessary for acquisition it is not sufficient (Obondo,2008).This has been repeatedly demonstrated in research showing either no significant differences in the L2 proficiency of children in L2 monolingual programmes and bilingual programmes or an advantage to those in bilingual programmes (Lindholm, 2001; Thomas & Collier, 2002). There is thus overwhelming evidence that an additive bilingual approach in which the home language is used for as long as possible while the child acquires other languages is the best for African children (Obondo, 2008), and yet there is still resistance in many countries.

Kishendo (2010) explains this resistance by suggesting that authors do not engage seriously enough with the issues raised by critics of home language education. He quotes Bull (1964, p. 528 in Kishendo, 2010, p.152) who in response to the 1953 UNESCO report, wrote that:

> *"Whatever claims are made concerning sound educational principles, the social, economic and political priorities at a particular time will be decisive. While language practitioners and educators make compelling arguments for home language instruction, other stakeholders may not agree, resulting in inertia at grass roots level."*

Kishendo (2010, p. 152) further argues that:

> *"The present system of learning in a foreign/additional language can only be kicked off its pedestal ….by a system which is equal and proportionate in breadth and global reach to the system it seeks to displace. Without this, the economic and political turmoil in many countries is so great that academic prognoses about mother tongue education are likely to remain just that-academic"*

Despite the general lack of support for home language instruction, Obondo (2008) describes a number of projects in various African countries where indigenous languages have been used in education, but she also points out that some of them have not succeeded since they are perceived as denying access to a language that is important for economic advancement, whether this is an indigenous or ex-colonial language; and they end when funding is no longer available from the foreign donors. There are however, other more recent initiatives such as the African Academy of Languages (ACALAN) to address the development of African languages and to promote multilingualism. The goals of this organisation, which are to define criteria for countries to formulate additive bilingual educational policies, resonate well with the language-in-education policy of South Africa, which unfortunately has not been fully implemented.

In South Africa, there are also numerous positive initiatives that should be acknowledged. One of these is the Concept Literacy Project, an interdisciplinary research study focusing on the development and mediation of mathematics and science concepts through home languages, specifically isiXhosa, isiZulu, and Afrikaans (Wildsmith-Cromarty & Gordon, 2009). This project involves four universities from the Western and Eastern Cape, Kwa-Zulu Natal and Gauteng, and the main aim is to use multilingual resource books to enhance the understanding of concepts by African language teachers and learners in grades 8-10, who use English as the medium of instruction. Another prominent example is the Project for Alternative Education in South Africa (PRAESA) in which Alexander and colleagues are doing significant work to promote the use of African languages in education. The Home Language Project (Owen-Smith, 2010) encourages children who attend a number of English-medium state schools in Johannesburg to develop and value their home languages through reading. The Home Language Project also provides support for mathematics and science in the African languages.

c) Research on children instructed in English as an additional language

In contrast to the generally positive findings on the achievement of children educated in their home language and/or in bilingual programmes, the language problems experienced by children who are instructed in a L2 have been extensively researched both internationally and in South Africa, and a growing number of educational researchers attribute under-achievement to learning in a second or additional language, which in the case of South Africa, is English (Alexander, 2010; Brock-Utne & Skattum, 2009; Pluddeman, Vuyokazi & Ncedo, 2010 in Webb et al., 2010). In most research studies there is almost complete agreement that under-achievement is linked to instruction and assessment in English. These studies are discussed below.

Referring to the TIMMS studies conducted in 1999 and 2003, Howie (2005b) states that fluency in English was the most significant determinant in learning science and mathematics. Reddy et al. (2006) report that in the 2003 TIMMS test, children who 'always' spoke the language of the test at home scored an average of 349, while those who 'never' spoke the language of the test at home scored only 192. The Western Cape grade 6 assessment study (WCED, 2006) showed that children who spoke English as an L1 had a mean score of 70% on the literacy test , while isiXhosa L1 speakers obtained only 37%. Only 1, 6% of isiXhosa speakers performed at official grade level.

Broom (2004) investigated the reading achievement of grade 3 learners in 20 urban primary schools in Gauteng, and found that the average score on the reading test for L2 English speakers in ex-DET schools was 31,8%, as opposed to the 87,8% achieved by L1 English speakers. The performance of L1 speakers was consistently higher than that of L2 speakers even in the same schools, but the performance of L2 learners in the historically white schools was better than that of their peers in the township schools.

A number of studies have also investigated the language proficiency, as opposed to educational outcomes, of children learning in English.

A study by Jooste (2003) on grade 5 children in a number of upper and lower SES schools in Cape Town, showed that by grade 5, EAL learners were still performing significantly below their L1 peers on measures of reading comprehension. Van Rooyen & Jordaan (2009) assessed 464 learners in an ex-model-C high school on a measure of complex sentence comprehension. Although the results of the study indicated that the majority of learners achieved within the average range, and there were no statistically significant differences between first- and additional-language English learners, the EAL

participants tended to score, on average, one scaled score below the first-language English participants, suggesting that they had not quite reached the proficiency levels of the first language participants. This means that despite a substantial period of educational exposure to English, parity with monolingual peers is not always evident, even on oral tasks. One may thus expect greater differences on reading or written tasks, which demand higher levels of language processing. In addition, the language comprehension scores were positively correlated with the most recent school report mark and the most recent English mark, confirming that oral language proficiency is strongly related to academic achievement.

A recent study by Meirim et al. (2010) investigated the development of language skills in foundation phase EAL learners attending three lower ex-model-C schools where English is the medium of instruction. A three year longitudinal investigation of the acquisition of some of the processes underlying language for academic purposes was undertaken using the semantics subtests of the DELV- CR (Seymour et al., 2003). The results indicated that the majority of EAL learners improved with increased exposure to English in the academic environment and by the time they were in grade 3, were performing at a higher level than L1 children in grade 2. However, the effect of this protracted period of oral language development on literacy attainment was not investigated, and this is important since the negative effects of English instruction appear only beyond the third grade (Heugh, 2009). The learners showed better performance on the understanding of quantifiers than on the other semantic skills and the authors conclude that since quantification is directly addressed through content teaching in the numeracy learning area, language skills can be developed through explicit instruction (Meirim et al., 2010). Specifically, this study highlighted the need for instruction in vocabulary acquisition which is critical for reading comprehension and thus literacy attainment.

These studies (Broom, 2004; Jooste, 2003; Van Rooyen & Jordaan, 2009; Meirim et al., 2010) all confirm that even in ex-model-C schools there is often a difference between L1 and EAL learners.

Fleisch (2008, p. 98) points out that although the research shows a relationship between achievement and instruction in English, the studies often do not provide insights into the "generative mechanisms, the underlying reasons or causes that link children's experiences with language at school and their failure to become proficient in reading and mathematics", i.e., exactly how language is linked to academic achievement.

Particularly in rural and township schools that adopt a transitional or English from first grade model, the generative mechanisms are considered to be: a lack of sufficient academic language development in the first language making the leap from learning the language in the first three grades to using it for learning in grade 4 too steep (Heugh, 2009); the inevitable use of code switching by the teachers which arguably builds neither the L1 or L2 (Holmarsdottir, 2003); and focusing on lower order cognitive tasks as a way of compensating for lack of mastery of the medium of instruction (Fleisch, 2008).

Another proposed mechanism involves the emotions of second language teaching and learning. Probyn (2001) showed that teachers in township schools found teaching in English to be stressful and felt that the learners were equally affected by the demands of learning in English, in that they often understood what they were learning but could not express themselves, leading to embarrassment and a loss of self-esteem.

There is also a difference in the "English language infrastructure'' (Fleisch, 2008, p.111) supporting the learning of English in rural and urban schools. In urban schools, which would include some township schools and the ex-model-C schools, children are exposed to English through the print media, television and radio, and in the environment. In rural schools, such exposure is limited and for children in these contexts English is often more like a foreign language.

However, it is a basic premise of this study that although these factors are important, they are not necessarily the real "generative mechanisms "as Fleisch (2008, p. 98) suggests. It is necessary to investigate actual language teaching and learning mechanisms on a psycholinguistic level to uncover what it is that teachers are teaching and learners are learning about language that may or may not support their academic development. The current study focuses on the children and some of the processes underlying their learning of language.

d) Interpretation of research on language-in-education practices

Reddy et al (2006) maintain that the effects of language on achievement scores are not straightforward. There are other variables that contribute to low achievement such as SES, the nature of teaching and the level of cognitive demand in the classroom, irrespective of whether the medium of instruction is the L1 or L2. Fleisch (2008) points out that although the evidence for language as a major factor contributing to the poor performance of South African children is convincing, the interpretation of these findings needs to be carefully evaluated. He bases this argument on a study by Braam (2004), Howie's detailed analysis

of the TIMMS studies and a re- appraisal of Heugh's arguments, which sometimes draw on earlier research by Malherbe (1977).

Braam (2004) found that in a dual medium English-Afrikaans school on the Cape Flats, serving a mixed community of lower middle class and working class coloured families, 55% of the children registered in the English stream, despite reporting that Afrikaans was their home language. Across the curriculum, these children were more successful academically than the Afrikaans-speaking children enrolled in the Afrikaans stream. Braam (2004) explains this as reflecting a complex set of class dynamics. In this specific community, Afrikaans is stigmatised as the language of the lower class and the teaching practices are aligned to this stigmatisation with the Afrikaans classes subjected to more direct, transmission teaching while the teachers in the English stream, who are also L1 speakers, associate English with academic achievement and encourage higher order thinking. The implication is thus that home language instruction "does not exist in a social and political vacuum "and the practice of teaching in the home language does not necessarily lead to better outcomes (Fleisch, 2008, p 112).

Howie's analysis of the TIMMS results, showed that there are other countries where a large proportion of children (more than 70%) did not speak the language of the test at home (e.g., Indonesia, Malaysia, Morocco, Phillippines and Singapore). In both Indonesia and Malaysia, a significant proportion of these children did better than children who 'always' or 'sometimes' spoke the language of the test at home. In Singapore, 'seldom' or 'never' speaking the language of the test at home did not preclude academic excellence. These findings apply not only to East Asia but also to countries in North Africa, and while the difference on the average mathematics score between children who 'always' and 'never' spoke the language of the test at home was 157 points in South Africa, it was only 46 points in Botswana. Taken together, these results suggest that education in a L2 is not the only contributor to poor educational achievement.

According to Fleisch (2008) the proponents of home language instruction and additive bilingual programmes frequently cite the work of Malherbe (1977) on Afrikaans-English bilingual schools. Malherbe showed that children who had Afrikaans home language instruction up to grade 7, followed by dual-medium instruction in Afrikaans-English from grades 8-12, performed better than children in monolingual Afrikaans or English schools in both the L1 and L2 as well as other areas of the curriculum. They also showed higher levels of tolerance for linguistic diversity and even learning-disabled children

performed better. In addition, the dual-medium schools were mostly in rural and less well-resourced areas.

Fleisch (2008) interprets these findings as offering evidence against the 'home language is best' position. He cites Malherbe's conclusion that although learning in the second language results in an initial disadvantage in content subjects, the medium of instruction is less significant as the child progresses to higher grades and eventually has no impact on achievement.

However, what Malherbe (1977) actually found was that the language performance of Afrikaans-speaking children in English-medium schools was better than for Afrikaans-speaking children in Afrikaans schools at the higher grades. It is ironic that Fleisch (1995) himself criticised Malherbe's ground-breaking work for its link to a particular political agenda, when in fact it showed the importance and advantage of maintaining both languages, either through using them as the language of learning or teaching them as subjects. The fact that the majority of schools in Malherbe's (1977) research were either parallel- or dual-medium, meant that even if the children were being educated in the L2 (English), they still received input in the L1 (Afrikaans) at an academic level through subject teaching.

Naturally, comparisons between Afrikaans and the African languages should be treated with caution, since the apartheid government invested significant amounts of money into the development of Afrikaans. Textbooks, dictionaries and fiction etc. were readily available. Afrikaans also enjoyed high status and was used extensively in the public domain. This support for the home language in these learning conditions makes a significant difference.

Fleisch (2008) points out that Heugh's argument for an extended period (at least 8 years) of home language instruction within the context of bilingual education, is often based on the fact that when black learners in the former Department of Education and Training (DET) received home language instruction for 8 years under the Bantu Education Act during apartheid, the grade 12 results were significantly better than when the years of home language instruction were reduced to three. Fleisch (2008) suggests that this is a misinterpretation, since the poor educational outcomes during the 1980s can be attributed to the disintegration of education for black learners following the Soweto uprisings in 1976 and the ANC slogan of "liberation before education." In addition, Hartshorne (1992) and Young (1995) ascribe the poorer matriculation results during this period to insufficient support by the DET for the teaching of English.

The results of a study by Morrow, Jordaan & Fridjhon (2005) contribute some insights to the perceived advantages of bilingual and home language instruction. In this study 181 Grade 7 learners from three different contexts (rural, urban, and township), were tested on an assessment tool constructed in English and translated into isiZulu. The assessment tasks were based on the frequency of occurrence of key concepts in a published curriculum package. The learners showed specific patterns of performance dependent on context. The learners in urban ex-model-C schools performed significantly better in English (89, 5%) than in isiZulu (58, 1%), demonstrating the highest level of competence in English but the lowest in isiZulu. Learners in townships schools showed similar proficiency in both languages, demonstrating the same level of competence in isiZulu (71,43%) but significantly higher English scores (73,5%) than the learners in rural schools, who did much better in isiZulu (75,1%) than in English (53,4%). The study showed that children in the urban schools who were instructed only in English did very well and better than the children in township and rural schools did in either English or isiZulu. These findings thus contradict the claim that bilingual education is preferable to monolingual education, and that performance in the L2 is dependent on L1 proficiency, especially since the urban learners obtained a relatively low average score on the isiZulu test. The children in the township schools demonstrated a balanced profile, but did not do as well in English as their urban counterparts, although they may have caught up at a later stage, and would have the advantage of being proficient in both English and isiZulu on an academic level. Despite receiving instruction in English from grade 4 onwards, the children in the rural schools showed that they were not coping with this medium of instruction and would be far better off if isiZulu were used as the language of learning. The findings of this study thus confirm the strong contextual influences on language-in-education, and reinforce the conclusion that the role of language in poor school performance is not clear-cut.

3.2.4. Quality of education and language teaching practices

In the rural and township schools that are classified into what Fleisch (2008, p. 2) refers to as the "second system", the quality of education is affected by five main factors: many teachers are not literate and have poor subject knowledge; the children receive less instructional time because of poor punctuality, absenteeism and pre-occupation with other tasks; teachers have low expectations of children; there is poor utilisation of existing materials and inadequate methods of instruction.

The extent to which these factors affect schools in the "first system" (Fleisch, 2008, p. 2) has not been widely researched, but there is some available evidence to suggest that there are problems in this system as well. For example, Van der Sandt & Niewoudt (2003) found that grade 7 and prospective student teachers in ex-model-C schools had weak knowledge of geometry. Also, in contrast to other countries where teacher expectations are low for certain children, South African teachers are said to have low expectations for all children because of misinterpretation of the grade level requirements of the official curriculum standards and misunderstanding of child-centred pedagogy (Vinjefold, 2004). This results in lower teaching standards and in children becoming complacent about what they know.

In particular, and of relevance to the current study, is South African teachers' knowledge of language and knowledge about language, collectively referred to as "teacher language awareness" (Andrews, 2003, p. 81), which directly affects their teaching practices. Andrews (2003, p. 84) defines language teaching practices as the "creation of opportunities for language learning in the classroom." Language teaching goals and methods may be planned in advance, but the teacher also needs to be flexible and adapt to the discourse demands created by classroom interactions (Wright & Bolitho, 1997). According to Andrews (2003, p. 86) teachers' language awareness is "metacognitive", involving the ability to reflect on knowledge of and about language, and this distinguishes the teacher from the learner. This metacognitive dimension of language teaching is central to educational linguistics (Brumfit, 1997; Reagan, 2009).

However, in the international literature as well as in South African research there is evidence to suggest that language-in-education practices are a "tricky business" (Reagan, 2009, p.vii). Educational linguistics is a specialised area that has unfortunately been neglected in teacher training programmes, and consequently few teachers have sufficient knowledge of the complex, multidimensional nature of language and the implications for language learning and teaching processes in either L1 or L2 contexts (Uys, et al., 2007; O'Connor & Geiger, 2009; Mroz, 2006; Wong-Fillmore & Snow, 2000; Andrews, 2003).

In South Africa, inadequate knowledge about language is exacerbated by ill-informed and misunderstood concepts and teaching practices such as "Whole Language", "Communicative Language Teaching" (Heugh, 2009, p.168) and "Natural Language", which have become almost "orthodoxies" in the education system (Balfour, 2007, p. 6). The communicative approach assumes that language learning only occurs in real-life contexts, where the communicative functions of language drives the acquisition process. Teachers do not act as instructors but as facilitators of the process through natural

communication and interaction, using comprehensible input of a sufficiently high quality and complexity to ensure that learners will acquire the semantic and syntactic systems of the language of instruction in a subconscious, implicit way (Balfour, 2007). This approach is based on Krashen's (1988) distinction between acquisition and learning, which are in fact not "distinct and separate" processes (Baker, 2001 in Reagan, 2009, p. 59), and are both adequately aligned with a constructivist approach to language learning (Reagan, 2009).

Heugh (2009) is critical of the adoption of Western approaches such as whole language, communicative language teaching and critical and social literacies within the outcomes-based curriculum. She argues that these approaches may suit English-dominant societies in the developed world but cannot be applied to African contexts where there is limited access to the resources required to implement them. She also maintains that these approaches were selected without research in the local context, without theoretical substance and without regard for the historical background in education.

The above discussion leads to the conclusion that perhaps the fundamental reason for the poor performance of South African schoolchildren and their failure to learn in any medium of instruction is that language learning should be approached within a "constructivist epistemology" (Reagan, 2009, p 54) that focuses on generative mechanisms and processes, while outcomes-based education, although claimed to be constructivist (Heugh, 2009), has been misunderstood and thus misdirected. It essentially reflects a positivist epistemology, focusing on performance and outcomes (Balfour, 2007), without sufficient attention to the actual process of language learning and literacy acquisition (Heugh, 2009).

Reagan (2009), in his book "Language Matters", maintains that theories of learning in general and of language learning in particular, are examples of metaphors which are culturally determined cognitive tools that shape our thoughts. It is thus understandable that there would be different philosophies of learning within a multicultural society such as South Africa, and that Western concepts would be misconstrued. To understand what learning is about, and how learning theories have evolved over time, Reagan (2009) argues that one should examine some of the philosophies of learning. Plato for example, theorised that learning is basically accessing what one already knows, and according to Reagan, the Socratic teaching method, involving active engagement with learners is grounded in this idea. In contrast, the philosopher Locke, posited that the child's mind is a "tabula rasa" and the "teacher pours knowledge into the child" (Reagan, 2009, p.57) This philosophy was adopted by 19th century psychologists, who emphasised scientific, observable facts in understanding learning, and the philosophy

developed into the behaviourist school of psychology, which was influential in education throughout the 20th century. Transmission teaching methods and the audio-lingual method in L2 teaching are applications of behaviourist psychology. It is interesting that these teaching methods are still evident in many South African classrooms (Fleisch, 2008), despite the introduction of the new curriculum.

Reagan (2009, p.59) claims that although cognitive science has changed our understanding of how the human brain learns, there is still a gap between this knowledge and application to classroom practice, and "the science of learning has not yet emerged ...we are still reliant on metaphors to understand the nature of learning." According to this author, constructivism is one of the more powerful metaphors, but has not been investigated extensively in the context of language learning. Furthermore, there is no general consensus on the meaning of the concept and whether it is an epistemology, educational philosophy, teaching approach or theory of teaching or learning (Reagan, 2009).

Because metaphors often inform us about what things are not, we do know that constructivism is not a theory of teaching, it is a theory for defining knowledge and learning (Fosnat, 1993 in Reagan, 2009, p. 62) and it rejects traditional, transmission approaches to learning. Constructivism defines knowledge as temporary, developed socially, and mediated culturally. It emphasises the individual learner's construction of knowledge and the personal nature of learning. One of the principles of learning in constructivism is that the classroom is a discourse community, engaged in reflection, conversation and activity (Reagan, 2009).

According to Reagan (2009) there are two competing types of constructivism: radical constructivism, which is Piagetian in orientation and takes a cognitive view of learning, and social constructivism, which is Vygotskian and emphasizes the socio-cultural context of learning as a socially constructed, mediated process. The two types can however be reconciled. Social constructivism is also entirely compatible with direct instruction, and although it is learner-centred, the content and skills of the learning process is the teacher's responsibility (Reagan, 2009). Social constructivism can be applied to language acquisition and learning, if it is correctly interpreted, and furthermore, it is compatible with content and language-integrated learning (Coyle, 2008).

As Taylor, Vinjevold & Muller (2003, p.65) have said: The most significant issue for quality in education is: "the all-pervasive and extremely powerful influence of language which is unambiguously implicated in

learning….. and the need for pupils to have as good a grasp of the language of teaching and learning as possible."

3. 3. SUMMARY AND QUESTIONS ARISING

This chapter has outlined the complexities of the South African education system and elaborated on many of the issues raised in the introduction. The main points emerging from this chapter are:

- The political and educational history of South Africa has resulted in gross inequity in the education system and in the dominance of English as the preferred language of instruction.
- The primary school education system is not producing adequate results in terms of numeracy and literacy teaching and learning.
- Language-in-education practices, particularly the use of English as the medium of instruction, are considered by many to be the main cause of poor educational achievement in children who speak other home languages.
- However, there are a number of causative factors, not least of which is the quality of language teaching irrespective of the medium of instruction.
- The quality of language teaching has been affected by misconstruction and inappropriate application of some of the concepts embodied in the outcomes-based education system.
- The emphasis on outcomes has resulted in a lack of awareness of the underlying processes and mechanisms of language learning and literacy acquisition.
- Consequently the teaching methods for developing language and reading skills are inadequate.
- For various reasons, the development and use of the African languages in education are controversial and apparently not a priority. Thus, home language instruction and/or bilingual education programmes are not widely implemented.
- However, the implementation of such programmes as well as the teaching of African languages as subjects is equally dependent on adequate teaching methods.
- Adequate language-in-education practices require awareness and application of a number of theoretical concepts in educational linguistics (e.g., psycholinguistic processes underlying language acquisition and learning, academic language, content and language-integrated learning, social constructivism), which appear to be lacking at present.

The main questions arising from these points are:

In educational contexts where English is used as the medium of instruction from the first grade, how do the children develop the academic language skills required in the early stages of education?

Are there differences between L1 and EAL children in the rate and process of acquisition of these language skills?

Are there differences between EAL children in different contexts of education in the rate and process of academic language development?

3.4. AIMS AND RATIONALE OF THE STUDY

The present study therefore aimed to address these questions as well as the questions raised at the end of chapter 2, through a longitudinal investigation of the development of academic language skills in the foundation phase. Since language acquisition is a dynamic process and is influenced by a number of different factors, this design was considered the most appropriate to address the main research question: In educational contexts where English is used as the medium of instruction from the first grade, how do the children develop the academic language skills required in the early stages of education?

3.4.1. The development of academic language in the foundation phase

Given the research showing that younger children, 7-9 years of age, may not be as efficient at additional language learning as older children (Marinova-Todd et al., 2000) possibly because they do not yet have access to explicit learning strategies (Mac Whinney, 2005; Paradis, 2004; Ullman, 2001), it is important to establish how long it takes EAL learners to develop proficiency in the language of instruction, so that realistic expectations are created. By studying the trajectory and rate of acquisition of some of the psycholinguistic processes underlying academic language in the foundation phase, the aim was to contribute to an understanding of the generative mechanisms of additional language learning in the first three grades of schooling. This would provide an indication of which language skills could be developed through explicit teaching and which are acquired more naturally through incidental learning.

An important argument in this study is that educational researchers are not identifying the real reasons for the poor educational achievement of South African children because they are not considering the psycholinguistic processes that underpin language learning and literacy. In the foundation phase, oral language development is particularly important for EAL learners. However, it is equally important at this early stage, that all children acquire the academic language skills that will facilitate and enable their educational development in the higher grades when the conceptual and linguistic demands increase in complexity. The measure selected to assess the processes underlying oral academic language development in this study was the Developmental Evaluation of Language Variation-Criterion Referenced Edition (DELV-CR) (Seymour et al., 2003). This measure has not been used to assess EAL children and its application in this study is therefore novel, based on the following rationale.

The DELV-CR has strong theoretical foundations in psycholinguistics and assesses the processes involved in developing concepts and vocabulary, complex syntax, as well as narrative and communication functions, all of which are relevant to descriptions of academic language (Scarcella, 2007; Owens, 2008, Berman, 2009; Hoff, 2005; Cummins, 2000; Westby, 1994). The DELV-CR captures the language developments typically observed in young school-aged children (McKay, 2005; 2006) as well as the language outcomes stated in the South African foundation phase national curriculum statements. According to de Villiers (2005) it is specifically designed to tap many of the aspects that are important for early schooling and literacy acquisition, which makes it appropriate for assessing emerging academic language.

The DELV-CR draws on theories of the universal properties and processes of language (Seymour et al., 2003), and was developed primarily to address cultural and linguistic assessment bias against speakers of the African American English (AAE) dialect. However, this is not the primary reason for using it in this study, since AAE is not necessarily comparable to dialectal variations in either first or second language speakers of South African English. Rather, the appeal of the DELV-CR lies in the fact that in the process of avoiding dialectal features, the test was designed and constructed in a practical way "to assess underlying processes and structures common to all varieties of English" (Seymour et al., 2003, p. 4). In addition, the test items and picture stimuli contain situations, activities and people from different cultural and ethnic backgrounds, which make it particularly applicable to the South African context. The DELV-CR was field tested on 1014 4- 9,11 year old children from working class backgrounds in all regions of North America and is thus appropriate for the participants of this study, who were between 6 and 10

years of age. The DELV-CR sample included both African American and Mainstream American speakers of English, matched for parental education level, and one third of the children in each age and dialect group were language- impaired. Thus the DELV-CR also assesses many of the language processes that have been found to be clinical markers of language impairment (e.g., complex Wh-questions, passives and verb learning) which renders it appropriate for identifying language impairment.

It assesses three domains of language (syntax, semantics and pragmatics) and thus allowed for a comparison between domains to determine whether the rates and processes of acquisition vary for different components of language.

The DELV-CR has been piloted in a number of South African studies (e.g., Kallenbach, 2006; Meirim, 2007; Rijhumal, 2008; Meirim et al., 2010), and was found to be particularly valuable in describing the development of various language processes in both EAL and L1 learners, and in identifying language skills that could be explicitly addressed in the foundation phase.

3.4.2. The relationship between oral language development and reading

An additional aim of the study was to correlate the learners' performance on the language processing measures to their reading abilities, in order to establish whether and how oral and literate academic language skills are related in young EAL learners. The literature on reading development suggests that learning to read in a second language is not the optimal route to literacy (August, Calderon, Carlo & Nutall, 2006). There are also indications that L2 learners often acquire decoding skills fairly quickly but do not comprehend what they are reading because of limited oral language proficiency (Geva, 2006; Geva & Genesee, 2006). Since the EAL learners in this study were learning to read in an additional language, and there is considerable concern over the literacy skills of South African children, the objective was to describe their development of reading decoding and comprehension and to relate this to their oral language skills.

3.4.3. Comparison between EAL and L1 learners

Since the DELV-CR and the other measures used in this study were not developed in South Africa and the education system in this country differs from those in the US and Britain where the measures were standardised, the EAL participants were compared to a peer group of L1 learners. This comparison also served to address questions regarding possible differences between EAL and L1 learners in the rate and

processes of academic language development, as well as the time frame and extent to which EAL learners reach commensurate levels of proficiency with their monolingual peers.

3.4.4. Comparison between educational contexts

As stated in Chapter 1, the focus in this study is on English additional language learners because learning in English is considered by educational researchers to be the main reason for the poor achievement of South African children. However, as argued in previous chapters, the effects of instruction in English are not definitive. In addition, there is considerable variation in different contexts of education. Fleisch (2008) suggests that there are two education systems in South Africa. In the first, consisting of ex-model-C and independent schools attended by middle-class children, achievement in literacy and numeracy is similar to anywhere else in the world. In the second, comprised of former Department of Education and Training schools attended by poor and working-class children, literacy and numeracy achievement levels are very poor. However, this differentiation may be an oversimplification since there are many children from lower socio-economic backgrounds attending ex-model-C schools. In addition, the ex-model-C system has evolved into different contexts and many of the causes of poor achievement (e.g., conditions of poverty, poor teaching quality) are also evident in this context. In addition, there is considerable research to show that there are differences between EAL and L1 learners in this system.
This study aimed to compare the language and literacy skills of foundation phase children in two contexts within the ex-model-C system because there are potential advantages and disadvantages to each. Based on the discussion in previous chapters, the two contexts are compared and contrasted in table 3.7.

Table 3.7 Educational contexts compared in this study

Context	Context 1: EAL only	Context 2: Integrated
Composition of classes	Only EAL learners	EAL and L1 learners integrated in the same classes
Teachers' language profiles	English additional language	English first language
Potential advantages	Children and teachers are culturally and linguistically matched EAL teachers understand language needs of the children Teachers have realistic expectations of language proficiency Teachers do not compare EAL children to monolingual standards Teachers are able to use the African languages to support development of English.	EAL children are exposed to L1 models and children learn the language of those with whom they associate (Scarcella, 2011). May be beneficial for EAL and EFL children to be taught together (Genesee, Lindholm-Leary, Saunders, and Christian, 2005). Children develop both instrumental and integrative motivation
Disadvantages	Absence of L1 models Fewer opportunities to initiate interaction with L1 speakers , especially for children with facilitative personality characteristics Children must rely on instrumental as opposed to both integrative and instrumental motivation.	Teachers may have difficulty adapting to cultural diversity and different levels of language proficiency Teachers use complex language demanding high levels of auditory processing Teachers may have unrealistic expectations of learners' language proficiency EAL children are competing with L1 children leading to problems with self-esteem and confidence**.**

3.4.5. Comparison between classes in each context

An additional aim of the study was to compare the children in different classes within each context since the experience and expertise of different teachers may have affected performance on the language and reading comprehension measures.

3.4.6. Comparison between exposure groups within the EAL groups

Since the language environment in the home and experiences in the pre-school period also contribute to the learning of the L2 (Jia, 2003; Jia & Anderson, 2003; Genesee, Paradis & Crago, 2004), the amount and quality of English EAL children are exposed to in these contexts may be an important predictor of their ability to learn in English at school. The fact that parents and pre-school teachers may also be EAL speakers is an important consideration, since they may not be able to provide the rich and diverse

language models needed for language development (Paradis, 2009). In the current study, exposure to English in the pre-school period was determined through parent questionnaires and the participants were classified according to the amount of English spoken in the home and number of years of attendance in an English medium pre-school. The two exposure groups were compared to each other on all measures.

3.4.7. Gender comparisons

Although there is limited literature on gender effects in second language acquisition, the performance of males and females was compared on all measures since gender differences have been reported in the literature on language development (Westen, 1999).

3.4.8. Assessment of working memory

To explain the substantial individual variation in the rate of development and ultimate proficiency achieved by different L2 learners, researchers have suggested that language aptitude is a reliable predictor of achievement in classroom second language learning (Kormos & Safar, 2008; De Bot et al., 2005). However, aptitude has not been widely researched in children (Alexiou, 2009).

Working memory is considered to be an important component of the aptitude construct (Dornyei and Skehan, 2003; Kormos & Safar, 2008) and there are studies to suggest that working memory affects language acquisition in EAL learners (Archibald & Gathercole, 2007; Adams & Gathercole, 2000; Baddeley, 2003; van Daal, Verhoeven, van Leeuwe, & van Balkom, 2008; MacDonald, 2006). However, although working memory may be a valid cognitive construct, its assessment and measurement is controversial and often confounded by dependence on language knowledge and processing (Juffs & Harrington, 2011) and the results are difficult to interpret, particularly if the assessment is administered in a second language. In addition, there is a complex relationship between language processing and working memory and it may not be possible to separate these two constructs (Maimela-Arnold, Evans & Coady, 2008).

In this study working memory was assessed to determine whether it may constitute a component of aptitude for language learning in young children. Positive correlations between aspects of working memory and language learning would implicate this cognitive construct as a predictor of language learning success, and would provide support for the use of working memory assessment measures in the identification of language-learning difficulties. These cognitive processing measures are considered to be

less biased than language representation measures in the assessment of linguistically diverse populations, since they rely less on previous language experience (Kohnert & Medina, 2009). However, this claim may not be entirely valid. Although processing measures may reduce task bias they do not completely eliminate it, because the language of the test may affect the understanding of instructions etc, and thus performance. This study aimed to offer some clarity on this issue.

3.4.9. Identification and description of EAL children with language impairment

This study aimed to investigate in more detail those learners who demonstrated slow development of language skills to determine whether they could be identified as language-impaired, to describe the manifestations of the impairment in English as an additional language, and to address the extent to which children with language impairment can acquire and learn in an additional language.

Language impairment is difficult to identify in learners who speak the African languages, because of the limited availability of assessment tools in these languages and the subtle nature of specific language impairment. In addition, the language profiles of EAL learners and monolingual English-speaking children with language impairment tend to overlap. Such overlap complicates the search for markers that effectively distinguish the clinical from the non-clinical population in multilingual contexts. On a theoretical level such evidence is suggestive of possible language features in English that are vulnerable in both additional language learners and children with language impairment, and an analysis of the performance of typically developing EAL and language-impaired L1 and EAL learners on a range of language skills in this study, may shed light on language skills that may be considered indicative of impairment when affected. This analysis will also provide further information on the similarities and differences between typically developing EAL learners and monolingual children with language impairment.

While there is some research evidence to suggest that simultaneous bilinguals with language impairment are not disadvantaged in relation to their monolingual peers with language impairment (Paradis, Crago, Genesee & Rice, 2003) there is limited research on the rate and process of additional language development in sequential bilingual children with language impairment. Most studies have focused on verb morphology. This study seeks to provide insight on the rate and process of development on a range of language components in sequential bilinguals with language impairment.

This should contribute further theoretical insight on the nature of the underlying deficit in SLI, i.e., whether it is processing- or representation-based (Paradis, 2007).

CHAPTER 4

METHOD

4.1. AIMS

The primary aim of this longitudinal study was to describe the development of academic language by foundation phase English language learners in two educational contexts over a period of three years.

The specific aims were:

4.1.1 To compare the performance of the two groups of EAL learners with a peer group of L1 learners.

4.1.2 To compare the EAL learners in the two educational contexts on all assessment tasks.

4.1.3 To compare the learners' performance between language domains (syntax, semantics and pragmatics).

4.1.4 To relate the oral and literate measures of academic language.

4.1.5 To compare the performance of children in different classes within each context in each grade.

4.1.6 To compare the performance of EAL children with different levels of exposure to English in the pre-school period on all measures.

4.1.7 To compare the performance of males and females on all measures.

4.1.8 To correlate the learners' performance on the language and working memory measures.

4.1.9 To identify and describe learners with possible language impairment.

4.2. DESIGN

The study falls within a quantitative, descriptive paradigm, and is longitudinal in nature with both comparative and correlational components (Schiavetti & Metz, 2006). A longitudinal, as opposed to a cross-sectional design, was considered to be the most appropriate method of obtaining information on the rate and process of language acquisition, which is dynamic and influenced by a number of variables, all of which can affect performance on a single measure (de Bot et al., 2005). Repeated measures over time are thus essential to obtain an accurate reflection of language abilities. Although participant

attrition is an acknowledged disadvantage of longitudinal research, the selection of participants from four different schools ensured a large enough sample for meaningful statistical analysis at each phase of data collection.

This study is descriptive because there was no experimental manipulation of variables. Descriptive research is used to observe group differences, developmental trends, or relationships among variables (Pannbacker, Lass & Middleton, 1993). This design therefore allowed for the development of academic language and reading skills to be recorded over a period of three years. It also allowed for between group comparisons of the two EAL groups and the L1 group, within group comparisons to assess the different developmental processes across language components and the effects of class, gender and pre-school exposure to English, as well as the relationship between the language and working memory measures.

The nature of the variables under investigation determined the quantitative method, and although a quantitative design is not truly culturally reduced, it may be more culturally reduced than many other designs (Murphy & Davidschofer, 2001). Considering the cultural diversity of the learners in the current study, it was thus deemed to be an appropriate design.

4.3. ETHICAL CONSIDERATIONS

Ethical clearance was obtained from the Human Research Ethics Committee (Non-Medical) of the University of the Witwatersrand (protocol number: H080503) (Appendix 4A)

Approval was obtained from the Gauteng Department of Education (GDE) in order to conduct the research in an educational setting (Appendix 4B). In addition, informed consent was obtained from the principals of the selected schools as well as the teachers (Appendices 4C and 4D). Due to the fact that the participants in the study were under the legal age of eighteen, informed consent was obtained from their parents/legal guardians (Appendix 4E). Assent was also obtained from the children concerned (Greig & Taylor, 1999) (Appendix 4F). The information sheets and consent forms included details regarding the general purpose of the study and the voluntary nature of participation was emphasised. In addition, confidentiality and anonymity of responses and results was assured, and the information sheet stated that the researcher would be happy to answer any questions should these arise.

One of the ethical difficulties in this research was that intervention could not be withheld from children identified as language-impaired. The researcher thus ensured that mechanisms for appropriate referral were in place, by informing the teachers and parents of the children identified as at-risk for language impairment in a written communication. This was followed by consultation with those parents who requested it and referral to appropriate resources.

4.4. PARTICIPANTS

4.4.1. Criteria for selection

All the learner participants were required to be healthy and to present with no obvious physical, cognitive, hearing or visual impairments that may have impacted on language development. Children who had more subtle unidentified language impairments were not excluded, since the purpose of the study was to identify and describe the nature of language impairment in the second language. The information on general health and possible impairments was obtained by reviewing school records and from specified questions on the parent questionnaires (Appendix 4G).

All EAL learners who had primary home languages other than English were included, since an analysis of the effects of specific home language on English proficiency was beyond the scope of the study. It was thus not necessary to select learners from one language group only.

The EAL learners were required to be sequential bilinguals (Genesee & Nicoladis, 2009) who were exposed to English during the pre-school period and were learning in English at school, irrespective of the number of languages they had been exposed to before the age of three. The possibility that participants may have been exposed to English prior to the age of three, either in their home through interaction with older siblings or in early child care is acknowledged, and the EAL participants were further divided into two exposure groups: participants in exposure group 1 had attended an English pre-school for less than a year and English was not spoken frequently in the home environment. Participants in exposure group 2 had attended an English pre-school for more than a year and English was frequently spoken in the home environment.

The L1 participants were required to speak only English at home, and this was confirmed by the parent questionnaires (Appendix 4H).

4.4.2. Sampling procedure

Learners were purposively selected from four different schools in the two contexts of education in the Johannesburg area of the Gauteng province. The schools were identified in consultation with representatives from the Gauteng Department of Education and the principals were approached to participate in the research. Only schools where English is the medium of instruction from grade 1 were approached. Parent information sheets and consent forms were distributed to all the grade 1 children at these schools during October of the first year of data collection. Only children whose parents gave consent for their participation were included. The response rates at the four schools varied from 60-80%.

4.4.3. Description of participants

Table 4.1 below provides an overview of the number of schools, the learner composition and teachers' language profiles in each of the two contexts.

Table 4.1 Number of schools and description of learners and teachers in each context

	Context 1 (EAL only)	Context 2 (Integrated)
Number of schools	1	3
Composition of classes	Only EAL learners	EAL and L1 learners integrated in the same classes
Teachers' language profiles	English additional language	English first language

Figure 4.1 is a diagrammatic representation of the contexts and schools, the number of classes and number of EAL and L1 learners in each grade over the course of the study.

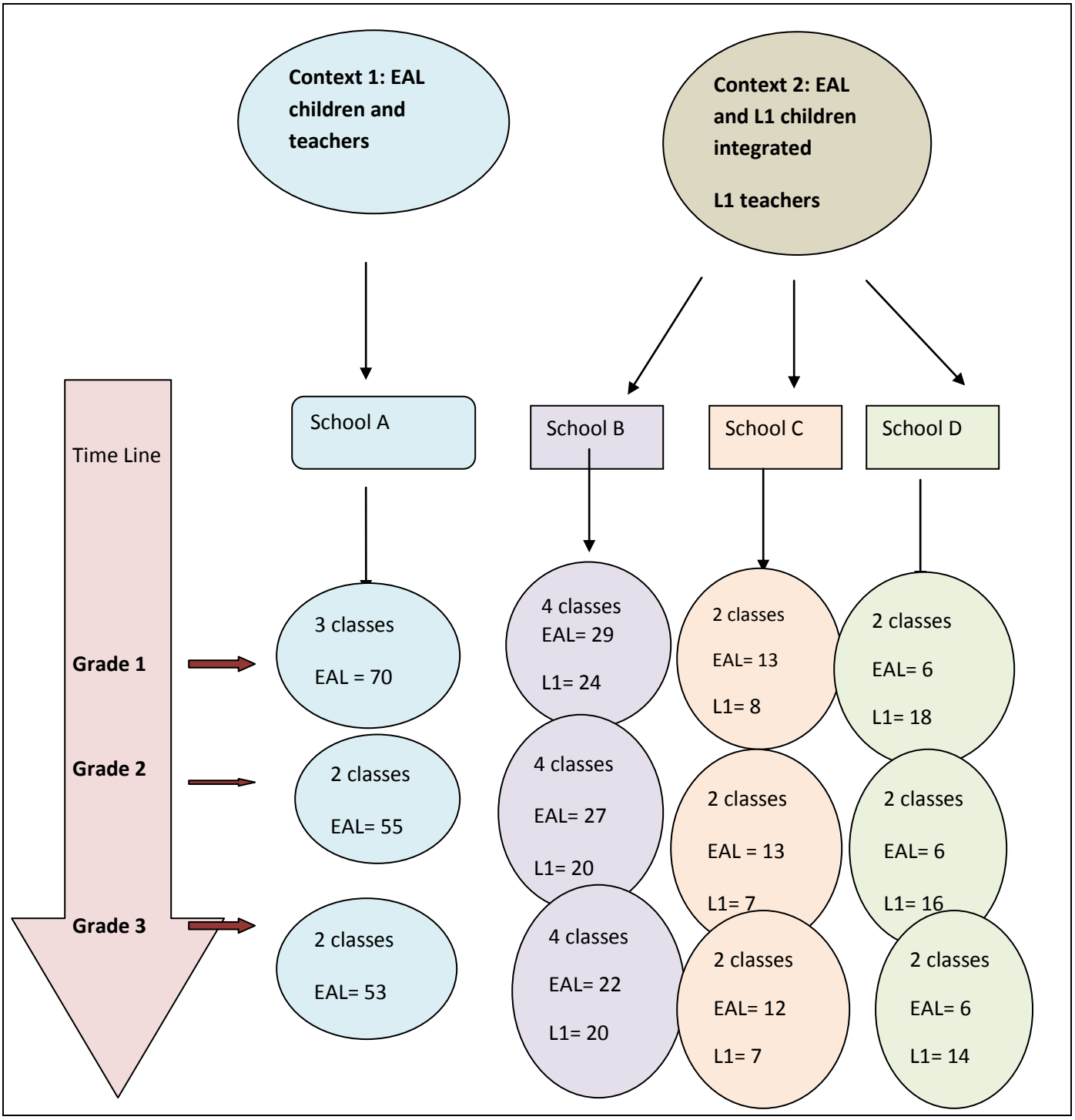


Figure 4.1 Contexts, number of schools, classes, EAL and L1 learners assessed over the three year period.

Tables 4.2 and 4. 3 provide more detail on the number of learners and teachers in each grade at each of the schools and a description of their respective language backgrounds in contexts 1 and 2 respectively. In both tables, the number of children speaking each language is indicated in parentheses.

Table 4.2 Context 1 (EAL only): Number of classes and learners in each grade and teacher and learner language profiles in school A

School	A		
Grades	1	2	3
Number of classes	3	2	2
Number of EAL learners	70	55	53
Languages spoken by teachers	**Teacher 1**: Setswana, IsiZulu, Sepedi, SeSotho, English. (Uses Setswana to teach) **Teacher 2:** Sepedi, IsiZulu, IsiXhosa, Xitsonga, Setswana English (Uses Setswana to teach) **Teacher 3**: SeSotho , IsiZulu, Setswana and English (Uses IsiZulu to teach)	**Teacher 1**: Bemba, Nyanja, Tumbuka (Zambian), English (uses English to teach) **Teacher 2:** IsiZulu, SeSotho, English (uses English to teach)	**Teacher 1**: Sesotho; IsiZulu, English, Afrikaans (Uses IsiZulu and SeSotho to teach) **Teacher 2**:Xitsonga, Thsivenda, Setswana, IsiZulu English (uses English to teach)
Primary home languages spoken by EAL learners	IsiZulu (30), Setswana (14), Sepedi (8), Sesotho (6), IsiXhosa (5),Thsivenda(3), Xitsonga (1), Siswati (1), French (2)	IsiZulu (22), Setswana (10), Sepedi (8), SeSotho (4), IsiXhosa(4), Thsivenda (3), SiSwati (1), Xitsonga (1), French (2)	IsiZulu (22), Setswana (10),Sepedi (7), Sesotho (3), IsiXhosa(4), Thsivenda (3), Xitsonga(1) SiSwati (1), French (2)

School A yielded a sufficient number of participants (n=70) when the first phase of data collection commenced and the school was considered to be representative of the first context, in which EAL children are taught by EAL teachers. Additional schools were thus not approached to participate. Although the school is in a middle-class suburban area, it is attended by mostly working-class and poor children, whose parents send them to school from the inner city and townships in various forms of public transport.

As is evident from table 4.2, the number of participants decreased from 70 in grade 1 to 53 in grade 3. This attrition was as a result of children leaving the school at the end of grades 1 and 2 and is indicative of the transient, migratory nature of the urban population.

All the teachers at this school spoke a number of African languages, which reflects the multilingual nature of the urban black population in Gauteng, and all spoke English as an additional language. One of the grade 2 teachers was from Zambia, one of South Africa's neighbouring states, and spoke three Zambian languages. All the teachers indicated that they were competent and proficient in English. All three grade1 and one of the grade 3 teachers reported that they used one or more of the African languages to explain instructions and concepts to the children, but the two grade 2 teachers and the second grade 3 teacher, reported using only English in the classroom.

The majority of the children at this school spoke a South African language. There were two Congolese children who spoke French and one child from Swaziland who spoke Siswati. The language demography of the school reflects the diversity and distribution of languages spoken in Gauteng. Most people speak IsiZulu, followed by Setswana, Sepedi (Northern SeSotho), SeSotho and IsiXhosa and to a lesser extent the other languages (Thsivenda and Xitsonga).

Table 4.3 Context 2 (Integrated): Number of classes and learners in each grade in each school and teacher and learner language profiles

Schools	B			C			D		
Grades	1	2	3	1	2	3	1	2	3
Number of classes	4	4	4	2	2	2	2	2	2
Number of EAL learners	29	27	22	13	13	12	6	6	6
Number of L1 learners	24	22	20	8	7	7	18	16	14
Languages spoken by teachers	Two grade 1and 2 teachers speak English and Afrikaans, 2 speak only English. All four grade 3 teachers speak only English. Afrikaans is taught as a subject.			All teachers in grades 1 2 and 3 speak only English but teach Afrikaans as a subject			All teachers in grades 1, 2 and 3 speak only English but teach Afrikaans as a subject.		
Primary home languages spoken by EAL learners	IsiZulu (12, 6 *); Setswana(3, 2*); SeSotho (2); Sepedi (1) IsiXhosa (1) Shona (1) Bemba (1) Siswati (1) Thsivenda (1) French (2) Spanish (1) Italian (1) Russian (1) Afrikaans (1) Italian (1)			IsiZulu (5); Setswana (1); SeSotho (2,1*) Sepedi (1) Afrikaans (2) Chinese (1)			SeSotho (4) Afrikaans (2)		

*indicates attrition of learners.

Table 4.3 confirms that the teachers in the second context were all English first language speakers, and that the classes at these schools were integrated, consisting of L1 and EAL learners in varying proportions. In contrast to school A however, some of the EAL children in this context (approximately 25%; n=10) spoke European languages and also Afrikaans as a primary home language. Similar to school A, there was some attrition of learners in this context. In particular, the number of IsiZulu-speaking children in School B decreased from 12 to 6 and one Setswana-speaking child left the school at the end of grade 2. The reasons why they left could not be ascertained but it is possible that they were not coping with the academic demands and expectations at the school. One SeSotho-speaking child also left school C. Schools C and D were smaller than school B, as they have two foundation phase classes while school B has four, hence the smaller numbers of participants from these schools. At school D there are also more L1 than EAL children and this is reflected in the respective sample sizes from that school. The three schools in context 2, although in close geographical proximity to school A, were attended by a majority of middle-class children but also some from working-class and poor backgrounds. At the third phase of data collection there were 40 EAL and 41 L1 participants in context 2.

Table 4.4 provides additional information on the mean ages of the participants in each grade as well as the number of children in each gender and exposure group (for the EAL children).

Table 4.4 Mean ages, and number of children in each gender and exposure group at each period of data collection.

	EAL context 1(EAL only)			EAL context 2(Integrated)			L1 group context 2 (Integrated)		
Grade	1	2	3	1	2	3	1	2	3
Mean age	7.6	8.6	9.6	7.5	8.5	9.5	7.6	8.6	9.6
Gender Males	38	29	27	19	18	15	25	20	20
Females	32	26	26	29	26	25	26	25	21
Exposure group 1	35	27	25	14	13	10	Not applicable		
Exposure group 2	35	28	28	34	33	30			
Totals	70	55	53	48	46	40	51	45	41

Since South African children start compulsory schooling in the year in which they turn 7, and the testing took place in November of each year, the mean ages in both contexts reflect a progression from approximately 7 years and 6 months in grade 1 to 8 years, 6 months in grade 2 and 9 years 6 months in

grade 3. The EAL children in context 2 were on average one month younger than their L1 peers and the EAL children in context 1, but this was not considered to be a significant age difference.

In context 1, there were 35 EAL participants in each exposure group in grade 1, but in the integrated context (context 2) there were many more participants in exposure group 2 (n=34) than in exposure group 1 (n=14). This may be because the EAL learners in context 2 were placed in the same classes as L1 peers, creating a perceived need for more exposure to English in the pre-school period, which parents or guardians then provided for. The gender groups were balanced across the contexts, with 38 females and 32 females in context 1, 19 male and 29 female EAL learners and 25 male and 26 female L1 learners in context 2.

In grade 2 there were 55 EAL participants in context 1, with 46 EAL and 45 L1 participants in context 2. There were 27 and 28 EAL participants in exposure groups 1 and 2 respectively, in context 1. In context 2 there were still more participants in exposure group 2 (n=33) than in exposure group 1 (n=13). The gender groups remained balanced with 29 males and 26 females in context 1, 18 male and 28 female EAL participants and 20 male and 25 female L1 participants in context 2.

In grade 3, there were 53 EAL participants in context 1, with 40 EAL and 41 L1 participants in context 2. There were 25 and 28 EAL participants in exposure groups 1 and 2 respectively, in context 1. In context 2 there were more participants in exposure group 2 (n=30) than in exposure group 1 (n=10). The gender groups remained balanced with 27 males and 26 females in context 1, 15 male and 25 female EAL participants and 20 male and 21 female L1 participants in context 2.

4.5. RESEARCH INSTRUMENTS

The following instruments were employed:

4.5.1. Language profiles of teachers

Each foundation phase teacher (Grades 1-3) at each school completed a brief questionnaire (Appendix 4I) to establish:

-Home language: this was to record the home languages spoken by the teachers and to ensure that they met the criteria for selection in each context (i.e., either L1 or EAL speakers).

-Other languages spoken: most black South Africans are able to speak more than one African language, and establishing which languages the teachers could speak reflected how many learners in each class could potentially benefit from use of their home language in context 1.

-The EAL teachers were also asked to rate their proficiency in English using a visual analogue scale, where the right end point reflects similar proficiency to a first language speaker, and the left anchor point reflects very limited proficiency. This provided a measure of the EAL teachers' preparedness to teach in English.

-To provide further background data, teachers were also questioned about their use of the African languages in the classroom.

The data gleaned from the teacher questionnaires has been recorded in tables 4.2 and 4.3.

4.5.2. Parent questionnaire

A parent of each learner participant was requested to complete a questionnaire (Appendix 4G and 4H) to obtain the following information:

-Dominant home language and other languages spoken;

-Relative amount of exposure to English and the other languages at home;

-Pre-school experiences and exposure to English;

The parent questionnaire also included questions pertaining to the general health of the child and milestones in the development of the home language.

4.5.3. Language Assessment Measure: The Diagnostic Evaluation of Language Variation Criterion Referenced Edition (DELV-CR) (Seymour, Roeper & de Villiers, 2003).

The test is described briefly to demonstrate its validity as an assessment of academic language. A detailed description of this test can be found in Appendix 4K. The DELV-CR is comprised of four subtests each assessing one of the components of language: syntax, semantics, pragmatics and phonology. For purposes of this study, only the language subtests were used, since the phonology subtest, which involves picture naming, was considered to be too reliant on vocabulary knowledge, which is experience-dependent and would make it difficult to interpret if used on EAL learners.

a) **The Syntax Subtest** is based on the principles of universal grammar (Chomsky, 1965) that sought to uncover the underlying system of rules generating language. This subtest assesses the understanding of implicit grammatical relationships in passive sentences, the rules governing syntactic movement in questions, including Chomsky's notion of barriers (1986) and discourse linking using articles (Roeper, 2004).

   The Wh- question subtest is relevant to academic language since the majority of the interactions between learners and teachers are didactic, whereby the teacher asks questions requiring responses from the learners (Owens, 2004). The degree of abstraction and syntactic complexity of the question form used by the teacher can cause difficulty and it is essential that children understand the various requirements of different question forms.

   Passive sentences are used increasingly in written language as children advance through the grades (Cummins, 2000), and in contrast to active sentences where the information is explicitly stated, passives rely on knowledge of the underlying grammar of the sentence for interpretation. The correct use of articles is important for discourse linking or cohesion and in understanding narratives and expository discourse. It involves the child's understanding of context and presupposition (Roeper, 2004; de Villiers, 2004).

b) **The Pragmatics Subtest** assesses several functional language abilities involved in classroom communication and for the attainment of literacy skills (Seymour et al., 2003). It has three components: question-answer planning, communicative role-taking and narratives.

   The understanding and correct use of narratives are especially important in early schooling as most of the texts utilized in pre-school through to the third grade are structured in narrative form (Haynes & Shulman, 1998). The DELV-CR assesses the two aspects most important to a narrative: linguistic cohesion and theory of mind. It assesses the ability to clearly differentiate between referents and to provide temporal links (de Villiers, 2004). These two forms of cohesion are important because as a child progresses through the grades, they are exposed to text with an increasing diversity of adverbs, adverbial clauses, relative clauses and conjunctions and an increase in the specificity of pronominal reference (Haynes & Shulman, 1998).The theory of mind item assesses the 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)

For a child starting school, being able to identify the information he/she needs to know, so that he/she may ask the correct question, is a profoundly important skill as the type of question will differ according to the information required. Children need to develop an awareness of information specificity (Owens, 2004). The question-asking subtest assesses the ability to identify missing information, and to ask a suitable question to attain the information (Seymour et al., 2003).

The communicative role-taking subtest requires the child to talk about a communication act taking place in a pictured event in order to assess perspective-taking ability or recognition of the speech act used by the speaker (Seymour et al., 2003). Scoring is not based on correct morpho-syntactic structures but the ability to demonstrate an awareness of the appropriate pragmatic form (Seymour et al., 2003).

c) **The semantics subtest** avoids the biased nature of acquired vocabulary tests, which generally tend to be experience and culturally-dependent by assessing how many words a child knows. Instead, the DELV-CR emphasises the processes of fast mapping and word organisation and retrieval.

Vocabulary, which is the most obvious component of school-aged language development, increases in both quantity and quality (Anglin, 1970), as a result of an increasing ability to learn new words from context, a process known as fast mapping. Fast mapping is present in all typically developing children, irrespective of cultural or linguistic background (Seymour et al, 2003). The fast mapping subtests assess the children's ability to use syntactic cues such as word order and morphological markers to derive the meaning of real and novel verbs, a process known as "syntactic bootstrapping" (Naigles and Swenson, 2009, p. 212). The first group of items included in this subtest, teach the child the task by using real verbs in the prompt. The second group of items is comprised of novel verbs (e.g., lelling, zanning).

Word learning is a complex process that requires a range of cognitive, linguistic, and social skills as well as specific learning and memory mechanisms (Sahlen & Hansson, 2006). During the school-age period, children progress toward an abstract level of understanding words and increasingly organise their vocabularies taxonomically as opposed to thematically (McLaughlin, 1998). They form strong semantic networks that become hierarchically organised according to super-ordinate and subordinate classifications (Mc Laughlin, 1998). According to Owens, Metz

and Haas (2003) a well-organised semantic network allows for more efficient retrieval. Lexical organisation and retrieval is assessed in the verb and preposition contrast items of the DELV-CR. Verbs are used because they are less influenced by cultural variation than nouns and verb meanings are central to language development (Tomasello & Merriman, 1995). The preposition contrast items assess the child's ability to provide spatial and grammatical prepositions at the appropriate hierarchical level.

Understanding of the quantifier 'every', is also assessed in the semantics subtest, as it is another example of how grammar affects complex concepts used in everyday discourse (Seymour et al., 2003). This quantifier is most evident in the language of mathematics (Seymour et al., 2003).

d) Scoring on the DELV-CR

In accordance with the instructions in the DELV-CR manual, each correct response is awarded a score of 1 or 2. Incorrect or no responses are scored as 0. The sub-total for each subtest of each test domain is calculated and a total score for the syntax, semantics and pragmatics subtests is derived. On the basis of the total score for each domain, the child can be placed in either the weakness, low average, average or strength categories (Seymour et al., 2003) by comparing them to the group on which the test was field tested. However, in this study, the children were not placed in these categories.

4.5.4. Reading measure: Gray Oral Reading Test-4 (GORT-4) *(*Wiederholt & Bryant, 2001).

The GORT-4 is a norm-referenced, reliable and valid test of oral reading and is appropriate for individuals aged 6 years 0 months to 18 years 11 months. It consists of 14 stories each followed by 5 multiple choice comprehension questions. The oral response mode on this test was considered to be an advantage in this study since many of the children were not able to write accurately and efficiently by grade 2. The child reads each story aloud, and answers comprehension questions about the content. The comprehension questions tap explicitly stated information within the text as well as literal, inferential, critical and affective information. In addition, the questions have few or no nouns, and the verbs or modifiers are different to the vocabulary used in the story thereby ensuring that the comprehension score does not merely reflect the child's ability to match words in the questions and text (Wiederholt & Bryant, 2001). Furthermore, the vocabulary in each question is controlled to ensure that it is not more

difficult than that used in the stories (Wiederholt & Bryant, 2001). Testing is discontinued when the child makes three or more errors on a set of comprehension items. The total score for each story is tallied and a total raw score for reading comprehension is obtained (Wiederholt & Bryant, 2001).

Performance on the GORT-4 also yields rate, accuracy and fluency scores as well as an overall reading ability score. For the purpose of this study, only the accuracy and comprehension scores were used. The accuracy score refers to the number of errors made in pronouncing each word in the text, and essentially reflects decoding ability.

The GORT-4 has a high degree of reliability related to three sources of test error: content sampling, test-retest and scorer differences with reliability coefficients in the upper brackets of r-values. The Cronbach alpha coefficient was found to exceed the $\alpha = 0.90$ criterion (Wiederholt & Bryant, 2001).

Although the GORT-4 was developed in the US, it can be used to assess children from various ethnic and cultural backgrounds (Wiederholt & Bryant, 2001) and was considered to be appropriate for use in the South African context. In contrast to a reading comprehension measure used in the classroom it was equally unfamiliar to all participants.

4.5.5. The Automated Working Memory Assessment (AWMA) (Alloway, 2007)

In this study, the conceptualisation of working memory is based on the Baddeley and Hitch model, formulated in 1974, modified in 2000 and reformulated by Alloway, Gathercole and Pickering in 2006. Working memory was thus assessed using the Automated Working Memory Assessment (AWMA) (Alloway, 2007) which is based on this model. The model has been supported by research findings in children, provides a functional framework with which to capture working memory performance and is the most widely accepted explanation of working memory (Alloway et al, 2006). The AWMA is a computer-based assessment of working memory skills in children aged 4 to 11 years. According to Conway, Kane, Bunting, Hambrick, Wilhelm and Engle (2005) and Rodriguez (2008), current best practice is for research participants to be assessed individually on a computer and carefully supervised by an administrator. The administration and scoring on the AWMA is fully automated. The testing sequence is pre-set, test scores are calculated by the computer programme and an interpretation of how the child's working memory scores will affect their learning is provided (Alloway, 2007). The short form of the AWMA was used in this study to reduce the testing time required for the large sample size and to avoid participant fatigue. A brief description of the AWMA subtests is provided.

a) Verbal Short -Term Memory: Digit recall subtest

This measure assesses the function of the phonological loop and the participant is required to recall a sequence of digits in the same order in which it was presented (Alloway, 2007).

b) Verbal Working Memory: Listening recall and processing listening recall subtest

The listening recall subtest assesses the function of the verbal central executive. In this task, the participant is presented with a series of spoken sentences and is required to judge each sentence as true or false. This yields the processing listening recall score. The participant is also required to recall the final word of each sentence in sequence, which yields the listening recall score (Alloway, 2007).

c) Visuo-spatial Short-Term Memory: Dot Matrix subtest

This subtest assesses the function of the visuo-spatial sketchpad, and the child is presented with a red dot in a series of four-by-four matrices and is required to recall the position of this dot by tapping a square on the computer screen (Alloway, 2007).

d) Visuo-spatial Working Memory: Spatial recall and spatial processing recall subtest

The spatial recall subtest assesses the function of the visuo-spatial central executive and requires the participant to view two shapes, where the shape on the right contains a red dot. The participant has to identify whether the shape on the right is the same or opposite to the shape on the left. The shape with the red dot can be rotated through 360˚. This yields the processing spatial recall score. At the end of the trial the child is required to recall the location of each red dot in sequence, by pointing to a picture with three compass points (Alloway, 2007), which yields the spatial recall score.

The test-retest reliabilities of the AWMA subtests range from $\alpha = 0.64$ to $\alpha = 0.84$ (Alloway, 2007).

4.5.6 Sentence Repetition Test (Redmond, 2005)

Vance (2008) and Alloway, Gathercole, Willis and Adams (2004) suggest that sentence recall involves the integration of information from short-term memory with the language processing system and assesses the function of the episodic buffer. 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 grammatically or semantically incorrect sentence is produced, then limited language knowledge is implicated (Vance, 2008). Since the AWMA does not assess episodic buffer function, a separate sentence recall test was included in the study.

Specifically, the sentence recall probes developed by Redmond (2005) were selected because in other standardised 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 test examines errors more closely and consists of 16 sentences comprised of 10 words, each consisting of 10- 14 syllables, with an equal number of active and passive sentences. Redmond (2005) showed that these sentences reliably differentiated SLI and typically developing groups as it allowed a graded scoring system rather than a correct/incorrect judgment. The sentences are 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 are added together to provide a total score.

Table 4.5 provides a summary of the instruments used in this study as well as an indication of when they were administered.

Table 4.5 Summary of research instruments and time of administration

Diagnostic Evaluation of Language variation –criterion referenced edition (DELV-CR)		Time of assessment		
Syntax Domain	Aspects assessed	Grd 1	Grd 2	Grd 3
• Wh- question comprehension	Knowledge of syntactic variables, movement rules, syntactic barriers to movement and embedded clauses.	✓	✓	✓
• Passives	Knowledge of movement rules and implied agents	✓	✓	✓
• Articles	Understanding of meaning expressed by articles	✓	✓	✓
Semantics Domain				
• Verb and Preposition Contrast Items	Organization of the verb lexicon into contrasting words and levels of meaning Ability to provide contrasting prepositions	✓	✓	✓
• Quantifier Items	Understanding the meaning and scope of the quantifier "every"	✓	✓	✓
• Fast Mapping	Fast mapping meaning of verbs and novel verbs from the argument structure of the sentence	✓	✓	✓
Pragmatics Domain				
• Communicative role taking	Understanding the point of view of speakers and the speech acts they are producing	✓	✓	✓
• Narratives	Reference specification, expressions of temporal relationships between events, understanding the mental states of the protagonists (theory of mind)	✓	✓	✓
• Question answer planning	Asking the right question to discover missing information	✓	✓	✓
Gray Oral Reading Test 4th Edition (GORT- 4)				
Reading accuracy	Number of decoding errors		✓	✓
Reading Comprehension	Ability to comprehend text		✓	✓
Working Memory Measures				
Automated Working Memory Assessment (AWMA)				
• Digit Repetition	Verbal Short Term Memory		✓	
• Dot Matrix	Visuo-spatial Short Term Memory		✓	
• Listening Recall	Verbal Working Memory		✓	
• Spatial Recall	Visuo-spatial Working Memory		✓	
Sentence Repetition Test				
• Recall Probes (Redmond, 2005)	Episodic buffer zone		✓	

4.6 PROCEDURE

Figure 4.2 provides a diagrammatic representation of the time frame and procedures employed at each phase of data collection.

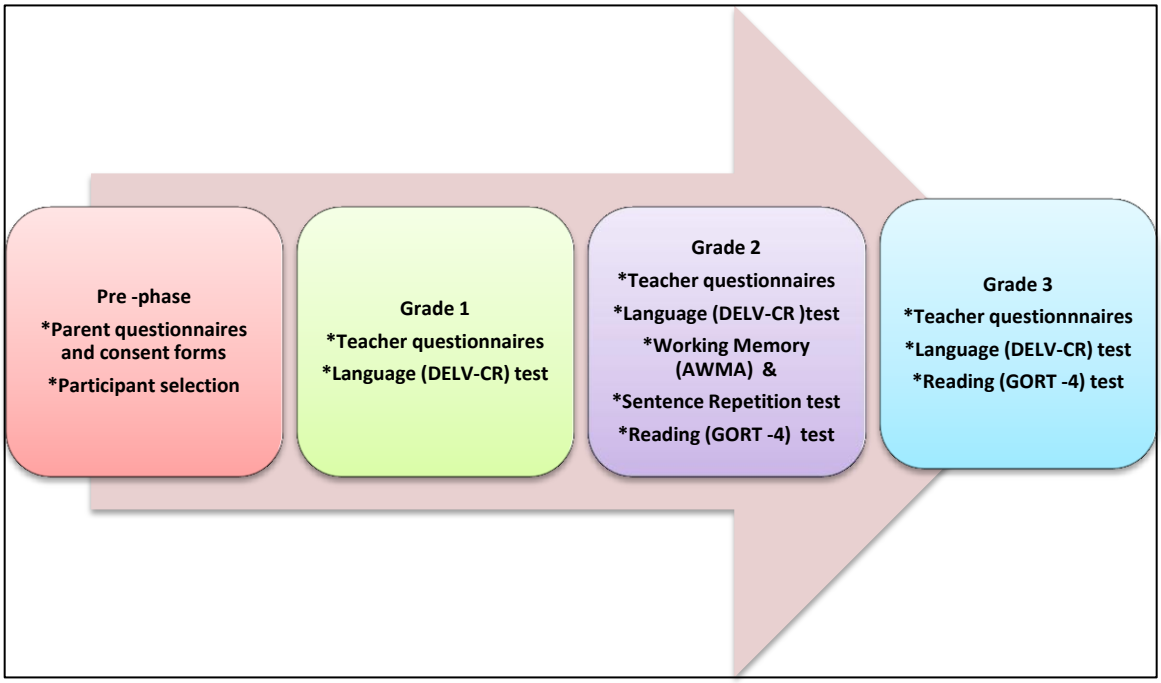


Figure 4.2 Time frame and procedures employed at each stage of data collection.

Parent questionnaires and informed consent forms were distributed before the first phase of data collection only. Teacher questionnaires were completed at each phase of data collection because there were different teachers from grades 1-3.

Participants were assessed on the DELV-CR at three data collection periods in November of 2008, 2009 and 2010. They were initially assessed at the end of the first grade to ensure sufficient exposure to English in an academic setting. The second assessment was conducted at the end of their grade 2 year and the third at the end of the grade 3 year. The reading assessments were conducted at the end of the grade 2 and 3 years only because many of the children were not reading at the end of grade 1. The working memory assessments were conducted in grade 2 only because of the time involved in testing and because the study did not aim to describe the development of working memory.

Participants were assessed individually during school hours on all measures but at different times to avoid fatigue. Thus the DELV-CR was administered on one day, the working memory measures on another (in grade 2) and the reading comprehension measure on the third day but in random order, so that the sequence was not the same for all the children. The DELV-CR and the reading comprehension tests were administered by the researcher and research assistants, who were speech therapy students in the final (4^{th}) year of study. They had thus had experience in working with children and were familiar with language testing. They were also trained by the researcher to administer and score the tests in strict adherence to the instructions in the respective manuals. The working memory assessments were all conducted by a postgraduate student doing research in this area, and she was thus familiar with the procedures. This ensured consistency of presentation, voice and pronunciation in the sentence repetition test, which is reliant on direct repetition.

All testing was conducted in a quiet area (library or empty classroom) of the respective schools to avoid distractions. At the end of each period of data collection, the scores were entered onto Microsoft EXCEL spread sheets, containing the name, surname, date of birth, gender, school attended, class, EAL/L1 status, and exposure group in the case of the EAL children. The scores obtained by each child on each measure shown in table 4.5 were then entered onto the spread sheets in each respective grade.

4.7. RELIABILITY AND VALIDITY

The validity of the DELV-CR as a measure of academic language has already been discussed, and the validity of both the reading and working memory measures has been extensively researched and reported in the respective manuals. The validity of all these measures in assessing L1 and EAL children in the South African context is addressed to some extent in this study, by comparing and correlating the participants' performance on the various measures to each other. For example, the language and reading measures were expected to be significantly correlated since oral language proficiency and literacy have been shown to be related. Similarly, there should be significant correlations between the language, reading and working memory measures since these constructs are also theoretically related.

With respect to reliability, defined as the extent to which the same result would be obtained if a participant was retested or tested by a different examiner (Schiavetti & Metz, 2006) the researcher attempted to ensure consistency in test administration and scoring by training all research assistants to

adhere to instructions in the respective manuals. Since re-testing any of the participants at any one test session, posed the risk of increased exposure and thus "learning" of the test, and the children were to be retested three times over the period of the study, a reliability check was carried out by having two examiners test one third of the children at the same time at each test session. One administered the test while the other scored it and vice versa. Using this method, reliability in administration and scoring was found to be 100%.

Reliability in data capturing was ensured by having entries checked by an additional research assistant.

4.8. DATA ANALYSIS

Since all the research instruments yielded an interval level of measurement, the appropriate parametric statistical procedures were selected for between and within group comparisons and correlations (Schiavetti & Metz, 2006).

All data analysis was done on the SAS 9.2 computer system by a qualified statistician.

Descriptive statistics (means, standard deviations and score ranges) were calculated for each group (L1, EAL context 1 and EAL context 2) on each measure in grades 1, 2 and 3. These values were captured in tables and the means were displayed graphically.

4.8.1. Development of academic language

In order to describe the development of the language and reading skills over the three year period, paired sample t-tests were conducted within each participant group to compare the grade 1 and 2, 2 and 3, and 1 and 3 scores on all DELV-CR subtests as well as the reading accuracy and comprehension scores, obtained in grades 2 and 3. This analysis determined which group(s) showed significant changes from one grade to the next as well as which changes (Grades 1 and 2 and/or grades 2 and 3) were significant.

4.8.2. Comparison between groups

Two way analyses of variance were conducted to compare the L1 group with the two EAL groups and to compare the two EAL groups on each measure in each year. Where significant differences emerged,

independent sample t-tests were conducted to locate the significant differences. This determined the influence of L1 and EAL status and educational context on the development of academic language and reading, and identified linguistic processes with which the EAL learners in each context could be assisted through explicit teaching.

4.8.3 Comparison between language domains

In order to determine whether there were significant differences between the sub-components of the DELV-CR, the raw scores were converted to percentages since each subtest yielded a different total score. Paired sample t-tests were then conducted to compare the scores on each language domain within each group of participants in each year.

4.8.4 Relationship between language and reading scores

To determine the relationship between oral and literate measures of academic language the DELV-CR subtest and total scores were correlated to the reading accuracy and comprehension scores in grades 2 and 3 using the Pearson correlation procedure.

4.8.5. Class, gender and exposure group comparisons

The performance of the children in different classes within each context in each grade, the scores of the EAL children in the two exposure groups within contexts 1 and 2 and the performance of males and females was compared using analyses of variance on all measures.

4.8.6. Working memory assessment

The learners' performance on the language measures and working memory tests were correlated using the Pearson correlation procedure. This revealed whether there was a relationship between working memory and language, which would implicate working memory as a component of aptitude for language learning.

The three groups were also compared on the working memory measures using an analysis of variance and where significant differences were found, independent sample t-tests were performed, to provide information on the value of this cognitive processing measure in the assessment of linguistically diverse learners.

4.8.7. Identification and description of children with language impairment

Adhering to recommendations in the literature (Bishop & MacDonald, 2009) learners who scored two standard deviations below the peer group mean on two or more of the DELV-CR total scores in any grade were identified and their performance on all measures was analysed in detail in order to determine whether they could be identified as language impaired and to describe the manifestations of the impairment.

4.8.8. Levels of statistical significance

All statistical comparisons between and within groups as well as all correlations were deemed to be significant if the probability of rejecting the null hypothesis (i.e., that the difference or correlation was not significant) was less than 5% (i.e., $p < 0.05$).

CHAPTER 5

RESULTS AND DISCUSSION

In order to provide an overview of the results, this chapter commences with a presentation of the main findings of the study, followed by a more detailed analysis of each of the aims.

5.1 SUMMARY OF MAIN FINDINGS

- All the participants in this study showed significant development of the psycholinguistic processes underlying academic language throughout the foundation phase.
- However, there were significant differences between the EAL and L1 learners and between the EAL learners in the two educational contexts on most of the language measures and on the reading assessments.
- There were significant correlations between the oral and literate measures of academic language, particularly in the EAL groups.
- The findings with respect to working memory and aptitude were inconclusive and the working memory measures were significantly influenced by language proficiency.
- A small number of children (n=7) with language impairment were identified, and their results indicated that EAL children with language impairment have significant difficulties learning in English, relative to their peer groups, and display language deficits that are both similar and different to L1 children with language impairment.
- The measures used in this study were all found to be highly sensitive to different levels of academic language development and with the exception of the working memory measures on the AWMA, were all correlated to each other.

The following sections describe and discuss the development of academic language in the three groups of children over the three year period, compare the results obtained by the three groups and compare the results between language domains. In order to achieve an overview of the results in each case, the total scores obtained by the participants on the DELV-CR is presented first, followed by a more detailed analysis of the results on each subtest within each language domain. The reading accuracy and comprehension scores, and the correlations between the language and reading scores, reflecting the relationship between oral and literate measures of academic language are presented next. Finally, the

effects of class, exposure to English in the pre-school period and gender are presented. The results of the working memory assessments, the relationship between the working memory and language and reading scores and the analysis of the participants identified as language impaired are presented in chapter 6.

5.2 RESULTS: DEVELOPMENT OF ACADEMIC LANGUAGE FROM GRADES 1 -3

5.2.1. Overview of total DELV-CR scores obtained by each group over 3 years.

Table 5.1 reflects the means, standard deviations and range of scores obtained by the three groups of participants (the L1 and EAL groups in contexts 1 (EAL only) and 2 (integrated) respectively) on the total DELV-CR domain scores (syntax, pragmatics and semantics). Where appropriate, and for ease of comparison, the raw scores have been converted to percentages out of the total possible score for each measure.

Table 5.1 Means, standard deviations and range of scores obtained by each group in each grade on each DELV-CR domain.

	Statistics	**L1**			**EAL cont 1(EAL only)**			**EAL cont 2 (integrated)**		
DELV –CR Domain		**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 (total possible =32)	**Mean**	26.8 **(84%)**	28.6 **(89%)**	29.5 **(92%)**	16.6 **(52%)**	22.4 **(70%)**	24.7 **(77%)**	23.0 **(72%)**	26.3 **(82%)**	27.4 **(86%)**
	Std Dev	3.39	2.35	2.06	4.8	4.3	4.24	5.53	4.05	3.79
	Range	14-31	21-32	25-32	3-29	10-31	14-31	10-32	15-32	17-32
Pragmatics (total possible = 24)	**Mean**	19.2 **(80%)**	21 **(88%)**	21.7 **(90%)**	11.2 **(46%)**	17.3 **(72%)**	19.1 **(80%)**	17 **(71%)**	21 **(88%)**	22 **(92%)**
	Std Dev	3.39	2.08	1.51	5.04	4.5	3.12	5.02	6.72	2.41
	Range	10-23	15-24	18-24	3-22	6-24	10-24	5-23	4-24	10-24
Semantics (total possible = 46)	**Mean**	33.7 **(73%)**	35.78 **(78%)**	38 **(83%)**	21.9 **(48%)**	27.18 **(59%)**	30.4 **(66%)**	29.15 **(63%)**	32.61 **(71%)**	35.4 **(77%)**
	Std Dev	4.73	4.47	3.62	5.36	5.48	6.00	6.33	4.46	4.69
	Range	24-43	26-44	29-44	7-34	14-36	19-41	16-38	17-40	23-43

The mean % DELV-CR scores reflected in table 5.1 are represented graphically in figure 5.1, and illustrate the developmental trends in the three groups of participants.

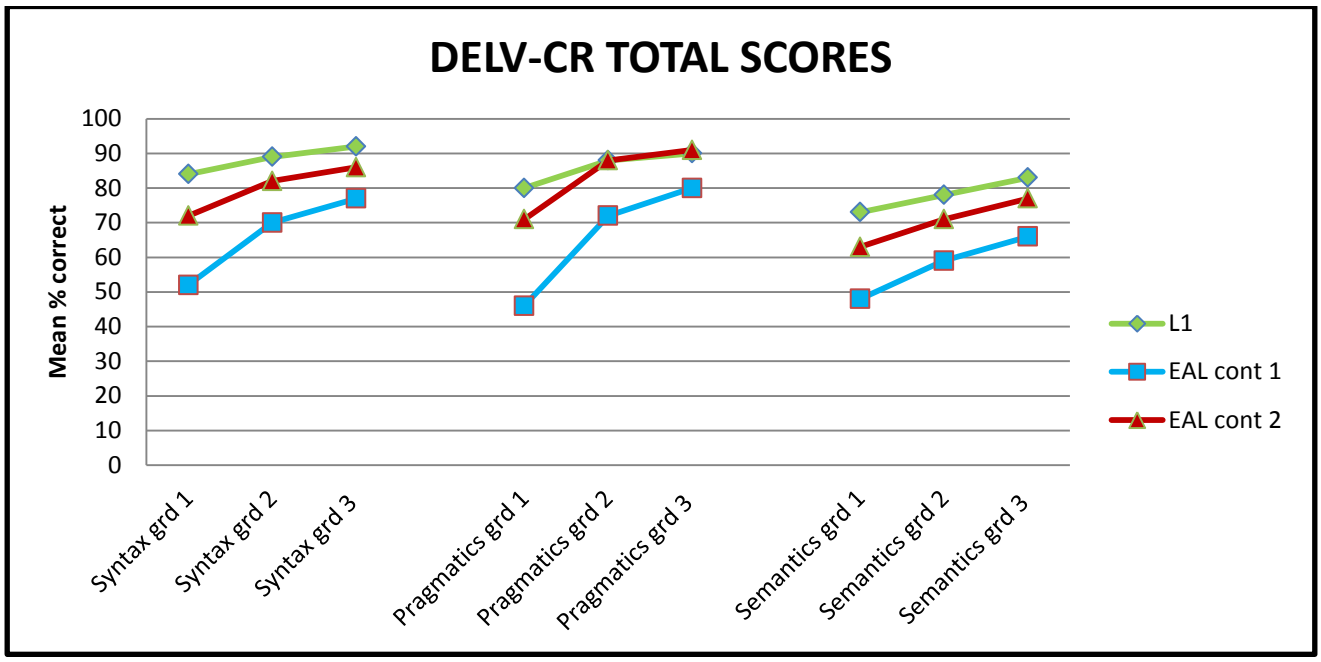


Figure 5.1 Mean DELV-CR domain scores (in %) obtained by each group in grades 1, 2 and 3

The graphs in figure 5.1 reflect substantial development in all three groups of children over the duration of the study on all three language domains. The L1 group made steady progress from grades 1- 3 on all domains obtaining mean scores of 84%, 89%, and 92% respectively in each progressive grade on syntax; 80%, 88% and 90% on pragmatics and 73%, 78% and 83% on semantics. The EAL group in the integrated context (context 2) also made steady progress, obtaining mean scores of 72%, 78% and 86% in each progressive grade on syntax, 71%, 88% and 92% on pragmatics and 63%, 71% and 77% on semantics. The EAL group in context 1(EAL only), demonstrated steady improvement on the semantics domain obtaining mean scores of 48%, 59% and 66 % in each progressive grade. However, a salient characteristic of this group was the very low scores they obtained in grade 1 relative to the other two groups, which suggests that their academic language in English was possibly underdeveloped before they started school and remained so during grade 1. In grade 2 these skills developed rapidly as evidenced in the dramatic improvements between grades 1 and 2 on the syntax (52-70%) and pragmatics domains (46-72%). This was followed by less dramatic gains between grades 2 and 3, where they obtained mean scores of 77% and 80% for syntax and pragmatics respectively.

5.2.2. Statistical comparison between grades over the three year period within each group

In order to assess the statistical significance of the development of academic language over the three grades, paired sample t-tests were conducted within each group to compare the results obtained on

each measure in grades 1 and 2, grades 2 and 3 and grades 1 and 3. The results of this analysis are presented in table 5.2. The only non-significant result is highlighted in blue.

Table 5.2 Results of paired sample t-tests comparing total DELV-CR scores obtained by each group in grades 1 & 2, 2 & 3 and 1 & 3.

Measure	Comparison between	L1		EAL cont 1(EAL only)		EAL cont 2 (integrated)	
		t-value	Pr > t	t- value	Pr > t	t-value	Pr > t
Total syntax Score	Grade 1 and 2	-3.72	0.0005**	-8.88	<.0001**	-2.65	0.0112*
	Grade 2 and 3	-2.39	0.0214*	-3.83	0.0003**	-1.05	0.3019
	Grades 1 and 3	-5.85	<.0001**	-12.19	<.0001**	-2.94	0.0055**
Total pragmatics score	Grades 1 and 2	-3.69	0.0006**	-6.68	<.0001**	-2.90	0.0058**
	Grades 2 and 3	-2.49	0.0171*	-3.55	0.0008**	-2.89	0.0062**
	Grades 1 and 3	-5.11	<.0001**	-9.90	<.0001**	-5.36	<.0001**
Total Semantics Score	Grades 1 and 2	-3.05	0.0039**	-7.26	0.0001**	-4.71	0.0001**
	Grades 2 and 3	-4.09	0.0002**	-4.62	<.0001**	-4.46	<.0001**
	Grades 1 and 3	-5.89	<.0001**	-8.77	<.0001**	-6.64	<.0001**

**** Significant at 1% level ** significant at 5% level.**

The statistical analysis in table 5.2 confirms that, with only one exception, all three groups of children improved significantly over all three years on all measures, showing gains in language development from one year to the next. Although the mean score obtained by the EAL group in context 2 (integrated) on the syntax domain improved from 82 % in grade 2 to 86% in grade 3, the difference was not statistically significant (t= -1.05; Pr> t= 0.3019).

5.2.3. Development of Syntax over the three grades

The means, standard deviations and range of scores obtained by each group in each year on the syntax subtests of the DELV-CR are contained in Table 5.3.

Table 5.3 Means, standard deviations and range of scores obtained by each group on each syntax subtest in grades 1, 2 and 3.

Subtest	Statistic	L1			EAL context 1 (EAL only)			EAL context 2 (integrated)		
		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
Wh-Questions (total possible = 14)	Means	**13.3 (95%)**	**13.6 (97%)**	**13.5 (96%)**	**9.5 (67%)**	**11.9 (85%)**	**12.7 (91%)**	**12.5 (89%)**	**12.8 (91%)**	**13.2 (94%)**
	Std Dev	1.48	0.88	1.08	3.06	2.14	1.75	2.84	1.66	1.56
	Range	6-14	10-14	10-14	0-14	6-14	8-14	2-14	8-14	8-14
Passives (total possible= 10)	Means	**6.9 (69%)**	**7.9 (79%)**	**8.7 (87%)**	**4.3 (42%)**	**5.7 (57%)**	**6.5 (65%)**	**6.8 (68%)**	**7.4 (74%)**	**7.8 (78%)**
	Std Dev	1.48	1.24	1.37	1.69	1.95	2.03	1.93	1.79	1.77
	Range	4-10	5-10	5-10	0-8	2-9	2-10	3-10	3-10	4-10
Articles (total possible = 8)	Means	**6.5 (81%)**	**6.9 (86%)**	**7.2 (90%)**	**2.9 (35%)**	**4.7 (59%)**	**5.5 (69%)**	**5.5 (68%)**	**6.1 (76%)**	**6.5 (81%)**
	Std Dev	1.75	1.18	1.02	1.85	1.83	1.79	2.34	1.56	1.57
	Range	1-8	4-8	4-8	0-8	0-8	2-8	0-8	3-8	2-8

The mean percentage scores reflected in table 5.3 are displayed graphically in figure 5.2 and illustrate the development of the ability to answer Wh-questions, understand passive sentences and use the correct articles by all three groups from grades 1-3. It also shows the differences between the groups on each of these subtests.

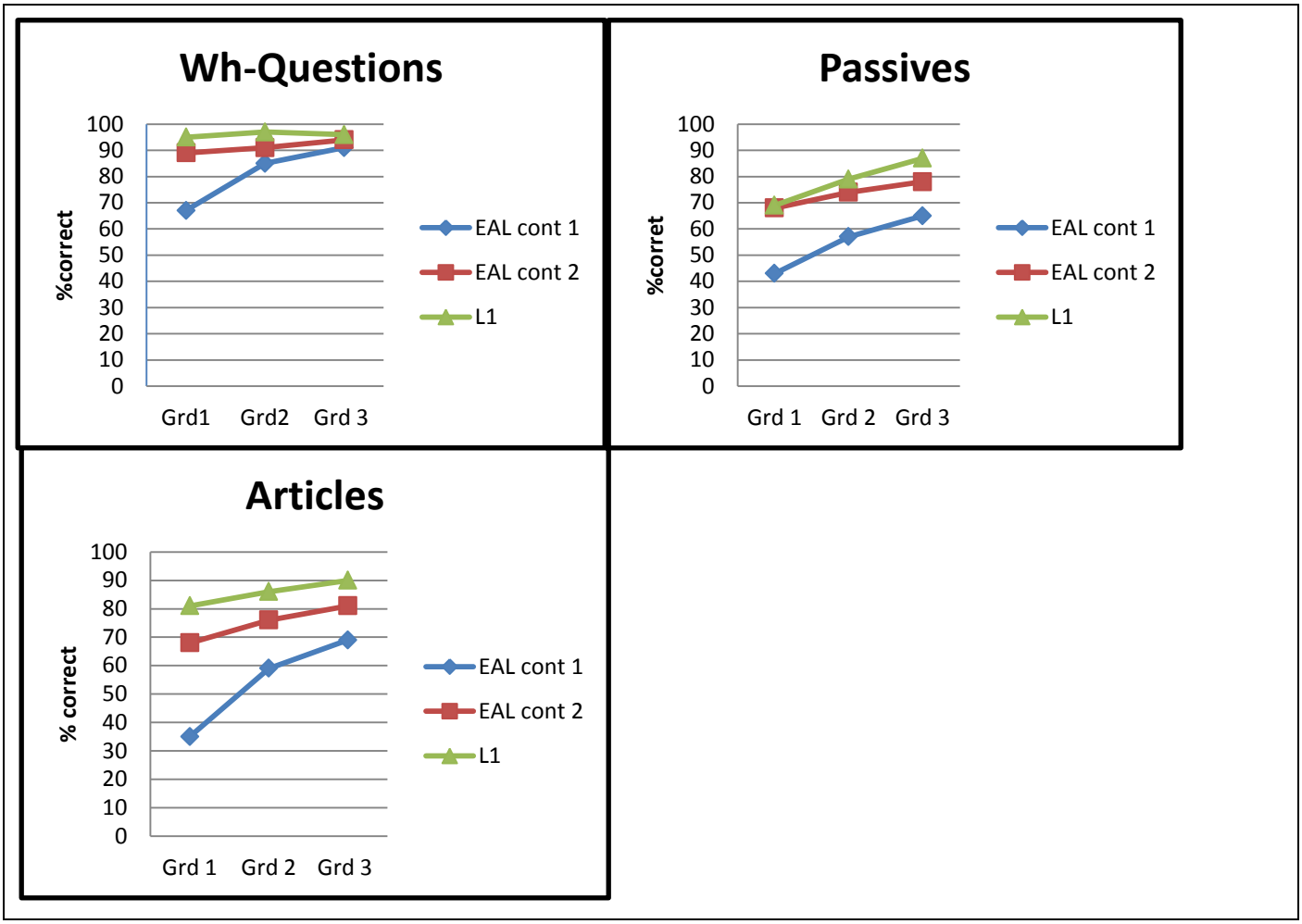


Figure 5.2 Mean % scores obtained by each group on each syntax subtest in grades 1, 2 and 3.

To assess whether the development across the three years reached levels of statistical significance within each of the groups, paired sample t-tests were used to compare the scores from grades 1 to 2, 2 to 3 and 1 to 3. The results are contained in table 5.4. Non-significant results are highlighted in blue.

Table 5.4 Results of paired sample t-test procedure comparing scores obtained by each group in grades 1 & 2, 2 & 3 and 1 & 3 on syntax subtests.

Measure	Comparison	L1		EAL cont 1 (EAL only)		EAL cont 2(integrated)	
		t- value	Pr > t	t-value	Pr > t	t-value	Pr > t
Wh- questions	Grades1 and 2	-1.22	0.2292	-5.82	<.0001**	-0.53	0.6016
	Grades 2 and 3	0.53	0.5992	-2.33	0.0239*	-0.95	0.3492
	Grades 1 and 3	-0.50	0.6230	-7.61	<.0001**	-1.43	0.1599
Passives	Grades 1 and 2	-4.88	<.0001**	-5.83	<.0001**	-2.04	0.0471*
	Grades 2 and 3	-3.37	0.0017**	-2.67	0.0100*	-0.21	0.8363
	Grades 1 and 3	-8.43	<.0001**	-8.44	<.0001**	-2.24	0.0311*
Articles	Grades 1 and 2	-1.33	0.1914	-5.08	<.0001**	-1.91	0.0631
	Grades 2 and 3	-1.14	0.2590	-2.32	0.0243*	-1.01	0.3206
	Grades 1 and 3	-2.49	0.0168*	-7.79	<.0001**	-2.11	0.0410*

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

The statistical comparison across grades reveals no significant improvement on the Wh-questions and articles subtests by the L1 group, which is due to the high initial mean scores on these subtests in grade 1 (95% and 81% respectively). There was however, a significant improvement on the understanding of passives across all grades in the L1 group. The EAL participants in context 1(EAL only) improved significantly on all subtests from grades 1 to 3. The EAL group in context 2 (integrated) did not improve significantly on the Wh-questions subtest, because like their L1 classmates they obtained a high mean score on this test in grade 1 (89%). However, they improved significantly on the passives and articles subtests from grades 1 to 3.

5.2.4. Development of pragmatics within each group

The means, standard deviations and range of scores obtained by each group each year on each pragmatics subtest are recorded in table 5. 5.

Table 5.5 Means, standard deviations and range of scores obtained by each group on each pragmatics measure in Grades 1, 2 and 3.

Measures	Statistics	L1			EAL context 1 (EAL only)			EAL context 2 (integrated)		
		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**
Role- Taking (total possible=8)	Means	**6.9 (86%)**	**7.5 (94%)**	**7.9 (99%)**	**5.1 (64%)**	**6.5 (81%)**	**6.7 (84%)**	**6.0 (75%)**	**7.0 (88%)**	**7.5 (95%)**
	Std Dev	1.66	1.21	0.53	1.94	1.79	1.84	2.12	1.62	1.06
	Range	2-8	2-8	6-8	2-8	2-8	2-8	2-8	2-8	4-8
Narratives (total possible=7)	Means	**5.1 (73%)**	**5.4 (77%)**	**5.5 (79%)**	**3.5 (50%)**	**4.5 (64%)**	**5.2 (74%)**	**4.6 (66%)**	**4.6 (66%)**	**5.6 (80%)**
	Std dev	1.09	1.22	1.31	1.56	1.44	1.15	1.36	1.67	1.1
	Range	2-7	2-7	3-7	0-7	0-7	2-7	2-6	0-7	2-7
Question-Asking (total possible=9)	Means	**7.1 (79%)**	**8.0 (89%)**	**8.3 (92%)**	**2.5 (28%)**	**6.1 (68%)**	**7.2 (80%)**	**6.4 (70%)**	**7.6 (84%)**	**7.9 (88%)**
	Std Dev	2.20	0.98	0.76	2.91	2.91	7.21	2.97	1.77	1.0
	Range	0-9	5-9	5-9	0-8	0-9	0-9	0-9	0-9	4-9

The mean % score obtained by each group on each pragmatics subtest is illustrated graphically in figure 5.3.

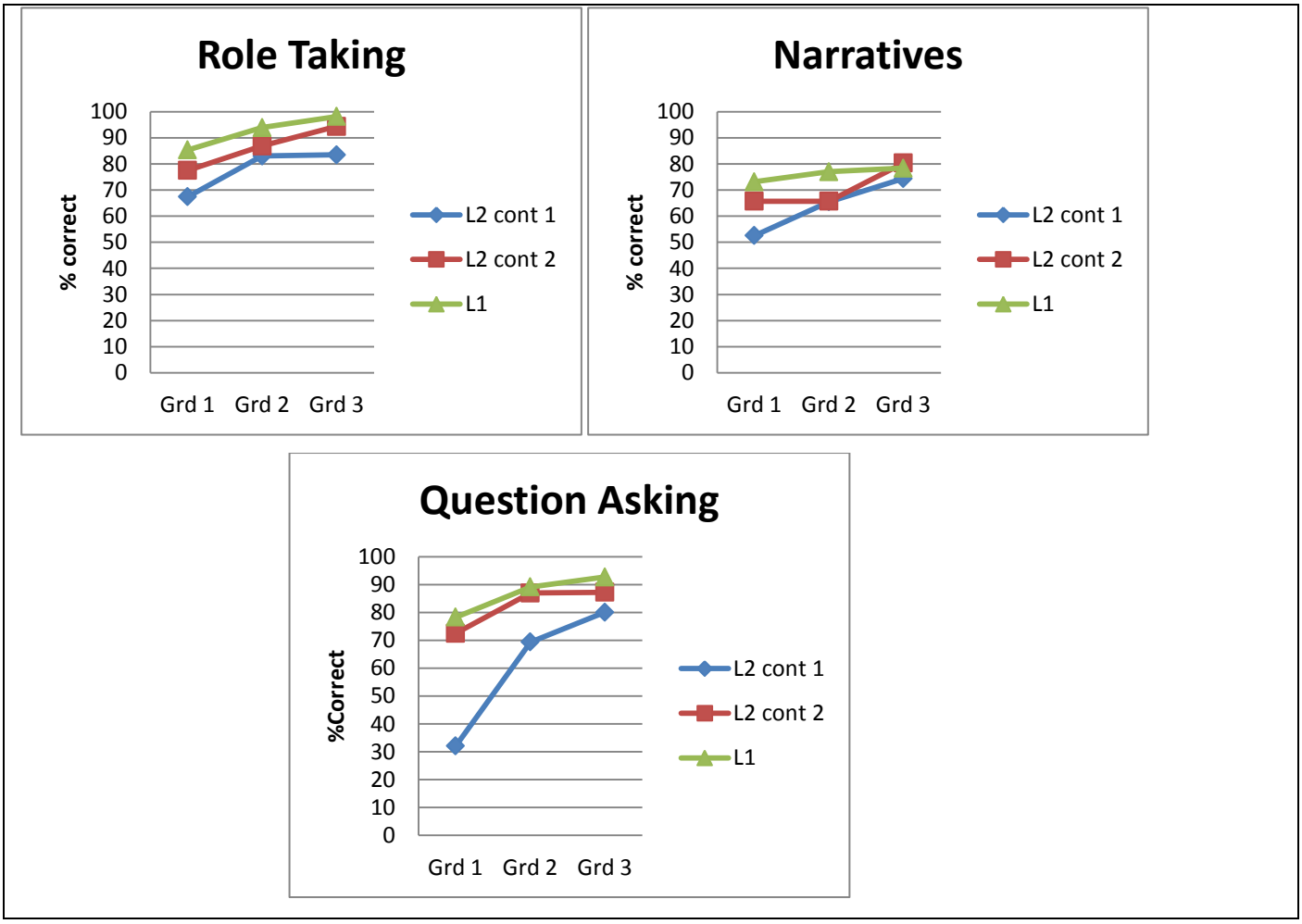


Figure 5.3 Mean % score obtained by each group on each pragmatics measure from grades 1 to 3

The development of pragmatics skills was assessed using paired sample t-tests to compare the scores obtained within each group of learners in grades 1 and 2, 2 and 3 and 1 and 3. The results of this statistical analysis are reported in Table 5. 6. Non-significant results are highlighted in blue.

Table 5.6 Results of Paired sample t-test procedure comparing scores obtained by each group in grades 1 & 2, grades 2 & 3 and grades 1 & 3 on pragmatics subtests

Measure	Comparison	L1		EAL context 1(EAL only)		EAL context 2 (integrated)	
		t-value	Pr > t	t-value	Pr > t	t-value	Pr > t
Role-Taking	Grades 1 and 2	-2.97	0.0048**	-3.58	0.0007**	-3.08	0.0035**
	Grades 2 and 3	-1.86	0.0701	-0.10	0.9177	-2.31	0.0265*
	Grades 1 and 3	-3.77	0.0005**	-3.91	0.0003**	-3.98	0.0003**
Narratives	Grades 1 and 2	-1.64	0.1085	-4.25	<.0001**	0.07	0.9438
	Grades 2 and 3	-0.36	0.7175	-3.11	0.0030**	-3.56	0.0010**
	Grades 1 and 3	-1.49	0.1453	-7.06	<.0001**	-3.68	0.0007**
Question-Asking	Grades 1 and 2	-2.71	0.0096**	-6.91	<.0001**	-3.04	0.0039**
	Grades 2 and 3	-1.65	0.1077	-2.80	0.0072**	-0.12	0.9016
	Grades 1 and 3	-3.61	0.0008**	-10.75	<.0001**	-3.32	0.0020**

**** Significant at 1 % level * significant at 5 % level.**

Although the L1 group obtained increasingly higher scores on the narratives subtest in grades 1, 2 and 3 (73% and 79% respectively) the differences were not statistically significant. Their development on communicative role taking and question asking was significant from grades 1 to 2 and 1 to 3, but not from grades 2 to 3, when it appeared to reach a plateau.

The EAL group in context 1(EAL only) improved significantly on all subtests every year with the exception of the communicative role taking subtest, where they did not improve from grades 2 to 3 (t= -0.10; Pr>t= 0.9177).

The EAL group in context 2 (integrated) also improved significantly from grades 1 to 3 on all subtests, but their development from grades 1 to 2 on the narratives subtest (t= 0.07; Pr> t = 0.9438) and from grades 2 to 3 on the question-asking subtest (t= -0.12; Pr> t = 0.9016) was not significant.

5.2.5. Development of Semantics within each group

The means, standard deviations and range of scores obtained by each group each year on each semantic subtest are recorded in table 5. 7.

Table 5.7 Means, standard deviations and range of scores obtained by each group on each semantics subtest in grades 1, 2 and 3

		L1			EAL context 1 (EAL only)			EAL context 2 (integrated)		
	Statistic	**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**
Verb Contrasts (total possible = 10)	Mean	**8 (80%)**	**8.6 (86%)**	**9.0 (90%)**	**3.7 (37%)**	**5.6 (56%)**	**7.6 (76%)**	**6.6 (66%)**	**7.4 (74%)**	**8.1 (81%)**
	Std dev	1.41	1.13	0.91	2.24	2.16	2.0	2.21	1.81	1.2
	Range	4-10	5-10	7-10	0-9	1-10	3-10	2-10	3-10	5-10
Preposition Contrasts(total possible = 6)	Mean	**5.5 (92%)**	**5.4 (90%)**	**5.6 (93%)**	**2.9 (48%)**	**4.5 (75%)**	**4.3 (72%)**	**4.7 (78%)**	**5.2 (87%)**	**5.2 (87%)**
	Std Dev	0.70	0.98	0.67	1.36	1.33	1.31	1.38	0.97	1.08
	Range	3-6	2-6	3-6	0-6	2-6	1-6	1-6	2-6	1-6
Quantifiers (total possible = 9)	Mean	**7.5 (83%)**	**7.5 (83%)**	**8.2 (91%)**	**5.9 (67%)**	**6.5 (72%)**	**7.2 (80%)**	**6.6 (73%)**	**7.2 (80%)**	**7.8 (87%)**
	Std dev	1.26	1.31	0.94	1.37	1.41	1.08	1.33	1.43	0.9
	Range	3-9	4-9	5-9	2-9	3-9	5-9	4-9	4-9	6-9
Fast Mapping Real Verbs (total possible = 9)	Mean	**6.3 (69%)**	**6.8 (76%)**	**7.4 (82%)**	**4.2 (47%)**	**4.6 (51%)**	**5.1 (57%)**	**5.5 (61%)**	**6.3 (70%)**	**6.6 (73%)**
	Std Dev	1.41	1.35	1.23	1.49	1.45	1.54	1.53	1.35	1.63
	Range	3-9	3-9	5-9	1-9	1-7	1-8	2-8	3-9	2-9
Fast Mapping Novel Verbs(total possible = 12)	Mean	**6.3 (53%)**	**7.4 (62%)**	**7.8 (65%)**	**5.2 (43%)**	**5.92 (49%)**	**6.4 (53%)**	**6.1 (51%)**	**6.5 (54%)**	**7.7 (64%)**
	Std Dev	2.70	2.43	1.85	2.51	2.54	2.65	2.49	2.19	2.21
	Range	1-11	1-11	3-11	0-11	0-10	0-11	0-10	2-11	3-11

The mean percentage scores obtained by each group on the DELV-CR semantic subtests are displayed graphically in figure 5.4.

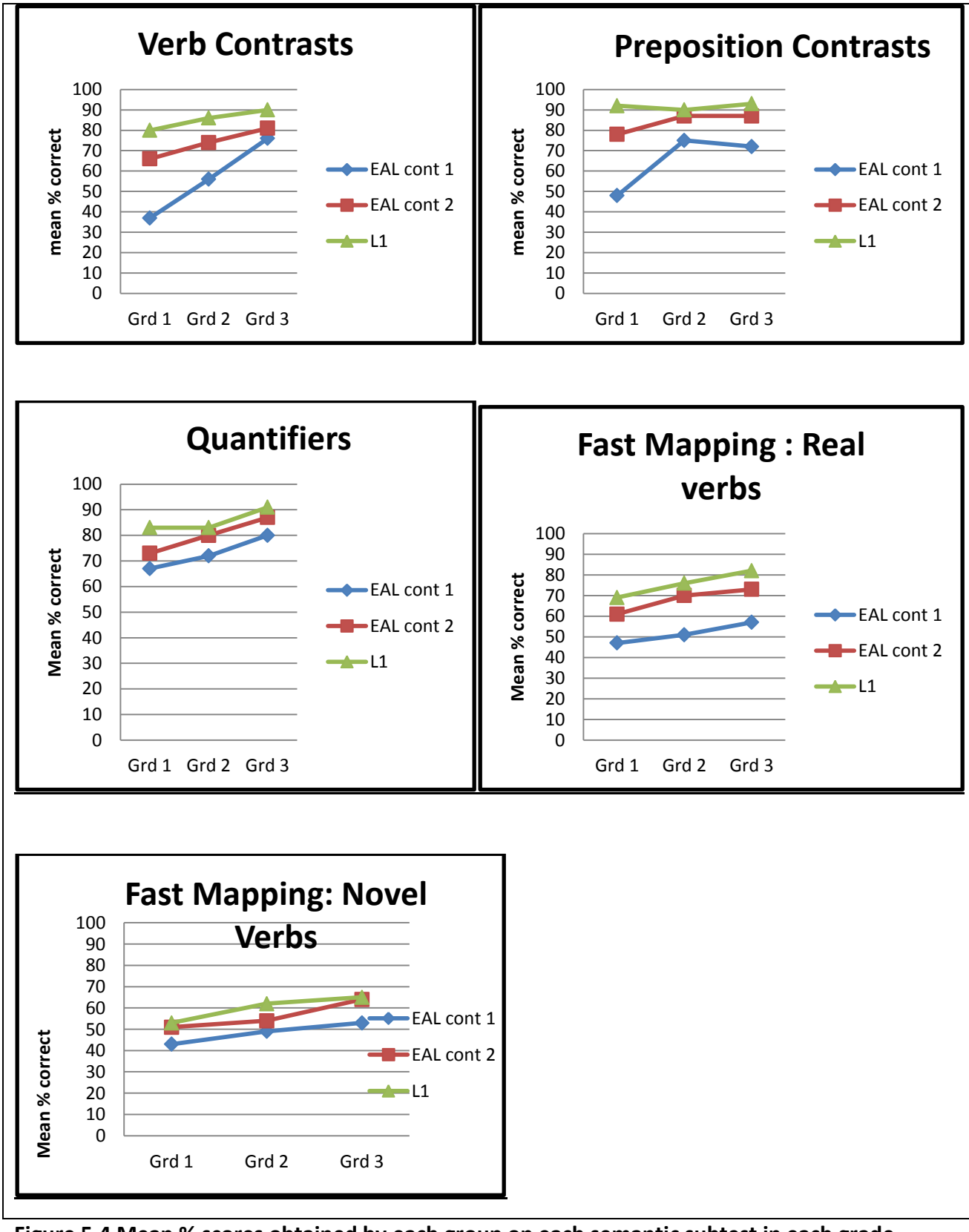


Figure 5.4 Mean % scores obtained by each group on each semantic subtest in each grade

The results of the paired sample t-test procedure to establish whether the differences between grades 1 and 2, 2 and 3 and 1 and 3 were significant within each group on the semantic subtests are contained in

Table 5.8. Non-significant results are highlighted in blue.

Table 5.8.Results of Paired sample t-test procedure comparing grades 1 and 2, 2 and 3 and 1 and 3 semantic subtest scores obtained by each group of learners

Measure	Comparison	L1		EAL context 1(EAL only)		EAL context 2 (integrated)	
		t	Pr > t	t	Pr > t	t	Pr > t
Verb Contrasts	Grades 1 and 2	-2.64	0.0112*	-4.83	0.0001**	-2.71	0.0096**
	Grades 2 and 3	-2.59	0.0134*	-6.66	<.0001**	-2.86	0.0068**
	Grades 1 and 3	-4.09	0.0002**	-10.72	<.0001**	-4.62	<.0001**
Preposition Contrasts	Grades 1 and 2	0.38	0.7053	-7.39	0.0001**	-2.54	0.0147*
	Grades 2 and 3	-1.03	0.3093	1.22	0.2288	-0.15	0.8782
	Grades 1 and 3	-0.39	0.700	-5.65	<.0001**	-2.10	0.0424*
Quantifiers	Grades 1 and 2	-0.11	0.9150	-2.63	0.0112*	-1.80	0.0792
	Grades 2 and 3	-2.68	0.0105*	-3.23	0.0022**	-1.79	0.0807
	Grades 1 and 3	-3.05	0.0041**	-5.17	<.0001**	-4.29	0.0001**
Fast Mapping Real Verbs	Grades 1 and 2	-1.97	0.0545	-2.23	0.0298*	-3.61	0.0008**
	Grades 2 and 3	-2.59	0.0134*	-1.88	0.0662	-1.00	0.3235
	Grades 1 and 3	-4.22	0.0001**	-3.97	0.0002**	-4.44	<.0001**
Fast Mapping Novel Verbs	Grades 1 and 2	-2.45	0.0183*	-2.29	0.0258*	-1.28	0.2084
	Grades 2 and 3	-1.51	0.1379	-1.02	0.3109	-3.12	0.0034**
	Grades 1 and 3	-3.18	0.0028**	-2.38	0.0208*	-3.56	0.0010**

The L1 group made significant progress from grades 1 to 3 on all the semantic subtests with the exception of preposition contrasts. Since they obtained a mean score of 5.5/6 on the preposition contrast subtest in grade 1, it was unlikely that their further progress would be statistically significant. Both the EAL groups improved significantly from grades 1 to 3 on all the semantic subtests. Both EAL groups demonstrated non-significant improvements, and thus slower development on prepositions (t= 1.22; Pr>t= 0.2288) (t= -0.15; Pr>t= 0.8782) and fast mapping of real verbs (t= -1.88; Pr>t= 0.0662) (t=-1.00; Pr>t= 0.3235) from grades 2 to 3. The EAL group in context 1(EAL only) showed non-significant development of novel verbs (t= -1.02: Pr>t= 0.3109) from grades 2 to 3, and the EAL group in context 2 (integrated) showed an initial lack of development on fast mapping of novel verbs from grades 1 to 2 (t=-1.28; Pr>t= 0.2084) followed by a significant improvement from grades 2 to 3 (t= -3.12; Pr>t= 0.0034).

5.2.6. Profiles of development

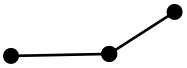
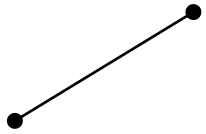
The growth patterns exhibited by the three groups confirm that language development is a dynamic process that proceeds irregularly through periods of rapid growth followed by slow steady transitions (de

Bot & Makoni, 2005; Evans, 2009, Herdina & Jessner, 2002), and the longitudinal design of this study revealed that the process varied considerably within the different groups of children and on the different language measures.

The three groups of participants improved significantly from each grade to the next on the total DELV-CR scores for the syntax, pragmatics and semantics domains but detailed analysis of the DELV-CR subtest results showed that they exhibited five identifiable developmental trajectories based on the statistical significance of their improvements from one grade to the next. The different trajectories are represented graphically in table 5.9 below, with a brief description of each and the measures on which the different groups exhibited a particular developmental profile.

Table 5.9 clearly shows that the groups did not exhibit the same developmental pattern on all measures and there are similarities and differences between them depending on the language measure in question. On the ability to provide hierarchically contrastive verbs, all three groups demonstrated the same profile. Specifically, this skill developed significantly from one grade to the next over all three grades. The verb and preposition contrast subtests both rely on vocabulary knowledge, and it is interesting that the EAL and L1 learners developed verb vocabulary in the same way because it supports Kohnert's (2004) claim that the rate of vocabulary development will be consistent in L1 and L2 learners. The fact that both groups of EAL learners developed prepositions in the same way, but differently to the L1 learners adds an important caveat to this claim and suggests that the rate and pattern of development may be determined by the type of vocabulary in question. English prepositions are complex and challenging for additional language learners, and some prepositions take longer to be acquired or alternatively are not acquired without instruction, hence the plateau in development during grade 3 in both EAL groups.

Table 5.9 Developmental profiles exhibited by each group on DELV-CR subtests

Description of profile	Graphic Representation Grd 1 2 3	L1	EAL cont 2 (Integrated)	EAL cont 1 (EAL only)
High scores with no significant improvements from one grade to the next		Wh Questions Narratives Preposition Contrasts	Wh Questions	Did not demonstrate this profile
Overall significant improvement from grades 1 to 3 but not between grades 1 and 2 or 2 and 3		Articles	Articles Quantifiers	Did not demonstrate this profile
Non-significant improvement from grades 1 to 2 followed by significant improvement from grades 2 to 3		Role taking FMRV	Narratives FMNV	Did not demonstrate this profile
Significant improvement from grades 1 to 2 followed by non-significant improvement from grades 2 to 3		Quantifiers Question asking FMNV	FMRV Passives Question asking Prepositions	FMRV Role taking Prepositions FMNV
Significant improvement over all three grades		Verb Contrasts Passives	Verb contrasts Role taking	Verb contrasts Wh questions Passives Articles Narratives Q asking Quantifiers

5.2.7. Developmental trends in EAL context 1 group (EAL only)

The EAL learners in context 1 exhibited only two developmental profiles. The predominant profile, on 7/11 measures, was significant improvement over all three grades, but they also demonstrated a pattern of significant development during grade 2 followed by a plateau or lack of significant improvement during grade 3 on 4/11 measures. In addition to the verb contrast measure mentioned above, they exhibited a similar pattern to the L1 group only on passive comprehension.

5.2.8. Developmental trends in L1 and EAL context 2 groups (integrated).

In contrast, the EAL group in the integrated context (context 2) and their L1 peers developed similarly on Wh-questions, articles, question-asking and verb contrasts (4/11 measures) and both groups also

showed more variation than the EAL group in context 1 in the development of different language skills, each exhibiting 4 out of the 5 developmental profiles.

5.2.9. Discussion: Development of academic language in the foundation phase

The question arising out of the results presented thus far is: to what can the significant developments in academic language be attributed?

Although it is likely that the participants' progress was the result of a combination and interaction of direct instruction, incidental learning and exposure to learning materials (Dockrell & Messer, 2004; Cummins & Yee Fun, 2007), there is evidence that some of the progress and development observed in the participants of this study over the three year period can be attributed to the instruction they received in the classroom. This inference is based on the fact that although the DELV-CR assesses a limited number of language processes, it may be regarded as a valid measure of oral academic language in the early school grades, and academic language develops mainly as a result of instruction (Cummins & Yee Fun, 2007; Cummins, 2008; Scarcella, 2011). There are also a number of findings to support this claim. First, there were differences between the EAL learners in contexts 1 and 2 and similarities between the L1 and EAL learners in the integrated context (context 2), indicating that the instructional context played a significant role in the developmental profiles observed in the children. Second, both groups of EAL learners obtained similar scores to the L1 children on answering Wh-questions in grade 3, and this was also the subtest on which all three groups obtained higher scores than on any of the other syntax measures. Since the majority of the interactions between learners and teachers are didactic, whereby the teacher asks questions requiring responses from the learners (Owens, 2004), it can be assumed that the children would learn to respond to various types of Wh-questions. The three groups also obtained similar scores on the narratives subtest in grade 3, and since most of the texts utilised in pre-school through to the third grade are structured in narrative form (Haynes & Shulman, 1998) and storytelling is heavily emphasised in the OBE curriculum, it is likely that this genre would be acquired from exposure in the academic environment. This is important since Westby (1994) maintains that narrative language underlies the development of de-contextualised communication, which is a characteristic of academic language (Cummins, 2008). These findings also imply that the teachers participating in this study were able to scaffold the development of these particular academic language skills.

However, the comparison between the groups does reveal differences that raise certain concerns. These comparisons are presented in the next section.

5.3. RESULTS: COMPARISON BETWEEN GROUPS

Although the mean scores on the DELV-CR generally improved systematically over the three year period in all three groups of children, there were differences between the groups on all measures in all grades. The standard deviations and range of scores on table 5.1 also reflect substantial variation between and within groups on all measures. Specifically, the standard deviations are consistently larger within the EAL groups than within the L1 group, confirming the well documented finding that there is more individual variation in additional language learning than in first language learning (Paradis, 2009). The wider ranges in scores within the EAL groups confirm this variation. However, the highest scores obtained each year within the EAL groups in both contexts 1 and 2 also indicate that there were in fact EAL learners who did as well as their monolingual peers across all grades on all measures.

The results of the analysis of variance (ANOVA) comparing the three groups on the DELV-CR measures in each grade are presented in Table 5.10.

Table 5.10 Results of ANOVA comparing language groups and contexts on DELV-CR measures in each grade.

	Grade 1		Grade 2		Grade 3	
	F value	**Pr>F**	**F value**	**Pr>F**	**F value**	**Pr>F**
Total Syntax score	78.39	<.0001**	31.50	<.0001**	21.46	<.0001**
Total Pragmatics score	36.93	<.0001**	12.24	<.0001**	13.77	<.0001**
Total Semantic Score	54.74	<.0001**	33.13	<.0001**	28.03	<.0001**

**** Significant at 1% level.**

As is evident from the values in table 5.10, the differences between the groups were highly significant (Pr > F<.0001) on all the DELV-CR total scores in every grade thus justifying the separation of the three groups in all the statistical analyses.

Independent sample t-tests were conducted to identify which groups differed significantly from each other on each measure in each year, and the results are presented in Table 5.11. Non-significant results are highlighted in blue.

Table 5.11 Results of independent sample t-tests comparing language groups and contexts on DELV-CR total scores.

Comparison		L1 and EAL (context 1)			L1 and EAL groups in context 2 (integrated)			EAL groups in context 1 (EAL only) and context 2 (integrated)		
	Statistic	Grd 1	Grd 2	Grd 3	Grd 1	Grd 2	Grd 3	Grd 1	Grd 2	Grd 3
Total syntax	t pr>t	13.06 <.0001**	8.66 <.0001**	6.67 <.0001**	2.66 0.0093**	7.91 <.0001**	3.01 0.0035**	-8.49 <.0001**	3.26 0.0016**	4.21 0.0008**
Total pragmatics	t pr>t	9.82 <.0001**	5.19 <.0001**	4.89 <.0001**	2.46 0.0144*	-0.92 0.3588	1.48 0.1439	6.23 <.0001**	-4.19 <.0001**	-3.25 0.0016**
Total semantics	t pr>t	11.88 0.0001**	8.53 <.0001**	7.11 <.0001**	3.75 0.0033**	3.41 0.0010**	2.80 0.0064**	-6.56 <.0001**	-5.39 0.0001**	-4.31 <.0001**

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

The t-test results in table 5.11 reflect significant differences between the L1 and EAL groups and between the two EAL groups on the majority of measures in all grades. The only exceptions were that the L1 group and their EAL peers in context 2 (integrated) did not differ significantly on the total pragmatics scores in either grade 2 (t= -0.92; Pr>t=0.3588) or grade 3 (t= 1.48; Pr>t= 0.1439), indicating that the EAL learners in this context were performing at a similar level to their monolingual peers on the pragmatics domain by the end of grade 2. This is an interesting finding and indicates that where EAL and L1 learners are integrated, EAL children develop appropriate pragmatic skills relatively quickly, possibly because of the models provided by their monolingual peers and the practice they get in interacting in English. While Paradis (2009) argues that the relatively easier development of pragmatics skills may be because these skills are common to all languages and therefore more transferable across languages, the fact that the EAL learners in context 1 (EAL only) did not show the same rate of development on the pragmatics domain, and still performed significantly below the other two groups, would suggest that although the development of pragmatics skills is possibly easier, this is still dependent on the availability of L1 models and communicative practice in the target language.

The statistical results reported in tables 5.10 and 5.11 and the line graphs in figure 5.1, clearly indicate that although the EAL group in context 1 (EAL only) improved significantly across the three year period on all the DELV-CR domains, they performed significantly below the L1 and EAL groups in the integrated context (context 2) on all measures.

5.3.1. Group differences on syntax subtests

Table 5.12 provides the statistical results of the comparison between the groups on the syntax subtests. Non-significant results are highlighted in blue.

Table 5.12 ANOVA Results of comparison between groups (L1 and EAL contexts 1 and 2) in Grades 1, 2 and 3 on syntax subtests

	Grade 1		Grade 2		Grade 3	
	F value	**Pr>F**	**F value**	**Pr>F**	**F value**	**Pr>F**
Wh- questions	37.41	<.0001**	13.26	<.0001**	3.85	0.0286
Passives	43.76	<.0001**	25.01	<.0001**	17.9	< .0001**
Articles	33.20	<.0001**	24.58	<.0001**	16.29	<.0001**

****Significant at the 1% level.**

With the exception of the Wh-question subtest in grade 3, the groups differed significantly on all syntax subtests in all grades. On the Wh-question subtest in grade 3, the L1 and EAL groups in context 2 (integrated) obtained mean scores of 96% and 94% respectively, while the EAL context 1(EAL only) participants obtained a mean score of 91%, suggesting that the understanding of Wh-questions does not pose significant difficulty for EAL learners in either context in relation to their L1 peers by the time they are in grade 3. In this respect, typically developing EAL learners appear to be different to monolingual English- speaking children with SLI, who demonstrate significant difficulty in understanding long distance syntactic dependencies in complex Wh-questions (Schwartz, 2009; Deevy & Leonard, 2004; Marinis & van der Lely, 2007; Stavrakaki, 2006).

Independent sample t-tests were conducted to locate the significant differences between groups on each of the measures, and the results are recorded in Appendices 5A, 5B and 5C. The statistical values in the tables show that the L1 group and EAL group in context 1 and the two EAL groups differed significantly on all subtests (except Wh-questions) in all grades. The EAL learners in context 1 (EAL only) consistently obtained significantly lower scores than the other two groups.

The L1 and EAL groups in the integrated context (context 2) did not differ significantly on the passives subtest in grades 1(t=0.55; Pr>t=0.5839) and 2(t=1.63; Pr>t=0.1068). However, in grade 3 this EAL group obtained a significantly lower score (78%) than their L1 peers (87%) (t= 2.73; Pr>t= 0.0077) on the

understanding of passives. They also obtained significantly lower scores on the use of articles in all grades. With respect to the understanding of passives, the typically developing EAL learners in this study appear to be similar to monolingual English-speaking children with language impairment who also show difficulty in understanding the complex syntactic structures in passives (Schwartz, 2009). However, since the underlying difficulty in understanding complex Wh-questions and passives is the same (i.e., processing long distance syntactic dependencies), and the EAL children in this study do not demonstrate the same difficulty with Wh-questions, it would seem that the scaffolding they received in responding to Wh-questions, assisted them to overcome the difficulty. In combination, these findings confirm the claim by Linan-Thompson and Ortiz (2009) that without scaffolding (as may be the case in understanding passives) typically developing EAL learners may present with similar difficulties to L1 children with language impairments.

While monolingual children with SLI may omit articles in the early stages of acquisition, they do not appear to have consistent difficulty with these structures. The findings thus suggest that typically developing EAL children are different to monolingual language-impaired children in this respect in that they have particular difficulty with articles. This may be due to cross-linguistic influence, since all South African Bantu languages do not make use of articles (Singh, 2009).

5.3.2. Group differences on pragmatics subtests

The differences between the groups on the pragmatics subtests each year were analysed statistically using an analysis of variance, and the results are reported in table 5.13. Non-significant results are highlighted in blue.

Table 5.13 ANOVA results of comparison between groups (L1 and EAL contexts 1 and 2) in Grades 1, 2 and 3 on pragmatic subtests

	Grade 1		Grade 2		Grade 3	
	F value	**Pr>F**	**F value**	**Pr>F**	**F value**	**Pr>F**
Role-Taking	8.41	0.0004**	4.84	0.0092**	10.08	<.0001**
Narratives	14.96	<.0001**	5.51	0.0050**	1.51	0.2238
Question-Asking	35.47	<.0001**	11.4	<.0001**	10.40	<.0001**

**Significant at the 1% level.

With the exception of the narratives subtest in grade 3 (F= 1.51; Pr>F= 0.2238), on which the groups performed similarly, the differences between the groups were statistically significant on all subtests every year.

Independent sample t-tests were conducted to locate the significant differences between the groups on the pragmatics subtests and the results are recorded in Appendices 5A, 5B and 5C.

The statistical analysis indicates that the EAL group in context 1 (EAL only) obtained significantly lower scores than the L1 group on all subtests (except narratives in grade 3) every year. They also obtained significantly lower scores than the EAL group in context 2 (integrated) on most subtests, excluding the role-taking subtest in grade 2 (t= -1.33; Pr>t= 0.1866). However, in grade 3, they fell significantly behind their EAL peers in the integrated context (context 2) on this subtest again (t= -2.68; Pr>t= 0.0088). On the narratives subtest, the differences between the two EAL groups were not significant in grade 2 (t= 0.05; Pr >t= 0.9575) or grade 3 (t= -1.76; Pr>t= 0.0810). Thus the EAL learners in context 1 had developed narrative skills to a similar level as the EAL learners in context 2 by grade 2, and had caught up to the L1 learners by grade 3.

The L1 group and their EAL peers in the integrated context (context 2) differed significantly only on role-taking (t= 2.25; Pr>t= 0.0267) and narratives (t= 1.99; Pr>t= 0.0491) in grade 1 and on narratives in grade 2 (t=2.85; Pr>t= 0.0054). In grade 3, there were no significant differences between the two groups on any of the measures, confirming that the EAL learners in this context were at the same level as their monolingual classmates with respect to their pragmatic skills.

5.3.3. Group differences on semantic subtests

The results of the statistical comparison between the groups in each grade on the semantic subtests are reflected in Table 5.14. With the exception of the fast mapping of novel verbs subtest in grade 1, the groups differed significantly on all the semantic measures in every grade.

Table 5.14 ANOVA results of comparison between groups in Grades 1, 2 and 3 on semantics subtests

	Grade 1		Grade 2		Grade 3	
	F value	**Pr>F**	**F value**	**Pr>F**	**F value**	**Pr>F**
Verb Contrasts	58.5	<.0001**	36.63	<.0001**	10.31	<.0001**
Preposition Contrasts	61.87	<.0001**	9.65	<.0001**	19.14	<.0001**
Quantifiers	17.63	<.0001**	6.74	0.0016**	12.17	<.0001**
Fast mapping Real Verbs	30.81	<.0001**	36.3	<.0001**	31.18	<.0001**
Fast Mapping Novel Verbs	2.68	0.0721	4.65	0.0111*	5.81	0.0038**

****Significant at the 1% level. * Significant at 5% level**

Independent sample t-tests were conducted to locate the significant differences between the groups on each of the measures, and the results are contained in Appendices 5A, 5B and 5C.

The statistical analysis revealed that the EAL group in context 1 (EAL only) scored significantly below the L1 group on all measures in all grades, and significantly below the EAL group in context 2 (integrated) on all measures in grade 3, with the exception of the verb contrast subtest (t= 1.46; Pr> t = 0.1482).The differences between the two EAL groups were not significant on the quantifier subtest in grade 1(t= -1,84; Pr> t= 0.0682) and on the fast mapping of novel verbs subtest in grades 1 (t= -1.96;Pr>t= 0.027) and 2 (t= -1.09; Pr>t= 0.2801), but by grade 3 the EAL group in the integrated context (context 2) performed significantly better than the EAL group in context 1 (EAL only) on these two measures.

There were fewer significant differences between the L1 and EAL groups in the integrated context 2 (context 2). While there were significant differences between them on 4 out the 5 semantic measures in grade 1, by grade 3 the L1 group obtained significantly higher scores than their EAL classmates only on verb contrasts (t= 3.81; Pr> t = 0.0003) and fast mapping of real verbs (t= 2.55 Pr>t= 0.0128). There were no significant differences between these two groups on fast mapping of novel verbs in any of the grades, suggesting that this task was equally difficult for both groups.

5.3.4. Summary of comparison between L1 and EAL learners in the integrated context (context 2).

The EAL learners in context 2 demonstrated significantly lower levels of functioning than their monolingual English-speaking classmates on a number of academic language measures in each grade, but they closed the gap systematically either during grade 2 or 3. This is clearly illustrated in appendix

5B, showing the results of the independent sample t-tests comparing the groups on each measure each year. While they obtained significantly lower mean scores on 7/11 measures in grade 1, they obtained significantly lower scores on only 5/12 and 4/12 measures (including reading comprehension) in grades 2 and 3 respectively. Specifically, by the end of grade 3, their understanding of passives, use of articles, and verb knowledge (as assessed on the verb contrasts and fast mapping of real verbs subtests) were significantly below that of the L1 group with whom they shared classes and teachers. Thus despite their exposure to English first language models, the EAL children in context 2 were still obtaining significantly lower scores on passives, articles and verbs, implying the need for additional instruction in these aspects.

In general, the results obtained by the EAL learners in context 2 suggest that in integrated schools, where L1 and EAL learners are taught by L1 teachers, EAL learners in the foundation phase may demonstrate initial language difficulties but make significant progress either during grades 2 or 3 and mostly catch up to their L1 peers by the end of grade 3. If they were to receive additional instructional support on certain language skills they would in all likelihood, function at the same level as the English speaking children before they enter grade 4, when these skills become increasingly important for understanding text and the subject matter of various learning areas. An important implication for future research would thus be to investigate in a controlled experimental study, whether these particular skills (e.g., understanding of passives, use of articles and verb learning) develop more efficiently if teachers provide the necessary scaffolding.

5.3.5. Summary of comparison between EAL learners in context 1 (EAL only) and L1 and EAL groups in integrated context (context 2).

While there were some EAL learners in context 1 who obtained scores in the upper ranges, performing similarly to the L1 and EAL learners in context 2 in all grades, the mean scores suggest that as a group these children were significantly disadvantaged in relation to the other two groups on most measures by the end of grade 3. At this stage, they obtained significantly lower scores than the L1 and EAL groups in context 2 on 10/12 and 9/12 measures respectively. In addition, over the three years they showed only minimal evidence of catch-up development. They obtained significantly lower mean scores than the L1 group on all measures and the EAL group in context 2 on 10/11 measures in grade 1. In grade 2, they obtained significantly lower mean scores than the L1 and EAL groups in the integrated context on 11/12 and 8/12 measures respectively. However in grade 3, there were non- significant differences between their scores and those of the other two groups on the Wh-questions and narratives subtests only. They

thus obtained significantly lower mean scores than both the other two groups on 10/12 measures. Of particular concern, was that although this group did not differ significantly from the EAL group in context 2 on role-taking and fast mapping of novel verbs in grade 2, they had fallen significantly behind again on these measures in grade 3.

5.3.6. Discussion: Comparison between groups

The differences between the EAL learners in contexts 1 and 2 suggest that the effects of language-in-education practices and specifically the use of English as the medium of instruction, are not restricted to the first and second education systems suggested by Fleisch (2008), and that even in urban ex- model-C schools, where there is a reasonable infrastructure for English, EAL learners may be at a significant disadvantage.

The questions arising from the results obtained by the EAL group in context 1 are:

- Why did they perform so poorly relative to the other two groups?
- Should they be instructed in English at all? and/or
- What could be done to improve their learning?

There are a number of possible explanations for their relatively poor academic English skills. First, their significantly poorer performance in grade 1 suggests that they may have started formal schooling at a disadvantage, and that this was still evident when they were tested at the end of grade 1. It was interesting that when these children were in grade 1, they obtained a significantly higher mean score on the quantifier subtest than on the other semantic measures, and this was also one of the two subtests on which they did not differ significantly from the EAL group in the integrated context (context 2). Since quantifiers are used in the language of mathematics, they may have learned something about the concept “every” during numeracy instruction in grade 1. This would suggest that language and content-integrated instruction can in fact compensate for disadvantage. Nevertheless, they fell behind their EAL peers in context 2 in grades 2 and 3 on the quantifier subtest, and their scores on all other measures in grade 1 were significantly lower than those of the aforementioned group. Thus, despite their progress over the three grades they did not manage to close the gap created by the significantly higher scores achieved by the other two groups, confirming that EAL children are often “chasing a moving target” (Genesee, Paradis & Crago, 2004, p. 132; Reagan, 2009, p.6).

Second, it is possible that the anticipated advantages in this context (instruction by EAL teachers, who may have a better understanding of the needs of the children, are able to teach at a pace conducive to the whole group and use the children's home languages in teaching), were not sufficient to overcome the initial disadvantage experienced by this group. However, in the absence of controlled classroom observations in this study and thus concrete evidence of what these children were taught, it is difficult to substantiate this conclusion.

It is also difficult to separate the effects of educational context and possible socio-economic factors. It is possible that the initial disadvantage was due in part to the fact that there were more children from lower socio-economic backgrounds in this group than in the EAL group in the integrated context (context 2). Since lower SES has a significant effect on language acquisition, it is possible that there were many children in this group whose primary language development was delayed on entering school. This would result in slower development of the additional language because the L1 and L2 are developmentally interdependent (Cummins, 2000).

Third, the EAL learners in context 1 were not integrated with L1 children and were taught by EAL teachers. Thus, as suggested in the introductory chapters, the absence of L1 English models may have had an effect on their learning of academic English since children tend to learn the language of those with whom they associate (Scarcella, 2011). In addition and in contrast to the findings of other researchers (e.g., Reddy et al., 2006), the teachers in the integrated context may have had higher expectations of the children resulting in increased cognitive demand, which would account for the better outcomes achieved by the EAL learners in this context.

As discussed in chapter 2, it is also possible that in the absence of L1 speakers, the EAL children in context 1 could not make use of the social strategies (O'Malley & Chamot, 1990; Oxford, 1990) or assertive and outgoing personality characteristics (Paradis, 2009) that increase the quantity and quality of practice in English through interaction with L1 speakers.

In addition, they may not have experienced the integrative motivation to become part of the community of English speakers (Gardner, 1985). They may have been more reliant on instrumental motivation (i.e., to learn the language to succeed in school) and as suggested in chapter 2, this is difficult to separate from the general motivation to learn which is affected by the relationship between general attitudes to English, learner-specific motives such as self-confidence and self-esteem, the social context of the

classroom, the teacher's influence on motivation, the motivational characteristics of the curriculum and the learner's self-regulation of motivation (Dornyei & Skehan, 2003). In short, the EAL children in context 1 (EAL only), may not share their parents' motivation to be educated in English and find it difficult to comprehend why they need to learn in an unfamiliar language.

One possible solution to the problems experienced by the EAL children in context 1 would be to acknowledge that instruction in English is simply not viable, and that they should be taught in their home languages. However, as discussed in chapter 3, this may be interpreted as denying access to English, and in view of the economic, social and educational value attached to English in the South African context, few experts would argue that access to English in the education system is important. However, there are different ways in which such access may be achieved. In schools such the one in context 1, it may be better to use the home language as the medium of instruction, to teach English as a subject and gradually introduce it as a complementary medium of instruction in the higher grades, in line with the suggestion by Heugh (2009).

There are a number of counter-arguments to this proposal, which were raised in chapter 3. The heterogeneous language backgrounds of these children would make it very difficult to provide home language instruction unless separate classes are created for different language groups and teachers and learners are linguistically matched. This suggestion is likely to be met with resistance because it is reminiscent of the segregationist policies during apartheid. In addition, groups of African language speakers may oppose the choice of certain African languages over others. This is evident in a recent investigation by Nyika (2009) on the complaints lodged with PANSALB from 1997- 2007. His investigation showed that of the 400 complaints, slightly more than 10% (43) were concerned with language practices in education. Of these, only 12 were against language policies in schools, but it is significant that the majority (9/12) were by African language speakers against the use of other African languages (e.g., Sepedi and Southern Ndebele vs. Setswana, IsiXhosa vs. Setswana, and Ndebele vs. Sepedi). There was also awareness amongst complainants that when home language teaching takes place, it should be of an acceptable standard. As discussed in Chapter 3, the provision of adequate home language instruction is currently a matter of concern because of the underdevelopment of the African languages (Webb, 2010).

In addition, some experts (e.g., Beukes, 2009; Kamwangamalu, 2000) argue that home language instruction will only be accepted if the government adopts an aggressive marketing approach to the African languages, educates parents about the value of home language instruction, and sheds the

shackles of apartheid education. Using the African languages as media of instruction would also require large-scale development of these languages (Webb, 2009). Kamwangamalu (2000) suggests that the government should promote the African languages in the same way as Afrikaans was promoted by the apartheid government by offering bursaries and financial incentives to students who achieve high levels of competence in these languages, study them at university and then become teachers. Requiring proficiency in African languages for appointment to positions in government organisations would also enhance their economic value and assist in their promotion (Webb, 2010).

For the reasons outlined above, it is likely that English will continue to be the medium of choice in context 1 (EAL only) type schools in the foreseeable future. If this is the case, the findings of the current investigation indicate a strong need for enhanced English instruction before or during grade 1 so that the initial disadvantage seen in the EAL participants in context 1 in particular, can be counteracted. This should be followed by continued intensive efforts to ensure that the benefits of early intervention are maintained throughout the foundation phase and beyond.

The results of this study provided indications that certain aspects of language teaching could be improved in both contexts of education. This is important not only to ensure that EAL learners function at the same levels as their L1 counterparts, but also because research by Heugh (2009) has shown that while there are often no achievement differences between L1 children and children in L2 instruction from grade 1, early exit from L1 instruction, or dual-medium instruction programmes in the first to third grades, gaps in performance start to emerge late in the third year and reach significant levels by grade 6. The only L2 learners who perform at similar levels to their monolingual peers are those who have had instruction in their home languages as well as the L2 throughout. The implication is that even if EAL learners in English-only instruction programmes, as in the two contexts in this study, appear to have caught up to their monolingual peers in the first 3 grades, they will fall behind if they do not receive adequate support and scaffolding. This was certainly evident on some of the measures (e.g.,, passive comprehension, question-asking, prepositions, and fast mapping of real verbs) where the EAL learners in context 1 obtained scores equivalent to the EAL learners in the integrated context (context 2) in grades 1 and 2, but by grade 3 they had fallen behind and obtained significantly lower scores. Similarly, the EAL learners in context 2 did not differ from their L1 peers in grades 1 or 2 on the role-taking, quantifier and fast mapping of novel verbs subtests, but obtained significantly lower scores on these measures in grade 3. The importance of continued, enhanced language instruction is thus emphasised.

An important consideration is how to provide such enhanced instruction. As discussed in the introductory chapters, language is a complex phenomenon, and the learning of language is equally complex. Scarcella (2011) maintains that teachers need extensive professional development and support to teach academic language effectively. Without an adequate understanding and awareness of language, educators will find it difficult to apply theoretical constructs such as social constructivism and content and language-integrated learning to achieve optimal outcomes. The indications are that in the long term educational linguistics needs to be integrated into teacher training programmes but in the short term it would be advisable to make use of experienced and expert language practitioners (e.g., speech-language therapists) who could work collaboratively with teachers in mainstream education to provide all learners with the necessary support for academic language development.

In addition, it is necessary to develop appropriate materials that would support such development. Many of the materials currently in use are not written by language experts and consequently do not assist teachers to provide effective content and language-integrated instruction. Gersten et al. (2007) argue that the selection of learning materials should be based on their ability to promote the development of academic language through a curriculum with a defined scope and sequence. Unfortunately there are few materials with solid empirical support and that is why it is important to select published materials carefully and to devote considerable thought and planning to how to use these materials in the classroom (Gersten et al., 2007).

Another important consideration in contexts where English is used as the medium of instruction with EAL children is the extent to which home language support is provided, since this will ultimately lead to better outcomes. As indicated in the methods chapter, only some of the teachers in context 1 (EAL only) reported using the children's home languages to support the development of English. In the integrated context (context 2), this would not be possible since the teachers cannot speak these languages. The education department should perhaps adopt a stronger, more formal stance on this issue. In context 1-type schools teachers should be encouraged to use the L1s regularly, books and materials should be available in these languages and parents should be encouraged to use the L1 at home when assisting children with homework. The Home Language Project (Owen-Smith, 2010), described in chapter 3, which encourages EAL children who attend English-medium schools to develop and value their home languages through reading books in these languages, provides valuable resources for teachers and children in both context 1 and 2-type schools and could be supported and expanded by the authorities.

5.4. RESULTS: COMPARISON BETWEEN LANGUAGE DOMAINS

The performance on each language domain by each group of participants in each year was compared using paired sample t-tests. Since the total possible scores varied across the domains the analysis was conducted on percentage scores. The results are reported in table 5.15.

Table 5.15 Statistical comparison between language domains within each group in each grade.

Comparison		Syntax and Pragmatics		Syntax and Semantics		Pragmatics and Semantics	
Statistics		t -value	Pr>t	t- value	Pr>t	t -value	Pr>t
L1	Grd 1	2.09	0.0434*	-6.04	<.0001**	2.01	0.0507
	Grd 2	1.25	0.2196	-7.43	<.0001**	4.54	<.0001**
	Grd 3	1.29	0.2053	-9.72	<.0001**	6.05	0.7708
EAL cont 1	Grd 1	1.74	0.0871	-4.08	0.0002**	0.29	<.0001**
	Grd 2	-1.04	0.3016	-7.86	<.0001**	6.08	<.0001**
	Grd 3	-1.61	0.1131	-5.63	<.0001**	7.15	<.0001**
EAL cont 2	Grd 1	2.81	0.0077**	-7.76	<.0001**	3.08	0.0005**
	Grd 2	0.92	0.3640	-8.22	<.0001**	4.74	<.0001**
	Grd 3	-1.09	0.2813	-5.18	<.0001**	7.07	<.0001**

***Significant at the 5 % level ** significant at the 1 % level.**

The statistical values in table 5.15 and the line graphs in figure 5.1 both show that the L1 and EAL learners demonstrated both similar and different patterns of performance on the different language domains.

They were similar in that all three groups obtained significantly lower scores over the three testing periods on the semantics domain than on the syntax domain. The EAL groups differed from the L1 group in that their scores were also significantly lower on the semantics domain than on the pragmatics domain in all three grades. The L1 group performed similarly on the pragmatics and semantics domains in grades 1 and 3, only obtaining significantly lower scores on semantics in grade 2. There is thus some evidence that the semantic processing skills of EAL learners are weaker than their pragmatics skills and in this respect they are different to L1 learners but may be similar to L1 learners with language impairment, who demonstrate significant difficulties with word learning (Schwartz, 2009).

There were no significant differences between the syntax and pragmatics domains in the EAL context 1 (EAL only) group, but the L1 and EAL groups were similar in that their scores on the syntax domain were significantly higher than their scores on the pragmatics domain in grade 1.

Although this was not an intended aim of the study, it was considered necessary to clarify the discrepancy between domains. The mean raw scores and standard deviations obtained by the participants of this study were thus compared with those recorded for the equivalent age groups in the DELV-CR sample (Seymour et al., 2003, p.89) and are captured in table 5.16. The equivalent age groups in the DELV-CR sample and the respective grades in this study are 7.0-7.11 in grade 1, 8.0 -8.11 in grade 2 and 9.0 -9.11 in grade 3. The DELV-CR scores appear in red on the table.

Table 5.16 Mean raw scores and standard deviations obtained by L1 and EAL groups in relation to those obtained by age equivalent groups in the DELV-CR sample on each language domain.

		L1 group			EAL cont 1 group			EAL cont 2 group		
DELV-CR domain	Statistics	**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 (total possible =32)	Mean	26.8	28.6	29.5	16.6	22.4	24.7	24.8	23.0	27.4
	Std dev	3.39	2.35	2.06	4.8	4.3	4.24	5.53	4.05	3.79
DELV	**Mean**	**26.26**	**27.96**	**29.15**	**26.26**	**27.96**	**29.15**	**26.26**	**27.96**	**29.15**
	Std dev	**3.71**	**3.15**	**1.53**	**3.71**	**3.15**	**1.53**	**3.71**	**3.15**	**1.53**
Pragmatics (total possible = 24)	Mean	19.2	21	21.7	11.2	17.3	19.1	17	22	21
	Std dev	3.39	2.08	1.51	5.04	4.5	3.12	5.02	6.72	2.41
DELV	**Mean**	**19.23**	**21.04**	**21.60**	**19.23**	**21.04**	**21.60**	**19.23**	**21.04**	**21.60**
	Std dev	**3.49**	**2.14**	**1.53**	**3.49**	**2.14**	**1.53**	**3.49**	**2.14**	**1.53**
Semantics (total possible = 46)	Mean	33.7	35.78	38	21.9	27.18	30.4	29.15	32.61	35.4
	Std dev	4.73	4.47	3.62	5.36	5.48	6.00	6.33	4.46	4.69
DELV	**Mean**	**34**	**36.13**	**37.53**	**34**	**36.13**	**37.53**	**34**	**36.13**	**37.53**
	Std dev	**4.66**	**4.51**	**4.45**	**4.66**	**4.51**	**4.45**	**4.66**	**4.51**	**4.45**

5.4.1. Discussion: Comparison between language domains

It is evident from the values in Table 5.16 that the L1 group in this study obtained almost identical mean scores and standard deviations to the DELV-CR age equivalent groups across all domains in all three grades, and as would be predicted, the EAL groups obtained consistently lower scores than the DELV-CR age equivalent groups. These findings suggest firstly, that the DELV-CR has validity when applied to South African English-speaking children in the specified age groups and secondly, that the general trends in the domain scores observed in this study are consistent with those seen in the criterion group and are therefore not cause for concern. In other words, it can be expected that the semantic score will be lower than the score on the syntax domain, and does not imply that South African children have specific difficulties in lexical processing. However, it does appear that the EAL learners have more difficulty with

this domain than with both syntax and pragmatics, which indicates that lexical development may be slower than the development of syntax and pragmatics and should therefore be an important instructional goal for EAL learners.

Another implication of these findings is that the DELV-CR cannot be used to identify language impairment in EAL children by comparing their scores to those of the age-equivalent groups in the DELV-CR sample. Therefore, as will become evident in the next chapter, language impairment was identified by comparing the EAL learners to their peer groups in the two contexts in this study.

In this study, the L1 learners were used as a comparative group in order to avoid comparing the EAL learners to the American and British criterion groups on which the language, reading and working memory measures were standardised. The results obtained by the EAL learners, showing that none of the measures are unbiased when applied to EAL learners, confirm that this approach was necessary and useful. However, an important question arising from this methodological choice is whether the L1 learners have necessarily reached the level of development that will enable them to cope with the language demands of the curriculum in the higher grades. Are they thus a suitable comparative group?

An analysis of the results obtained by the L1 learners, specifically the range of scores evident on the DELV-CR subtests, and the overlap in these ranges between the L1 and EAL groups, shows that there were English-speaking children who did not achieve average scores on many of the measures. The implication is thus that there are some L1 children who, like their EAL peers, would benefit from enriched language instruction. As Clegg (1996, p.12) so aptly stated: all children can benefit from a "language rich diet." Notwithstanding this finding, the comparison between the mean scores attained by the L1 learners and those of the DELV-CR criterion group, implies that on the DELV-CR measures, which assess the language skills required in the first few years of schooling, the L1 learners demonstrate performance levels commensurate with English speaking children in the US and it is thus appropriate to have used them as a comparative group.

5.5 RESULTS: THE RELATIONSHIP BETWEEN ORAL AND LITERATE MEASURES OF ACADEMIC LANGUAGE

5.5.1. Development of reading accuracy and comprehension from grades 2 to 3

The means, standard deviation and range of scores obtained by each group on the reading accuracy and comprehension scores in grades 2 and 3 are contained in Table 5.17.

Table 5.17 Means, standard deviation and range of scores obtained by each group on the reading accuracy and comprehension scores in grades 2 and 3.

	Statistics	L1 group		EAL cont 1 (EAL only)		EAL cont 2 (integrated)	
		Grd 2	Grd 3	Grd 2	Grd 3	Grd 2	Grd 3
Reading Accuracy score (no of errors)	Mean	3.8	5.9	8.7	5.3	3.5	11.6
	Std Dev	5.44	8.73	14.12	11.34	5.53	21.93
	Range	0-27	0-37	0-65	0-71	0-23	0-70
Reading Comprehension score (total possible in adult population= 70)	Mean	12.93 (19%)	18.59 (27%)	7.06 (10%)	7.53 (11%)	9.02 (13%)	16.58 (24%)
	Std Dev	9.4	11.28	6.70	7.63	8.37	10.46
	Range	0-27	1-36	0-26	0-27	0-28	0-38

Although the standard deviations for the reading accuracy scores are larger in the EAL groups than in the L1 group, reflecting a larger variation in decoding skills, the standard deviations are more similar across the groups on reading comprehension. The score ranges reflect similar variation within the groups. In all three groups there were minimum scores of 0, indicating that there were L1 and EAL children who could not read for meaning in either grades 2 or 3, while there were some who read very well, as reflected in the high maximum scores. The mean reading accuracy and comprehension scores are depicted graphically in figure 5.5.

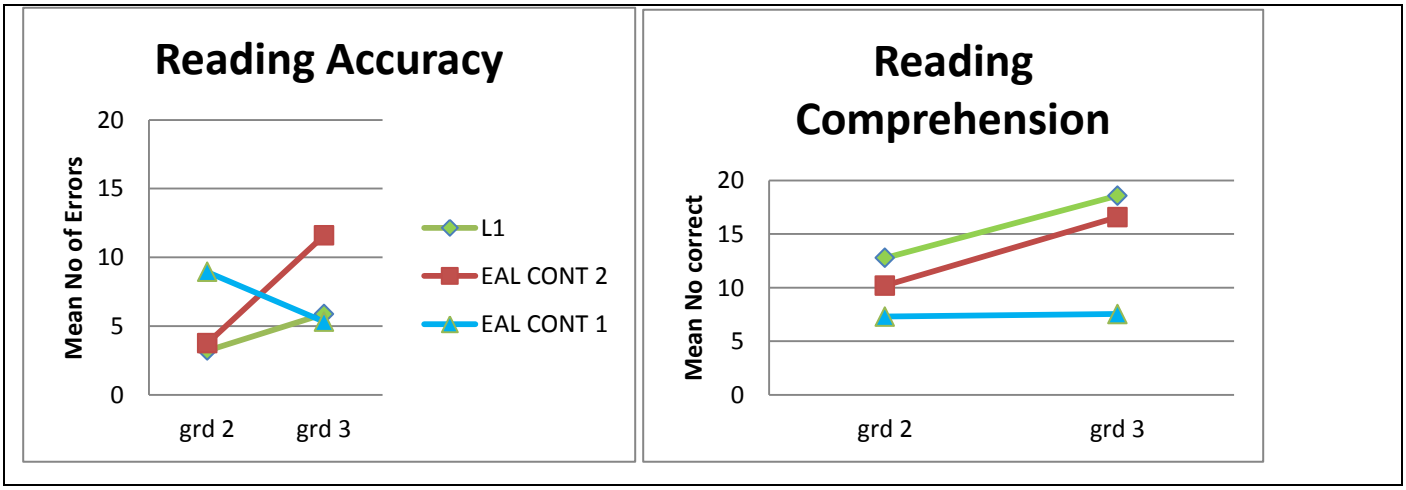


Figure 5.5 Mean reading accuracy and comprehension scores obtained by each group in grades 2 and 3.

5.5.2. Statistical comparison between grade 2 and 3 reading accuracy and comprehension scores within each group

Paired sample t-tests were conducted within each group to compare the results obtained on each measure in grades 2 and 3. The results of this analysis are presented in table 5.18. Non-significant results are highlighted in blue.

Table 5.18 Paired sample t-test results of comparison between grade 2 and 3 reading scores within each group

	L1		EAL cont 1(EAL only)		EAL cont 2(integrated)	
	t-value	Pr>t	t- value	Pr>t	t- value	Pr>t
Reading Accuracy	-1.78	0.0822	1.45	0.1523	-2.43	0.0195*
Reading Comprehension	-3.04	0.0041**	-0.20	0.8425	-4.26	0.0001**

The statistical analysis confirms that the EAL group in context 1 (EAL only) did not improve significantly on reading comprehension from grade 2 to 3 (t= -0.20; Pr>t= 0.8425). Their mean reading comprehension scores were 10% and 11% in grades 2 and 3 respectively. The standard deviations in the reading comprehension scores obtained by this group were also smaller than those observed in the other two groups suggesting that more of the children scored around the mean. The highest score obtained in this group in grade 3 (27) was also lower than the maximum scores obtained by the other two groups (36 and 38 respectively).

The implication is thus that while their language skills improved, this did not transfer to their reading comprehension, which may be an indication that the protracted period of language development has a delaying effect on reading comprehension. At the same time, it is possible that their reading comprehension skills did not improve because they were not receiving sufficient instruction in this aspect of reading. The fact that they made fewer decoding errors in grade 3 than in grade 2 may also indicate that the focus in reading teaching was on decoding rather than on comprehension. Since reading comprehension is critical for meaningful engagement with all learning materials, particularly from grade 4 onwards, this group is likely to experience major difficulties with English as the medium of instruction in the intermediate phase (i.e., grades 4-7). In fact, the principal of the school attended by these EAL learners has informed the researcher in a personal communication that they are not doing at all well in grade 4.

In contrast, the EAL learners in the integrated context (context 2) improved significantly on reading comprehension (t= -4.26; Pr>t = 0.0001) despite some of their syntactic and semantic language skills still being significantly below that of their L1 classmates. This was a most encouraging finding, and may be indicative of successful, focused instruction in reading comprehension by the teachers in this context. As discussed in Chapter 2, it has been shown that enhanced instruction in the key components of reading facilitates the process in an additional language (August and Shanahan, 2006). In a sense this result also lends support to Cook's (2007) claim that L2 learners should be regarded as successful when they can carry out the aspects of language appropriate to their anticipated uses (in this case reading comprehension), but may not necessarily function at equivalent levels to L1 speakers on other measures.

Only the EAL group in context 2 demonstrated a significant difference between grades 2 and 3 (t= -2.43; Pr>t= 0.0195) on reading accuracy, implying that they made significantly more decoding errors in grade 3 (Mean = 11.6) than in grade 2 (Mean = 5.3).The most likely explanation for this is that they were able to read more and therefore made more errors. However, their L1 peer group did not make significantly more decoding errors in grade 3 (Mean = 5.9) than in grade 2(Mean = 3.8) (t=-0.20; Pr>t= 0.8425). It is thus possible that the EAL children in context 2 were using the context to compensate for their decoding inaccuracies since they were less accurate but understood more of what they were reading.

5.5.3. Comparison between groups on reading

The results of the analysis of variance (ANOVA) comparing the three groups on the reading measures in each grade are presented in Table 5.19.

Table 5.19 Results of ANOVA comparing the three groups on the reading accuracy and comprehension measures in grades 2 and 3.

	Grade 2		Grade 3	
Statistic	**F value**	**Pr>F**	**F value**	**Pr>F**
Reading Accuracy score	4.49	0.0128*	2.37	0.0978
Reading Comprehension score	6.58	0.0019**	17.60	<.0001**

As is evident from the values in table 5.19, the differences between the groups were significant on the reading comprehension score every year, but the differences between groups on the reading accuracy measure were significant only in grade 2 (F= 4.49; Pr>F= 0.0128). The non-significant differences between the groups in grade 3, confirms that word level skills such as decoding develop relatively quickly in EAL learners, so that they attain equal levels of performance with their L1 peers (Weber & Longhi-Chirlin, 2001; Geva, 2000; Lesaux & Siegel, 2003), but there may be little transference to academic language proficiency (Kwan & Willows, 1998; Verhoeven, 2000), as seen in the significant differences in reading comprehension and language scores.

Independent sample t-tests were conducted to identify which groups differed significantly from each other in each year on each measure, and the results are presented in Table 5.20.

Table 5.20 Results of independent sample t-tests comparing groups on reading scores in grades 2 & 3.

Comparison		**L1 and EAL (context 1)**		**L1 and EAL (context 2)**		**EAL context 1 and 2**	
		Grd 2	Grd 3	Grd 2	Grd 3	Grd 2	Grd 3
Reading accuracy	**t** **pr>t**	-2.18 0.0320*	0.26 0.7951	0.26 0.7969	-1.55 0.1252	2.28 0.0246*	-1.79 0.0763
Reading Comp	**t** **pr>t**	3.84 0.0004**	5.66 <.0001**	2.10 0.0387*	0.83 0.4082	-1.31 0.1925	-4.83 <.0001**

The t-test results in table 5.20 reflect significant differences between the L1 and EAL group in context 1 (EAL only) on reading comprehension in both grades 2 and 3 and between the two EAL groups in grade 3. The two EAL groups did not differ significantly on the reading comprehension score in grade 2(t=-1.31; Pr>t= 0.1925), suggesting that the EAL learners in contexts 1 and 2 had similar reading comprehension skills in grade 2, but in grade 3 the EAL group in the integrated context (context 2) obtained significantly higher scores than the EAL group in context 1 (t= -4.83; Pr>.0001). The EAL group in context 1 had thus fallen behind their EAL peers in the integrated context in grade 3.

The L1 group and their EAL peers in the integrated context (context 2) did not differ significantly on the reading accuracy scores in grades 2 (t=0.26; Pr>t= 0.7969) and 3 (t= -1.55; Pr>t= 0.1252), indicating that they were making a similar number of decoding errors in grades 2 and 3. In grade 3, there was no

significant difference between the two groups (t=0.83; Pr>t= 0.4082) on reading comprehension either, which implies that the EAL learners in the integrated context (context 2) were understanding text at a similar level to their L1 peers by grade 3.

As was the case with DELV-CR results, discussed earlier in this chapter, the main question pertaining to the reading comprehension scores is how the L1 group performed in relation to the GORT-4 standardisation sample. The L1 participants obtained mean raw scores of 12.93 and 18. 59 on reading comprehension in grades 2 and 3 respectively, which convert to age equivalents of 6,9 and 8,0 and grade equivalents of 1.7 and 3.0 (Wiederholt & Bryant, 2001, p. 122). The L1 learners, who were tested in grades 2.11 and 3.11 are thus slightly behind the American standardisation sample on reading comprehension. This may be explained by the fact that American children start school earlier than South African children and therefore learn to read sooner.

5.5.4. Correlations between language and reading comprehension scores

The relationships between the language and reading comprehension scores in grades 2 and 3 are reflected in table 5.21. Significant correlations are highlighted in green.

Table 5.21 Pearson correlation co-efficients between reading comprehension and language scores for each group in grades 2 and 3

	Syntax		Pragmatics		Semantics	
	Grade 2	Grade 3	Grade 2	Grade 3	Grade 2	Grade 3
L1	r=0.41 Pr>r=0.0054**	r=0.09 Pr>r=0.5844	r=0.08 Pr>r=0.6143	r=0.04 Pr>r=0.8081	r=0.35 Pr>r=0.0189*	r=0.14 Pr>r=0.3864
EAL cont 1	r=0.15 Pr>r=0.2638	r=0.48 Pr>r=0.0002**	r=0.28 Pr>r=0.0378*	r=0.36 Pr>r=0.0077**	r=0.31 Pr>r=0.0203*	r=0.23 Pr>r=0.3864
EAL cont 2	r=0.29 Pr>r=0.0540*	r=0.32 Pr>r=0.0450*	r=0.21 Pr>r=0.1526	r=0.38 Pr>r=0.0169*	r=0.36 Pr>r=0.0136**	r=0.47 Pr>r=0.0023**

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

Within the L1 group, reading comprehension was significantly correlated to the total score on the syntax (r=0.41; Pr >r =0.0054) and semantics domains (r=0.35; Pr> r=0.0189) in grade 2 only. Reading comprehension and the total pragmatics domain were not significantly correlated in grade 2 (r= 0.08; Pr>r= 0.5844), and there were no significant correlations between reading comprehension and any of the language measures in grade 3. These findings suggest firstly that the pragmatics abilities assessed on the DELV-CR do not predict reading comprehension in L1 children and secondly, that the language

abilities assessed on the DELV-CR and reading comprehension are no longer related by the time L1 children are in grade 3.

In contrast, there were significant positive correlations between the language and reading comprehension scores within the two EAL groups on most language scores (4/6) in all three grades, confirming that oral language proficiency in English is a strong predictor of reading comprehension in additional language learners within the foundation phase (August & Shanahan, 2006).

However, there were no significant correlations between the language and reading accuracy scores (see appendix 5D), verifying that decoding skills are not necessarily related to language proficiency in either L1 or EAL children (Geva, 2006; Geva & Genesee, 2006) and should not be the sole focus in reading instruction.

With the exception of the non-significant correlation in the EAL context 2 group in grade 2 (r=0.09: Pr>r= 0.52) there were significant correlations between reading accuracy and comprehension in all groups in both grades 2 and 3. Since the reading accuracy score reflects the number of decoding errors made on oral reading, this means that as their comprehension scores increased, the children made more decoding errors in reading. The most logical explanation for this is that they were using the context to interpret what they were reading. This can lead to more decoding errors but more accurate comprehension. The correlations are reflected in table 5. 22.

Table 5.22 Pearson correlations co-efficients between reading accuracy and comprehension scores for each group in grades 2 and 3.

	L1	EAL context 1	EAL context 2
Grade 2	r=0.55; Pr>r<.0001**	r=0.64; Pr>r<.0001**	r=0.09:Pr>r= 0.52
Grade 3	r= 0.66; Pr>r<.0001**	r=0.62;Pr>r<.0001**	r=0.53; Pr>r<.0005**

5.5.5. Correlations between syntax subtest and reading comprehension scores

The Pearson correlation co-efficients assessing the significance of the relationship between the reading comprehension and syntax subtest scores on the DELV-CR within each group in grades 2 and 3 are contained in appendix 5E. Significant correlations are highlighted on the table.

Within the L1 group there were significant correlations between reading comprehension and the scores on the Wh-question (r= 0.35; Pr>r= 0.0173) and passives subtests (r= 0.35; Pr> r= 0.0240) in grade 2, but no significant correlations between any of the syntax subtest scores and reading comprehension in grade 3.

Within the EAL groups there were no significant correlations between reading comprehension and the syntax subtest scores in grade 2 but in grade 3, there were significant correlations with the passives subtest in both groups (r= 0.48; Pr> r= 0.0003 in the EAL context 1 group and r= 0.37; Pr>r= 0.0205 in the EAL context 2 group) and with the articles subtest in the EAL context 1 group (r= 0.29; Pr> r= 0.0374). The analysis of developmental trends within the EAL groups and the differences between the groups highlighted passive comprehension and article use as language skills requiring additional instruction in the EAL learners. This finding is therefore supported by the significant relationship between these skills and reading comprehension in the EAL learners.

5.5.6. Correlations between pragmatics skills and reading comprehension

The Pearson correlation co-efficients in appendix 5E show that both the communicative role-taking and question asking-subtest scores were significantly correlated to the reading comprehension scores in the two EAL groups. Role-taking was significantly correlated to reading comprehension in grade 3 in both the EAL context1 (r= 0.29; Pr> r= 0.0374) and EAL context 2 (r= 0.31; Pr> r= 0.0205) groups. Question-asking was significantly correlated to reading comprehension in both grades 2(r= 0.35; Pr>r= 0.0090) and 3 (r= 0.27; Pr>r = 0.0555) in the EAL context 1 group and in grade 2 (r=0.41; Pr>r= 0.0051) in the EAL context 2 group. The combined findings that the EAL group in the integrated context (context 2), did not demonstrate significantly lower scores than their L1 peers on the pragmatics subtests in grades 2 or 3 or on reading comprehension in grade 3, and the significant correlations between the scores on the pragmatics subtests and reading comprehension, suggest that this group may well have better reading comprehension skills than their EAL peers in context 1 (EAL only), because of better pragmatics skills, specifically in role-taking and question-asking. This argument is substantiated by Snow (1998) who suggests that learning to read involves pragmatic awareness about the writer's intent to communicate in written mode as well as the insight that texts, like talk, convey information. Similarly, the ability to formulate questions to obtain information facilitates reading comprehension because the reader is able to check his/her understanding of the text by constantly questioning the writer's intended message.

An important implication is thus that these skills should be focused on in both language and reading comprehension instruction with EAL learners.

5.5.7. Correlations between semantic measures and reading comprehension

The Pearson correlation co-efficients in appendix 5E indicate that reading comprehension was significantly correlated with fast mapping of novel verbs in grade 2 in both the L1 group(r=0.31; Pr >0.0413) and the EAL group in context 1(r=0.32; Pr>r=0.0182), but there were no further significant correlations in these two groups. It is difficult to explain why there were so few significant correlations between the scores on the semantic subtests and reading comprehension in the EAL group in context 1, since the results obtained by this group indicated a need for instruction in all aspects of semantic processing. It is possible that their semantic processing skills were not sufficiently developed at this stage to predict their reading comprehension skills.

However, within the EAL group in the integrated context (context 2) reading comprehension was significantly correlated with the majority of semantic subtest scores in either grades 2 or 3, and since verb learning in particular was implicated as a skill requiring enhanced instruction in this group, these correlations with reading comprehension support this finding, and may also suggest that their more advanced semantic processing skills were supporting their reading comprehension.

5.5.8. Discussion: The relationship between oral and literate measures of academic language

The results pertaining to the development of reading and the correlations between the language and reading measures corroborate many of the existing research findings on additional language learners. The EAL participants were learning to read in English without or with very little support in their L1. This route to literacy has been questioned since research has shown that children learn to read more efficiently in their home language (August, Calderon, Carlo & Nutall, 2006). The results obtained by the EAL group in context 1 (EAL only) confirm that learning to read in an additional language can be a difficult and protracted process. There are a number of possible explanations for their relatively poor performance. Since most of their language proficiency scores were significantly correlated to reading comprehension and they performed significantly below the L1 and EAL groups in the integrated context (context 2) on most language measures in grade 3, the most obvious explanation is that they had not acquired sufficient English to understand what they were reading. This once again raises the question as to whether instruction in English is beneficial for these children.

The significant correlations between the language and reading comprehension scores within the two EAL groups on most language scores in both grades 2 and 3 confirms that oral language proficiency in English is a strong predictor of reading comprehension in additional language learners within the foundation phase (Geva, 2006; Geva & Genesee, 2006; August & Shanahan, 2006). Specifically the significant correlations between reading comprehension and passive comprehension, article use, communicative role-taking, question-asking and the majority of semantic processing skills in the EAL learners in context 2 (integrated), provides support for this conclusion and suggest that the teaching of these language skills can improve reading comprehension.

As discussed in chapter 2, Cummins (2008), Guthrie (2004) and Wong-Fillmore and Snow (2000) suggest that written texts are a reliable source of academic language, which underlines the importance of teaching reading comprehension by discussing not only the content but also the language used in texts. Teachers can transform text into usable input by helping children to make sense of what they read and drawing attention to how language is used in the materials they are reading (Wong-Fillmore, 1997).

Finally, the finding that there were children in the L1 and both EAL groups who could not read for meaning in either grades 2 or 3 is concerning and suggests that further assessment and remediation of reading is indicated for some of the participants of this study.

5.6 RESULTS AND DISCUSSION: CLASS DIFFERENCES WITHIN EACH CONTEXT

Since the participants within each group were taught by different teachers each year, and the teachers differed with respect to qualifications and experience as well as the extent to which they used the EAL children's home language in context 1, analyses of variance were conducted to determine whether the different classes within each group performed differently on each of the DELV-CR measures in each grade. The results of these analyses are captured in appendix 5F for the L1 and EAL groups in context 2, who were in the same classes, and in appendix 5G for the EAL group in context 1. Significant differences are highlighted in green on the tables.

As is evident from appendix 5F, there were no consistent significant differences between the classes in context 2 to suggest that different teachers had an impact on the learning of specific language skills although there is some evidence that different teachers may have had an influence on the EAL learners' acquisition of syntax and semantics in grade 2 and pragmatics and semantics in grade 3.

Within the EAL group in context 1 there were significant differences between the two classes in grade 3 on passive comprehension, the total syntax score, question-asking and verb contrasts, with the first class obtaining higher mean scores on three of the four measures, while the second class obtained a higher mean score on question-asking. While this may indicate differences between the two teachers in terms of their ability to facilitate the learning of these language skills, the fact that the significant differences are not consistently in favour of one class would mitigate against this conclusion.

The statistical comparison of classes within each group on the reading measures are reflected in table 5.23. Significant results are highlighted in green.

Table 5.23 ANOVA results of comparison between classes in each educational context on reading measures in Grades 2 and 3

	Reading Accuracy (no of errors)				Reading Comprehension (no correct)			
Grade	**Grade 2**		**Grade 3**		**Grade 2**		**Grade 3**	
	F value	**Pr>F**	**F value**	**Pr>F**	**F value**	**Pr>F**	**F value**	**Pr>F**
L1	1.91	0.0956	1.76	0.1375	1.20	0.3263	1.30	0.2836
EAL cont 1	0.51	0.4789	32.08	<.0001**	7.58	0.0080**	6.58	0.0008**
EAL cont 2	3.96	0.0013**	1.66	0.1422	0.93	0.5178	1.59	0.1620

There were no significant differences between classes with respect to the L1 learners, but in both grades 2 and 3 there were significant differences between the classes in the EAL group in context 1 (EAL only) on reading comprehension, suggesting that in this context, either one of the two grade 2 and 3 teachers may be more successful at teaching reading comprehension. There are also significant differences between the EAL context 1 classes on reading accuracy in grade 3, and between the grade 2 classes in the EAL context 2 (integrated) group.

In summary, there is some, albeit limited evidence for different teachers having a significant impact on the learning of specific language and reading skills, but since classroom observations were not conducted in this study, this conclusion remains speculative. A detailed analysis of the differences between classes is beyond the scope of this study but provides valuable implications for future research. In addition, the

deduction that the participants' development was due to instruction is partly supported by the finding that certain classes within each group obtained significantly higher mean scores on some measures, indicating that different teachers may have had an effect on the learning of some language and/or reading skills.

5.7 RESULTS: EXPOSURE GROUP COMPARISONS

In order to assess whether the extent of pre-school exposure to English had any effect on the development of academic language and reading, analyses of variance were conducted to compare the two exposure groups within the EAL groups on the language and reading measures in each grade. The results are reported in table 5.25. Significant results are highlighted in green.

Table 5.24 ANOVA results of comparison between exposure groups in each EAL context on total DELV-CR and reading scores in grades 1, 2 and 3

	EAL context 1 (EAL only)			**EAL context 2 (Integrated)**		
	Grade 1	**Grade 2**	**Grade 3**	**Grade 1**	**Grade 2**	**Grade 3**
Total Syntax score	F=0.25 Pr>F=0.6218	F=3.20 Pr>F=0.0758	F=0.66 Pr>F=0.4220	F=1.40 Pr>F=0.2428	F= 14.63 Pr>F= 0.0004**	F=0.01 Pr>F=0.9061
Total Pragmatics score	F=0.04 Pr>F=0.8512	F=1.15 Pr>F=0.2889	F=0.68 Pr>F=0.4137	F=9.39 Pr>F=0.0036**	F=0.07 Pr>F=0.7897	F=0.51 Pr>F=0.4793
Total Semantic score	F=0.09 Pr>F=0.7593	F=0.46 Pr>F=0.4988	F=0.59 Pr>F=0.4449	F=1.60 Pr>F=0.2121	F=0.08 Pr>F=0.775	F=0.83 Pr>F=0.3669
Reading Accuracy		F=1.49 Pr>F=0.2273	F=0.02 Pr>F=0.8856		F=2.88 Pr>F=0.0955	F=2.38 Pr>F=0.1315
Reading Comprehension		F=0.47 Pr>F=0.4901	F=0.64 Pr>F=0.4285		F=0.45 Pr>F=0.0547	F=0.77 Pr>F=0.3848

There were no significant differences between the exposure groups on any of the measures within the EAL group in context 1, but within the EAL group in context 2, pre-school exposure to English had a significant effect on the pragmatics score in grade 1 and on the syntax score in grade 2. However, by grade 3, there were no significant effects on any of the measures. Pre-school exposure to English did not have a significant effect on the semantic scores in either of the EAL groups. There is thus only very limited evidence for pre-school exposure to English having an effect on the development of academic language by EAL learners in the foundation phase, and whatever influence it may have is neither

consistent nor lasting. This may be because exposure to English in the pre-school period is more likely to have an effect on social language than on academic language proficiency.

5.8 RESULTS: GENDER COMPARISONS

Gender differences in language learning are frequently recorded in the literature, and to determine whether the boys and girls in this study differed significantly on the language or reading measures, one way analyses of variance were conducted. The results are reported in Table 5.24.

Table 5.25 ANOVA results of comparison between males and females on total DELV-CR and reading scores in Grades 1, 2 and 3.

		L1		EAL cont 1		EAL cont 2	
	Grade	**F value**	**Pr>F**	**F value**	**Pr>F**	**F value**	**Pr>F**
Total Syntax score	Grd1	0.97	0.3291	0.00	0.9560	0.87	0.3560
	Grd 2	0.54	0.4666	0.13	0.7160	1.36	0.2468
	Grd 3	2.24	0.1425	1.20	0.2794	0.83	0.3673
Total Pragmatics score	Grd 1	0.14	0.7093	0.03	0.8697	1.33	0.2551
	Grd 2	0.18	0.6738	0.11	0.7397	1.56	0.2188
	Grd 3	4.03	0.0516	0.86	0.3572	0.39	0.5382
Total Semantics score	Grd 1	1.38	0.2458	0.38	0.5485	0.06	0.8032
	Grd 2	0.80	0.3746	3.15	0.2885	0.03	0.8655
	Grd 3	0.15	0.7033	1.31	0.2244	0.28	0.6018
Reading accuracy	Grd 2	1.07	0.3070	0.88	0.3537	1.47	0.2326
	Grd 3	2.76	0.1046	0.73	0.3971	0.50	0.4819
Reading comprehension	Grd 2	0.82	0.3691	0.56	0.4592	3.89	0.0549
	Grd 3	0.61	0.4401	2.20	0.1328	0.37	0.5468

The statistical values in table 5.25 indicate that there were no significant gender effects on either the language or reading measures, suggesting that language differences between males and females are no longer apparent in the age group studied or alternatively that gender effects are less likely to be found on measures of academic language.

5.9. SUMMARY OF CHAPTER 5.

In summary, the results were positive in terms of the significant development of academic language in all three groups of participants. There is thus conclusive evidence that the learners in both contexts benefitted from the instruction they were receiving. There is also evidence that the teachers either intentionally or otherwise had a constructive effect on their language learning.

The language skills of the EAL learners in the integrated context (context 2) were not quite on par with their L1 classmates, but with support, the indications are that they could achieve similar proficiency by the end of grade 3. This is confirmed by the most encouraging finding that their reading comprehension scores were not significantly different to those of the L1 children in their classes. In general the results in this context show that

- being educated in English as an L1 is an advantage, and
- being an EAL learner in an integrated context with L1 teachers is better than being an EAL learner in an EAL only context.

However, since less than 10% of the South African population speaks English as a L1, it would be unrealistic to suggest that all children should be in integrated contexts with L1 teachers.

The relatively poorer language and reading comprehension skills of the EAL children in context 1 (EAL only) on the other hand, are cause for concern. The reasons for their lower achievement levels may be a combination of:

- socio-economic factors affecting their learning of both their primary language and English,
- the absence of L1 models,
- non-facilitative teaching practices

Whatever the cause of their difficulties, there are strong indications that these children should receive intervention in the form of enhanced English instruction much earlier, possibly even before Grade 1. This may counteract the initial disadvantage they demonstrate at the end of grade 1. Simultaneously, support for the development of their home languages should be a more formal focus in the instructional programme.

The results provide some evidence that typically developing EAL children and monolingual English – speaking children with language impairment demonstrate both similar and different patterns of difficulty

in acquiring English. Both groups appear to have difficulty with the processing of complex syntax in passive sentences and in verb learning but EAL children also have difficulty with articles, which may be due to cross-linguistic transfer. Unlike monolingual children with SLI, typically developing EAL children do not seem to have difficulty with understanding complex Wh-questions if they receive the necessary scaffolding to develop these structures.

The results also confirm the relationship between oral proficiency and reading comprehension in the additional language, and suggest that reading instruction should not be limited to developing decoding skills but should also address comprehension.

Although there was limited evidence that the experience and skills of different teachers within each context had an effect on the language and reading skills of the learners, the results pertaining to the class differences suggest that this is an area for future research. Classroom observations coupled with assessment of specific language and literacy skills may reveal whether teachers and/or teaching practices have significant effects on learning. In addition, the effects of advising and assisting teachers on language facilitation techniques could be assessed.

Finally, it appears that the development of academic language and literacy is not significantly influenced by the amount of exposure to English in the pre-school period or by gender.

CHAPTER 6

RESULTS AND DISCUSSION: WORKING MEMORY AND LANGUAGE IMPAIRMENT

This chapter describes and discusses the results obtained on the working memory measures and presents an analysis of the participants identified as language impaired.

6.1. WORKING MEMORY RESULTS

Working memory was assessed in this study to evaluate the value of this cognitive processing measure in the assessment of linguistically diverse learners and to establish whether there is a relationship between working memory and language measures which would implicate working memory as a component of aptitude for language learning. The mean scores, standard deviations and range of scores obtained by each group on the working memory measures are recorded in table 6.1.

Table 6.1 Mean scores, standard deviations and range of scores obtained by each group on each working memory measure in grade 2

	Statistics	**Digit Repetition**	**Dot matrix**	**Listening Recall**	**Spatial Recall**	**Processing Listening Recall**	**Processing Spatial Recall**	**Sentence Repetition**
L1 (n=46)	Means	25.66	19.95	9.19	15	20.71	37.09	26.51
	Std dev	3.47	2.52	2.99	3.19	9.05	12.35	4.33
	Range	21-32	16-24	2-14	10-21	5-44	19-60	17-32
EAL context 1 (n=55)	Means	23.43	15.96	6.45	12.16	9.8	22.9	16.87
	Std dev	3.22	3.27	2.85	4.12	4.44	11.61	6.83
	Range	16-29	10-23	1-14	1-20	1-22	1-54	0-30
EAL context 2(n=45)	Means	25.39	17.65	8.56	14.09	19.65	26.43	23.33
	Std dev	3.63	3.41	3.85	5.62	11.59	14.15	7.57
	Range	19-31	12-25	2-16	5-25	3-53	8-58	0-32

As in the case of the language measures, the standard deviations are larger in the EAL groups than the L1 group on some of the working memory measures, specifically the dot matrix, listening recall, spatial recall and sentence repetition measures, indicating greater individual variation in the EAL groups. The

processing listening recall scores of EAL learners in context 1 (EAL only) varied less (std. dev=4.44) than in the other two groups (std dev = 9.05 in L1 and 11.59 in EAL context 2 groups respectively). This measure, which relies on language knowledge was thus less variable within the EAL context 1(EAL only) group, with the scores more clustered around the mean.

The mean scores in table 6.1 are displayed graphically in figure 6.1.

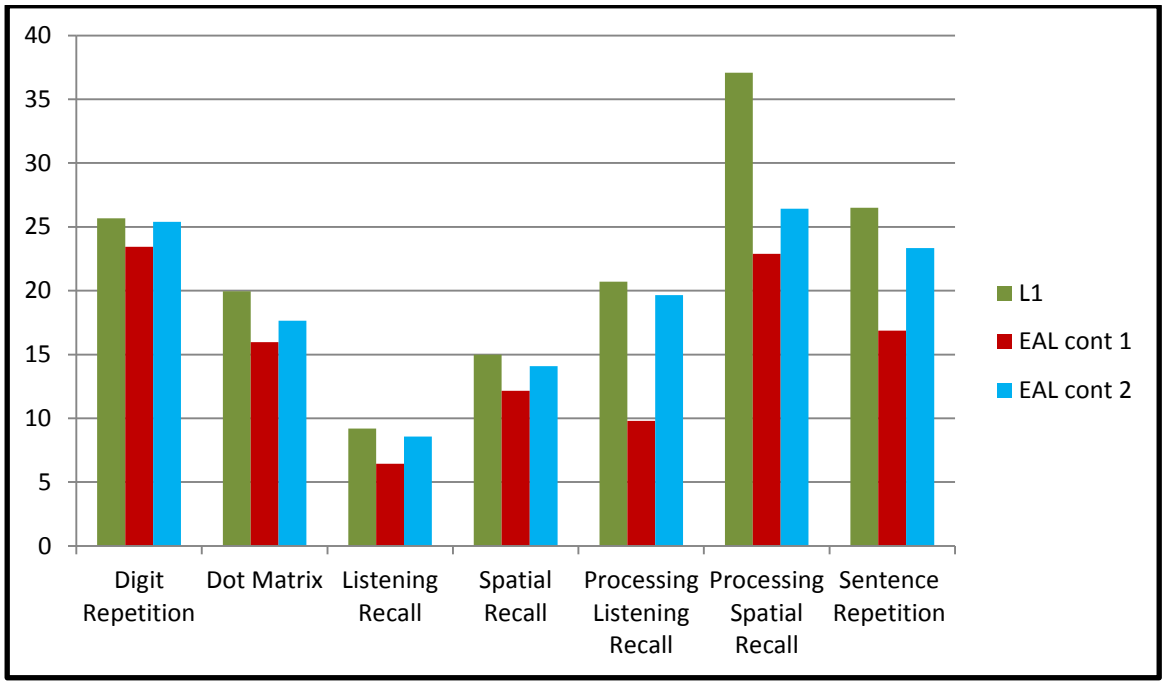


Figure 6.1 . Mean Scores obtained by each group on each working memory measure in grade 2

It is not possible to compare the scores obtained on each WM measure within each group since the maximum possible score varies across the measures, but the bar graphs in figure 6.1 suggest that the three groups demonstrate similar profiles across the measures.

The results of the independent sample t-tests comparing the working memory scores obtained by the three groups of participants are contained in table 6.2. Significant differences are highlighted in green on the table.

Table 6.2 Independent sample t-tests comparing groups on working memory measures

Comparison	L1 and EAL cont 1		L1 and EAL cont 2		EAL cont 1and 2	
WM measure	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**
Spatial Recall	2.84	0.0058**	0.65	0.5170	-1.68	0.0969
Processing Listening Recall	7.05	<.0001**	0.34	0.7383	-5.45	<.0001**
Processing Spatial Recall	4.68	<0.0001**	2.85	0.0112*	-1.15	0.2556
Sentence Repetition	7.89	<0.0001**	2.33	0.0222*	-4.31	<0.0001**

The results of the t-tests contained in table 6.2 suggest that the working memory measures employed in this study are not unbiased with respect to linguistically diverse learners and as suggested in Chapters 1 and 2, raise a number of questions pertaining to the validity of this construct or at least the manner in which it is measured. In particular, it would seem that the various measures that are used to assess the components of working memory capacity (WMC) are heavily reliant on language knowledge and processing (Montgomery, Magimairaj & Finney, 2010). Maimela-Arnold & Evans (2005) argue that WMC and linguistic knowledge are not separable constructs. Rather WM reflects the activation of specific representations in long term memory (Cowan, Nugent, Elliott, Ponomarev & Sault, 2005), and limited WMC is a reflection of weak linguistic representations (Maimela-Arnold, Evans & Coady, 2008). The strength, access and retrieval of representation are dependent on the frequency of input of linguistic units (MacDonald & Christiansen, 2002). These statements are supported by the following findings.

The values in table 6.2 show significant differences between the EAL learners in context 1 (EAL only) and the L1 learners on all the working memory subtests. The mean scores in table 6.1 and the bar graphs in figure 6.1 show that the EAL group in context 1 (EAL only) obtained significantly lower scores than the L1 group on all measures. Since all their language scores were also significantly below the L1 group in grade 2 when the working memory assessment was conducted, there is no question that this group did not perform as well on the working memory measures because of their limited language proficiency. The effects of their language limitations were evident across all the working memory measures, even those that reportedly rely less on language knowledge such as the digit repetition test (Harrington & Sawyer, 1992), and the visuo-spatial short-term (dot matrix) and working memory tests (spatial recall and

processing spatial recall). These measures require understanding of the instructions, which may well have been a problem for the EAL learners in context 1 (EAL only). However, they did perform better on these tests than on the verbal working memory measures. This implies that the more dependent the tests are on language knowledge, the more limited language proficiency will influence the results. This is also borne out by the fact that they did not obtain significantly lower scores than the EAL group in the integrated context (context 2) on the spatial recall (t= -1.68; Pr>t= 0.0969) and processing spatial recall (t= -1.15; Pr > t= 0.2556) subtests.

There were fewer significant differences between the L1 and EAL groups in the integrated context (context 2). The EAL learners in context 2, who did not differ significantly from their L1 peers on all the language measures in grade 2, and are thus more linguistically proficient than the EAL learners in context 1, obtained significantly lower scores than the L1 learners on only three of the working memory measures. Specifically, the EAL learners in the integrated context (context 2) obtained significantly lower scores than the L1 group on the dot matrix (t=2.53; Pr>t=0.0154), processing spatial recall (t=2.85; Pr>t=0.0112) and sentence repetition tests (t=2.33; Pr>t=0.0222). It is interesting that they performed similarly to the L1 group on the verbal short-term (digit repetition) and working memory measures (sentence recall and processing sentence recall) since one would assume that these tests are the most sensitive to different levels of language functioning. While the sentence repetition test appeared to be highly sensitive to different levels of language proficiency, it appears from these results that the dot matrix subtest which assesses short-term visual memory and the processing component of the visual recall test are also highly sensitive to differences in language proficiency, perhaps because of the complexity of their instructions or response modes.

The working memory measure used in this study is thus not unbiased with respect to linguistic differences and cannot be used to assess EAL learners in English. It would be necessary to establish how these children perform if they were tested in their first languages in order to reveal whether the measures assess WMC or language processing, and whether it is possible to separate these two constructs at all.

6.2. Comparison with AWMA scoring system

An analysis of the proportion of learners in each group whose scores fell into each scoring category of the AWMA is represented graphically in figure 6.2 for each of the working memory measures.

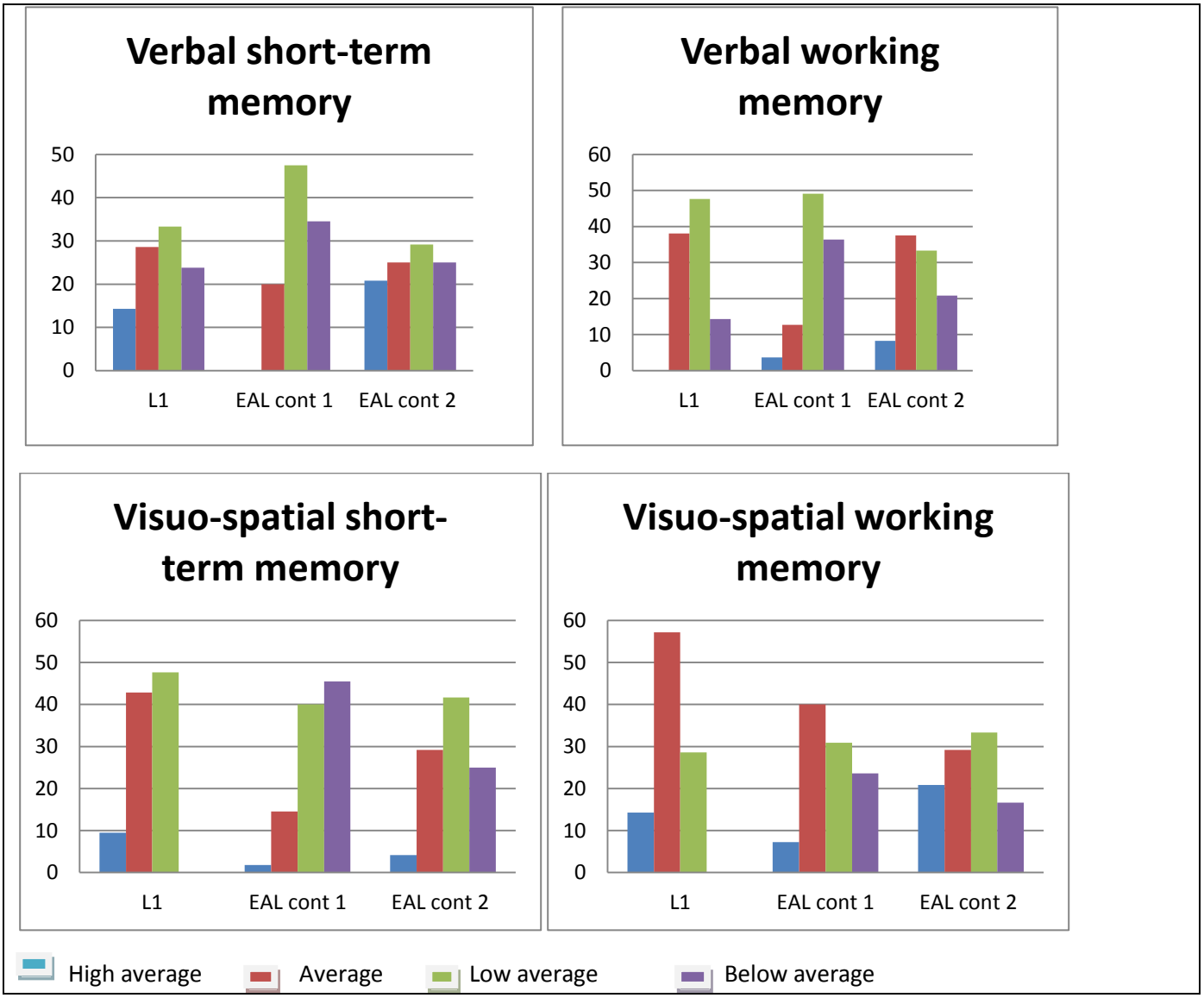


Figure 6.2 Proportion of learners in each group in each scoring category on the AWMA

The graphs in figure 6.2 reveal a more normal distribution of scores in the L1 and EAL groups in the integrated context (context 2) than in the EAL group in context 1 (EAL only), and show that the majority of children in the L1 and EAL groups in context 2 performed in the average and low average categories on all measures, while the majority of children in the EAL context 1 group (EAL only) performed in the low average and below average categories on all measures. In addition there were more children in the EAL context 2 group than in the L1 group scoring in the below average category on the verbal working memory measures. None of the L1 children scored in the below average category on the visuo-spatial

memory measures. These results confirm that using the AWMA scoring system would not be valid in assessing working memory in EAL learners, because the results are skewed.

6.3. CORRELATIONS BETWEEN WM MEASURES AND DELV AND READING SCORES

The results on the WM measures were correlated to the results on the language measures within each group in order to establish the nature of the relationship between different components of working memory and language processing, and to determine whether working memory may be considered a component of aptitude for language learning.

The correlations between the working memory measures and the total DELV-CR and reading scores are reflected in table 6.3. Significant correlations are highlighted in green on the table.

The Pearson correlation co-efficients assessing the relationship between the working memory and language measures within each domain are recorded in appendix 6A for each of the groups respectively.

The most consistent finding in relation to the correlations in table 6.3 was the number of strong ($r>0.5$) and significant correlations between the DELV-CR language measures and the sentence repetition scores, which reportedly reflect the episodic buffer component of working memory and was included in this study for this purpose, despite the fact that it is not part of the AWMA battery.

This finding indicates that this component of working memory, responsible for the integration of information from short-term memory with the language processing system (Vance,2008; Alloway et al., 2004), is strongly related to language proficiency and is thus implicated as a component of aptitude for language learning in all children. This conclusion is supported by the significant correlations reflected in appendix 6A, showing that sentence repetition is significantly correlated to passive comprehension and all the subtest scores on the semantics domain of the DELV-CR in the L1 group; to all the DELV-CR subtest scores (except Wh-questions and quantifiers) in the EAL context 1 group, and to all the DELV-CR subtest scores (except articles and fast mapping of novel verbs) in the EAL context 2 group.

The sentence repetition scores are also significantly correlated to the reading comprehension scores in both the EAL groups, suggesting that the episodic buffer component of working memory is also related to reading comprehension in EAL children.

Table 6.3 Pearson correlation co-efficients reflecting the relationship between each of the working memory scores and the DELV-CR and reading scores within each group.

Measure	Digit Rep	Dot matrix	Listening recall	Spatial recall	Processing Listening Recall	Processing Spatial Recall	Sentence Repetition
L1 group							
Total syntax score	r= 0.47 Pr>r=0.0303	r= 0.24 Pr>r=0.2961	r=0.12 Pr>r=0.6188	r=0.41 Pr>r=0.0671	r=-0.03 Pr>r=0.8936	r=0.35 Pr>r=0.1194	r= 0.4 Pr>r=0.0105
Total pragmatics score	r= -0.11 Pr>r=0.6225	r= 0.22 Pr>r=0.3455	r=0.03 Pr>r=0.8895	r=0.19 Pr>r=0.4199	r=-0.04 Pr>r=0.8803	r=0.05 Pr>r=0.8357	r= 0.37 Pr>r=0.0185
Total semantics score	r= 0.26 Pr>r=0.2517	r= 0.19 Pr>r=0.3984	r=0.38 Pr>r=0.0884	r= 0.38 Pr>r=0.0929	r=0.27 Pr>r=0.2299	r= 0.34 Pr>r=0.1313	r= 0.6 Pr>r=0.0001
Reading accuracy	r= 0..20 Pr>r=0.3901	r= -0.18 Pr>r=0.4392	r=0.46 Pr>r=0.0418	r=-0.12 Pr>r=0.6261	r=0.66 Pr>r=0.0015	r= -0.07 Pr>r=0.7672	r= 0.15 Pr>r=0.3477
Reading comprehension	r= 0.44 Pr>r=0.0516	r= -0.14 Pr>r=0.5521	r=0.44 Pr>r=0.0532	r=0.34 Pr>r=0.1442	r=0.34 Pr>r=0.1382	r=0.37 Pr>r=0.1060	r= 0.31 Pr>r=0.0530
EAL context 1 group							
Total syntax score	r= 0.09 Pr>r=0.5156	r=-0.01 Pr>r=0.9227	r=0.28 Pr>r=0.0359	r=-0.09 Pr>r=0.4960	r= 0.26 Pr>r=0.0581	r= -0.05 Pr>r=0.7431	r=0.49 Pr>r=0.0002
Total pragmatics score	r= -0.02 Pr>r=0.9035	r=0.01 Pr>r=0.9309	r=0.21 Pr>r=0.1315	r=0.01 Pr>r=0.9268	r=0.18 Pr>r=0.1872	r=0.13 Pr>r=0.3400	r= 0.54 Pr>r=0.0001
Total semantics score	r= 0.04 Pr>r=0.7514	r=-0.08 Pr>r=0.5599	r=0.21 Pr>r=0.1271	r=-0.03 Pr>r=0.8231	r=0.18 Pr>r=0.1864	r= 0.08 Pr>r=0.5500	r= 0.48 Pr>r=0.0003
Reading accuracy	r= 0.21 Pr>r=0.1160	r=-0.02 Pr>r=0.8644	r=-0.14 Pr>r=0.2978	r=0.06 Pr>r=0.6897	r=-0.09 Pr>r=0.463	r=0.14 Pr>r=0.3143	r= 0.05 Pr>r=0.7170
Reading comprehension	r= 0.23 Pr>r=0.0954	r=0.04 Pr>r=0.7821	r= 0.04 Pr>r=0.7967	r=0.19 Pr>r=0.1459	r=0.04 Pr>r=0.7727	r=0.22 Pr>r=0.1146	r= 0.39 Pr>r=0.0041
EAL context 2 group							
Total syntax score	r= 0.42 Pr>r=0.0478	r=0.41 Pr>r=0.0521	r=0.57 Pr>r=0.0048	r=0.32 Pr>r=0.1409	r=0.47 Pr>r=0.0245	r=0.47 Pr>r=0.0249	r= 0.64 Pr>r=0.0001
Total pragmatics score	r= -0.17 Pr>r=0.4425	r= 0.16 Pr>r=0.4747	r=-018 Pr>r=0.4216	r=0.37 Pr>r=0.0806	r=-0.20 Pr>r=0.3794	r=0.31 Pr>r=0.1528	r= 0.66 Pr>r=0.0001
Total semantics score	r= 0.64 Pr>r=0.0010	r=0.39 Pr>r=0.0599	r=0.52 Pr>r=0.0111	r=0.32 Pr>r=0.1314	r=0.43 Pr>r=0.0390	r=0.38 Pr>r=0.0777	r= 0.63 Pr>r=0.0001
Reading accuracy	r= 0.19 Pr>r=0.3863	r=-0.13 Pr>r=0.5719	r=0.21 Pr>r=0.3546	r=0.06 Pr>r=0.7742	r=0.21 Pr>r=0.3602	r=0.15 Pr>r=0.5138	r= 0.24 Pr>r=0.1349
Reading comprehension	r= 0.30 Pr>r=0.1620	r=0.40 Pr>r=0.0585	r=0.57 Pr>r=0.0046	r=0.19 Pr>r=0.3915	r=0.49 Pr>r=0.0182	r= 0.21 Pr>r=0.3462	r= 0.49 Pr>r=0.0014

Table 6.4 provides a summary of the language and reading measures on which significant correlations were found with sentence repetition in each of the groups.

Table 6.4 Language and reading measures on which significant correlations with sentence repetition were found in each group

	L1	EAL context 1	EAL context 2
Wh-questions			√
Passives		√	√
Articles		√	
Total syntax score	√	√	√
Role-taking		√	√
Narratives		√	√
Question-asking			√
Total Pragmatics score	√	√	√
Verb Contrasts	√	√	√
Preposition Contrasts	√	√	√
Quantifiers	√	-	√
Fast Mapping Real Verbs	√	√	√
Fast Mapping Novel Verbs	√	√	-
Total Semantics Score	√	√	√
Reading Accuracy	-	-	-
Reading Comprehension		√	√

KEY: √: correlated with sentence repetition in all three groups

The total scores on the three DELV-CR domains were significantly correlated with the sentence repetition scores in all three groups, and in addition three of the five semantic subtest scores were also significantly correlated to sentence repetition across the groups. These findings have a number of implications. If sentence repetition is indeed a reflection of the episodic buffer zone in working memory capacity, then this component of WMC is strongly related to language processing, as assessed on the DELV-CR. Since the role of the episodic buffer zone in language processing has not been researched (Juffs & Harrington, 2011), this study provides new evidence that it is important for language processing in both L1 and EAL children. This means that sentence repetition may serve as a valid predictor of language learning success across all domains and could possibly be used as an aptitude measure. The sentence repetition task is relatively quick and easy to administer, requiring only that the children repeat the sentences read aloud by the examiner. Its sensitivity to academic language proficiency in both groups of EAL learners, who were at different stages of English proficiency, makes it a potentially very useful tool in assessing these children. This finding is certainly worthy of further research. For example, it can be used as a screening tool to identify EAL children who may be at risk for language learning difficulties, provided that the children are compared to their peer group within a particular context of education. This is because there were significant differences between the EAL children within the two contexts and between the EAL and

the L1 group in context 2 on this measure. At this stage there is no normative data on how EAL children perform on this measure but a large-scale national research study may be able to provide information on whether such standardisation is possible.

Although it has not always been recognized as a working memory measure, sentence repetition has a long and extensive history as an assessment procedure in speech-language therapy and such tasks are included in many formal tests (Vance, 2008). The rationale for its use has always been that children would not be able to repeat sentences beyond their level of language knowledge and processing capacity (Conti-Ramsden, Botting & Faragher, 2001). Critics argue that sentence repetition is merely a measure of short-term memory, but although it relies on short-term memory, Vance (2008) suggests that existing language knowledge also provides support for short-term memory and thus sentence recall assesses the integration of these two systems. Irrespective of this argument, the findings in this study confirm that the results on the sentence repetition task and the language and reading comprehension measures are correlated, adding to the validity of each as a measure of language processing in both L1 and EAL learners.

With respect to the other components of working memory, the findings are less definitive.

6.4. CORRELATIONS BETWEEN WORKING MEMORY AND LANGUAGE MEASURES IN L1 GROUP

Within the L1 group, there was a positive significant correlation between digit repetition and the total syntax score (r= 0.47; Pr>r= 0.0303), which was most likely due to the significant correlation between scores on the passive subtest and digit repetition (r= 0.51; Pr>r= 0.0179). The digit repetition scores were also significantly correlated to the scores on the question asking subtest (r= 0.45; Pr>r= 0.0413). The L1 children thus appeared to have tapped their verbal short-term memory capacity in understanding passive constructions and formulating appropriate questions. The dot matrix scores were significantly correlated to the scores on the quantifier subtest (r=0.56; Pr>r= 0.0105), perhaps indicating that visuo-spatial short-term memory is used in responding to the items on the quantifier subtest. The listening recall (r= 0.56; Pr>r= 0.0088) and processing listening recall scores (r= 0.54; Pr>r= 0.0115) were significantly related to the scores on the fast mapping of novel verbs subtest and to the reading accuracy scores (r= 0.46; Pr>r= 0.0418 and r= 0.66; Pr>r= 0.0015 respectively), suggesting that L1 children recruit verbal working memory capacity for the processing of novel verbs and in reading decoding. There were

no significant correlations and hence no relationships between visuo-spatial working memory and the language or reading scores in the L1 group.

6.5. CORRELATIONS BETWEEN WORKING MEMORY AND LANGUAGE MEASURES IN EAL CONTEXT 1 GROUP (EAL ONLY)

Within the EAL context 1 group the total syntax score was significantly correlated to the listening recall measure on the AWMA (r= 0.28;Pr> r= 0.0359), most likely due to the significant correlation between the Wh-questions subtest score and the listening recall score(r=0.3;Pr>r=0.0276). Otherwise there were no significant correlations between the verbal short-term or working memory scores and the language measures in this group. It was interesting that there were significant correlations between the scores on the preposition contrast subtest and the spatial recall (r= 0.3; Pr>r= 0.0233) and processing spatial recall scores (r= 0.33;Pr>r= 0.0128) in this group, suggesting that they tapped their visuo-spatial working memory capacity in responding to the preposition contrast items, which are also spatial in nature.

6.6. CORRELATIONS BETWEEN WORKING MEMORY AND LANGUAGE MEASURES IN EAL CONTEXT 2 GROUP (INTEGRATED)

In contrast, the EAL context 2 group, appeared to tap both their verbal and visual short-term and working memory capacities in responding to the different subtests on the DELV-CR, as is evident from the number of significant correlations in appendix 6A. There were significant correlations between the verbal short-term memory measure as assessed on the digit recall test, and the total syntax score, the passives subtest, the total semantic score, the preposition contrast, quantifier and fast mapping of novel verbs subtests.

There were also significant correlations between the dot matrix scores, assessing visuo-spatial short-term memory, and the total syntax score, the verb contrast score and the total semantics score.

With respect to verbal working memory, there were significant correlations between the listening recall scores and the passives subtest scores, the total syntax score, the fast mapping of novel verbs subtest scores and the total semantics scores as well as the reading comprehension score. The processing listening recall scores were significantly correlated to the same language measures as the listening recall scores just mentioned.

There were also significant correlations between the visuo-spatial working memory measures (spatial recall and processing spatial recall) and the question-asking, verb contrasts, passives, total syntax and role-taking subtests.

6.7. INTERPRETATION OF CORRELATIONS

The correlations obtained within the different groups between the different working memory measures on the AWMA and the language measures confirm that the relationships between these constructs is complex and depend on the type of task as well as the stage of language acquisition (Juffs & Harrington, 2011). In order to interpret the correlational findings, a summary of the measures found to correlate in the three groups of participants is provided in Table 6. 5. Since correlations between the WM measures and the total DELV-CR scores would be influenced by correlations on the subtests within each domain, the total scores are not considered on the table.

It should also be noted that the interpretation of correlations is subject to a number of standard precautions including effect size (the strength of the association between two measures), sample size and range of scores (Juffs & Harrington, 2011). Since the sample sizes were fairly similar across the three groups, the fact that larger samples are likely to result in more significant correlations (Juffs & Harrington, 2011) would not have played a major role. Although the correlations reported in table 6.5 were significant, some of the effect sizes were weak ($r < 0.5$), indicating that only some of the variance between the two variables is accounted for. Correlations are also sensitive to the range of scores, and if participants are too closely grouped in terms of ability it is likely that no correlation will be evident. Since the score ranges varied between the measures within each group this factor may also have played a role in producing non-significant correlations on some measures.

Table 6.5 Summary of working memory and language measures found to correlate in each of the groups

	Digit Repetition	Dot Matrix	Listening Recall	Spatial Recall	Processing Listening Recall	Processing Spatial Recall
Wh-questions			EAL cont. 1			EAL cont. 2
Passives	L 1 EAL cont. 2		EAL cont. 2		EAL cont. 2	
Articles						
Role-Taking						EAL cont. 2
Narratives						
Question-asking	L1			EAL cont. 2		
Verb Contrasts		EAL cont. 2				EAL cont. 2
Preposition Contrasts	EAL cont. 2			EAL cont. 1		EAL cont. 1
Quantifiers	EAL cont. 2	L1				
Fast Mapping Real Verbs						
Fast Mapping Novel Verbs	EAL cont. 2		L1 EAL cont. 2		L1 EAL cont. 2	
Reading accuracy			L1		L1	
Reading Comprehension	L1		EAL cont. 2		EAL cont. 2	

It is immediately apparent from Table 6.5 that there were many WM and language measures that correlated within the EAL group in the integrated context (context 2). This group, who may be considered to be at an intermediate stage of language acquisition in relation to their L1 peers and the EAL group in context 1, thus recruited a number of verbal and visuo-spatial short-term and working memory capacities in the processing of many of the language assessment tasks. Perhaps this suggests that working memory is more engaged when EAL learners are beyond a basic level of acquisition but not quite at the more advanced level of proficiency as L1 learners. This conclusion is supported by the finding that the EAL group in context 1, who may be considered to be at a relatively more basic level of language proficiency, only tapped their verbal short-term memory in processing Wh-questions, on which they were already more proficient than the other language measures in grade 2.

It is also interesting that on the more difficult language tasks, namely passive comprehension and fast mapping of novel verbs, on which both the L1 and EAL learners in the integrated context (context 2),

obtained lower scores, both groups tapped the same verbal short-term and working memory capacities (phonological memory, listening recall and processing listening recall). This finding implies that verbal working memory is recruited for the processing of more demanding language tasks in children who are above a basic level of proficiency. This may relate to the discussion in chapter 2 on the use of larger cortical networks for more difficult processing tasks (Williams, 2010). The L1 and EAL children in the integrated context (context 2) can be said to be recruiting more general cognitive processing functions (verbal working memory) in the processing of more difficult language tasks. The EAL children in context 1 (EAL only), who were still at a more basic level of language proficiency did not show this pattern.

These findings raise very interesting questions about the processing of additional languages, and relate to the discussion in chapter 2 on implicit and explicit learning. The lack of significant correlations between WM and language in the EAL context 1 group, who were at a more basic stage of acquisition, supports the claim by Ellis (2008) that young children may be using automatic, implicit L1 mechanisms in the processing of the L2. However, the correlations seen in the L1 and EAL groups in the integrated context (context 2) also suggest that once EAL children reach a certain stage of proficiency they recruit more explicit, general cognitive learning mechanisms particularly when the language task is difficult.

In general, the correlations between the verbal short-term and working memory measures and many of the language measures in the L1 and EAL groups in the integrated context (context 2), confirm that WMC plays a role in some but not all aspects of language processing and reading, and that the nature of the language task is an important consideration. For example, verbal working memory did not appear to be implicated at all in the processing of the articles, communicative role-taking, narratives, verb contrast and fast mapping of real verbs subtests. In fact, none of the working memory measures correlated with the scores on the articles, narratives and fast mapping of real verbs subtests in any of the groups.

The correlations between the visuo-spatial short-term and working memory measures and some of the language measures revealed that the visual domain may be more involved in the processing of some language tasks than researchers may think, and that these measures should be retained in working memory batteries and researched in more detail. However, some of these correlations are more difficult to explain than others and it is not always clear why visuo-spatial working memory would be related to certain language measures. For example, while it is possible that spatial recall and processing would be related to providing preposition contrasts, as seen in the correlation between these measures in the EAL context 1 group, it is less apparent why there would be correlations between spatial recall and

formulating questions and between spatial processing and passive comprehension, role-taking and providing contrastive verbs, as seen in the EAL group in context 2. It is possible that the nature of the tasks used in assessing these language skills, specifically the use of pictures requiring spatial processing, could account for these correlations. The L1 learners also appeared to tap their short-term visual memories in understanding the quantifier items as reflected in the significant correlation between the scores on this language measure and the dot matrix subtest on the AWMA.

In summary, the complex and inconsistent nature of the relationship between working memory and language processing revealed in this study does not provide conclusive evidence for either verbal or visuo-spatial short-term or working memory as components of aptitude in young children acquiring an additional language in an instructional setting. Rather, it appears that different working memory components are recruited for the processing of various language tasks; that L1 and EAL learners tap different working memory capacities depending on the nature and complexity of the task as well as the learners' level of language proficiency. The only working memory component that is strongly linked to language processing is the episodic buffer zone as assessed on the sentence repetition task.

As discussed in chapter 2, the individual variation observed among the EAL learners must therefore be attributed to differences in other intrinsic factors such as learning style or information processing patterns (Dornyei & Skehan, 2003), language learning strategies (O'Malley & Chamot, 1990; Oxford, 1990), motivation (Dornyei & Skehan, 2003; Baker, 2006; Paradis, 2009) and personality characteristics (Paradis, 2009). Additional language acquisition is a complex, dynamic process dependent on a host of different variables and it is virtually impossible to explain why some children are more successful than others. It is important to note however, that there were individual EAL children in both contexts 1 and 2, who obtained language scores comparable with those obtained by the L1 group. These children clearly have resources that make them successful language learners irrespective of the context of education and the nature of the instruction they are receiving.

6.8. THE EFFECTS OF CLASS, EXPOSURE GROUP AND GENDER ON WORKING MEMORY

The results of the statistical comparison between classes within each group, and the gender and exposure group comparisons within the two EAL groups on the working memory measures are contained in appendix 6B.

There were no statistically significant differences between the classes in any of the groups on the working memory measures, which was to be expected since working memory would not be an instructional goal.

Within the EAL group in context 1, the difference between the boys and girls was significant on the dot matrix subtest (F=8.51; Pr>F= 0.0052) and within the EAL group in context 2, the males and females differed significantly on the spatial recall measure (F= 4.93; Pr>F= 0.0374). In both cases, the boys obtained higher mean scores than the girls, suggesting that they have an advantage on visuo-spatial short-term memory tasks (Golon, 2007). However, these findings were not consistent across all the groups and firm conclusions cannot be drawn.

There were significant differences between the exposure groups within the EAL group in context 1 on the processing spatial recall task (F=4.95; Pr>F= 0.0303) and within the EAL group in context 2 on the dot matrix subtest (F= 5.95; Pr>F= 0.0237), the listening recall task (F= 5.36; Pr>F= 0.0308) and the processing listening recall task (F=4.75; Pr>F=0.0408). These results further confirm that performance on the WM measures seem to be affected by language proficiency, since children with more exposure to English in the pre-school period do better on tasks involving verbal material.

6.9. CHILDREN WITH LANGUAGE IMPAIRMENT

6.9.1. Identification of children with language impairment

Based on the fact that the L1 participants in this study performed similarly to the DELV-CR age-matched groups on all language domains, the English-speaking children were identified as at risk for language impairment if their scores were two standard deviations below the peer group mean and/or fell in the "weakness" category in the DELV-CR scoring system on two or more domains in any of the grades. The criteria used to identify the EAL children as at risk for language impairment were different since the mean scores obtained by the two groups of EAL participants in this study were lower than those reported for the DELV-CR criterion groups. The criterion of two standard deviations below the **peer group** mean on two or more language domains in any of the grades was thus adhered to.

Table 6. 6 provides the mean raw scores, standard deviations and the raw scores corresponding to 2 standard deviations below the mean obtained by each group on each DELV-CR domain in each grade.

The raw scores corresponding to 2 standard deviations below the mean have been rounded off to the nearest whole number and are highlighted on the table.

Table 6.6 Mean raw scores, standard deviations and raw scores corresponding to 2 standard deviations below the mean obtained by each group on each DELV-CR domain in each grade.

DELV –CR Domain	Statistics	L1			EAL cont 1 (EAL only)			EAL cont 2 (integrated)		
		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 (total possible =32)	Mean raw score	26.8	28.6	29.5	16.6	22.4	24.7	23.0	26.3	27.4
	Std Dev	3.39	2.35	2.06	4.8	4.3	4.24	5.53	4.05	3.79
	2 SD < mean	20.02	23.9	25.38	9.4	15.95	18.34	11.94	17.2	19.82
	Rounded off	20	24	25	9	16	18	12	17	20
Pragmatics (total possible = 24)	Mean raw sore	19.2	21	21.7	11.2	17.3	19.1	17	21	22
	Std Dev	3.39	2.08	1.51	5.04	4.5	3.12	5.02	6.72	2.41
	2 SD <mean	12.42	16.84	18.68	3.64	10.25	14.92	6.96	7.56	17.18
	Rounded off	12	17	19	4	10	15	7	8	17
Semantics (total possible = 46)	Mean	33.7	35.78	38	21.9	27.18	30.4	29.15	32.61	35.4
	Std Dev	4.73	4.47	3.62	5.36	5.48	6.00	6.33	4.46	4.69
	2 SD <mean	24.24	26.84	30.76	13.05	19.98	21.4	16.49	23.69	26.02
	Rounded off	24	27	31	13	20	21	17	24	26

In grade 1, there were five L1 children who met the criteria for language impairment, but by grade 2 only two still met the criteria. Within the EAL group in context 1 (EAL only), there was only one child who met the criteria in grade 1 and she continued to perform below the peer group means in grades 2 and 3. There were two additional children in this group who met the criteria in grades 2 and 3. These three children were thus included as at risk for language impairment.

In the EAL group in context 2 (integrated) there were two children who met the criteria in grade 1 and they continued to fulfil the criteria in grades 2 and 3.

The total raw scores obtained by the children identified as at risk for language impairment on the DELV-CR are contained in Table 6.7. Those scores corresponding to 2 standard deviations below the peer

group mean are highlighted for each language domain in each year. The children are identified by their initials on the table.

Table 6.7 Total raw scores obtained by each child identified as at risk for language impairment on the DELV-CR domains in each grade.

DELV-CR domain		Syntax			Pragmatics			Semantics		
Child	Group	Grd 1	Grd 2	Grd 3	Grd 1	Grd 2	Grd 3	Grd 1	Grd 2	Grd 3
Z.G.	L1	18	24	25	10	17	19	24	27	29
S.P.	L1	21	24	26	18	20	22	24	26	30
O.M.	EAL con 1	14	19	20	5	6	10	17	17	19
C.M.	EAL con1	13	18	22	5	10	13	18	20	20
M.K.	EAL con1	8	10	20	4	7	18	11	14	22
M.F.	EAL con2	10	20	20	8	16	19	17	21	24
H.R.	EAL con2	15	16	17	6	4	10	17	18	23

As would be expected, the EAL children identified as language impaired (EAL-LI) in both contexts 1 and 2, obtained lower scores on all language measures than their L1 counterparts. However, the differences between the scores obtained by the EAL-LI children in contexts 1 and 2 were not as obvious as the differences between the scores obtained by their respective peer groups. It would thus appear that the context of education did not make a difference in the case of the EAL-LI children, and that these children performed poorly, irrespective of the type of education system they were enrolled in.

The results of this study thus show that EAL children with language impairment can be identified as a subgroup but only if a specific peer group serve as the standard of comparison. This peer group should be the EAL children with whom they share the context and not EAL children in general. This implies that SLTs can make a valuable contribution in screening foundation phase EAL children and selecting those who perform significantly below the peer group average for further investigation and most importantly, follow-up. The results of this study also show that both the DELV-CR and the sentence repetition test are

reliable and valid measures of oral academic language for this population since they were correlated to each other and to reading comprehension within each group. The sentence repetition task in particular, is a potentially valuable screening tool since it is quick and easy to administer. It certainly warrants further research on a larger scale.

The process of identifying children at risk for specific language impairment within the longitudinal design of this study revealed that continued assessment throughout the early grades is essential. While some children may be identified early and show persistent language and literacy difficulties, some may "outgrow" their difficulties and simply be slow starters. This was evidenced in the finding that of the 5 L1 children identified in grade 1, only two continued to have difficulties in grades 2 and 3. Other children display significant problems only later, presumably because the increased linguistic demands of the curriculum exceed their rate of language development and their capacity for language processing. Particularly within the EAL context 1 group (EAL only), it was significant that only one out of 70 children met the criteria for language impairment in grade 1. This illustrates the difficulty in distinguishing between language difference as a result of EAL status and language impairment at this early stage of exposure to instruction in English. It only became clear in grade 2, which children were performing significantly (2 SD) below the peer group mean, suggesting that the identification of language impairment in EAL learners in context 1-type situations, should be delayed until grade 2 to avoid over-identification. Since the group of EAL learners in context 1 also performed significantly poorer than the other two groups in grade 1, making significant progress in grade 2, grade 1 is not the best time to identify children who are at risk for language impairment in this context. Most of the children are at a very basic stage of English development and delaying identification until grade 2, will determine how they respond to instruction in English. Within the EAL group in the integrated context (context 2), however, it seemed that early identification was more reliable in that the two children who met the criteria for language impairment in grade 1, both continued to show deficits in grades 2 and 3.

The fact that 7 out of a total of 134 (5.2%) children were identified as language-impaired in this study, suggests that the incidence was slightly lower than the 7% normally quoted in the literature (Tomblin et al., 1997). It is possible that this was due to the availability of longitudinal data in this study allowing the exclusion of children identified in grade 1 but no longer demonstrating deficits in grades 2 and 3. It should also be noted that adhering to the strict criterion of 2 standard deviations below the peer group

mean may have contributed to this finding, since many studies on SLI use 1 to 1.5 standard deviations below the mean as the criterion (Rice, 2009).

The limited number of children identified as language-impaired makes generalisation of the findings beyond this study impossible, but they can be used as a starting point for further research.

6.9.2. Description of the performance of the children identified as language-impaired

The purpose of this study pertaining to the children with language impairment was to describe the manifestations of impairment in English as the additional language. Within the limitations of the small sample size, the results of this study indicated that EAL language -impaired children have similar profiles and deficits to those of monolingual English speaking language-impaired children, but they are further disadvantaged by their EAL status, both in relation to L1 children with language impairment and to their typically developing EAL peers. A characteristic common to most of the language-impaired children was the limited progress made from one grade to the next on the language components they were having difficulty with. They are thus able to develop in an additional language but the process is slow and irregular with periods during which there is little or no development or even regression in language skills. Both of these findings are in keeping with existing research on SLI. M.K. in the EAL context 1 group was an exception in that she made substantial progress on all domains in grade 3, and would no longer meet the criteria for language impairment. However, she has been included in the analysis since she still performed below the peer group means in grade 3, and her reading and working memory performance would be of interest.

The different profiles exhibited by the language-impaired children illustrate that some (2 out of 7 in this study) appear to be more severely impaired in that they consistently obtained scores that are two standard deviations below the peer group means on all language domains.

The development of semantics was the most affected since all the language-impaired children demonstrated significantly lower performance than their peer groups on this domain. This is consistent with the literature on the general slow rate of lexical development in children with SLI (Schwartz, 2009). In addition, the semantic domain on the DELV-CR assesses lexical organisation and retrieval, verb learning through fast mapping and the understanding of the quantifier “every” in complex syntactic structures. Since these skills have been found to be impaired in SLI children (McGregor,1997; McGregor, Newman & Reily, 2002; McGregor & Windsor, 1996), the findings of this study are consistent with the

literature and also suggest that these aspects will be impaired in both L1 and EAL learners with language impairment.

Five out of the seven children demonstrated impairments on the syntax and pragmatics domains respectively, indicating that these domains are also affected by language impairments, but not in all language-impaired children. However, a more detailed analysis of performance on the DELV-CR subtests revealed that most of the children obtained below average scores in relation to their peer groups on many of the syntax and pragmatics measures, suggesting that their impairments are in fact pervasive.

6.9.3. Detailed analysis of DELV-CR results for children identified as language-impaired

A more detailed descriptive analysis of the results obtained by the children on the DELV-CR was undertaken to gain an understanding of the difficulties they were experiencing on specific language skills within each domain. This analysis was intended to identify the possible manifestations of language impairment in EAL learners. Because of the small sample size and the fact that the total possible score on each DELV-CR subtest is low, the analysis did not consider the raw scores corresponding to 2 standard deviations below the mean on each subtest. Instead, the subtests on which each language impaired child scored below the peer group means were identified and are highlighted on the tables in appendix 6C.

a) Performance of children identified as language-impaired on the syntax domain

The data in appendix 6C show that all the children with language impairment in all three groups obtained scores below the peer group means on the Wh-questions subtest throughout the study. This was one of the subtests on which the typically developing peer groups performed the best and on which the three groups performed similarly by grade 3. The children identified as language-impaired thus show a specific deficit in understanding complex Wh-questions. This finding supports previous research showing that children with SLI display persistent difficulty understanding syntactically complex Wh-questions that involve long- distance dependencies (Schwartz, 2009; Deevy & Leonard, 2004; Marinis & van der Lely, 2007; Stavrakaki, 2006). Researchers propose that children with SLI have difficulty processing such complex sentences due to deficits in working memory (Deevy & Leonard, 2004; Montgomery, 2000, 2003), attention, control of attention and processing speed (Leonard, Weismer et al., 2007). These deficits also underlie the processing of passive sentences (Leonard et al., 2006; Marinis & van der Lely, 2007; Owen & Leonard, 2006; Grela & Leonard, 2000) on which all the language-impaired children in this study obtained below average scores in grade 3.

b) Performance of children identified as language-impaired on the pragmatics domain

In general, it would appear that the EAL-LI learners had more problems on the pragmatics domain, particularly on question-asking, than the L1 learners with language impairment. Since responding to the pragmatics items required formulation of syntactically correct questions and cohesive narrative discourse, it is possible that the EAL-LI children performed poorly on these subtests due to their syntactic difficulties and not a pragmatic deficit *per se.* This is consistent with previous research showing that children with SLI perform similarly to their language-matched peers in the communication functions expressed but do so less efficiently or appropriately (Leonard, 1986; Brinton, Fujiki & Sonnenberg, 1988), due to deficits in structural language rather than a lack of pragmatic knowledge (Craig, 1985). The implication of this finding is that it would be necessary to analyse the results of formal language assessments carefully to make differential diagnoses, particularly in EAL children with language impairment.

c) Performance of children identified as language-impaired on the semantics domain

The information in appendix 6C confirms that all the children identified as language-impaired had difficulty with the semantics subtests, obtaining scores below the peer group means on almost all measures every year. Some of the children also deteriorated in their performance on some of the subtests, and some showed no or little progress from one year to the next. Overall, it would seem that the fast mapping of novel verbs was the test on which these children performed the poorest. This is in keeping with the peer group means, which were also the lowest on this test.

6.9.4. Reading performance of children identified as language-impaired

The reading accuracy and comprehension scores of the children identified as language impaired are shown in table 6.8. Reading accuracy scores higher that the respective peer group means, indicating more decoding errors, and reading comprehension scores lower than the peer group means are highlighted in green on the table.

Table 6.8 Reading accuracy and comprehension scores of children identified as language-impaired

Participant	Group	Reading accuracy		Reading comprehension	
		Grd 1	Grd 2	Grd 1	Grd 2
Z.G.	L1	0	1	13	13
S.P.	L1	3	2	1	9
Peer group means	L1	3.8	5.9	12.93	18.59
O.M.	EAL cont 1	0	9	0	1
C.M.	EAL cont 1	3	11	4	18
M.K.	EAL cont 1	12	2	7	1
Peer group Means	EAL cont 1	8.7	5.3	7.06	7.53
M.F.	EAL cont 2	1	0	0	14
H.R	EAL cont 2	2	1	1	0
Peer group Means	EAL cont 2	3.5	11.6	9.02	16.58

In relation to the peer groups, only two language-impaired children made more decoding errors but the majority obtained reading comprehension scores below the means of the respective peer groups in both grades 2 and 3, confirming that language impairments have a negative effect on reading comprehension. While Z.G in the L1 group read as well as his peer group in grade 1, he made no progress from grade 2 to 3 and fell behind in grade 3. C.M. in the EAL-LI group in context 1, improved dramatically in her reading comprehension in grade 3, and obtained a score well above that of the peer group mean, despite the fact that her scores on the semantic and pragmatic language components were significantly below that of her peer group. Her performance confirms that there are exceptions, and that not all language impaired children have difficulties with reading comprehension. M.K. in the EAL-LI group in context 1, showed improvements in her language scores but deteriorated in her reading comprehension in grade 3, suggesting that she could still be considered an at-risk child, and should receive continued support.

The below average reading comprehension scores obtained by most of the children with language impairments, relative to their peer groups confirm that difficulties with oral language affect reading comprehension more than decoding (Kelso, Fletcher & Lee, 2007). However, not all children with language impairment have reading comprehension deficits (Nation et al., 2004; Bishop & Adams, 1990). In addition, children with language impairments who may appear to have recovered oral language skills may have persistent problems with reading comprehension and may still fall behind their peers or even

regress on reading comprehension in the same way as they regress on oral language skills (Botting, 2005).

6.9.5. Working Memory scores of children identified as language-impaired

The working memory scores of the children identified as language impaired are captured in table 6.9. The working memory measures on which the children scored below the peer group means are highlighted on the table.

Table 6.9 Working memory scores obtained by children identified as language-impaired.

Participant	Group	Digit Repetition	Dot Matrix	Listening Recall	Spatial Recall	Processing Listening Recall	Processing Spatial Recall	Sentence Repetition
Z.G.	L1	28	21	6	18	12	40	22
S.P.	L1	30	20	7	19	13	42	18
Peer group means	L1	25.66	19.95	9.19	15	20.71	37.09	26.51
O.M.	EAL cont 1	25	13	8	17	11	13	3
C.M.	EAL cont 1	28	17	3	11	4	18	16
M.K.	EAL cont 1	18	12	1	15	3	32	4
Peer group Means	EAL cont 1	23.43	15.96	6.45	12.16	9.8	22.9	16.87
M.F.	EAL cont 2	19	18	3	17	6	34	22
H.R	EAL cont 2	22	15	7	5	13	8	6
Peer group Means	EAL cont 2	25.39	17.65	8.56	14.09	19.65	26.43	23.33

The analysis of the working memory scores obtained by the children identified as language impaired revealed that the EAL children had both similar and different working memory profiles to the L1 children. The two L1 learners demonstrated the same working memory profiles, obtaining below average scores on the verbal short-term (listening recall) and working memory (processing listening recall) measures, and on the sentence repetition test. However, they did not perform below the peer group mean on the phonological memory measure (digit recall). Their verbal working memory deficits are thus consistent with predictions in the literature (Vance, 2008; Montgomery, Magimairaij & Finney, 2010). However, contrary to research findings that phonological memory deficits are a hallmark of SLI (Tager-Flusberg & Cooper, 1999; Dollaghan & Campbell, 1998; Montgomery, 1995; Schwartz, 2009; Bishop, 2006) neither

of the L1 children with language impairments showed deficits in phonological memory on the digit repetition task. Van der Lely & Howard (1993) and Van der Lely (2003) did however acknowledge that not all children with language impairments have phonological memory deficits. This is also true of the EAL-LI children since only two of these children scored below the peer group means on the phonological memory measure.

The working memory profiles of the EAL-LI learners were less definitive, and individual children within the EAL-LI groups appeared to score below the peer group means on different working memory subtests. All of them obtained scores below the peer group means on sentence repetition. In addition, those with higher sentence repetition scores had better reading comprehension scores (C.M and M.F), confirming the relationship between reading comprehension and the sentence repetition measure.

O.M in the EAL context 1 group demonstrated an interesting profile in that he was not below average on the verbal working memory measures but on the visuo-spatial measures (dot matrix and processing spatial recall). He did not have significant syntactic deficits either and it is possible that his relative strength in this area is evident in his better performance on the verbal working memory scores. Similarly his semantic difficulties may have led to difficulty understanding the instructions on the visuo-spatial working memory tasks.

M.K and M.F. were more similar to the L1 children in that they obtained below average scores on the verbal recall and working memory measures but not on the visuo-spatial recall and processing measures. However, both scored below the peer group mean on the phonological memory measure and M.K also performed below average on the visual short-term memory measure. She was also a poor reading comprehender, and her decoding skills were poor in grade 1 which may indicate some relationship between deficits in decoding and both phonological and visual memory.

The findings pertaining to the EAL-LI children suggest that their language impairments may affect their performance on both verbal and visuo-spatial working memory tasks or alternatively they have deficits in both these working memory capacities. In view of the results showing that the working memory assessments were not linguistically unbiased, the former explanation seems more feasible.

6.10. SUMMARY OF CHAPTER 6

The results presented in this chapter suggest that:

- Working memory measures such as the AWMA are not unbiased when assessing EAL children and cannot be used to diagnose working memory deficits.
- It appears that many of the working memory measures actually assess language processing and it is therefore not possible to separate these two processes.
- The relationship between working memory capacity and language processing is complex, and the correlations between the various measures of working memory and language processing suggest that children draw on different working memory components in processing language tasks. The exact relationship depends on the nature and difficulty level of the language task and the stage of language proficiency.
- The only consistent relationship between working memory and language proficiency was seen on the sentence repetition test which assesses the episodic buffer zone of the working memory construct. This finding has significant implications for sentence repetition as an aptitude measure and identification of language impairment in EAL children.
- EAL children who are at risk for language impairment can be identified by assessing them in English but they must be compared to a peer group in a similar educational context.
- The manifestations of language impairment are similar in EAL and L1 children in that both groups have significant difficulty with complex sentence processing (e.g., long distance dependencies in Wh-questions and comprehension of passive sentences). Both groups also have significant difficulty with semantic processing, specifically verb learning. EAL children with language impairment also have more difficulty than L1 language-impaired children with pragmatic aspects of language that depend on syntactic skills (e.g., formulating questions and structuring cohesive narratives).
- EAL language-impaired children who acquire English sequentially are disadvantaged by both their language impairment and their EAL status, and for them language development is a slow process. Their language impairment also has a significant impact on their reading comprehension. The implication is that they need a great deal of support and once again the role of the speech - language therapist in mainstream education is highlighted. These children should be identified through appropriate assessment so that intervention can be delivered in a timely manner.

CHAPTER 7

CONCLUSIONS

On a theoretical level, the longitudinal design of the study and the combination of assessment methods used have provided information on the dynamic nature of language acquisition and processing in both first and additional language learners. The study has also confirmed that language learning occurs as a result of a complex interaction between individual child factors and contextual variables.

On an applied level, the results are both encouraging and concerning and have a number of important implications for language-in-education policies and practices in the South African context and for the assessment and identification of language impairment in EAL children. The role of the speech-language therapist also needs to be seriously considered.

7.1. THEORETICAL IMPLICATIONS

In the first three grades of formal schooling, the development of the psycholinguistic processes underpinning oral academic language is influenced by a number of factors. Children learning in English as an L1 and children learning in English as an additional language show both similar and different rates and profiles of acquisition for different language components because language is complex and the acquisition process is dynamic. The results of this study showed that language development may be facilitated by instructional practices (e.g., learning to answer Wh-questions and formulating narrative discourse). The nature of the educational context plays a significant role (e.g., pragmatics development when L1 models are available). However, language development may also be constrained by having to learn in an additional language (e.g., learning prepositions, understanding passive sentences, articles and verbs in English), by the school and home environment (e.g., the effects of low SES on primary home language development), and language impairment. An interaction of these factors affects the acquisition of various language forms either positively or negatively.

However, the importance of oral language development for literacy was clearly evident in this study. First, there were significant relationships between the language measures and reading comprehension scores. Second, the negative effects of a protracted period of oral language development on literacy were seen in the EAL context 1 (EAL only) group. Although these children were able to read in that they could decode print, their understanding was poor and did not improve from grades 2 to 3. Particularly in

relation to additional language learners, these findings support theoretical models of reading that include both bottom-up (decoding) and top-down (comprehension) processes (Kimborough-Oller & Jarmulowitz, 2009). In addition, it would seem that well developed pragmatic skills aid EAL children in the reading process (Snow, 1998). This was evidenced in the finding that the EAL learners in the integrated context (context 2) who had similar scores to their L1 peers on the pragmatics subtest of the DELV-CR by grade 2 were also obtaining reading comprehension scores at the same level as their L1 classmates in grade 3. This finding also has significant implications for methods of teaching reading comprehension. Learners should be encouraged to formulate questions about what they are reading and to determine the writer's perspective and intentions.

The findings of this study also confirm that language comprehension and production are highly complex cognitive processes. As discussed in chapter 2, these processes draw on domain-specific or dedicated language processing mechanisms as well as more general cognitive mechanisms such as attention and working memory (Williams, 2010). The findings offer support for William's (2010) explanation that language processing and learning require a number of co-ordinated, functional cortical networks, and that more demanding language processing requires more elaborate networks. As processing becomes more automatic, the level of activation in the regions that are less central to the task is reduced. Thus as language processing becomes more automatic fewer general cognitive resources are recruited and the cortical network becomes more focal and specific to language. The domain-general mechanisms are engaged to support learning until automatic processing emerges with practice.

The correlations between the working memory and language measures obtained in this study suggest that the extent to which learners recruit more general working memory processes for language processing depends on the demands of the language task. For example, the EAL and L1 learners in the integrated context appeared to be engaging their verbal working memory in processing a number of language tasks which they found relatively more difficult (e.g., understanding passives, fast mapping of novel verbs). It was interesting that the EAL learners in context 1(EAL only), who may be regarded to be at a more basic level of proficiency relative to the other two groups, did not appear to recruit their verbal working memory in language processing since there were few correlations between the language and verbal working memory scores in this group. It thus appears that the level of language proficiency also determines the extent to which working memory and language processing are related. The EAL learners in context 1(EAL only) seemed to be using either more automatic, implicit L1 mechanisms (Ellis,

2008) or visual working memory to process language tasks, leading to less efficient processing (Williams, 2010) and thus lower scores on the language measures. The EAL learners in the integrated context, who were at an intermediate level of proficiency, were recruiting their verbal working memory capacity more than the L1 learners, who had reached a more automatic level of processing and no longer needed to engage working memory and thus larger cortical networks in processing the easier language tasks.

The fact that the EAL learners in the integrated context (context 2) appeared to tap both their verbal and visual short-term and working memory capacities in responding to the different subtests on the DELV-CR, indicates firstly that visuo-spatial memory tasks also depend on language processing, and secondly that visuo-spatial memory may play a more important role in language processing than researchers have attributed to it. These findings warrant further investigation in the EAL population.

The complex and inconsistent nature of the relationship between working memory and language processing revealed in this study does not provide conclusive evidence for working memory as a component of aptitude in young children acquiring an additional language in an instructional setting.

As discussed in chapter 2, the individual variation observed among the EAL learners must therefore be attributed to differences in other intrinsic factors such as intelligence, learning style or information processing patterns, language learning strategies, motivation and personality characteristics which interact with the different learning contexts and the nature of the input provided. Additional language acquisition is a complex, dynamic process dependent on a host of different variables and it is virtually impossible to explain why some children are more successful than others as revealed in the findings of this study. It is important however, that there were EAL children in both educational contexts who obtained language scores comparable with those obtained by the L1 group. These children clearly have resources that make them successful language learners irrespective of the context of education and the nature of the instruction they are receiving. Future research should be directed at identifying these resources.

Although the evidence for working memory as a component of aptitude for language learning was inconclusive, this study does indicate that the episodic buffer zone of working memory capacity as assessed on the sentence repetition task is strongly related to language processing. Since the role of the episodic buffer zone in language processing has not been researched (Juffs & Harrington, 2011), this study provides new evidence that it is important for language processing in both L1 and EAL children.

This means that sentence repetition may serve as a valid predictor of language learning success across all domains and could possibly be used as an aptitude measure. The sentence repetition task is relatively quick and easy to administer, and its sensitivity to academic language proficiency in both groups of EAL learners, who were at different stages of English proficiency, makes it a potentially very useful tool in assessing these children. This finding is certainly worthy of further research. For example, it can be used as a screening tool to identify EAL children who may be at risk for language learning difficulties, provided that the children are compared to their peer group within a particular context of education.

7.2 IMPLICATIONS FOR LANGUAGE-IN-EDUCATION POLICIES AND PRACTICES IN THE FOUNDATION PHASE

The main findings of this study indicate that both L1 and EAL children in the foundation phase make significant progress in the development of the psycholinguistic processes underlying oral academic language. In addition, those language skills addressed in the instructional programme (e.g., answering Wh-questions, producing cohesive narratives) develop to a similar level in L1 and EAL children by grade 3, irrespective of the educational context. This is a most encouraging result, since it suggests that the teachers participating in this research were able to provide the learners with the necessary scaffolding to acquire some of the fundamentals of academic language. Although this scaffolding may not always have been provided intentionally, it does seem that the children learnt from the focused stimulation and practice in the above-mentioned language skills. It should be noted that classroom observations were not conducted in this study, and future research should include such observations so that the children's language learning can be correlated with teaching practices and classroom input.

The results also suggest that home language education is an advantage since L1 children in the South African context develop oral academic language within much the same timeframe as children in an international context such as the US. Their reading comprehension skills may not be at quite at the same level as their same-aged peers in the US, but this may be because they start school a year later.

EAL children who are integrated with L1 children and are taught by English-speaking teachers tend to be less proficient than their L1 peers in grade 1, but by grades 2 and 3, they have caught up on most language skills. Their development of pragmatics skills (communicative role-taking, question-asking and formulating narratives) seems to proceed relatively quickly so that they are functioning at the same level as their monolingual peers by the end of grade 2. This can be attributed to their exposure to first

language models, and also seems to facilitate their acquisition of reading comprehension. However, there are some language skills (passive comprehension, use of articles and verb knowledge) that could be taught explicitly to these children, since they still function significantly below their L1 classmates on these structures by the end of grade 3. These language skills will become more important for understanding increasingly complex text in the higher grades. There is thus room for improvement even in "upper ex-model-C schools", where the children are assumed to have "reasonably adequate English" (Webb et al, 2010, p.276).

There are particular patterns of development in EAL children who are learning alongside other EAL learners and are taught by EAL teachers in context 1-type schools. Firstly, their development of academic language in English is significantly delayed by the end of grade 1 relative to their L1 and EAL peers in integrated (context 2) schools. Secondly, although they make significant progress during grades 2 and 3, they do not manage to reach the same level as the EAL learners in an integrated context on most language skills by the end of grade 3. The most concerning aspect is that their reading comprehension skills are particularly affected by this protracted period of oral language development. The differences between the two EAL groups confirm that language-in-education practices, specifically teaching and learning in English, do not have a simple cause-effect relationship with literacy achievement. In addition, the effects are not restricted to one of the two education systems proposed by Fleisch (2008). There are children in lower ex-model-C schools within the urban context, who demonstrate significant difficulties with academic language development in the foundation phase. It is not possible to attribute these difficulties only to learning in English, since many of these children also come from lower socio-economic environments, the effects of which can have serious consequences for learning, irrespective of the language of instruction. However, it does seem that the absence of L1 models in context 1 (EAL only) schools has an effect despite a good infrastructure for English in the broader environment. The problem is that less than 10% of the South African population speaks English as an L1. It would thus be unrealistic to suggest that integrated schools are the only option for learning successfully in English. In addition this is not necessary, since there are indications that if the teaching of English can be improved in context 1-type schools, better outcomes may be achieved. This would require support and training for educators. Collaboration with speech-language therapists in the education system would certainly address this need. In addition, a much more intensive focus on educational linguistics in teacher training programmes is indicated.

The dilemma facing authorities in the education of EAL children in context 1-type schools is complex. As discussed in chapter 3, current policy is that all children should be instructed in their home language in the foundation phase (Motshega, 2010). Although home language instruction may be more facilitative for these children, there are practical obstacles to such provision, e.g., the heterogeneity in language backgrounds of learners and teachers, the problem of creating separate classes for different language groups, and the choice of particular African languages over others. However, even if these obstacles were to be overcome, the quality of instruction in the home language also needs to be of an acceptable standard and there are various reasons why this may not be easily achieved. As discussed in chapter 3, there are other impacting factors such as the under-development of the African languages and the use of urban vernaculars, poor teacher language awareness and skills, problems with curriculum design, as well as low expectations and reduced cognitive demand in the classroom.

In addition, because of the perceived and real status of English as an avenue to educational empowerment, parents send their children to these schools to learn in English. Thus access to English would still need to be provided through good quality subject teaching or bilingual instruction.

As suggested in the introduction, one of the primary goals of education is to develop academic language at all stages of the process. Whether the medium of instruction or subject of study is an African language or English, language teaching practices within a multilingual context must be of a particularly high standard. Without adequate attention to all aspects of educational linguistics, it is likely that the historical inequalities in educational achievement will be perpetuated.

Although this was not a specific focus of the study, another important implication is the effects of English instruction on the development of the home language and more importantly on the EAL children themselves. Acquiring an additional language is “not just about gaining vocabulary, grammar and pronunciation” (Baker, 2006, p. 136). It is also about the construction of a social identity, joining a social grouping, finding an accepted voice (Bourdieu, 1991; Pavlenko, 2003) and constructing meaning (Norton and Tooey, 2002). Baker (2006) argues that learning additional languages is not only a cognitive activity but also entails becoming part of a language community and developing multiple identities. We cannot ignore these effects, irrespective of the educational context, and the subtle messages of power and dominance conveyed by the practice of using only English as the medium of instruction with EAL children.

Within the South African context, with its aspirations of multilingualism and tolerance for cultural and linguistic diversity, the implications are that all South Africa's official languages should be valued and developed as communicative and academic languages. We are still a long way from achieving this goal and there are more questions than answers. However, I believe that the African languages can be elevated in status and developed through teaching them as subjects in schools where English is the medium of instruction. The discussion on the Home Language Project in chapter 3 shows that in these schools, EAL learners could be encouraged to read in the African languages so as to develop and strengthen their conceptual understanding.

In addition, the effective teaching of African languages to speakers of English and Afrikaans would be an important step in the right direction. However, currently this poses its own set of challenges since there is a shortage of teachers who can teach the African languages as subjects (Balfour, 2007) and most of the existing teaching of these languages is ineffective. Once again, the implication is a greater emphasis on educational linguistics in teacher training programmes, so that the teaching of African languages can be improved.

Given the value of content and language-integrated instruction, it may be advisable to teach subject matter in both English and an African language. As indicated in the research by Wildsmith-Cromarty & Gordon (2009) and Ramani et al. (2007) this may also lead to more effective development of the African languages.

On the basis of personal experience and Malherbe's (1997) research discussed in chapter 3, I believe that there are clear indications within the South African context that an educational approach, in which the home language is acknowledged and used, is facilitative of overall academic development. For example, in dual-medium Afrikaans-English schools (e.g., Grey colleges) content is often taught in either or both languages leading to high levels of bilingualism in the learners. In line with an additive approach, there is considerable value in using both languages as instruments of thought, learning, and social interaction. This ultimately conveys the message that all languages can achieve these functions. In my own experience, high levels of bilingualism are achieved when English subject teaching is of a high standard in Afrikaans-medium schools, or when Afrikaans children attend English-medium schools where Afrikaans subject teaching is provided throughout.

The application of these practices to the African languages is within our reach but will require concerted will and effort not only by the education authorities, but also by language practitioners and researchers. The main challenges lie in training all teachers to be good language teachers, irrespective of the medium, as well as an investment in the development of the African languages.

As discussed in chapter 2, the extent to which support is provided in the home languages of EAL learners is also an important consideration from a developmental cognitive perspective, especially in the foundation phase and because of the developmental interdependence of the L1 and L2 (Cummins, 1981). However, the results of this study, particularly those pertaining to the EAL group in context 1, suggest that this is not a straightforward matter. The relatively poorer performance by these children in grade 1, raises important questions about the status of their home language functioning and its ability to support the development of English. The rapid progress they made in grade 2, once instruction in English was well underway, suggests that their language development was facilitated by the structured environment of the classroom. It is possible that they did not have a well-developed home language on which to base the development of English in grade 1, because of the general effects of low SES on language development and/or the absence of a clearly defined home language due to the exposure to different languages and urban vernaculars in the pre-school period. Contrary to expectations, the use of the home languages by some of the teachers in this context did not seem to make a significant difference either. The developmental profiles exhibited by this group indicate that they responded well to instruction in English showing a cumulative effect in grade 2. As discussed in chapter 2, these children may experience a dominance shift to English, and eventually learn better in English provided that they receive enhanced instruction and input. However, this does not mean that formalised and good quality support for the home language should not be provided. Further research to evaluate the effects of such support in comparison to instruction only in English, should provide valuable insights. An acknowledged limitation of this study is that the participants were not assessed in their primary home languages.

7.3. IMPLICATIONS FOR LANGUAGE, READING AND WORKING MEMORY ASSESSMENT OF EAL CHILDREN

The results of this study also hold important implications for the assessment of EAL children. None of the assessment measures used in the study were unbiased when applied to these children, but the results

showed that the DELV-CR, the reading test and the sentence repetition measure can be used with these children to assess levels of academic language proficiency and identify children who are at risk for language impairment provided they are compared to a peer group in a similar educational context. This finding contra-indicates any attempt at standardisation of these measures in assessing EAL children since contextual factors and the nature of the exposure to English will always play a major role in performance.

The inter-correlations between these measures provide evidence of the internal validity of the study in assessing academic language. The strong and significant positive correlations of the DELV-CR and reading comprehension measures with the sentence repetition task, suggest that this test can be used as a screening tool to predict language learning success in the foundation phase, and also to identify children who may be at risk for language impairment.

The results obtained on the working memory measures confirm that these measures may be nothing more than language processing measures and are most definitely not unbiased when applied to EAL learners.

7.4 IMPLICATIONS FOR CHILDREN WITH LANGUAGE IMPAIRMENT

The findings pertaining to the children identified as language impaired were interesting and although the limited sample size precludes generalisation, a number of tentative conclusions can be drawn. First, the EAL children identified as language-impaired demonstrated similar profiles and deficits to monolingual English speaking language- impaired children, but they were further disadvantaged by their EAL status, both in relation to English-speaking language-impaired children and to their typically developing EAL peers. The context of education did not appear to affect the EAL-LI children in the same way as the typically developing EAL children in that there were insubstantial differences between the EAL-LI children in contexts 1 and 2. These findings suggest that instruction and/or intervention in English may not be beneficial to them especially since they made very limited progress from one grade to the next on the language components they were having difficulty with. They thus demonstrated a slow and irregular process of development with periods during which there was little or no forward movement or even a regression in language skills. The question arising from these findings is whether they would be better served by instruction and/or intervention in the home language. The answer to this question may be similar to the one proposed for the typically developing children: it depends on the quality of the

instruction and/or intervention. There are a number of problems in providing intervention in the home language, not least of which is the shortage of trained SLTs who speak the African languages and the dearth of information on normal developmental processes and milestones in these languages. Nevertheless, best practice guidelines dictate that intervention for bilingual children should be provided in both languages and this issue begs research in the South African context. In addition it warrants close attention to recruitment and selection processes in the training programmes for SLTs.

The analysis of the performance of the children identified as language- impaired showed that they generally exhibit a delayed pattern of development relative to their peer groups, and all of them performed consistently below average on the semantics domain of the DELV-CR, which assesses many of the language skills affected in the clinical population. This was also the domain on which the performance of the typically developing EAL children in both contexts was significantly below that of their performance on syntax and pragmatics. In this respect, typically developing EAL children and monolingual children with language impairment present with a similar profile of difficulty.

However, all the children identified as language impaired showed a specific deficit in understanding complex Wh-questions, which their peer groups found easier and developed quickly. This finding supports previous research showing that children with SLI display persistent difficulty in understanding syntactically complex Wh-questions that involve long-distance dependencies (Schwartz, 2009; Deevy & Leonard, 2004; Marinis & van der Lely, 2007; Stavrakaki, 2006), and also lends support to the "disruption within delay" hypothesis of SLI proposed by Rice (2009, p. 419). This representational account of the underlying cause of SLI is thus supported in this study by the findings on the EAL-LI children. It appears that difficulty with long distance dependencies manifests in both monolingual and bilingual children with language impairment and that this is not merely a delay but a disruption within the delay.

Thus the manifestations of language impairment in children learning in English as both a first and additional language were found to be similar, but the difficulties experienced by the typically developing EAL children and those reported for English monolingual children with SLI were both similar and different. The typically developing EAL children experienced slower development of the understanding of complex passive sentences but not Wh-questions, which has been reported to be a distinct difficulty for children with SLI. The typically developing EAL children experienced difficulty with the use of articles, which is not a common problem reported for SLI children, but is most probably due to the absence of articles in the African languages. The EAL children also demonstrated particular difficulty with verb

learning, which is also a problem for children with SLI. This may be due to the complexity of the verb system in English, which poses problems for both monolingual children with SLI and EAL children. In summary, these findings suggest that typically developing EAL learners and monolingual children with SLI are not two of a kind (Paradis, 2007).

7.5 IMPLICATIONS FOR THE ROLE OF SPEECH–LANGUAGE THERAPISTS IN EDUCATION

The findings pertaining to both the typically developing EAL children and those identified as language-impaired, raises the important issue of the role of the speech-language therapist in the South African education system. As proposed in chapter 1, one of the goals of this study was to promote this role because at present, very few SLTs are employed by the Departments of Education.

The findings of this study provide support for the need to include a collaborative framework of SLTs, educators and other role-players in future planning on issues of educational achievement. The role and services of SLTs need to be seriously considered in improving language and literacy outcomes.

Teachers and SLTs should address academic challenges as a team within the classroom (Ritzman, Sanger & Coufal, 2006) by analyzing the language demands of the curriculum and planning relevant and meaningful programmes for all learners. A developmental approach within the policy of inclusion and collaboration is essential in preventing later scholastic difficulties (Owens, 2010).

A systematic review of the evidence base regarding SLT intervention for primary school learners over the past 30 years (Cirrin et al., 2010) suggests that SLT intervention has positive outcomes, that direct classroom-based intervention is at least as effective as traditional pull-out models and that trained assistants can be as effective as SLTs when working with this population. However, there are very few studies and an expanded research agenda is urgently required. The latter is particularly pertinent in the South African context. Since SLTs are not employed in the education system, there are few South African studies that demonstrate the effectiveness of SLT involvement in mainstream schools (Wium, Louw & Eloff, 2010).

Linan-Thompson and Ortiz (2009) describe a multi-tiered model of service delivery in which children with the greatest need receive the most instruction. Tier 1 is core instruction, which is provided to all children by the classroom teacher. Children who do not meet the expected outcomes in tier 1 receive tier 2 instruction which is provided in small groups and supplements tier 1 instruction. Many EAL learners

respond well to this level of explicit, systematic instruction which is aimed specifically at oral language development. Those who do not make sufficient progress receive tier 3 intervention which is more intensive, focuses on individual children or much smaller groups and specific language skills. Instruction at each tier can be delivered either sequentially or simultaneously. This approach seems to be particularly suited to the needs of EAL children in both context 1 and 2-type schools, since it was evident that there were learners who performed at the same level as the L1 children in all grades and needed no more than tier 1 instruction. Tier 2 instruction would possibly be sufficient for those learners who were making significant progress with additional support while tier 3 interventions could be provided for only those learners who made only limited progress or seemed to be at risk for language impairment. The language measures used in this study, particularly the sentence repetition test, could be employed in conjunction with the teachers' assessments to identify children who would benefit from each level of instruction.

The Royal College of Speech-Language Therapists (2011) describes a similar system emphasising the SLTs role at different levels within the school setting ranging from highly specialised work with individual children to preventative work with all children or particularly vulnerable groups of children.

While the focus thus far has been on the school-aged population, it is well known that language and communication develop from birth, and this early development is one of the most reliable predictors of scholastic success. In the pre-school environment teachers can be supported by SLTs to facilitate language and literacy development and thus contribute towards preventing academic failure. Such intervention should focus not only on teaching basic communication skills, but also on the learners' acquisition of more complex academic language skills. This conclusion is supported by the results achieved by the EAL learners in this study, particularly those in context 1, who showed significant differences with the L1 and EAL learners in the integrated context in grade 1, and had so much catching up to do in the foundation phase.

Against the background of this discussion, the South African Speech Language and Hearing Association has formed a task group, of which I am a member, to investigate the way forward in promoting co-operation with the Department of Education. The following recommendations have been made to the Minister of Basic Education:

Proposal 1: Becoming partners in the "Action plan to 2014"

It is imperative that the profession of speech-language therapy is part of the National Department of Basic Education Action Plan to 2014. Speech-language therapists could make key contributions to realising the following goals emanating from the Action Plan: Towards the realisation of Schooling 2025 (Department of Basic Education; Notice 752 of 2010) by paying close attention to the transitional grades as articulated in the goals that follow.

Goal 1: Increase the number of learners in grade 3 who by the end of the year have mastered the minimum language and numeracy competencies for Grade 3. The current study makes a significant contribution to the realisation of this goal.

Goal 2: Increase the number of learners in grade 6 who by the end of the year have mastered the minimum language and numeracy competencies for Grade 6.

In addition SLTs may also support the provision of quality Early Childhood Development as envisaged in Goal 11.

Professional development and growth for educators may be facilitated by SLTs through continued professional development programmes, in-service training and support and mentorship initiatives especially in the foundation phase, thereby contributing to improved subject knowledge and teaching skills as recommended in Goal 16.

Proposal 2: Employ SLTs in the Education sector to serve Basic Education

The further employment of SLTs in the Department of Education will ensure that children with language and literacy problems are managed within a school context thereby maximising learning outcomes. The current service delivery model in the Department of Health does not prioritise school-aged learners if they do not have an accompanying medical condition. In effect the majority of learners in mainstream education are unable to access support due to other priorities in the health sector. The employment of SLTs will also affirm that the DOE is accepting responsibility and accountability to manage children with language and literacy problems as spelled out in their policies and legislative imperatives. The following are some employment options that may be pursued.

1. Community service posts: Each year the universities graduate approximately 200 speech-language therapists. SLTs could be integrated into the education system by using a strategy of Compulsory Community Service in Education. This strategy is already in place in the Department of Health and has been successful in establishing services in under-resourced areas.
   In the future, the therapists could be placed in either health or education settings during their community service year given that their roles straddle both these sectors.
2. Improving post-provisioning in the Basic Education sector for qualified practitioners with emphasis on strengthening interventions to support language and literacy development in mainstream classrooms.

Proposal 3: (Re) Skilling therapists

Speech-language therapists will have to be (re)skilled to become effective participants in supporting basic education. While university curricula are increasingly aware of how therapists should be working to support Basic Education, the profession does not have a guideline of the specific competencies or description of service delivery options. While this is an evolving process, the critical need suggests that undergraduate training should revisit the curriculum as an important part of a national process to ensure that future clinicians are skilled to shape future practice. Among the key issues, the profession needs to consider are the following:

- How would it support the development of ALL languages, especially African languages, particularly as the majority of clinicians are English first language speakers?
- How would it respond to the many calls to develop English as an additional language?
- What would intervention priorities be?
- What type of service delivery model would be cost effective?
- What human resource base would be required?

The importance of this study and the relevance of the above proposals are appropriately captured in the following quotation:

“Language is not everything in education but without language everything in education is nothing” (Wolff in Alidou, Brock-Utne, Dallio, Heugh and Wolff, 2006, p.9).

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APPENDIX 4A: Ethics Clearance Certificate

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49/1 Jordaan

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER H080503**
PROJECT	Delving into the development of language for academic purposes by foundation phase English Additional Language Learners
INVESTIGATORS	Mrs H Jordaan
DEPARTMENT	Speech pathology and audiology
DATE CONSIDERED	16/05/2008
DECISION OF THE COMMITTEE*	Approved Unconditionally

NOTE:

This ethical clearance is valid for 2 years and may be renewed upon application

DATE 4.06.2008 **CHAIRPERSON** .....
(Professor R Thornton)

cc: Supervisor : Prof C Penn

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

Signature

This ethical clearance is valid for two years from date of approval.

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

APPENDIX 4B: Gauteng Department of Education Approval

UMnyango WezeMfundo
Department of Education

Lefapha la Thuto
Departement van Onderwys

Enquiries: Nomvula Ubisi (011)3550488

Date:	21 April 2008
Name of Researcher:	Jordaan Heila
Address of Researcher:	35 Langley Levy Street
	Montgomery Park
	Johannesburg 2195
Telephone Number:	0117174580/0823238016
Fax Number:	0117174572
Research Topic:	"Delving" into development of language for academic purposes by foundation phase English additional language learners
Number and type of schools:	6 Primary Schools
District/s/HO	Johannesburg East

Re: Approval in Respect of Request to Conduct Research

This letter serves to indicate that approval is hereby granted to the above-mentioned researcher to proceed with research in respect of the study indicated above. The onus rests with the researcher to negotiate appropriate and relevant time schedules with the school/s and/or offices involved to conduct the research. A separate copy of this letter must be presented to both the School (both Principal and SGB) and the District/Head Office Senior Manager confirming that permission has been granted for the research to be conducted.

Permission has been granted to proceed with the above study subject to the conditions listed below being met, and may be withdrawn should any of these conditions be flouted:

1. *The District/Head Office Senior Manager/s concerned must be presented with a copy of this letter that would indicate that the said researcher/s has/have been granted permission from the Gauteng Department of Education to conduct the research study.*
2. *The District/Head Office Senior Manager/s must be approached separately, and in writing, for permission to involve District/Head Office Officials in the project.*
3. *A copy of this letter must be forwarded to the school principal and the chairperson of the School Governing Body (SGB) that would indicate that the researcher/s have been granted permission from the Gauteng Department of Education to conduct the research study.*

Office
Room 501, 111 C

ge Management
(7710, Johannesburg, 2000

4. A letter / document that outlines the purpose of the research and the anticipated outcomes of such research must be made available to the principals, SGBs and District/Head Office Senior Managers of the schools and districts/offices concerned, respectively.
5. The Researcher will make every effort obtain the goodwill and co-operation of all the GDE officials, principals, and chairpersons of the SGBs, teachers and learners involved. Persons who offer their co-operation will not receive additional remuneration from the Department while those that opt not to participate will not be penalised in any way.
6. Research may only be conducted after school hours so that the normal school programme is not interrupted. The Principal (if at a school) and/or Director (if at a district/head office) must be consulted about an appropriate time when the researcher/s may carry out their research at the sites that they manage.
7. Research may only commence from the second week of February and must be concluded before the beginning of the last quarter of the academic year.
8. Items 6 and 7 will not apply to any research effort being undertaken on behalf of the GDE. Such research will have been commissioned and be paid for by the Gauteng Department of Education.
9. It is the researcher's responsibility to obtain written parental consent of all learners that are expected to participate in the study.
10. The researcher is responsible for supplying and utilising his/her own research resources, such as stationery, photocopies, transport, faxes and telephones and should not depend on the goodwill of the institutions and/or the offices visited for supplying such resources.
11. The names of the GDE officials, schools, principals, parents, teachers and learners that participate in the study may not appear in the research report without the written consent of each of these individuals and/or organisations.
12. On completion of the study the researcher must supply the Director: Knowledge Management & Research with one Hard Cover bound and one Ring bound copy of the final, approved research report. The researcher would also provide the said manager with an electronic copy of the research abstract/summary and/or annotation.
13. The researcher may be expected to provide short presentations on the purpose, findings and recommendations of his/her research to both GDE officials and the schools concerned.
14. Should the researcher have been involved with research at a school and/or a district/head office level, the Director concerned must also be supplied with brief summary of the purpose, findings and recommendations of the research study.

The Gauteng Department of Education wishes you well in this important undertaking and looks forward to examining the findings of your research study.

Kind regards

CHIEF DIRECTOR: INFORMATION & KNOWLEDGE MANAGEMENT

The contents of this letter has been read and understood by the researcher.		
Signature of Researcher:		
Date:		

APPENDIX 4C: PRINCIPAL INFORMATION SHEET AND CONSENT FORM

Dear Principal

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 entitled: *DELVing into the acquisition of academic language 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 grades 1, 2 and 3 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 1 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. The children's reading abilities will also be assessed by asking them to read a series of short stories and answer questions verbally. Each child will also be required to complete a memory test by looking at some pictures on a computer screen. These tests will be done at different times to avoid fatigue. It is estimated that the total testing time per child is 45 minutes. These assessments will be repeated when the children are in grades 2 and 3.

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 — Prof. Claire Penn

(PhD student) — Supervisor

(011) 717 4580/ 0823238016

PROJECT: *"DELVing into the acquisition of academic language 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: .....

APPENDIX 4D: TEACHER INFORMATION SHEET AND 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 academic language 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 children's reading abilities will also be assessed by asking them to read a series of short stories and answer questions verbally. Each child will also be required to complete a memory test by looking at some pictures on a computer screen and thereafter answering questions. 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 grades 2 and 3 at which stage the grades 2 and 3 teachers will again be invited to participate and complete the questionnaire on language background.

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 academic language by foundation phase English language learners"*

Formal Consent Form

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: _____

APPENDIX 4E: PARENT/GUARDIAN INFORMATION SHEET AND 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 45 minutes but will be done on separate occasions to avoid fatigue. Your child's reading will be assessed by asking him/her to read a series of short stories and to answer some questions verbally. 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)

(011) 717 4580

0823238016

Prof. Claire Penn

Supervisor

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

Formal Consent Form

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: .....

APPENDIX 4F: CHILD ASSENT FORM

PROJECT: *"DELVing into the acquisition of academic language 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 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 read some short stories for me and to answer some questions afterwards. When you are in grades 2 and 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 4G: PARENT QUESTIONNAIRE (EAL LEARNERS)

PROJECT: ***Delving into the acquisition of academic language by foundation phase English language learners.***

Date:

Parent's name:

Child's name:

School:

Grade:

Which language do you consider to be your home language?

Which language do you speak the most to your child?

Which other languages are spoken in your home? Please indicate who speaks each of these languages?

Language	Spoken by :

Do you speak English to your child?

Yes ☐

No ☐

How much English do you speak to your child?

Most of the time ☐

Sometimes ☐

Very little ☐

Did your child attend pre-school/grade R? _____

If yes, for how many years? _____

Which language was spoken most by the teachers at the pre-school?

How would you describe your child's development in his/her home language?

Like most other children ☐

Slower than other children ☐

If it was slower than other children, please explain what you mean

_____

Please list any health problems your child has had or has currently:

Thank you very much for completing this questionnaire!

APPENDIX 4H: PARENT QUESTIONNAIRE (L1 LEARNERS)

PROJECT: ***Delving into the acquisition of academic language by foundation phase English language learners.***

Date:

Parent's name:

Child's name:

School:

Grade:

Do you speak only English in your home?_____

Are any other languages spoke in your home?_____

If yes, please indicate who speaks each of these languages:

Language	Spoken by :

Did your child attend pre-school/grade R? _____

If yes, for how many years? _____

Which language was spoken most by the teachers at the pre-school?

How would you describe your child's development in his/her home language?

Like most other children ☐

Slower than other children ☐

If it was slower than other children, please explain what you mean

---

Please list any health problems your child has had or has currently:

Thank you very much for completing this questionnaire!

APPENDIX 4I: TEACHER QUESTIONNAIRE

PROJECT: ***Delving into the acquisition of academic language by foundation phase English language learners.***

Date:

School:

Teacher's name:

Grade:

Which language do you consider to be your home language?

Which other languages do you speak?

_____

Which language do you speak the most?

Do you ever use any of these languages in teaching your current class? If so, which?

Please rate your proficiency in English on the following scale:

Please make a cross on the line where you feel your proficiency is best represented.

Limited proficiency_____Like a first language speaker

Please describe the specific teaching strategies /techniques that you use to assist the learners in your class to acquire the language skills they need for school.

Thank you for taking the time to complete this questionnaire.

APPENDIX 4K: DETAILED DESCRIPTION OF THE DELV-CR (Seymour et al., 2003)	
SYNTAX DOMAIN	
Subtest	Description and Example
Wh- questions	This subtest assesses three aspects of Wh- questions: 1.Understanding the logical requirements for answers to questions that contain two Wh- words in double Wh-questions 2. Taking multiple clauses into account when interpreting questions with embedded clauses. 3.Recognising when the Wh- question words move out of clauses and when they are blocked by relative clauses, purpose clauses or component clauses in barrier questions. For every item, the participant is presented with one or two pictures and told a short story of one to five sentences. The participant is then required to answer a Wh- question. <u>*Double Wh- Questions*</u> The double Wh- questions are reliant on a paired exhaustive requiring that all the characters in the incident are stated and linked in the correct ordered relationship. In other words, the *who* element is accurately coupled with the w*hat* element. **Example:** "There are two people eating, who ate what?" The appropriate reply would involve "The father ate an apple and the baby ate a banana" <u>*Embedded Clause Questions*</u> The Wh- word in the question refers to an omitted piece of information that one communicative partner needs to know from another. **Example:** when the participant is asked "what did the man eat?", he or she needs to determine what component the Wh- word replaces or where in the sentence the Wh- word comes from (e.g., object, subject). In more complex sentences, such as those with two clauses, for example "what did Johnny say he drank?" the Wh- word signifying the object of "drank" has changed places by crossing over two clauses. 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 not to what "he drank" but to what Johnny said he drank. <u>*Barrier Questions*</u> Barrier questions contain barriers to the movement of certain components and restrict the question word to a single word answer. This is assessed by using a second question word in the middle of the sentence as well as adjunct clauses (including relative and purposive clauses). 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. 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 .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. It is not feasible to ask a W*h*-question in which, the W*h*-word has been transferred from within the relative or any other adjunct clause. **Example (Second question word):** "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" However, the long distance answer would be incorrect, as the second question forms a barrier to this response. **Example (Adjunct Clauses):** "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) are 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.
Passives	This subtest assesses knowledge of movement as well as inherent associations. 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 where the object is placed in the subject position and is treated like the subject. This component assesses knowledge of movement in creating simple passive sentences. *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 that is implied from the syntax of the sentence. The hidden features are 1. hidden agents i.e., the person completing the action is inferred rather than directly expressed. **Example:** "the umbrella was opened" implies that someone opened the umbrella; 2. the difference between an action and the result refers to the ability to distinguish between "the house is being built" (continuous action) and "the house is built" (completed action); and 3. 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 child needs to be able to distinguish that another person is performing the washing and not the bear himself.

	Alternate by phrase meanings This component examines the 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. **Example:** in the sentence "The ball is rolling by the boy" the passive construction "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 a deeper understanding of the demands of the passive construction.
Articles	This subtest assesses the ability to utilize the suitable article and is based on the skill of cohesion and discourse linking. Use of the appropriate article requires that the child focus on the manner in which the article was explained in previous utterances as well as what s/he assumed about the object. The correct use of 'the' and 'a' is a prominent difficulty for English second language learners. The child 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. 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. Two types of definite articles are assessed in this subtest: familiar 'the,' which is used when referring to an object that has been named before and part 'the' that refers to part of an object that has been used beforehand. **Example (Familiar the):** "a tiger and a monkey were sitting in the jungle. They were friends. One of them climbed up a tree. Guess which?" **Example (Part the):** "Thabo wanted to eat an orange but first he had to take something off it. What did he take off?" In addition, three types of indefinite articles are also assessed namely: 1. Specific 'a' which refers to a particular object that is only familiar to the speaker, **Example:** "I am sure you have something hanging on the wall of your classroom;" What is it? 2. Non referential 'a' which refers to a non specific object but where the answer is derived from the circumstance. **Example:** "Sipho wants to go to sleep but he is cold and wants something to cover himself. What does he need?" 3. Predictional 'a' which is used before a noun in response to a question containing the word "have." **Example :** "Think about a fireman. What does he have?"

SEMANTICS DOMAIN	
Verb and Preposition Contrast Items	The verb and preposition contrast items examine how a child organizes and retrieves his or her vocabulary. This is an important skill because no matter how different the child's experiences and resulting vocabulary are, his or her lexicon must be organized in a hierarchical pattern to efficiently retrieve words when needed. 1. *Verb Contrast Items* The verb contrast items assess the child's competence in using suitable contrasts at the appropriate hierarchical level in naming actions. The overall classification of verbs examined include: motion, grooming, breaking, corresponding, and dressing. A picture is shown to the child and he or she is required to provide verbs to complete a sentence about the picture. **Example:** "She's not taking off her coat, she's....." 2. *Preposition Contrast Items* The preposition contrast items are structured similarly to 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. The child is shown a picture, and is required to complete two sentences about the pictures using prepositions. **Example:** "She's not eating *under* the TV, she's eating ....."
Quantifiers	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. These items are capable of detecting very subtle problems such as whether the child knows to what range of structures within and across sentences the word "every" applies. 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. 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. The child is shown one picture, and asked a question about it. **Example:** " Is *every*man riding a horse?" Why not?**;** **a**nother three items which examine the child's understanding that 'every' only affects the noun that follows it. **Example :** "The man watched *every* boy throw a ball**.";** and two which analyse the child's understanding of the syntactic constraints that regulate the production of 'every' across sentences. **Example:** "The man watched *every* baby. He played the piano." The child is shown two pictures, and is asked to point to the picture that was being spoken about.
Fast Mapping	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. The child is taught the task through the use of real verbs in the prompt and then novel verbs are utilized. For each item, the child is provided with a series of three pictured episodes, while the administrator expresses an action (e.g.,, Real verb: “The boy is pouring juice”; Novel verb: “The girl is zanning the apple to the boy”). The child is 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 to the right of the pictured episode (e.g., “Which one was the pourer? “What got poured?”; “Who was the zanner?” What got zanned?”). 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 do not provide the child with the material needed to respond correctly. 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 verbs.
PRAGMATICS DOMAIN	
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 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 W*h*-question task corresponds with the comprehension W*h*-question task in the syntax sub-test, and as in the comprehension task it also includes a double W*h*-question. The child is required to ask different questions (who, what, where, when why and how) in order to find out missing information. (e.g.,,” The boy is crying for a reason. Ask me and I’ll show you the answer?”) In each of these items, the child is shown a picture with a missing element and when he/she asks the appropriate question (e.g., “Why is the boy crying?”), s/he is shown the complete picture. For all the items in this subtest, the child has two chances to ask the correct question and questions are scored for pragmatic and semantic appropriateness i.e., his/her ability to recognize what must be said to get the information needed.
Communicative Role Taking	The child is required to talk about a communication act or event taking place in two pictures and the ability to take on another’s perspective is assessed. The child is required to understand what the character (i.e., the speaker) in the pictures wanted to accomplish in his or her utterance. In other words, the participant needs to recognize the speaker’s speech act. **Example:** the examiner shows a picture of a young girl discovering a cake in the refrigerator. A picture of the little girl pulling at her mother's shirt and saying something to her mother is then presented. The examiner asks the participant: "what is the girl *asking* her mom?" The use of the word "asking" by the examiner,

	restricts the appropriate speech act to either a direct or indirect question. A suitable response is: "May I have a piece of cake" or "She is asking if she can have a piece of cake." 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).
Narratives	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 tells the story, the examiner evaluates the story for use of contrastive reference and temporal features i.e., whether the participant is able to provide the necessary information for the examiner to understand the story without looking at the pictures. When the participant completed his/her story, the examiner asks two follow up questions. The responses are judged for mental state references i.e., whether the participant understood what the character wanted or what the character was thinking and for the participant's awareness of the character's false belief. The pictures have three key characteristics to 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 occurr 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 assessed. Furthermore, the participants' story also shows how he/she linked events in time using a short phrase or a clause. 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 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).

APPENDIX 5A: Independent sample t-tests comparing the L1 and EAL groups in context 1(EAL only) on all DELV -CR subtests and reading comprehension in Grades 1, 2 and 3.

	Grade 1		Grade 2		Grade 3	
	t value	**pr>t**	**t value**	**pr>t**	**t value**	**pr>t**
1.Wh-uestions	8.3	<.0001**	5.11	<.0001**	2.68	0.0088**
2.Passives	9.19	<.0001**	6.82	<.0001**	5.92	<.0001**
3.Articles	11.2	<.0001**	6.86	<.0001**	5.72	<.0001**
4.Role-taking	5.22	<.0001**	3.16	0.0021**	3.96	.0001**
5.Narratives	6.25	<.0001**	3.16	0.0021**	1.10	0.2723
6.Question-Asking	9.60	<.0001**	4.22	<.0001**	4.24	<.0001**
7.Verb Contrasts	12.08	0.0001**	8.51	0.0001**	4.21	<.0001**
8.Preposition Contrasts	12.38	0.0001**	3.99	0.0001**	5.95	<.0001**
9.Quantifiers	4.82	0.0001**	3.56	0.0006**	4.69	<.0001**
10.Fast mapping Real Verbs	7.69	0.0001**	7.95	0.0001**	8.04	<.0001**
11.Fast Mapping Novel Verbs	2.24	0.0270*	2.92	0.0043**	2.93	0.0043**
12. Reading comprehension			3.84	0.0004**	5.66	<.0001**

APPENDIX 5B: Independent sample t-tests comparing the L1 and EAL groups in the integrated context (context 2) on all DELV –CR subtests and reading comprehension in grades 1, 2 and 3

	Grade 1		Grade 2		Grade 3	
	t- value	**pr>t**	**t value**	**Pr>t**	**t value**	**Pr>t**
1.Wh-questions	1.94	0.0551	2.98	0.0037**	1.05	0.2956
2.Passives	0.55	0.5839	1.63	0.1068	2.73	0.0077**
3.Articles	2.68	0.0086**	2.71	0.0081**	2.62	0.0105*
4.Role-taking	2.25	0.0267*	1.75	0.0831	1.64	0.1056
5.Narratives	1.99	0.0491*	2.85	0.0054**	-0.51	0.6113
6.Question-asking	1.49	0.1387	1.45	0.1492	2.49	0.0149*
7.Verb Contrasts	3.88	0.0002**	3.81	0.0003**	3.81	0.0003**
8.Preposition Contrasts	3.76	0.0003**	1.28	0.2037	2.06	0.0431*
9.Quantifiers	3.41	0.0009**	0.91	0.3649	1.94	0.0557
10.Fast mapping real verbs	2.62	0.0101*	1.85	0.0671	2.55	0.0128*
11.Fast mapping novel verbs	0.29	0.7741	1.94	0.0556	0.18	0.8593
12.Reading comprehension			**2.10**	0.0387*	0.83	0.4082

APPENDIX 5C: Independent sample t-tests comparing EAL groups in contexts 1(EAL only) and 2(integrated) on all DELV -CR subtests and reading comprehension in Grades 1, 2 and 3

	Grade 1		Grade 2		Grade 3	
	t- value	pr>t	t value	Pr>t	T value	Pr>t
1.Wh-questions	-5.34	<.0001**	-2.32	0.0224*	-1.49	0.1401
2.Passives	-7.53	<.0001**	-4.66	<.0001**	-3.04	0.0031**
3.Articles	-6.69	<.0001**	-4.00	<.0001**	-2.87	0.0051**
4.Role-taking	-2.38	0.0191*	-1.33	0.1866	-2.68	0.0088**
5.Narratives	-3.95	0.0001**	0.05	0.9575	-1.76	0.0810
6.Question-asking	-7.05	<.0001**	-2.98	0.0036**	-2.26	0.0263*
7.Verb Contrasts	-6.87	<.0001**	-4.51	0.0001**	-1.46	0.1482
8.Preposition Contrasts	-6.84	<.0001**	-2.89	0.0047**	-3.64	0.0005**
9.Quantifiers	-1.84	0.0682	-2.51	0.0138*	-2.84	0.0056**
10.Fast mapping real verbs	-4.57	<.0001**	-6.09	0.0001**	-4.68	<.0001**
11.Fast mapping novel verbs	-1.96	0.0527	-1.09	0.2801	-2.59	0.0110*
12. Reading comprehension			-1.31	0.1925	-4.83	<.0001**

APPENDIX 5D: Pearson correlation co-efficients between reading accuracy and language scores for each group in grades 2 and 3

	Syntax		Pragmatics		Semantics	
	Grade 2	Grade 3	Grade 2	Grade 3	Grade 2	Grade 3
L1	r= 0.21652 Pr>r=0.1531	r= -0.15366 Pr>r=0.3375	r= 0.08957 Pr>r=0.5585	r= 0.13188 Pr>r=0.4111	r= 0.13718 Pr>r=0.3689	r= -0.11573 Pr>r=0.4712
EAL cont. 1 (EAL only)	r= 0.04662 Pr>r=0.7354	r= 0.23560 Pr>r=0.0895	r= 0.10093 Pr>r=0.4634	r= 0.09821 Pr>r=0.4842	r= 0.13169 Pr>r=0.3379	r= -0.04930 Pr>r=0.7259
EAL cont. 2 (integrated)	r= 0.30295 Pr>r=0.0483*	r= 0.05261 Pr>r=0.7471	r= 0.03954 Pr>r=0.7989	r= 0.20470 Pr>r=0.2051	r= 0.01666 Pr>r=0.9145	r= 0.26256 Pr>r=0.1017

APPENDIX 5E: Pearson correlation co-efficients between reading comprehension and DELV-CR subtest scores for each group in grades 2 and 3

	L1		EAL cont. 1(EAL only)		EAL cont. 2(integrated)	
DELV-CR subtests	**Grd2 n=46**	**Grd 3 n=41**	**Grd2 n=55**	**Grd 3 n=53**	**Grd 2 n=45**	**Grd 3 n=40**
Wh-questions	r=0.35315 Pr>r=0.0173	r=0.12309 Pr>r=0.4432	r=0.15763 Pr>r=0.2504	r=0.24315 Pr>r=0.0794	r=0.26696 Pr>r=0.0729	r=0.22761 Pr>r=0.1578
Passives	r=0.33600 Pr>r=0.0240	r=0.19172 Pr>r=0.2298	R=0.21514 Pr>r=0.1147	r=0.47699 Pr>r=0.0003	r=0.03356 Pr>r=0.8248	r=0.36505 Pr>r=0.0205
Articles	r=0.19767 Pr>r=0.1931	r=-0.20845 Pr>r=0.1909	R=-0.05327 Pr>r=0.6993	r=0.36739 Pr>r=0.0068	r=0.23946 Pr>r=0.1090	r=0.13456 Pr>r=0.4078
Role- taking	r=0.02962 Pr>r=0.8468	r=-0.20383 Pr>r=0.2012	r=0.02535 Pr>r=0.8542	r=0.28667 Pr>r=0.0374	r=0.21825 Pr>r=0.1451	r=0.30591 Pr>r=0.0549
Narratives	r=0.19068 Pr>r=0.2096	r=-0.02835 Pr>r=0.8603	r=0.11296 Pr>r=0.4116	r=0.16047 Pr>r=0.2510	r=0.27937 Pr>r=0.0601	r=0.25949 Pr>r=0.1059
Question-asking	r=-0.10997 Pr>r=0.4721	r=0.26710 Pr>r=0.0914	r=0.34909 Pr>r=0.0090	r=0.26463 Pr>r=0.0555	r=0.40598 Pr>r=0.0051	r=0.29500 Pr>r=0.0646
Verb contrasts	r=0.18824 Pr>r=0.2156	r=-0.08444 Pr>r=0.5997	r=0.08999 Pr>r=0.5135	r=0.14607 Pr>r=0.2967	r=0.36885 Pr>r=0.0117	r=0.29193 Pr>r=0.0676
Preposition contrasts	r=0.13277 Pr>r=0.3846	r=0.14543 Pr>r=0.3643	r=0.18573 Pr>r=0.1746	r=0.10957 Pr>r=0.4348	r=0.36000 Pr>r=0.0140	r=0.38248 Pr>r=0.0149
Quantifiers	r=0.10856 Pr>r=0.4778	r=0.22352 Pr>r=0.1601	r=0.19837 Pr>r=0.1466	r=0.15798 Pr>r=0.2585	r=0.14237 Pr>r=0.3452	r=0.38406 Pr>r=0.0144
Fast mapping real verbs	r=0.24558 Pr>r=0.1039	r=0.15817 Pr>r=0.3233	r=0.12632 Pr>r=0.3581	r=0.20245 Pr>r=0.1460	r=0.16657 Pr>r=0.2685	r=0.33533 Pr>r=0.0344
Fast mapping novel verbs	r=0.30544 Pr>r=0.0413	r=0.04224 Pr>r=0.7932	r=0.31735 Pr>r=0.0182	r=0.18473 Pr>r=0.1854	r=0.07589 Pr>r=0.6162	r=0.24295 Pr>r=0.1309

APPENDIX 5 F: ANOVA results of comparison between classes within L1 and EAL groups in the integrated context (context 2) on DELV-CR measures in Grades 1, 2 and 3

	L1 group			EAL group context 2 (integrated)		
No .of classes	Grd 1 8	Grd 2 8	Grd 3 8	Grd 1 8	Grd 2 8	Grd 3 8
Wh-questions	F=0.64 Pr>F=0.7208	F=3.31 Pr>F=0.0076**	F=0.87 Pr>F=0.5267	F=1.04 Pr>F=0.4192	F=2.67 Pr>F=0.0153*	F=2.98 Pr>F=0.0118*
Passives	F=1.60 Pr>F=0.1604	F=1.44 Pr>F=0.2199	F=1.54 Pr>F=0.1951	F=1.09 Pr>F=0.3909	F=1.63 Pr>F=0.1396	F=1.16 Pr>F=0.3531
Articles	F=0.93 Pr>F=0.4966	F=1.48 Pr>F=0.2037	F=1.59 Pr>F=0.1808	F=1.38 Pr>F=0.2424	F=1.30 Pr>F=0.2674	F=0.60 Pr>F=0.7870
Total syntax	F=1.63 Pr>F=0.1532	F=1.75 Pr>F=0.1260	F=1.76 Pr>F=0.1373	F=1.84 Pr>F=0.1066	F=3.62 Pr>F=0.0023**	F=1.95 Pr>F=0.0824
Role-taking	F=1.60 Pr>F=0.1628	F=4.35 Pr>F=0.0013**	F=1.52 Pr>F=0.2013	F=1.78 Pr>F=0.1177	F=2.01 Pr>F=0.0620	F=1.74 Pr>F=0.1240
Narratives	F=0.82 Pr>F=0.5769	F=0.33 Pr>F=0.9229	F=5.51 Pr>F=0.0004**	F=1.69 Pr>F=0.1396	F=0.49 Pr>F=0.8862	F=2.38 Pr>F=0.0358
Question-asking	F=0.54 Pr>F=0.8013	F=2.00 Pr>F=0.809	F=2.33 Pr>F=0.0539	F=1.69 Pr>F=0.1396	F=1.67 Pr>F=0.1267	F=3.86 Pr>F=0.0024**
Total Pragmatics	F=0.89 Pr>F=0.5220	F=1.09 Pr>F=0.3887	F=2.54 Pr>F=0.0386	F=0.77 Pr>F=0.6140	F=1.30 Pr>F=0.2680	F=5.63 Pr>F=0.0001**
Verb contrasts	F=0.90 Pr>F=0.5172	F=1.01 Pr>F=0.4384	F=0.72 Pr>F=0.6348	F=0.79 Pr>F=0.5991	F=2.48* Pr>F=0.0232	F=1.96 Pr>F=0.0816
Preposition contrasts	F=1.07 Pr>F=0.3962	F=1.27 Pr>F=0.2915	F=1.46 Pr>F=0.2219	F=0.68 Pr>F=0.6911	F=0.76 Pr>F=0.6615	F=5.28 Pr>F=0.0002**
Quantifiers	F=1.44 Pr>F=0.2156	F=1.23 Pr>F=0.3117	F=1.04 Pr>F=0.4185	F=2,53 Pr>F=0.0295*	F=1.51 Pr>F=0.1776	F=2.55 Pr>F=0.0260*
Fast mapping real verbs	F=0.74 Pr>F=0.6416	F=1.88 Pr>F=0.1004	F=1.08 Pr>F=0.3951	F=1.24 Pr>F=0.3020	F=0.76 Pr>F=0.6631	F=1.50 Pr>F=0.1941
Fast mapping novel verbs	F=2.64 Pr>F=0.0233*	F=2.10 Pr>F=0.0670	F=0.63 Pr>F=0.7026	F=0.47 Pr>F=0.8523	F=0.37 Pr>F=0.9527	F=1.33 Pr>F=0.2651
Total Semantics score	F=2.08 Pr>F=0.0661	F=3.43 Pr>F=0.0061**	F=1.29 Pr>F=0.2875	F=0.46 Pr>F=0.8579	F=2.30 Pr>F=0.0340*	F=2.59 Pr>F=0.0241*

APPENDIX 5G: ANOVA results of comparison between classes within EAL group in context 1 (EAL only) on DELV measures in Grades 1, 2 and 3

	EAL group context 1 (EAL only)		
	Grd 1 (n= 70) 3 classes	Grd 2(n=55) 2 classes	Grd 3(n=53) 2 classes
Wh-questions	F=0.33 Pr>F=0.7184	F=1.68 Pr>F=0.2008	F=0.51 Pr>F=0.6742
Passives	F=0.20 Pr>F=0.8203	F=5.14 Pr>F=0.0276*	F=4.47 Pr>F=0.0075**
Articles	F=1.58 Pr>F=0.2132	F=0.27 Pr>F=0.6050	F=2.61 Pr>F=0.0622
Total syntax	F=0.38 Pr>F=0.6844	F=3.60 Pr>F=0.0631	F=3.70 Pr>F=0.0177*
Role- taking	F=0.99 Pr>F=0.3772	F=0.43 Pr>F=0.5125	F=0.47 Pr>F=0.7072
Narrative	F=2.68 Pr>F=0.0757	F=1.08 Pr>F=0.3044	F=1.19 Pr>F=0.3215
Question- asking	F=5.90 Pr>F=0.0044**	F=3.13 Pr>F=0.0826	F=4.79 Pr>F=0.0053**
Total Pragmatics	F=3.33 Pr>F=0.0417*	F=1.36 Pr>F=0.2482	F=1.85 Pr>F=0.1513
Verb contrasts	F=2.53 Pr>F=0.0876	F=2.36 Pr>F=0.1305	F=3.27 Pr>F=0.0288*
Preposition contrasts	F=2.81 Pr>F=0.0676	F=1.15 Pr>F=0.2878	F=2.78 Pr>F=0.0508
Quantifiers	F=0.03 Pr>F=0.9738	F=0.05 Pr>F=0.8232	F=0.72 Pr>F=0.05468
Fast mapping real verbs	F=2.04 Pr>F=0.1386	F=0.01 Pr>F=0.9198	F=1.97 Pr>F=0.1302
Fast mapping novel verbs	F=0.22 Pr>F=0.8030	F=2.13 Pr>F=0.1508	F=1.17 Pr>F=0.3310
Total Semantics score	F=1.96 Pr>F=0.1486	F=2.50 Pr>F=0.1200	F=2.46 Pr>F=0.0737

APPENDIX 6A: Correlation Matrices for Working Memory and DELV–CR scores

L1 group

	Digit repetition	Dot matrix	Listening recall	Spatial recall	Processing Listening recall	Processing Spatial recall	Sentence repetition
Wh-questions	R= 0.2099 Pr>r=0.3775	R= 0.13857 Pr>r=0.5192	R=-0.00988 Pr>r=0.9661	R=0.11672 Pr>r=0.6144	R=-0.02942 Pr>r=0.8993	R=0.00383 Pr>r=0.9868	R= 0.22680 Pr>r=.01539
Passives	R= 051112 Pr>r=0.0179	R= 0.37029 Pr>r=0.0985	R=0.13296 Pr>r=0.5656	R= 0.28964 Pr>r=0.2028	R= 0.06362 Pr>r=0.7841	R= 0.33582 Pr>r=0.1367	R= 0.30519 Pr>r=0.0523
Articles	R= 0.20953 Pr>r=0.3620	R= -0.05096 Pr>r=0.8264	R=0.07883 Pr>r=0.7341	R=0.39724 Pr>r=0.0746	R=-0.12015 Pr>r=0.6039	R=0.30011 Pr>r=0.1862	R= 0.15221 Pr>r=0.3421
Total Syntax score	R= 0.47304 Pr>r=0.0303	R= 0.23931 Pr>r=0.2961	R=0.11527 Pr>r=0.6188	R=0.40692 Pr>r=0.0671	R=-0.03108 Pr>r=0.8936	R=0.35043 Pr>r=0.1194	R= 0.39534 Pr>r=0.0105
Role- taking	R= 0.36178 Pr>r=0.1071	R= -0.11860 Pr>r=0.6086	R=0.39926 Pr>r=0.0730	R=0.13098 Pr>r=0.5714	R=0.35656 Pr>r=0.1126	R=0.27424 Pr>r=0.2290	R= 0.12122 Pr>r=0.4503
Narratives	R= -0.02731 Pr>r=0.9065	R= 0.40824 Pr>r=0.0662	R=-0.12432 Pr>r=0.5913	R=0.32628 Pr>r=0.1489	R=-021831 Pr>r=0.3418	R=0.10192 Pr>r=0.6602	R= 0.23757 Pr>r=0.1347
Question – asking	R= -0.44880 Pr>r=0.0413	R= 0.00103 Pr>r=0.9965	R= -0.11230 Pr>r=0.6279	R=-0.15304 Pr>r=0.5078	R=-0.08829 Pr>r=0.7035	R=- 0.24670 Pr>r=0.2810	R= 0.23358 Pr>r=0.1416
Total Pragmatics sore	R= -0.11407 Pr>r=0.6225	R= 0.21669 Pr>r=0.3455	R=0.03230 Pr>r=0.8895	R=0.18584 Pr>r=0.4199	R=-0.03501 Pr>r=0.8803	R=0.04818 Pr>r=0.8357	R= 0.36635 Pr>r=0.0185
Verb contrasts	R= 0.22826 Pr>r=0.3197	R= 0.23996 Pr>r=0.2948	R=0.19088 Pr>r=0.4072	R=0.30776 Pr>r=0.1747	R=0.05236 Pr>r=0.8217	R=0.35645 Pr>r=0.1127	R= 0.30827 Pr>r=0.0499
Preposition contrasts	R= 0.22534 Pr>r=0.3260	R= 0.00964 Pr>r=0.9669	R=-0.06650 Pr>r=0.7746	R=0.15963 Pr>r=0.4895	R=-0.11909 Pr>r=0.6071	R=0.14056 Pr>r=0.5434	R= 0.54896 Pr>r=0.0002
Quantifiers	R= -0.05655 Pr>r=0.8076	R= 0.54577 Pr>r=0.0105	R=0.01814 Pr>r=0.9378	R=0.35705 Pr>r=0.1121	R=-0.11264 Pr>r=0.6269	R=0.21220 Pr>r=0.3558	R= 0.35685 Pr>r=0.0220
Fast mapping real verbs	R= 0.32587 Pr>r=0.1494	R= 0.09243 Pr>r=0.6903	R=0.27312 Pr>r=0.2310	R=0.31296 Pr>r=0.1672	R=0.22538 Pr>r=0.3260	R=0.19065 Pr>r=0.4078	R= 0.41340 Pr>r=0.0072
Fast mapping novel verbs	R= 0.15799 Pr>r=0.4940	R= -0.12387 Pr>r=0.5927	R=0.55622 Pr>r=0.0088	R=0.13777 Pr>r=0.5515	R=0.54024 Pr>r=0.0115	R=0.21182 Pr>r=0.3567	R= 0.36057 Pr>r=0.0206
Total Semantic score	R= 0.26177 Pr>r=0.2517	R= 0.19440 Pr>r=0.3984	R=0.38096 Pr>r=0.0884	R= 0.37612 Pr>r=0.0929	R=0.27374 Pr>r=0.2299	R= 0.34017 Pr>r=0.1313	R= 0.59630 Pr>r=0.0001
Reading accuracy	R= 0..20323 Pr>r=0.3901	R= -0.18331 Pr>r=0.4392	R=0.45902 Pr>r=0.0418	R=-0.11605 Pr>r=0.6261	R=0.66064 Pr>r=0.0015	R= -0.07067 Pr>r=0.7672	R= 0.15047 Pr>r=0.3477
Reading comprehension	R= 0.44105 Pr>r=0.0516	R= -0.14140 Pr>r=0.5521	R=0.43833 Pr>r=0.0532	R=0.33857 Pr>r=0.1442	R=0.34345 Pr>r=0.1382	R=0.37232 Pr>r=0.1060	R= 0.30439 Pr>r=0.0530

EAL context 1(EAL only) group

	Digit repetition	Dot matrix	Listening recall	Spatial recall	Processing Listening recall	Processing Spatial recall	Sentence repetition
Wh-questions	R= 0.13899 Pr>r= 0.3115	R=-0.00039 Pr>r=0.9978	R= 0.29709 Pr>r=0.0276	R= 0.03074 Pr>r=0.8237	R=0.19875 Pr>r=0.1458	R=0.12637 Pr>r=0.3579	R= 0.24563 Pr>r=0.0763
Passives	R= 0.13860 Pr>r=0.3129	R=-0.04240 Pr>r=0.7586	R=0.16436 Pr>r=0.2305	R= -0.06308 Pr>r=0.6473	R=0.19203 Pr>r=0.1602	R=-0.09446 Pr>r=0.4927	R= 0.39323 Pr>r=0.0036
Articles	R= -0.09971 Pr>r=0.4689	R=0.01412 Pr>r=0.9185	R=0.14359 Pr>r=0.2956	R=-0.18884 Pr>r=0.1674	R=0.16700 Pr>r=0.2230	R=-0.15330 Pr>r=0.2638	R= 0.46688 Pr>r=0.0004
Total Syntax score	R= 0.08955 Pr>r=0.5156	R=-0.01340 Pr>r=0.9227	R=0.28359 Pr>r=0.0359	R=-0.09374 Pr>r=0.4960	R= 0.25714 Pr>r=0.0581	R= -0.04521 Pr>r=0.7431	R= 0.48692 Pr>r=0.0002
Role- taking	R= -0.11969 Pr>r=0.3841	R=0.09253 Pr>r=0.5017	R=0.24214 Pr>r=0.0749	R=-0.12829 Pr>r=0.3506	R=0.16846 Pr>r=0.2189	R=0.02750 Pr>r=0.8420	R= 0.47944 Pr>r=0.0003
Narratives	R= -0.19440 Pr>r=0.1550	R=-0.05415 Pr>r=0.6946	R=0.05591 Pr>r=0.6852	R=0.21320 Pr>r=0.1181	R=0.08069 Pr>r=0.5581	R=0.16176 Pr>r=0.2380	R= 0.33678 Pr>r=0.0137
Question – asking	R= 0.15331 Pr>r=0.2638	R=0.00447 Pr>r=0.9742	R=0.14618 Pr>r=0.2869	R=-0.01901 Pr>r=0.8904	R=0.13216 Pr>r=0.3361	R=0.09256 Pr>r=0.5015	R= 0.26397 Pr>r=0.0561
Total Pragmatics sore	R= -0.01674 Pr>r=0.9035	R=0.01197 Pr>r=0.9309	R=0.20591 Pr>r=0.1315	R=0.01267 Pr>r=0.9268	R=0.18054 Pr>r=0.1872	R=0.13111 Pr>r=0.3400	R= 0.54043 Pr>r=0.0001
Verb contrasts	R= -002273 Pr>r=0.8692	R=-009951 Pr>r=0.4698	R=0.10220 Pr>r=0.4578	R=-0.00223 Pr>r=0.9871	R=0.09862 Pr>r=0.4738	R=0.10484 Pr>r=0.4462	R= 0.42634 Pr>r=0.0015
Preposition contrasts	R= 0.12624 Pr>r=0.3584	R=0.04251 Pr>r=0.7580	R=0.06706 Pr>r=0.6266	R=0.30561 Pr>r=0.0233	R=0.01550 Pr>r=0.9106	R=0.33365 Pr>r=0.0128	R= 0.38303 Pr>r=0.0046
Quantifiers	R= 0.00548 Pr>r=0.9683	R=-0.12425 Pr>r=0.3661	R=-0.00544 Pr>r=0.9685	R=-0.16460 Pr>r=0.2298	R=0.00676 Pr>r=0.9609	R=-0.04334 Pr>r=0.7534	R= 0.13561 Pr>r=0.3330
Fast mapping real verbs	R= 0.17167 Pr>r=0.2101	R=0.00485 Pr>r=0.9720	R=0.15536 Pr>r=0.2574	R=-0.21916 Pr>r=0.1079	R=0.14292 Pr>r=0.2979	R=-0.17197 Pr>r=0.2093	R= 0.33698 Pr>r=0.0136
Fast mapping novel verbs	R= -0.05332 Pr>r=0.6990	R=-0.04469 Pr>r=0.7459	R=0.24169 Pr>r=0.0754	R=-0.00855 Pr>r=0.9506	R=0.21299 Pr>r=0.1185	R=0.03572 Pr>r=0.7957	R= 0.32090 Pr>r=0.0191
Total Semantic score	R= 0.04370 Pr>r=0.7514	R=-0.08032 Pr>r=0.5599	R=0.20824 Pr>r=0.1271	R=-0.03085 Pr>r=0.8231	R=0.18085 Pr>r=0.1864	R= 0.08236 Pr>r=0.5500	R= 0.47897 Pr>r=0.0003
Reading accuracy	R= 0.21439 Pr>r=0.1160	R=-0.02357 Pr>r=0.8644	R=-0.14295 Pr>r=0.2978	R=0.05507 Pr>r=0.6897	R=-0.09805 Pr>r=0.463	R=0.13820 Pr>r=0.3143	R= 0.05098 Pr>r=0.7170
Reading comprehension	R= 0.22715 Pr>r=0.0954	R=0.03816 Pr>r=0.7821	R= 0.03555 Pr>r=0.7967	R=0.19870 Pr>r=0.1459	R=0.03984 Pr>r=0.7727	R=0.21522 Pr>r=0.1146	R= 0.38787 Pr>r=0.0041

EAL context 2 (integrated) group

	Digit repetition	Dot matrix	Listening recall	Spatial recall	Processing Listening recall	Processing Spatial recall	Sentence Repetition
Wh-questions	R= 0.11313 Pr>r= 0.6073	R=0.23060 Pr>r=0.2898	R= 0.03097 Pr>r=0.8885	R=0.28991 Pr>r=0.1796	R=-0.01541 Pr>r=0.9444	R= 0.29652 Pr>r=0.1695	R= 0.58871 Pr>r=0.0001
Passives	R= 0.41684 Pr>r=0.0478	R=0.31501 Pr>r=0.1432	R=0.52545 Pr>r=0.0100	R=0.36329 Pr>r=0.0884	R=0.48819 Pr>r=0.0181	R=0.54410 Pr>r=0.0073	R= 0.69903 Pr>r=0.0001
Articles	R= 0.32623 Pr>r=0.1287	R=0.02281 Pr>r=0.9177	R=0.23275 Pr>r=0.2852	R=0.14111 Pr>r=0.5207	R=0.21131 Pr>r=0.3331	R=0.21838 Pr>r=0.3168	R= 0.17020 Pr>r=0.2937
Total Syntax score	R= 0.41697 Pr>r=0.0478	R=0.40987 Pr>r=0.0521	R=0.56720 Pr>r=0.0048	R=0.31670 Pr>r=0.1409	R=0.46739 Pr>r=0.0245	R=0.46632 Pr>r=0.0249	R= 0.63677 Pr>r=0.0001
Role- taking	R= 0.08649 Pr>r=0.6948	R=0.19506 Pr>r=0.3724	R=0.17908 Pr>r=0.4136	R=0.38978 Pr>r=0.0660	R=0.21181 Pr>r=0.3319	R=0.45811 Pr>r=0.0279	R= 0.35710 Pr>r=0.0237
Narratives	R= -0.13757 Pr>r=0.5314	R=-000349 Pr>r=0.9874	R=0.04941 Pr>r=0.8228	R=0.37048 Pr>r=0.0818	R=0.24316 Pr>r=0.2636	R=0.31850 Pr>r=0.1386	R= 0.48520 Pr>r=0.0015
Question – asking	R= 0.36248 Pr>r=0.0892	R=0.09883 Pr>r=0.6537	R=0.34517 Pr>r=0.1067	R=0.41881 Pr>r=0.0467	R=0.26544 Pr>r=0.2209	R=0.38788 Pr>r=0.0674	R= 0.68657 Pr>r=0.0001
Total Pragmatics sore	R= -0.16837 Pr>r=0.4425	R= 0.15687 Pr>r=0.4747	R=-017608 Pr>r=0.4216	R=0.37181 Pr>r=0.0806	R=-019229 Pr>r=0.3794	R=0.30799 Pr>r=0.1528	R= 0.66368 Pr>r=0.0001
Verb contrasts	R= 0.20373 Pr>r=0.3511	R=0.44661 Pr>r=0.0326	R=0.31686 Pr>r=0.1407	R=0.41109 Pr>r=0.0513	R= 0.27236 Pr>r=0.2086	R=0.43307 Pr>r=0.0390	R= 0.62932 Pr>r=0.0001
Preposition contrasts	R= 0.41790 Pr>r=0.0472	R=0.10311 Pr>r=0.6397	R=0.30685 Pr>r=0.1544	R= 0.12031 Pr>r=0.5845	R= 0.27817 Pr>r=0.1987	R= 0.15851 Pr>r=0.4701	R= 0.45562 Pr>r=0.0031
Quantifiers	R= 0.55269 Pr>r=0.0062	R=0.12069 Pr>r=0.5833	R=0.25642 Pr>r=0.2376	R=-0.03744 Pr>r=0.8653	R=0.21850 Pr>r=0.3165	R=0.06628 Pr>r=0.7638	R= 0.37031 Pr>r=0.0187
Fast mapping real verbs	R= 0.20787 Pr>r=0.3412	R= 0.18576 Pr>r=0.3961	R=0.05868 Pr>r=0.7903	R= 0.39267 Pr>r=0.0638	R=0.02714 Pr>r=0.9022	R=0.26621 Pr>r=0.2195	R= 0.55524 Pr>r=0.0002
Fast mapping novel verbs	R= 0.54288 Pr>r=0.0074	R=0.24516 Pr>r=0.2595	R=0.51974 Pr>r=0.0110	R=0.08040 Pr>r=0.7153	R=0.42617 Pr>r=0.0426	R=0.16602 Pr>r=0.4490	R= 0.21447 Pr>r=0.1839
Total Semantic score	R= 0.63847 Pr>r=0.0010	R=0.39807 Pr>r=0.0599	R=0.51929 Pr>r=0.0111	R=0.32408 Pr>r=0.1314	R=0.43312 Pr>r=0.0390	R=0.37523 Pr>r=0.0777	R= 0.63150 Pr>r=0.0001
Reading accuracy	R= 0.19428 Pr>r=0.3863	R=-0.12745 Pr>r=0.5719	R=0.20732 Pr>r=0.3546	R=0.06490 Pr>r=0.7742	R=0.20494 Pr>r=0.3602	R=0.14704 Pr>r=0.5138	R= 0.24050 Pr>r=0.1349
Reading comprehension	R= 0.30155 Pr>r=0.1620	R=0.40009 Pr>r=0.0585	R=0.56912 Pr>r=0.0046	R=0.18754 Pr>r=0.3915	R=0.48786 Pr>r=0.0182	R= 0.20576 Pr>r=0.3462	R= 0.48805 Pr>r=0.0014

APPENDIX 6B: CLASS, GENDER AND EXPOSURE GROUP COMPARISONS ON WORKING MEMORY MEASURES

Results of comparison between classes in each educational context on WM measures in Grade 2

	L1		EAL cont 1(EAL only)		EAL cont 2 (integrated)	
	F value	**Pr>F**	**F value**	**Pr>F**	**F value**	**Pr>F**
Digit Repetition	2.49	0.0741	3.56	0.0647	1.72	0.1848
Dot matrix	0.45	0.8516	0.97	0.3280	1.15	0.3751
Sentence Recall	1.54	0.2380	1.63	0.2066	1.97	0.1353
Spatial Recall	1.12	0.4058	1.77	0.1895	1.07	0.4096
Processing Sentence Recall	0.88	0.5471	0.04	0.8408	1.21	0.3448
Processing Spatial Recall	2.31	0.0911	1.60	0.2117	1.93	0.1412
Sentence Repetition	2.50	0.0414	1.12	0.3500	1.73	0.1250

ANOVA results of comparison between males and females on WM scores in Grade 2

	L1		EAL cont 1(EAL only)		EAL cont 2(integrated)	
	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
Spatial 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 Spatial Recall	0.20	0.6566	2.47	0.1223	0.23	0.6381

ANOVA results of comparison between EAL exposure groups in each context on WM measures in grade 2

	EAL cont 1 (EAL only)		EAL cont 2 (integrated)	
	F value	**Pr>F**	**F value**	**Pr >F**
Digit Repetition	2.27	0.1376	0.70	0.4125
Dot matrix	0.43	0.5148	5.95	0.0237*
Listening Recall	3.49	0.0674	5.36	0.0308*
Spatial Recall	0.38	0.5427	2.12	0.1606
Processing Sentence Recall	0.01	0.9369	4.75	0.0408*
Processing Spatial recall	4.95	0.0303*	2.31	0.1439
Sentence Repetition	1.88	0.1769	0.01	0.9152

APPENDIX 6C: Raw scores obtained by each participant identified as language- impaired on each DELV –CR subtest in relation to the peer group mean in each grade

Syntax

Syntax subtest		Wh- questions Total possible=14			Passives Total possible=10			Articles Total possible =8)		
Child	Group	Grd 1	Grd 2	Grd 3	Grd 1	Grd 2	Grd 3	Grd 1	Grd 2	Grd 3
Z.G.	L1	10	12	10	4	7	8	4	5	7
S.P.	L1	12	12	12	4	5	6	5	7	8
Peer group means		13.33	13.6	13.5	6.9	7.9	8.7	6.5	6.9	7.2
EAL only										
O.M.	EAL cont1	8	10	10	3	5	6	3	4	4
C.M.	EAL cont1	4	10	12	5	3	6	4	5	4
M.K.	EAL cont1	4	6	10	2	3	5	2	1	5
Peer group means		9.5	11.9	12.7	4.3	5.7	6.5	2.9	4.7	5.5
Integrated context										
M.F.	EAL cont2	2	10	10	5	6	4	3	4	6
H.R.	EAL cont2	10	8	8	3	4	5	2	3	4
Peer group means		12.5	12.8	13.2	6.8	7.4	7.8	5.5	6.1	6.5

Pragmatics

Pragmatics Subtest		Role-taking Total possible =8			Narratives Total possible =7			Question- asking Total possible =9		
Child	Group	Grd 1	Grd 2	Grd 3	Grd 1	Grd 2	Grd 3	Grd 1	Grd 2	Grd 3
Z.G.	L1	4	6	8	4	6	6	2	5	5
S.P.	L1	8	8	8	5	6	6	5	6	8
Peer group means		6.9	7.5	7.9	5.1	5.4	5.5	7.1	8.0	8.3
EAL only										
O.M.	EAL cont1	4	4	4	1	2	3	0	0	3
C.M.	EAL con1	4	2	8	1	3	5	0	5	0
M.K.	EAL con1	2	4	8	2	3	3	0	0	7
Peer group means		5.1	6.5	6.7	3.5	4.5	5.2	2.5	6.1	7.2
Integrated context										
M.F.	EAL cont2	4	6	8	4	5	5	0	5	6
H.R.	EAL cont2	2	2	4	3	0	2	1	2	4
Peer group means		6.0	7.0	7.5	4.6	4.6	5.6	6.4	7.6	7.9

Semantics

Semantic Subtest		Verb contrasts			Preposition contrasts			Quantifiers			Fast mapping real verbs			Fast mapping novel verbs		
Child	Group	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Z.G.	L1	7	8	9	4	4	3	5	5	5	4	6	7	4	4	5
S.P.	L1	6	8	9	4	6	5	5	6	7	5	3	5	4	3	4
Peer group means		8	8.6	9.0	5.5	5.4	5.6	7.5	7.5	8.8	6.3	6.8	7.4	6.3	7.4	7.8
O.M	EALcont1	1	3	4	3	2	2	6	4	6	3	4	2	4	4	5
C.M.	EALcont1	4	4	6	2	3	3	5	7	7	4	4	2	3	2	2
M.K.	EALcont1	0	3	8	0	2	3	2	4	7	3	2	1	6	3	3
Peer group means		3.7	5.6	7.6	2.9	4.5	4.3	5.9	6.5	7.2	4.2	4.6	5.1	5.2	5.9	6.4
M.F.	EALcont2	6	6	5	3	4	5	6	4	7	2	3	2	0	4	5
H.R.	EALcont2	3	4	7	3	2	1	6	6	7	3	3	4	2	3	4
Peer group means		6.6	7.4	8.1	4.7	5.2	5.2	6.6	7.2	7.8	5.5	6.3	6.6	6.1	6.5	7.7