PHONOLOGICAL AWARENESS AND SPEECH PERCEPTION IN NOISE: SKILLS OF ENGLISH SECOND LANGUAGE LEARNERS IN GRADE 1

By
Casey Jane Eslick
13092562

A dissertation submitted in fulfilment of the requirements for the degree MA (Speech-Language Pathology)

In the Department of Speech-Language Pathology and Audiology at the

UNIVERSITY OF PRETORIA

FACULTY OF HUMANITIES

SUPERVISOR: Dr. Mia le Roux
CO-SUPERVISORS: Dr. Lidia Pottas and Dr. Salomé Geertsema

July 2018

UNIVERSITY OF PRETORIA

FACULTY OF HUMANITIES

RESEARCH PROPOSAL AND ETHICS COMMITTEE

DECLARATION

Full Name: Casey Jane Eslick

Student Number: 13092562

Degree/ Qualification: MA (Speech-Language Pathology)

Title of Dissertation: Phonological awareness and speech perception in noise: Skills of English second language learners in Grade 1

I declare that this dissertation is my own original work. Where secondary material is used, this has been carefully acknowledged and referenced in accordance with the university requirements.

I understand what plagiarism is and am aware of university policy and implications in this regard.

_____ 31 October 2018

SIGNATURE **DATE**

ACKNOWLEDGEMENTS

“Alone we can do so little, together we can do so much.”

Helen Keller

I would like to express my gratitude to:

My Lord, Elohim, the Beautiful Maker, for the blessing of curiosity.

Dr. Mia le Roux, Dr. Lidia Pottas and Dr. Salomé Geertsema, a special thank you for many hours of guidance, insight, motivation and support. I will always be grateful!

My family for their love and always believing in me.

My friends for hours of laughter, shared tears, and encouragement.

The participating schools for their enthusiasm and assistance.

The parents and learners whose participation was invaluable.

To each and every one of you,

I could not have completed this journey without you.

Your kindness is truly appreciated!

With all my heart,

Thank you.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF IMAGES

LIST OF ABBREVIATIONS

ANA	**-**	Annual National Assessment
BICS	-	Basic Interpersonal Communication Skills
CALP	**-**	Cognitive Academic Language Proficiency
CAPS	-	Curriculum Assessment Policy Statement
DIN	-	Digits-in-Noise
dB	-	Decibel
ELoLT	**-**	English Language of Learning and Teaching
EL1	-	English First Language
EL2	-	English Second Language
Hz	-	Hertz
IQR	**-**	Interquartile Range
KLST-2	**-**	Kindergarten Language Screening Test – 2nd Edition
LiEP	**-**	Language in Education Policy
LoLT	-	Language of Learning and Teaching
L1	-	First Language
L2	-	Second Language
PA	-	Phonological Awareness
PAT-2	**-**	Phonological Awareness Test – 2nd Edition
PIRLS	**-**	Progress in International Reading Literacy Study
SA Eng DIN Test	**-**	South African English Digits-in-noise Test
SD	-	Standard Deviation

SES	-	Socio-economic Status
SNR	-	Signal-to-noise-ratio
SRT	-	Speech Reception Threshold

LIST OF APPENDICES

FORMATTING

The American Psychological Association *(6th ed.)* referencing style was used in this dissertation.

CLARIFICATION OF TERMS

Basic Interpersonal Communication Skills (BICS):
Language competence adequate for social communication interactions (Kotze, van der Westhuizen, & Barnard, 2017).

Cognitive Academic Language Proficiency (CALP):
Language proficiency understood to be more cognitively demanding, necessary to understand abstracted language which occurs without context in formal or academic situations (du Plessis & Louw, 2008).

Decibel (dB):
The unit used to measure the intensity of sound (National Institute of Occupational Safety and Health, 1998).

First Language (L1):
A language acquired during early childhood, generally accepted as a language developed from birth (Saville-Troike & Barto, 2017).

Language of Learning and Teaching (LoLT):
The language used and developed academically in order to learn (Jordaan, 2011).

Language Proficiency:
The acquisition of BICS and CALP to develop competency at which an individual uses a language for communication and academic learning (Kotze et al., 2017).

Literacy:
Interrelated abilities to read, write, speak, listen, and think (Wildschut, Moodley, & Aronstam, 2016).

Metalinguistic Awareness:
The knowledge and ability to consciously control sub-lexical representations such as phonemes (Ouellette & Haley, 2013).

Multilingualism:
A characteristic identified in a person who can speak more than two languages or is proficient in many languages (Saville-Troike & Barto, 2017).

Noise:

Any undesirable sound (National Institute of Occupational Safety and Health, 1998).

Phonemic Awareness:

An aspect of phonological awareness requiring manipulation of sounds (phonemes), such as blending or segmenting (Ouellette & Haley, 2013).

Phonics:

The knowledge of letter-sound correspondence, also referred to as the understanding of relations between phonemes and their corresponding grapheme representations (Pretorius, 2014).

Phonological Awareness (PA):

The metalinguistic awareness and skills to recognise, discriminate, and manipulate sound units of words (Goldstein et al., 2017; Webb & Lederberg, 2014).

Second Language Acquisition:

Learning a language subsequent to a first language (Saville-Troike & Barto, 2017).

Second Language (L2):

An official language acquired subsequent to the first language within a language community including first language speakers, necessary to meet basic needs socially, academically, politically or economically (Saville-Troike & Barto, 2017).

Signal-to-Noise Ratio (SNR):

This is a measurement which shows the ratio of the speech signal to the corresponding background noise (Mealings, Dillon, Buchholz, & Demuth, 2015).

Speech Perception:

The process whereby sounds are able to be identified, interpreted, and understood (Potgieter, Swanepoel, Myburgh, Hopper, & Smits, 2016).

Speech Reception Threshold (SRT):

The lowest hearing level in dB, at which 50% of spoken language (sentences, words or digits) is able to be identified, interpreted and understood (Potgieter et al., 2016).

ABSTRACT

Purpose

Low literacy achievement of English second language (EL2) learners due to insufficient language development is a concern. Investigating foundational phonological awareness (PA) and speech perception in noise skills is important to inform evidence-based support during literacy acquisition. For this purpose, the study described the PA and speech perception in noise skills of South African Grade 1, EL2 participants, learning in an English first language (EL1) educational context.

Method

Twenty-five EL1 participants provided normative results for the matched 25 EL2 participants investigated from the Tshwane District. Quantitative data was collected using the *Phonological Awareness Test – 2 (PAT-2)* and the *South African English DIN Test* for between-group comparisons. Questionnaires were provided to parents and teachers to obtain demographic and background information.

Results and discussion

The EL2 learners presented with PA skills significantly below that of EL1 learners. Although the speech perception in noise skills of the EL2 learners were within the normative range for their age, their scores remained significantly lower than the EL1 learners.

Conclusions

The findings support inclusion of explicit PA instruction for rhyming, segmentation, isolation, deletion, substitution, and blending for EL2 literacy acquisition. Developing speech perception in noise skills is necessary to facilitate PA and phoneme-grapheme knowledge. This enables decoding for early EL2 literacy acquisition.

Keywords*:* Second language, multilingualism, literacy, language of instruction, phonological awareness, speech perception

CHAPTER ONE: INTRODUCTION

"To learn to read is to light a fire; every syllable that is spelled out is a spark."
Victor Hugo

Chapter Aim: This chapter provides the background of knowledge relating to this study. An understanding of the relationship between literacy development and the skills of phonological awareness and speech perception in noise is explained. In South Africa there appears to be a lack of knowledge regarding the specific level of phonological awareness and speech perception in noise skills of English second language learners in English first language educational contexts. The high noise levels in South African classrooms may be a compounding factor to the literacy development difficulties of English second language learners. Obtaining information of present learner skills is necessary to develop appropriate intervention and support for literacy development. This chapter also provides a statement of the problem and research question for this study.

1.1. Orientation and problem statement

1.1.1. Language in education

Language is the means by which an individual mediates their thoughts and experiences to acquire knowledge (Department of Basic Education, 2010; Nyaga, 2015). Recognised as the basis of independent cognitive, affective, and social functions, language is fundamental to learning and literacy acquisition (Collier & Thomas, 2012; Wildschut et al., 2016). Language proficiency is therefore widely acknowledged in research as central to academic success (Jordaan, 2011; Nyaga, 2015; Webb, Lafon, & Pare, 2010). Appropriate language skills in the medium of instruction during the early school years is thus important, particularly for multilingual societies (Hay & Fielding-Barnsley, 2012; Kotze et al., 2017; Pretorius, 2014).

Throughout the world education occurs in multilingual contexts (Nyaga, 2015). The school instruction outcomes and subsequent literacy levels are often low in multilingual settings, particularly on the African continent (Alcock, Ngorosho, & Matthew, 2017). In many developing countries the language proficiency of young learners is insufficient

for academic learning which leads to flat learning trajectories over time (Taylor & Fintel, 2016; Wildschut et al., 2016).

Poor learning advancement as a result of language is a concern, as language plays an important role in the development of literacy (Wildschut et al., 2016). Language disadvantages are strongly associated with confounding factors such as historical disadvantage, low socio-economic status (SES), and poor school management (Taylor & Fintel, 2016). These factors were experienced in South Africa in recent years. Consequentially, academic underachievement and low literacy levels of learners in South Africa are currently a serious concern (Combrinck, van Staden, & Roux, 2014; Fleisch, Pather, & Motilal, 2017; Howie et al., 2017; Jordaan, 2011).

As a result of the academic underachievement and low literacy levels, questions regarding the influence of language on literacy and learning outcomes, remain pertinent to multilingual South Africa (Department of Basic Education, 2010; Taylor & Fintel, 2016). Developmental trajectories for literacy skill acquisition begin early with phonological awareness and speech perception in noise, thus necessitating early support for learners (Goldstein et al., 2017; Lessing & de Witt, 2016). The necessary support however, is often not available (Howie et al., 2017). To provide support, it is necessary to determine the skills which learners have in order to develop literacy in their educational context. To enable understanding of the development of phonological awareness (PA) and speech perception in noise skills within the South African context, a review of the context is provided hereafter. A discussion of PA and speech perception in noise within the educational context will follow afterwards.

1.1.2. The state of literacy in the South African educational context

A large number of South African learners present with a low level of literacy achievement, as was first evidenced in the Progress in International Reading Literacy Study (PIRLS) 2006 (Howie et al., 2008). In the PIRLS 2006, South Africa presented with the lowest reading achievement of the 45 education systems (Howie et al., 2008). The literacy underachievement of South African learners was highlighted when renewed quantitative evidence from the PIRLS 2011 showed no difference in literacy achievement over the prior five years (Spaull, 2015).

An easier version of the PIRLS which is designed for developing countries, namely the PIRLS Literacy 2011, was conducted with the Grade 4 learners in South Africa

(Combrinck et al., 2014). The learners were assessed in the language of learning and teaching (LoLT) during their prior Grades 1-3. The PIRLS Literacy 2011 study showed that 80% of the Grade 4 learners had not acquired basic reading skills (Howie, van Staden, Tshele, Dowse, & Zimmerman, 2012).

In response to the low level of literacy skills, the Department of Education agreed to implement Annual National Assessments (ANAs) from Grades 1 to 6 and Grade 9 in mathematics and literacy (Department of Basic Education, 2014). Results from the ANAs supported findings of the PIRLS 2006 and PIRLS 2011 (Department of Basic Education, 2014; Howie et al., 2008; Howie et al., 2012). In the ANAs 2014 the average Home Language scores decreased from 63% at the Grade 1 level to 56% at the Grade 3 level (Department of Basic Education, 2014). This standard dropped further to 48% at the Grade 9 level. The decline in language abilities across the grades within the same year as the grade levels increase, raises further concern (Wildschut et al., 2016), as the difficulties and delays which learners experience are not being alleviated (Webb et al., 2010). Rather, the persistent underachievement tends to become greater over time (Bruwer, Hartell, & Steyn, 2014), necessitating early intervention as the language abilities of learners play a crucial role in literacy achievement.

The data sets pertaining to the literacy underachievement of South African learners are shining a spotlight on the education system (van Staden, Bosker, & Bergbauer, 2011). In efforts to reduce inequality the Department of Education implemented policies, such as the *Language in Education Policy (LiEP)* (Department of Education, 1997), and the more recent *Curriculum Assessment Policy Statements (CAPS)* (Department of Basic Education, 2011a, Department of Basic Education, 2011b). Though the goal of the *LiEP* is to use an additive multilingual model to accommodate all learners, the implementation has been ineffective thus far (van Staden et al., 2011). Despite efforts made by the Department of Education, the academic outcomes remain low, particularly for literacy achievement (Combrinck et al., 2014; Department of Basic Education, 2014).

New evidence from the PIRLS 2016 showed no significant difference in the literacy achievement of English language learners between 2006 and 2016 (Howie et al., 2017). Of 50 countries, once again South Africa presented with the lowest reading achievement (Howie et al., 2017). The reported statistic remains that approximately

80% of Grade 4 South African learners do not have basic reading skills (Howie et al., 2012; Howie et al., 2017). The low levels of literacy skills of learners have recently been described as a crisis (Fleisch et al., 2017; Spaull, 2015). The urgent need for literacy intervention within the country is highlighted when the 80% of South African learners without basic literacy skills are compared to the 4% of learners internationally (Howie et al., 2017).

Failure to acquire basic literacy skills during early school years heightens the risk of later reading failure which leads to the underachievement of South African learners (Lessing & de Witt, 2016). Improving methods used to teach literacy is a goal which emerged from the PIRLS 2016 study (Howie et al., 2017). However, in order to effectively intervene and improve the teaching of literacy, research is required to determine in what areas of literacy development learners need support.

The aim to address inequality in education and subsequent academic achievement, as well as concurrently improve the literacy performance of learners, poses a dual challenge for the South African education system (Fleisch et al., 2017; Taylor & Fintel, 2016). This challenge is further exacerbated as the South African Constitution acknowledges 11 official languages, and states that every child may exercise their right to receive education in their L1 (Constitution of the Republic of South Africa, Act no. 108 of 1996, (Kotze et al., 2017; Taylor & Fintel, 2016).

1.1.3. Teachers as language models

The White Paper 6 (Department of Education, 2001) emphasizes the role of teachers to adjust the educational environment and accommodate the diverse needs of learners, including their L1, through inclusive education (Kotze et al., 2017). As the primary resource for inclusion and provision of support in the LoLT, teachers require sufficient training and expertise (Department of Basic Education, 2015; Department of Education, 2001; du Plessis & Louw, 2008; Howie et al., 2017; Sibomana, 2017). However, many teachers have a lack of knowledge and training regarding the diversity of language use and support available to L2 learners in their classrooms (du Plessis & Louw, 2008; Kotze et al., 2017; Webb et al., 2010). The language proficiency of teachers themselves is also often limited in the required LoLT, as the LoLT may not be the L1 of teachers (Nel & Müller, 2010; Sibomana, 2017; Webb et al., 2010). A common practise observed in South African schools is the use of code-switching to

facilitate effective communication and understanding (du Plessis & Louw, 2008; Webb et al., 2010). In the Foundation Phase the language input by teachers needs to be adequate to facilitate effective acquisition of the LoLT for academic learning (Department of Education, 2001; Jordaan, 2011). Thus ideally, teachers would be using their L1 as the LoLT, which in an ideal world would also be the L1 of the learners.

1.1.4. Language of instruction

Use of the L1 as the LoLT is always desirable with evidence indicating a strong positive correlation to academic achievement (Department of Basic Education, 2010; Kotze et al., 2017). However, of 11 official languages, only two languages, namely English and Afrikaans, have sufficient academic literature for secondary school leaving examinations to be written (Taylor & Fintel, 2016). As a result of the lack of academic vocabulary in African languages, many learners receive education for the Foundation Phase in their L1 and change to English or Afrikaans at the end of Grade 3.

The language transition in Grade 4 leads to L2 LoLT, thus supportive material and teacher training is required (Sibomana, 2017; Taylor & Fintel, 2016; Webb et al., 2010). Researchers propose that an increased level of L1 proficiency prior to school attendance supports acquisition of the L2 through transference (du Plessis & Louw, 2008; Malda, Nel, & van de Vijver, 2014). The English language proficiency and PA skills of learners were extremely low following the transition to English language of learning and teaching (ELoLT) in Grade 4 (Howie et al., 2012; Pretorius, 2014; Webb et al., 2010). Research with South African learners indicated that reliance on transference alone is insufficient to develop the necessary L2 language and literacy skills for learning (Pretorius, 2014; Webb et al., 2010). This language transition is, nevertheless, in line with the initially developed *LiEP* (Department of Education, 1997), where learners receive lessons in their L1 while simultaneously acquiring additional languages. The language transition is viewed as a means to an end until sufficient academic vocabulary is developed in all 11 languages, or a better solution is proposed.

In the educational context, learners are required to use English socially to engage with their peers and academically in order to learn. This language use is indicative of the use of a L2. A L2 is recognised as an official language acquired subsequent to the L1 within a language community including L1 speakers (Saville-Troike & Barto, 2017). The L2 is necessary to meet basic needs socially, academically, politically or

economically (Saville-Troike & Barto, 2017). Learners who are enrolled in an ELoLT educational context, who do not speak English as their L1 at home, are thus considered to be English second language (EL2) learners in this research study.

There is a notable 65.3% of learners enrolled in ELoLT schools (Department of Basic Education, 2010). However, only 9.6% of the South African population speak English as their L1, resulting in L2 LoLT (Howie et al., 2012). L2 instruction frequently results in delays in the vocabulary and language competence of learners which needs to be addressed for effective learning and academic achievement (Hay & Fielding-Barnsley, 2012). The preference for ELoLT may thus be a contributing confounding factor of the current academic underachievement and low literacy skills (Webb et al., 2010) as EL2 learners often have limited language proficiency (Wildschut et al., 2016).

1.1.5. Language proficiency

Language proficiency occurs on two distinguished levels namely Basic Interpersonal Communication Skills (BICS) and Cognitive Academic Language Proficiency (CALP) (Kotze et al., 2017). BICS are developed through everyday interactions within approximately two years (du Plessis & Louw, 2008). BICS includes the use of facial expressions and objects to aid the comprehension of a message as opposed to language only (Kotze et al., 2017). Many learners attend school in Grade 1 having already acquired the BICS necessary for social interactions in the LoLT (du Plessis & Louw, 2008). CALP however, refers to a higher level of language proficiency which takes approximately five to seven years to develop (du Plessis & Louw, 2008). Abstracted academic language necessary to construct and understand concepts within a classroom for learning are included in CALP (Kotze et al., 2017). CALP development is a primary goal in education since it is fundamental for meaningful engagement to learn and progress in the early school years (Jordaan, 2011; Wildschut et al., 2016). However, many EL2 learners do not develop adequate CALP in English, which is detrimental to their learning in an ELoLT environment (du Plessis & Louw, 2008).

1.1.6. Language and literacy acquisition in the home environment

Many EL2 learners are disadvantaged as they have reduced opportunities to speak or hear English in the home environment (Nel & Müller, 2010). Recent research determined that only 21% of Grade 4 learners attending an ELoLT school, speak

English in their home environment (Howie et al., 2017). The reduced opportunities to have English conversations may be a consequence of the insufficient English language proficiency of EL2 parents who often have to rely on teachers to teach their children English (du Plessis & Louw, 2008). The insufficient language input and exposure for EL2 learners exacerbates their challenge to acquire sufficient language proficiency (Jarrett, Hamilton, & Coba-Rodriguez, 2015; Wildschut et al., 2016). As a result, many EL2 learners have language proficiency for social interactions but lack CALP for learning in an English first language (EL1) educational context (du Plessis & Louw, 2008; Webb et al., 2010).

EL2 learners who have limited English language proficiency may experience emotional and social difficulties as well as long-term difficulties learning in ELOLT schools (Wildschut et al., 2016). The development of language proficiency and early literacy acquisition is influenced by the quality of the home environment where language and literacy exposure is experienced (Hay & Fielding-Barnsley, 2012; Howie et al., 2012). Aspects which facilitate increased quality of language development include greater vocabulary diversity, longer mean length of utterances, increased prosody, semantic contingency and the use of decontextualised language such as narratives (Dale, Tosto, Hayiou-Thomas, & Plomin, 2015). The importance of the home environment is highlighted when it is acknowledged that some children develop literacy skills without attending school to receive formal literacy instruction (Alcock et al., 2017).

The cognitive skill development and educational outcomes of children are frequently associated with the parent literacy and education levels as well as the expectations placed on learners (Howie et al., 2012; Howie et al., 2017). Learners with parents who achieved higher education levels are often approximately six months ahead in their development of literacy (Wildschut et al., 2016). Higher parent education levels and urban or middle-to-high SES home environments, result in more opportunities to develop language and literacy skills, through communication and cognitive-linguistic tasks (Hay & Fielding-Barnsley, 2012). More than 50% of parents in Africa however, have insufficient literacy skills to assist their children with homework (Alcock et al., 2017). Recently literature highlighted that insufficient language and literacy development is a secondary consequence of a low SES which results from the poor quality of resources and type of activities undertaken within the home environment

(Alcock et al., 2017; Combrinck et al., 2014; Howie et al., 2017; Jarrett et al., 2015; Wildschut et al., 2016).

South Africa is a developing country where nearly two-thirds of children live in the poorest 40% of households (Hall & Sambu, 2016). This level of poverty is a serious concern as children of low SES background or low parent education level experience poor quality of language use, lack of resources and absence of parental care due to migration for employment (Delany, Jehoma, & Lake, 2016). Research has demonstrated that inadequate literacy exposure and learning experiences exacerbates difficulties to acquire EL2 early literacy skills and places EL2 learners at risk of school failure (Bruwer et al., 2014; Howie et al., 2012; Nel & Müller, 2010).

1.1.7. The role of the school

There is new recognition regarding the role of the school to provide inclusive education for children deprived of the quality learning opportunities required to be ready for formal academic learning (Bruwer et al., 2014; Department of Education, 2001; Howie et al., 2012). Pre-primary schooling is available to support development three years prior to attendance of formal schooling in Grade 1. Many learners however, only attend the compulsory Grade R (Kindergarten) year as a result of the expense or difficulties accessing schools (Howie et al., 2012). Furthermore, almost half of the schools in South Africa do not have a library or sufficient printed material available to the learners (Howie et al., 2017). This lack of exposure to printed material is a concern as children need to interact with enough text to become independent readers (Hay & Fielding-Barnsley, 2012). Learner characteristics including attitude, motivation, confidence and enjoyment of reading are also important factors for literacy success (Howie et al., 2012). Literature has shown that gender can influence literacy achievement in young children with females generally achieving higher results than males (Howie et al., 2017). A lack of exposure to reading material, the limited language and literacy skills in the LoLT of teachers, as well as poor learner-teacher ratios create further confounding barriers to literacy development (Howie et al., 2012; Howie et al., 2017; Jordaan, 2011).

Despite the barriers to learning which EL2 learners experience, they are required to develop literacy skills and compete with other learners who are learning in their L1 (Jordaan, 2011). Simultaneous acquisition of CALP and development of literacy in a

L2 is extremely challenging for a learner who does not receive support in their L1 (Nel & Müller, 2010). The expectation to perform at an academic level equal to that of their L1 peers thus places EL2 learners at a disadvantage (Jordaan, 2011). In addition, when the EL2 learners are expected to read, write and learn in their L2, their language proficiency, which impacts their rate of literacy acquisition, is confounding (du Plessis & Louw, 2008; Pretorius, 2014).

1.1.8. Second language and literacy acquisition

In order to acquire a L2 for academic learning and literacy development, learners are required to develop language processing skills (Baddeley, 2003). Language processing involves the basic functions of listening, speaking, reading and writing to convey meaning during communication (Baddeley, 2003). Once the abilities to read, write, speak, listen, and think become interrelated, they are thereafter known as literacy (Wildschut et al., 2016). Literacy abilities include spelling, reading decoding, reading comprehension, and reading fluency (Preston & Edwards, 2010). A recent increased awareness of literacy difficulties resulted in the identification of risk factors including insufficient language proficiency, limited vocabulary knowledge, reduced working memory, insufficient speech perception skills and PA skills (Cockcroft & Alloway, 2012; Preston & Edwards, 2010; Webb et al., 2010). Both PA and speech perception skills are predictive of literacy achievement and require access to the phonological structure of speech (Cockcroft & Alloway, 2012; Nelson, Kohnert, Sabur, & Shaw, 2005; Preston & Edwards, 2010).

1.1.9. Development of phonological awareness for literacy acquisition

The phonological structure can be conceptualised as a hierarchy of phonological complexity, developing through the perception of speech sounds from birth (Peeters, Verhoeven, van Balkom, & Moor, 2008; Webb & Lederberg, 2014). At birth, infants have an undifferentiated capacity to discriminate between the phonemes of multiple languages (Beattie & Manis, 2014). Following repeated exposure to one language, the ability to perceive speech sounds in other languages diminishes (Beattie & Manis, 2014). As children grow and enter school, their PA skills become increasingly more refined (Ambrose, Fey, & Eisenberg, 2012). Consequentially, the increasing development of refined speech perception for L1 phonemes, results in challenges to develop appropriate PA in a L2 at school age. Early language experience is thus important for the development of PA in the LOLT (Lewis, Hoover, Choi, &

Stelmachowicz, 2010). PA develops as metalinguistic awareness of rhyme, then syllables, and lastly phonemes (Goldstein et al., 2017; Peeters et al., 2008; Preston & Edwards, 2010). The skills to recognise, analyse, discriminate and manipulate sound units of words (Goldstein et al., 2017), through syllable deletion, phoneme segmentation and phoneme blending are included in PA skill development (Ambrose et al., 2012).

The development of PA skills is thought to correlate with the development of vocabulary (Ouellette & Haley, 2013; Preston & Edwards, 2010). Vocabulary is evidenced to be the measure of language which is a reliable predictor of PA for all children including those presenting with language difficulties (Cockcroft & Alloway, 2012; Preston & Edwards, 2010). The reduced language proficiency and limited vocabulary of EL2 learners thus may negatively impact their PA skill development and subsequent literacy acquisition.

A consequence of reduced language proficiency is frequently reduced knowledge of rhyming. Rhyming seldom exists or is seldom used in African languages, particularly Setswana (Prof. P.M. Sebate, personal communication, 05 April 2018). When rhyming does exist, often the initial syllable is emphasized, which differs from English where the final syllable is emphasized (Melby-Lervåg, Lyster, & Hulme, 2012). South African parents also report engaging in rhyming activities rarely within the home environment (Combrinck et al., 2014) which further diminishes the rhyme exposure of EL2 learners. As such, few EL2 learners are exposed to rhyme naturally prior to formal exposure upon school attendance (Prof. P.M. Sebate, personal communication, 05 April 2018). Rhyming skills, which are the foundation for PA development (Callaghan & Madelaine, 2012), are thus a new concept to most EL2 learners when introduced in the first term of Grade R (Department of Basic Education, 2011b). Rhyming requires speech perception abilities and develops sensitivity for the sound structure of speech (Callaghan & Madelaine, 2012; Wildschut et al., 2016; Willenberg, 2007). Without rhyming skills, early listening and auditory memory does not develop to support syllable and phoneme awareness for the development of later, formal PA for literacy (Peeters et al., 2008; Wildschut et al., 2016).

Recognised as essential to the literacy acquisition of EL2 learners, phonemic awareness skills are the sophisticated subset of PA skills, including processes to

consciously manipulate phonemes (Cockcroft & Alloway, 2012; Ouellette & Haley, 2013). Refined through processes of encoding, decoding and speech perception, phonemic awareness skills require adequate phonological working memory (Cockcroft & Alloway, 2012). The phonological working memory is also indicative of literacy development and refers to the implicit capacity to store, access and manipulate or process phonemes as unconscious speech codes (Cockcroft & Alloway, 2012).

In order to manipulate phonemes for phonemic awareness tasks such as blending and segmenting phonemes, learners require sufficient phoneme-grapheme knowledge to use phonological representations (Ambrose et al., 2012). Most children develop phonemic awareness skills to blend and segment words during Grade R, when learners are between five and six years old (Le Roux, Geertsema, Jordaan, & Prinsloo, 2017; Webb & Lederberg, 2014). Generally, the development of blending skills begins prior to segmenting skills (Ouellette & Haley, 2013). Converging evidence has shown that phonemic awareness skills are causally related and predictive of literacy skills including phonics, spelling, decoding, comprehension and fluency of reading (Alcock et al., 2017; Ouellette & Haley, 2013; Preston & Edwards, 2010; Willenberg, 2007).

Formal PA instruction is included in the *CAPS: Foundation Phase* syllabus (Department of Basic Education, 2011b) with sentence segmentation introduced in the first term of Grade R, and syllable segmentation in the second term. Phonemic awareness such as blending [c-a-t] into *cat*, or segmenting *cat* to [c-a-t], is described in the second term and prioritised in the fourth term of Grade R (Department of Basic Education, 2011b). Phonemic awareness is differentiated from PA and prioritised in the first term of Grade 1 to prepare for literacy acquisition (Department of Basic Education, 2011b).

1.1.10. Literacy acquisition

Segmentation and blending result in the relation of phoneme representations perceived as speech sounds to grapheme representations which leads to the recognition of words for literacy development (Goldberg & Lederberg, 2015; Nelson et al., 2005; Webb & Lederberg, 2014). Acquiring phonemic awareness skills is therefore necessary to understand relations between spoken language and orthography, facilitating knowledge of phoneme-grapheme coupling, thus phonics (Webb & Lederberg, 2014). Phoneme-grapheme knowledge refers to the ability to name

graphemes and having an understanding of the phonemes to which the graphemes are related (Goldstein et al., 2017). In order to form these relations, knowledge of the orthography for grapheme representations is necessary. As such, phonemic awareness and phoneme-grapheme knowledge are reciprocally related (Ambrose et al., 2012; Ouellette & Haley, 2013).

The relationship between the perceived phonemes of the acoustic signal and the graphemes which represent the phonemes in orthography is similar to a coded-system (Malda et al., 2014). In an opaque orthography such as English, there is morphological complexity (Fleisch et al., 2017). Opaque orthographies require detailed PA and understanding of many-to-one mappings of graphemes to phonemes such as 'red' and 'ready', as well as phonemes to graphemes correspondence such as /s/ in '*s*cissors', '*s*ays' or '*s*aid' and 'way*s*' (Cockcroft & Alloway, 2012; Fleisch et al., 2017). The development of PA and literacy is more complex for opaque orthographies as the phoneme produced may be represented by various graphemes when reading (Alcock et al., 2017).

In Setswana there are seven vowels and no diphthongs or long monophthongs. In English 19 vowels are distinguished, including long and short monophthongs as well as diphthongs (Bekker, 2009). As a result, the Setswana L1 learners may not distinguish all English monophthongs (Le Roux et al., 2017). The Setswana L1 learners have thus developed a lower level of PA to discriminate between vowels. Reading in English however, requires a higher level of PA skills to distinguish the different vowel phonemes which may further slow the literacy acquisition for EL2 learners (Cockcroft & Alloway, 2012; Malda et al., 2014).

1.1.11. Phonological awareness, speech perception and literacy

Researchers propose that literacy deficits are related to the inability to develop adequate phoneme-grapheme couples for phonological representations (Goldberg & Lederberg, 2015; Preston & Edwards, 2010). Phoneme-grapheme knowledge is theorised to contribute to phonemic awareness development, even more than age, whole word reading or school attendance (Callaghan & Madelaine, 2012; Ouellette & Haley, 2013). Furthermore, it is acknowledged that PA skills reflect the quality of the phonological representations of a learner (Boets et al., 2011). Knowledge of constituent phoneme representations, combinations thereof and associated phonetic

specifications of phonemes, are necessary to perceive speech (Chung, McBride-Chang, Cheung, & Wong, 2013; Lewis et al., 2010; Preston & Edwards, 2010). Conversely, in order to refine phoneme representations, it is necessary to relate fine-grained shifts perceived in the acoustic signal to these phoneme representations (Chung et al., 2013). Therefore, speech perception is fundamental to develop phoneme-grapheme knowledge, and access to the phonological representations are required for speech perception (Boets et al., 2011; Chung et al., 2013; Preston & Edwards, 2010).

Due to sharing of the internal phonological structure, the processes of PA and speech perception are hypothesised to be closely related (Boets et al., 2011; Chung et al., 2013). Thus, children with normal hearing abilities who present with speech perception deficits, speech production deficits or weakness in vocabulary and grammar, are at risk for delayed PA skill development (Ambrose et al., 2012; Preston & Edwards, 2010). As such, speech perception at both the segmental and suprasegmental level mediates the association of auditory sensitivity to phonemes for English word reading through PA (Chung et al., 2013). The ability to perceive and relate fine-grained shifts in the acoustic signal to meaningful differences at the various linguistic levels lies at the heart of early literacy development (Goldberg & Lederberg, 2015; Nelson et al., 2005).

The use of information from a linguistic context requires adequate working memory, vocabulary knowledge, PA skills, speed of information processing, and inference making skills (Kaandorp, Groot, Festen, Smits, & Goverts, 2016; Lagacé, Jutras, Giguère, & Gagné, 2011). The development of these skills for speech perception in noise occurs continuously, reaching adult-like development at approximately 15 years of age (Nelson et al., 2005). Suggested factors that may contribute to speech perception difficulties include the language proficiency and auditory development of the listener, as well as the quality and intensity of the acoustic signal compared to the background noise (Kaandorp et al., 2016; Nelson et al., 2005). Fatigue and memory are cognitive factors that may also influence listening in adverse conditions (Lewis et al., 2010).

Background noise results in difficulties to identify and recall spoken information which is problematic for learning in a classroom (Sörqvist, Hurtig, Ljung, & Rönnberg, 2014).

The intelligibility of the competing noise signal correlates with how distracting it is (Mealings et al., 2015). Research has demonstrated that learners need a favourable signal-to-noise ratio (SNR) to benefit from linguistic contexts and facilitate full comprehension of verbal messages (Bradlow & Alexander, 2007; Krizman, Bradlow, Lam, & Kraus, 2017). In a classroom the SNR refers to the difference between the level at which the teacher speaks and the background noise (Pottas, 2015). An SNR of approximately +15dB is necessary for learners in Grade 1 to comprehend 95% of an auditory signal (Lewis et al., 2010; Mealings et al., 2015).

The presence of background noise poses greater consequence for children than adults as their auditory systems are not as well developed to fill in missing information (Mealings et al., 2015). Moreover, speech remains intelligible in higher levels of background noise for EL1 listeners compared to EL2 listeners (Krizman et al., 2017; Lagace et al., 2011; Nelson et al., 2005; Obralić, 2016). Limited linguistic knowledge, reduced familiarity with semantic content and a lack of access to cues places EL2 learners at a disadvantage in the noisy EL1 educational context (Lagrou, Hartsuiker, & Duyck, 2013; Lewis et al., 2010; Wildschut et al., 2016). Linguistic knowledge refers to language proficiency, working memory and knowledge of semantic content which assists in the interpretation of meaning through background noise (Bradlow & Alexander, 2007; Kaandorp et al., 2016; Lewis et al., 2010). Thus, a higher SNR is important for EL2 learners to benefit from linguistic information (Bradlow & Alexander, 2007).

1.1.12. Speech perception in the South African classroom

A clear correlation exists between the listening conditions in a classroom and the academic achievement of learners, particularly in the case of learning language skills (Obralić, 2016). Adverse listening conditions have been shown to affect the concentration, behaviour and anxiety of learners (Mealings et al., 2015). It is therefore a concern that many educational environments are not conducive for teaching and learning due to unfavourable listening conditions which reduce speech intelligibility (Lewis et al., 2010). External noise such as aircrafts passing, cars and other means of transportation as well as internal noise and room noise such as heating systems, fans or air conditioning may disrupt learning (Obralić, 2016; Pottas, 2015). With open doors and windows which frequently feature in South African classrooms, external noise floods the classroom and exacerbates poor listening conditions (Sörqvist et al., 2014).

Within the classroom environment, other learners generate noise during active learning (Mealings et al., 2015). With large class sizes of 45 learners on average (Howie et al., 2017) it is a concern that internal noise has a greater consequence for learning than external noise (Mealings et al., 2015; Obralić, 2016).

The length of time before an auditory signal is inaudible once the sound source stops is referred to as reverberation (Sörqvist et al., 2014). Reverberation contributes to reduced listening comprehension in a classroom environment. When the teacher speaks, sound waves containing acoustic information of the initial words of a sentence bounce against classroom surfaces and reach the ears of learners simultaneously with latter parts of the sentence resulting in a masking effect which reduces speech intelligibility (Mealings et al., 2015; Sörqvist et al., 2014). The surface structures in the classroom environment impact the amount of reverberation experienced (Sörqvist et al., 2014). Hard surfaces such as tiled floors and bare walls increase reverberation times as opposed to sound-absorbent features including curtains and carpets (Pottas, 2015). As a result, a reduced distance between the teacher and learners increases speech intelligibility by minimizing the impact of interference from reverberation and background noise (Pottas, 2015). Though with large classroom sizes (Howie et al., 2012) there is often a large distance between the teacher and learners. The classroom environment is thus also a contributing factor to the low literacy levels and poor academic achievement and literacy skills of learners (Webb et al., 2010).

1.1.13. Why investigate phonological awareness and speech perception?

Internationally, literacy skills are a concern, thus the identification of related difficulties is important for insight to develop means of intervention (Preston & Edwards, 2010). Although research has been generated by developed countries, further research is needed in developing countries where literacy and educational practices differ (Taylor & Fintel, 2016). EL2 learners show lower academic achievement particularly in regard to literacy (Howie et al., 2012; Kotze et al., 2017). The current educational context in South Africa poses a challenge for L2 learners (Malda et al., 2014). With consideration of the diversity in South African society influencing education, as well as barriers to language and literacy acquisition such as L2 LoLT within schools, it is imperative that appropriate intervention is undertaken to support EL2 learners in Grade 1 (Kotze et al., 2017).

A lack of language skills is recognised as a barrier to learning (Department of Education, 2001). The improvement of language competence, subsequent literacy skills and academic achievement is a goal of education (Department of Basic Education, 2015; Malda et al., 2014). With the implementation of Early Grade Reading Assessments (Department of Basic Education, 2014) it is possible to identify learners who have, or are at risk for literacy difficulties. Identification of literacy difficulty however, does not inform the process of intervention. It is important that the development of support and intervention is informed by knowledge of the skills and challenges faced by the learners.

Numerous studies have been conducted with learners who have received opportunity to attain literacy skills before their assessment (Department of Basic Education, 2014; Howie et al., 2012; Pretorius, 2014). However, there is limited research available regarding the skills of South African EL2 learners for literacy acquisition, prior to literacy instruction (Cockcroft & Alloway, 2012). Converging evidence has shown that PA awareness intervention which targets phonemic awareness and phoneme-grapheme knowledge can be an effective means to improve the literacy skills of EL2 learners (Goldstein et al., 2017; Le Roux et al., 2017). There is a known difference between the PA and speech perception in noise skills of EL1 and EL2 learners, however these differences are frequently viewed as whole constructs as opposed to separate skills with different levels of understanding which comprise the total PA (Cassady, Smith, & Putman, 2008).

Therefore, to aid in the investigation of literacy difficulties and contributing factors, this study explored the various levels of PA and speech perception in noise skills of EL2 learners. The assessment of PA skills and speech perception in noise skills possessed by Grade 1 learners prior to literacy acquisition is important to aid in the understanding of the needs of learners for literacy skill acquisition. Determining the level of PA and speech perception in noise skills of EL2 learners may identify the challenges and opportunities for learners in order to provide support and intervention to improve their skills for the development of literacy.

1.2. Problem statement

PA and speech perception in noise are interrelated skills which are crucial to the literacy acquisition of learners. In South Africa, the literacy levels of learners are low,

particularly EL2 learners who face multiple challenges learning in the EL1 educational context. An ELoLT environment follows a curriculum designed for EL1 learners. The EL2 learners are expected to perform at an equal academic level to compete with the EL1 learners (Jordaan, 2011). The level of skills of the EL1 learners is thus the expected “norm” which indicates the level of skills expected of the EL2 learners. The above-mentioned concerns for the EL1 educational context, which are to support the language and literacy acquisition of EL2 learners, gave rise to the realisation of the following research question:

1.3. Research question

What is the level of PA and speech perception in noise skills of early Grade 1 EL2 learners, learning in an ELoLT educational context?

1.4. Summary

In this chapter the relevant literature pertaining to the PA and speech perception in noise skills for the literacy acquisition of EL2 learners is provided. The unique South African context was described including the role of the school, teachers, parents and the home environment. Further considerations included the process of literacy acquisition, PA development and speech perception in noise, particularly within the South African educational context.

This chapter serves as a theoretical foundation for the research methodology that follows in the next chapter. The literature overview provided supports the rationale, simultaneously motivating and highlighting the need for this present research study. Research is necessary in the field of EL2 learning to determine the level of skills possessed by EL2 learners for literacy acquisition at the start of their first formal year of schooling, thus Grade 1. Describing the PA and speech perception in noise skills of Grade 1, EL2 learners are important to inform the development of support for literacy acquisition.

CHAPTER TWO: METHOD

"Research is formalised curiosity."

Zora Neale Hurston

Chapter Aim: The purpose of this chapter is to provide a comprehensive elucidation of the methodological aspects followed for the completion of this study. The aims and objectives as well as the research design, ethical considerations, participant selection, materials and equipment are explained with an outline of all the procedures followed.

2.1. Research aim

In cognisance of the research problem and consideration of the research question proposed in Chapter 1, the following aim was formulated:

2.1.1. Aim

To determine the level of PA and speech perception in noise skills of early Grade 1 EL2 learners learning in an ELoLT environment.

2.1.2. Objectives

The following objectives were formulated in order to achieve the main aim:

- To describe the speech perception in noise skills of EL2 learners.
- To describe the PA skills of EL2 learners.
- To determine whether there is any association between the skills of the learners in the areas of PA, speech perception in noise, and early skills for reading of words.

Within the scope of the above-mentioned research aim and objectives, this study was conducted to obtain information regarding the level of skills of early Grade 1 EL2 learners. Determining the level of skills of EL2 learners provides knowledge of their skills to support literacy development. Knowledge of the skills of EL2 learners can be used to develop potential intervention programs to address literacy difficulties.

2.2. Hypotheses

2.2.1. Null hypothesis

The level of PA and speech perception in noise skills of the EL2 learners will be equal to the level of the EL1 learners learning in the ELoLT educational context.

2.2.2. Alternate hypothesis

The level of PA and speech perception in noise skills of the EL2 learners will differ from the level of the EL1 learners learning in the ELoLT educational context.

2.3. Research design

This research study employed a cross-sectional, descriptive design through between-group comparison within a quantitative approach (Leedy & Ormrod, 2016). Cross-sectional research refers to a design whereby the researcher studies a single moment in time (Neuman, 2014). The benefit of the once-off assessment conducted with each participant was efficiency as well as cost-effectiveness (Neuman, 2014). There was also less disruption to the school schedule making this design less intrusive in the lives of the teachers, parents and learners in the schools participating in this study. The descriptive nature of the study enables the researcher to determine a profile of the skills the research participants have which can inform future practices and support learning.

To describe the level of skills of the EL2 learners in a Grade 1 EL1 educational context, it is necessary to understand the level of skills expected. Formal objective tests provide quantified results of PA and speech perception in noise skills based on a learner's age. Standardised norms for the South African population however, do not exist for a detailed PA test. Furthermore, the norms are based on an American English dialect and are also based on EL1 learners rather than EL2 learners. The norms therefore cannot provide a reliable reflection of the PA skills of the South African EL2 participants. A between-group comparative design was thus necessitated. As EL2 learners are expected to perform at an equal level to EL1 learners, the EL1 participant scores were used as a measure of the expected level of skills against which the EL2 participant scores were compared. This design was recommended by (Højen & Flege, 2006). The design of this research study was valuable to determine and describe the level of skills of the EL2 learners, with acknowledgement of the social challenges which contribute to their results.

2.4. Ethical considerations

Prior to commencement of data collection, ethical clearance to conduct this study was obtained from the Research Ethics Committee of the Faculty of Humanities at the University of Pretoria (Appendix A). Ethics are defined as the principles of morality which guide the behaviour and activities of a person (Stevenson, 2010). In research it is important to adhere to ethical considerations in order to promote the aims of knowledge, truth, accountability and responsibility. Ethics create boundaries to ensure mutual respect, justice, beneficence and non-maleficence which are essential for collaborative work with human participants (Health Professionals Council of South Africa, 2008). A researcher is required to find a balance between the pursuit of knowledge and adherence to the rights of the research participants (Neuman, 2014). The way in which the above-mentioned principles informed the study is described under the headings to follow:

2.4.1. Protection from harm

When conducting research, it is the responsibility of the researcher not to cause physical or psychological harm to the participants (Neuman, 2014). The risks required to be taken by the participants should not surpass the risks of daily living (Leedy & Ormrod, 2016).

Participants were informed of the goals for the study and what the assessments would entail. Each participant was reminded of their right to not answer a question as well as withdraw from the study at any time without consequence. The voluntary nature of participation is explained in the next section.

2.4.2. Voluntary participation and informed consent

Research with human participants requires informed consent (Leedy & Ormrod, 2016). Informing recruited participants of the nature of the study to be conducted as well as the potential risks and requirements of participation, is the responsibility of the researcher (Leedy & Ormrod, 2016).

A letter was composed and provided to all stakeholders and participants with information pertaining to the goals, procedures, potential exposure to risks, the expectations, and the rights of the participants in the study (Neuman, 2014). Signed informed consent letters were provided by the principals (Appendix B) and teachers (Appendix C) of the participating schools, as well as the parents of the participants

(Appendix D). The teaching staff of each school mediated the provision and acquirement of parental consent letters.

All participants were asked to provide their own assent (Appendix E) prior to commencement of assessment by writing their name on the letter which was discussed without misleading the participants. Special care was taken to explain to the participants about the voluntary nature of the study in terms which they understood as they were minors. The researcher informed all participants that they could point to the sad face (Appendix F) and the assessment would be terminated immediately, without consequence.

2.4.3. Confidentiality

The researcher has the responsibility to protect and respect each of the participant's right to privacy (Neuman, 2014). All personal and identifying information obtained throughout the study was treated as confidential. In an effort to uphold the responsibility, the researcher provided each school, teacher, parent and learner participating in the study with a coded number to maintain confidentiality during data processing. Furthermore, no identifying information of the schools, teachers, parents or learners was disclosed in the article or dissertation.

The participants were informed that in accordance with the University of Pretoria research policy, the data and results would be stored in the archives for a minimum of 15 years. The public availability of the research study in order to provide access to other researchers and society was also brought to the attention of all participants.

2.4.4. Professional ethical conduct

The researcher responsible for carrying out the screening and assessment procedures is qualified as a Speech-Language Therapist and registered with the Health Professionals Council of South Africa. All services conducted were in adherence to the professional ethical guidelines (Health Professionals Council of South Africa, 2008). All participants identified with hearing difficulties or language differences, delays or disorders, received appropriate referrals for further diagnostic assessments and intervention if necessitated (Appendix G and Appendix H). All parents were informed of the hearing screening results.

2.4.5. Honesty and plagiarism

The researcher adhered to the principles of scientific and academic professionalism to ensure that scientific misconduct does not occur (Health Professionals Council of South Africa, 2008). Data was collected, analysed, interpreted, and reported without fabricating, falsifying, misleading or misinterpreting.

Full acknowledgement of all research and knowledge generated by another individual or organisation is mandatory (Health Professionals Council of South Africa, 2008; Leedy & Ormrod, 2016). Failure to do so results in passing off someone else's work or ideas as one's own, which is known as plagiarism (Stevenson, 2010). All publications and sources contributing to the content of this research study were acknowledged and cited appropriately within the text and reference list according to the American Psychological Association *(6th ed.)* referencing style.

2.5. Participants

The method, criteria, and screening procedures used in the selection of the participating learners are explained in sections 2.5.1, 2.5.2, and 2.5.3. A detailed description of the study population is provided at the end, in section 2.5.5.

2.5.1. Selection method

The schools from which the participants in the study population were selected, were included based on convenience sampling (Neuman, 2014). The researcher selected the schools based on their willingness to participate, use of English medium of instruction, and specific criteria to match the class environments and teaching practices closely. Convenience sampling was also used to select the Grade 1 teachers, and all parents of the participants who indicated their willingness to participate (Neuman, 2014).

The participants were selected based on whether they met the selection criteria and if there was a potential match. Furthermore, participants were matched as closely as possible to control for external influences on the subject and control groups such as difference in SES. The researcher could not guarantee that all prospective participants would meet the selection criteria in order to be represented in the study population. Therefore, the selection strategy was non-probability, purposive sampling (Leedy & Ormrod, 2016).

2.5.2. Participant selection criteria

The participants were selected based on the following criteria:

Age:

Participants selected were required to be between the ages of 6 years and 6 years 11 months (72 – 84 months). This age range is specified as this is the required age range for children to begin Grade 1 for the first time. Participants who were older than 7 years (84 months) were excluded as well as all participants who had repeated Grade R or were repeating Grade 1. By participants being in early Grade 1, the extent of formal literacy instruction provided was minimal so that their level of skills could be determined prior to literacy acquisition.

Medium of instruction:

All participants had to be in a school which uses ELoLT as the majority (65.3%) of learners in South Africa attend ELoLT schools (Department of Basic Education, 2010).

Prior education:

All participants were required to have attended their Reception year, Grade R, at their same school in the previous year. Standardizing prior education increased the consistency of English academic language exposure which minimised the potential for differences between the research groups. This requirement also ensured sufficient exposure to the ELoLT for comprehension of instructions and test material.

Home language:

Participants were matched in pairs, consisting of one EL1 and one EL2 participant, to compare their results and describe the level of skills of the EL2 participants. Close participant matching increased the validity of the results being attributed to the difference in their language exposure, thus adhering to the purpose of the study.

School setting:

Ideally, all participants should have attended the same school for consistency of academic language exposure and teaching practices, such as approaches to literacy development. However, same school attendance was not plausible for this research study as the intake in junior primary schools is higher in Grade 1 than in Grade R. All

of the potential schools investigated for participation also had a majority of either EL1 or EL2 learners. For this reason, it was not possible to find a sufficient number of appropriately matched participants (40 participants, thus 20 pairs) within the same school.

Two urban schools in the Tshwane District of Gauteng, South Africa, were therefore used for this research study. For consistency of literacy instruction, exposure and development, the schools identified to participate in the study were required to both follow the same approach to literacy development (in this case a phonics approach). The schools included were also determined based on their class size and carryover of Grade R learners from the previous year to Grade 1 so a higher number of learners were available for potential matching.

In order to enable closely paired matches for comparison, all EL1 participants were selected from one school and all EL2 participants were selected from another school. Both schools provide education services to learners of various population and language groups whereby the majority of learners attending the school are from middle SES backgrounds.

Language abilities:

Language disorders may reduce receptive vocabulary resulting in difficulty to accurately understand or interpret questions as well as formulate answers (Preston & Edwards, 2010). Furthermore, individuals with language disorders frequently present with speech perception in noise difficulties (Lagacé et al., 2011). All participants were therefore required to pass the language screening conducted by the researcher to ensure the validity of the results.

Hearing abilities:

Difficulty hearing consequentially impairs the ability to detect and discriminate sounds which disrupts the development of appropriate PA representations and PA skills (Boets et al., 2011). To ensure validity of results, all participants were required to pass the hearing screening conducted by the researcher.

2.5.3. Materials and equipment for participant selection

The equipment and material used to conduct hearing and language screening is shown in Table 1.

Table 1: *Summary of equipment and material for hearing and language screening*

EQUIPMENT	DESCRIPTION
Welch Allyn Otoscope	An otoscope was used to examine the outer ear canal and tympanic membrane.
GSI Tympstar: Comprehensive Middle Ear Tympanometer	A GSI tympanometer (Grayson Stadler, Eden Prairie, USA) was used to assess middle ear functioning including ear canal volume, middle ear pressure and compliance. Reflexes were measured to determine functioning of the auditory nerve pathway. Calibration according to ANSI/ASA 9S3.39-1987 (2012) standards was performed on the 10th of January 2017.
Sennheiser HD 202 II Supra-aural Headphones	This commercially available headphone (Sennheiser, Wedemark, Germany) was calibrated with the *HearScreen*™ Application and used to determine whether an individual has appropriate hearing abilities.
Samsung Galaxy Pocket Plus S5301	The Samsung Galaxy Pocket Plus S5301 is a commercially available smartphone run by Android OS, which was used to access the *HearScreen*™ Application.
HearScreen™ Application	The recently developed *HearScreen*™ application (Swanepoel, Myburgh, Howe, Mahomed, & Eikelboom, 2014) was loaded onto a Samsung Galaxy Pocket Plus S5301 Smartphone coupled with Sennheiser HD 202 II Supra-aural Headphones. Valid acoustic calibration was performed before use, with the *HearScreen*™ calibration function, according to prescribed standards by ANSI/ASA S3.6-2010 and ISO 389-1 (1998), with adherence to the equivalent sound pressure threshold determined for the headphones (Swanepoel et al., 2014). The *HearScreen*™ application (Swanepoel et al., 2014) was used for efficient, cost-effective, smartphone-based, hearing screening to determine whether participants presented with possible hearing difficulties. Screening test results have been proven comparable with other conventional as well as smartphone-based screening tests (Mahomed-Asmail, Swanepoel, Eikelboom, Myburgh, & Hall, 2016). The *HearScreen*™ application has real-time quality control for environmental noise influence. Average ambient noise levels are recorded and measured during the pure tone presentation (Swanepoel et al., 2014). An indication is provided to retest a pure tone on a frequency if background noise interferes, which increases the validity of the screening results.
Kindergarten Language Screening Test-Second Edition (KLST-2)	The *Kindergarten Language Screening Test- Second Edition (KLST-2)* (Gauthier & Madison, 1998) was used to screen for potential early language difficulty, difference or disorder. The individually administered screening tool is norm-referenced and applicable to children from age 4 to 6 years 11 months old. The *KLST-2* includes 17 items which generate one overall performance score. The reliability and validity measures are calculated for EL1 learners. This screening tool was used for both EL1 and EL2 participants as the EL2 participants are learning in an EL1 educational context and expected to achieve the same level as EL1 learners. The required language proficiency deemed sufficient for learning in the ELoLT environment is that of an EL1 learner, thus justifying the use of the *KLST*-2 with the EL2 learners. Internal consistency estimations were within 0.81 and 0.90 in addition to an inter-rater reliability evidenced to range from 0.83 to 0.98. The reliability of this tool is high as a co-efficient above 0.90 is considered reliable (Robertson & Salter, 2007a). A moderate-to-high level of criterion-related validity was indicated by correlations of results with the *Test of Language Development: Primary - Third Edition (TOLD: P-3)* (Newcomer & Hammill, 1997), the *Clinical Evaluation of Language Fundamentals - Pre-school (CELF-PS)* (Wiig, Secord, & Semel, 1992) and the *Pre-school Language Scale – Third Edition (PLS-3)* (Zimmerman, Steiner, & Pond, 1992) (Gauthier & Madison, 1998). Bi-serial correlations of all items were above 0.30 indicating a high content validity for this screening tool.

2.5.4. Procedure for selection of participants

Subsequent to obtaining informed consent from the principals, teachers and parents, the assent of participants was obtained. The participants were selected following the screening procedures and matching process which is explained in the sections to follow. The smiley and sad face image remained visible on the table throughout the screening and assessment procedures. No participants withdrew from the study.

2.5.4.1. Hearing screening

Hearing screening commenced in a quiet room provided by each of the schools. The otoscopic examination also determined whether there were contraindications for the continuation with hearing screening and/or assessment. The required results of the otoscopic examination included observation of an appropriate outer ear canal and tympanic membrane, with an appropriate light reflex (Stach, 2016).

Immittance measurements were to determine the integrity of the middle ear system and auditory nerve pathology which may affect the hearing screening results (Stach, 2016). A type A tympanogram was expected which indicates normal middle ear functioning with a pressure peak between -50 and +50 daPa, ear canal volume between 1.0 – 1.4 cm^3, and compliance between 0.3 – 1.7 ml (Stach, 2016).

The participants were instructed to listen and raise their hand if they heard the sound. The researcher sat behind the child to employ the automated screening protocol. An initial stimulus presentation at 1000 Hz, 10 dB above the level of screening stimuli (35 dB HL) was used to condition a response (raised hand). Following a positive response, the screening proceeded at a stimulus level of 25 dB HL at 1000, 2000, and 4000 Hz. In the instance of a participant failing to respond, an automated repetition of the frequency was initiated.

A participant was considered to fail their screening when all frequencies were not responded to at 25 dB HL. Upon failure, the full screening was repeated immediately on the same device, thus employing the test-retest method to ensure accurate results. Hearing difficulty may influence the ability to detect and discriminate speech sounds which may impair the development of PA skills (Boets et al., 2011). For this reason the two participants who failed the screening twice were excluded from the research study

(Swanepoel et al., 2014). Both of the participants who were excluded received appropriate referrals for a diagnostic hearing examination (Appendix G).

2.5.4.2. Language screening

The *KLST*-2 (Gauthier & Madison, 1998) was administered to all learners who passed the hearing screening. The time taken to administer the *KLST-2* was approximately 20 minutes. Throughout the language screening, the researcher was seated beside the participant. The provision of instructions, process of scoring and interpretation of the results were conducted in accordance to the *KLST-2* test manual guidelines (Gauthier & Madison, 1998), as provided by the authors, to ensure that the determined scores were valid. Analysis of individual results for the *KLST-2* was conducted according to their stanine scores. A stanine score of 3 or below was considered to be indicative of a possible language delay, difference or disorder. Language-based disorders are frequently associated with speech perception in noise difficulties (Lagacé et al., 2011). Reduced receptive vocabulary is a known consequence of a language delay, difference or disorder which may result in the inaccurate interpretation of questions, thus influencing results (Preston & Edwards, 2010). For this reason, one participant who obtained a stanine of 2 was excluded. The participant was an EL1 learner thus appropriate referral for a further diagnostic assessment was provided (Appendix H).

2.5.4.3. Estimated socio-economic status

Questionnaires were given to the parents of all participants who passed the screening procedures. A section of the parent questionnaire requested indication of an SES estimation. The researcher referred to “SES estimation” and provided categories for three reasons. Firstly, many parents are hesitant to give an indication of SES as they are unsure of the total monthly income in their household. Secondly, as some parents explained, they feel they may be incorrect giving an actual amount as the income fluctuates monthly. Thirdly, many people feel that income and SES is private information. In this research study the provision of labelled categories enabled parents to provide indication of SES without providing a specific amount.

The category options used to indicate SES estimation were elucidated to parents as low (<R5 000), middle (between R5 000 and R40 000) and high (>R40 000). The estimated SES was determined through indication on the questionnaires and is deemed reliable as the answers to the parent questionnaire were confirmed through

telephonic interviews. Answers were confirmed to eliminate potential misunderstandings, as participants were potentially not answering in their L1.

2.5.5. Description of the study population

The participants selected in accordance with the matching criteria resulted in a total of 50 learners. Two groups of 25 learners each were formed, namely the EL1 learner control group and the EL2 learner subject group. Close matching was required to enable description of the skills of EL2 learners prior to commencement of formal literacy instruction and literacy acquisition. Therefore, subsequent to the hearing and language screening, participants were matched according to their age, gender, and estimated SES. To prevent bias in selection, all participants were included in the study if consent and assent were received, and a match could be made. The interpretation of data and conclusive power from a small sample is acknowledged to be limited (Leedy & Ormrod, 2016). Though a larger sample is desirable, this was not possible, as including more schools introduces more uncontrollable variables (e.g. teaching styles) that influence the validity of results. By including all possible pairs of matched participants, effort was made to prevent reducing the external validity of the study further. The demographic distribution of the study population can be seen in Table 2.

Table 2: *Demographic distribution of the study population*

	Control Group: EL1	**Subject Group: EL2**
AGE mean (SD)	79.53 (3.42)	79.34 (3.40)
GENDER n (%)		
Male	10 (40%)	10 (40%)
Female	15 (60%)	15 (60%)
ESTIMATED SES n (%)		
Low (< R5 000)	7 (28%)	9 (36%)
Middle (R5 000 -R40 000)	15 (60%)	13 (52%)
High (> R40 000)	3 (12%)	3 (12%)
FIRST LANGUAGE n (%)		
English	25 (100%)	0 (0%)
isiZulu	0 (0%)	4 (16%)
Sepedi	0 (0%)	2 (8%)
isiXhosa	0 (0%)	1 (4%)
Setswana	0 (0%)	6 (24%)
Northern Sotho	0 (0%)	6 (24%)
Southern Sotho	0 (0%)	1 (4%)
Siswati	0 (0%)	1 (4%)
Xitonga	0 (0%)	1 (4%)
Tshivenda	0 (0%)	3 (12%)

The participants were matched so that their ages were within 3 months of each other. The mean age of EL1 participants was 79.53 months. This mean age did not differ significantly ($p = 0.49$) from the mean of 79.34 months of the EL2 participants. Although it was desirable to have an equal number of male and female participants, this was not possible due to the consent responses received and the required matching criteria. Each research group consisted of 15 female participants (60%) and 10 male participants (40%).

Twelve percent of the parents in each group indicated an estimated “high” SES of above R40 000 a month. Sixty percent of EL1 parents and 52% of EL2 parents indicated a “middle” SES between R5 000 and R40 000 a month. The parents’ indication of their highest education level obtained presented a broad range, whereby some parents did not finish school and others obtained postgraduate qualifications.

All EL1 participants were only exposed to English in their home environment prior to Grade 1. The use of English by the EL2 participants, to access information in order to learn in their ELoLT school environment indicates that English is in fact their L2. The language use in the home environment of the EL2 participants is diverse in that all EL2 participants were indicated to be from multilingual home environments. The most commonly spoken L1s in the EL2 group were Setswana (24%) and Northern Sotho (24%). isiZulu (16%) and Tshivenda (12%) were the second and third most commonly used L1s of the EL2 group respectively. The matching of individual participants is reflected in Table 3.

Table 3: *Participant matches*

Research Group					Control group				
#	DOB	Age: months	Gender	SES	#	DOB	Age: months	Gender	SES
A2	2/1/2011	74	F	Mid	**A1**	2/10/2011	74	F	Mid
B2	1/25/2011	74	M	Low	**B1**	1/22/2011	74	M	Mid
C2	11/11/2010	77	F	Mid	**C1**	12/10/2010	76	F	Mid
D2	11/5/2010	77	F	Low	**D1**	9/25/2010	78	F	Low
E2	1/2/2011	75	M	Mid	**E1**	2/28/2011	73	M	Mid
F2	12/3/2010	76	M	High	**F1**	11/21/2010	76	M	High
G2	11/29/2010	76	F	Mid	**G1**	11/11/2010	77	F	Low
H2	10/25/2010	77	F	Mid	**H1**	9/27/2010	78	F	Mid
I2	9/17/2010	78	F	Low	**I1**	9/24/2010	78	F	Low
J2	8/12/2010	80	F	Low	**J1**	9/7/2010	79	F	Low
K2	10/6/2010	78	M	Mid	**K1**	8/29/2010	79	M	Mid
L2	10/30/2010	77	M	High	**L1**	8/15/2010	80	M	High
M2	8/3/2010	80	F	Mid	**M1**	7/28/2010	80	F	Mid
N2	7/14/2010	81	F	Low	**N1**	7/26/2010	80	F	Low
O2	10/28/2010	77	M	Mid	**O1**	7/16/2010	81	M	Mid
P2	6/30/2010	81	F	High	**P1**	7/14/2010	81	F	High
Q2	9/26/2010	78	M	Mid	**Q1**	7/6/2010	81	M	Mid
R2	5/13/2010	83	F	Low	**R1**	5/20/2010	82	F	Mid
S2	4/26/2010	83	F	Mid	**S1**	5/13/2010	83	F	Mid
T2	4/8/2010	84	F	Low	**T1**	5/4/2010	83	F	Low
U2	5/31/2010	82	M	Mid	**U1**	5/3/2010	83	M	Mid
V2	4/1/2010	84	M	Mid	**V1**	4/22/2010	83	M	Mid
W2	3/3/2010	84	M	Mid	**W1**	4/12/2010	82	M	Mid
X2	3/27/2010	84	F	Low	**X1**	3/29/2010	84	F	Low
Y2	3/20/2010	84	F	Low	**Y1**	3/19/2010	84	F	Mid

This participant group may be regarded as a representation of the early Grade 1, EL2 population of the urban schools in the Tshwane district.

2.6. Data collection procedures

This section provides explanation of the materials, equipment, and data which were used in order to collect data for analysis.

2.6.1. Materials and equipment for data collection

2.6.1.1. Speech perception in noise equipment and material

Digits-in-noise (DIN) testing has been shown to be successful in diagnostically determining speech perception in noise skills (Potgieter et al., 2016; Smits, Theo

Goverts, & Festen, 2013). Research has shown that DIN testing yields approximately the same measure of speech recognition ability as what the sentence-in-noise test yields (Kaandorp et al., 2016). The DIN testing thus provides an appropriate indication of the speech perception in noise skills of learners in the classroom environment where learners are required to listen and comprehend sentences.

In the linguistically diverse country of South Africa there is an advantage to using digit-triplets for speech material as opposed to standard words. The use of digit-triplets reduces the influence of language exposure as digits in a closed set are more predictable and have less linguistic demand than words (Potgieter et al., 2016). Research has shown that the SNR for L2 learners need be only 0.8dB higher than the SNR for L1 learners to recognise 50% of digit-triplets correctly (Kaandorp et al., 2016). Frequently EL2 speakers are also exposed to English digits within the African languages and school or work environments making this speech material familiar (Smits et al., 2013). The use of digits also reduces the influence of auditory memory. Furthermore, the *South African English Digits-in-noise Test (SA Eng DIN Test)* is now determined as an accurate hearing screening tool for adult multilingual populations familiar with English digits (Potgieter, Swanepoel, Myburgh, & Smits, 2017). Pure tone audiometric testing was not used as pure tone thresholds show a weak relationship to understanding in noise (Smits et al., 2013). Use of the *SA Eng DIN Test* is therefore more suited to this research study as it mimics the listening requirement to understand speech in a noisy classroom environment.

A commercially available Samsung SM-G313H Trend Neo Smartphone operated by Android OS 4.4 was used to access the newly developed *SA Eng DIN Test* through the *HearZA*™ application (Potgieter et al., 2016). The purpose of the *SA Eng DIN Test* is to use DIN testing to determine the ability of individuals to perceive speech in noise. The *SA Eng DIN Test* is fully automated including automated generation of the speech reception threshold (SRT) score. Validated normative data for the South African population is available (Methula, Visser, & Zulu, 2016), thus valid objective results were determined.

2.6.1.2. Phonological awareness equipment and material

The *Phonological Awareness Test - Second Edition (PAT-2)* (Robertson & Salter, 2007a) was used to assess the phonological awareness, phoneme-grapheme

knowledge, and phonetic decoding skills of the participants. Assessment of PA skills is important to obtain knowledge about the proficiencies displayed by EL2 learners to support their acquisition of literacy skills in their L2. These PA skills may also contribute to subsequent development of intervention approaches (Preston & Edwards, 2010; Robertson & Salter, 2007a).

The *PAT-2* is a valuable tool to conduct a standardised assessment of PA skills as it provides standardised scores and normative measures for children age 5 years through to 9 years 11 months across all subtests (Robertson & Salter, 2007b). Discrete assessment of both large unit and phoneme level PA can be conducted with the *PAT-2*. This assessment tool has also been used in research conducted by Goldberg and Lederberg (2015). The first section of the test assesses phonological awareness skills in various subsections and subtests as seen in Appendix I. The Phonological Awareness section includes:

- Rhyming discrimination and production
- Segmentation of sentences, syllables and phonemes
- Isolation of phonemes in initial, medial, and final positions
- Deletion of phonemes from compounds and syllables
- Substitution with manipulation, and;
- Blending of syllables and phonemes (Robertson & Salter, 2007a).

A minimum level of phoneme blending and segmenting of words is required for literacy acquisition (Verhoeven, 2009), thus assessment of these skills is important in this study. The second section of the *PAT-2* is the Phoneme-Grapheme Knowledge section which is concerned with the understanding and use of phoneme-grapheme correspondence as well as non-word decoding skills. The specified sub-sections and subtests are described in Appendix I.

The differentiation of skills into various sections is valuable to the researcher as each section could be evaluated to draw conclusions separately about a specific skill on a specific level. The differentiation of sections also contributed to the internal consistency and validity of the research results as the total test score and section scores were potentially supported by the smaller subtest scores.

The reliability of the *PAT-2* was determined using both test-retest and internal consistency measures. A high internal consistency of items with an overall consistency co-efficient of 0.99 was established (Robertson & Salter, 2007b). The section totals and the total test, average test-retest co-efficients all exceeded 0.90 (Robertson & Salter, 2007a). Co-efficients of 0.90 are considered to be most reliable, therefore the reliability of the *PAT-2* is deemed to be high.

Content validity was qualitatively evidenced throughout the introduction to the test (Robertson & Salter, 2007a). Contrasted group validity was demonstrated by the authors with consideration of the developmental age, cognitive ability and group differences (Robertson & Salter, 2007b). Item validity was evidenced by the bi-serial correlations, whereby 89% of all individual items statistically correlated significantly. The *PAT-2* thus provides valid and reliable measures of the aspects of phonological awareness and measures of the whole construct.

2.6.1.3. Questionnaires

Questionnaires were compiled including both closed-ended and open-ended questions. Biographic and demographic information was obtained regarding SES as well as the exposure, experience and use of languages within the home and school environment. Separate questionnaires were compiled for parents and teachers so that appropriate, relevant questions could be asked respective to the home or classroom environments.

The parent questionnaire included questions about demographics, SES, exposure, use and contexts of English and other languages. Further questions were included regarding the reading practices and awareness of noise in the home environments (Appendix J). The questionnaires provided insight to the influence of SES and language exposure on acquisition of literacy and PA skills.

The teachers were asked to complete questionnaires to provide information regarding demographics, SES, exposure, use and contexts of English and other languages (Appendix K). The teacher questionnaire included further questions regarding the teaching methods, perspectives on inclusive education, classroom activities which support the development of PA skills and literacy acquisition as well as the awareness of noise and practices to reduce noise in the classroom environment. Information obtained may assist in efforts to determine whether academic instruction provided is

adherent to *CAPS* (Department of Basic Education, 2011b), and further recommendations which can be made.

2.6.2. Procedures for data collection

Data collection was conducted at the school of the participants where the participants were comfortable and familiar with their environment. In the school environment the participants were accustomed to the background noise and thus further distractions during assessments were reduced. A quiet room was used for the hearing screening and speech perception in noise assessment to minimise the influence of background noise on the results. Throughout the assessment the researcher sat next to the participant as shown in Image 1.

Image 1: *Setting for assessment*

2.6.2.1. Speech perception in noise assessment

In many educational environments the listening conditions experienced are not favourable (Lewis et al., 2010). With poor SNRs, discrimination skills and speech perception in noise abilities are important for learning and literacy development. The speech perception in noise abilities of learners were determined using the newly developed *SA Eng DIN Test* (Potgieter et al., 2016).

The *SA Eng DIN Test* opened with a tutorial screen. Following the tutorial, the gender and date of birth of the participant was entered. The participant was instructed to place the headphones on and their participant number was entered in place of their initials

and surname. Before initiation of the test, the participant was instructed to choose a comfortable listening intensity. Thereafter the *SA Eng DIN Test* was started and digit-triplets were presented binaurally. The test operates with a fixed noise level and the speech level is varied when the SNR is negative. When the SNR is positive however, the speech level becomes fixed and the noise level varies, ensuring the listening experience was comfortable to the participant.

The first triplet was presented at the intensity level chosen by the participant. An adaptive one level up or one level down approach was followed to determine the SRT. A correct response required that all three digits were accurately perceived and entered. Following the entered response, the proceeding digit-triplet was presented 2dB higher for a correct response and 2dB lower for an incorrect response. The three digits perceived were entered as the response on the pop-up keypad. As participants were in Grade 1, the researcher asked the participants to say the digits perceived out loud as they typed to ensure the intended digit perceived was accurately entered. Through the researcher's double check, typing errors could be amended.

2.6.2.2. Phonological awareness assessment

Following assessment of the speech perception in noise abilities of participants, the *PAT-2* was administered to assess their PA skills. Throughout the PA skills assessment the researcher was seated next to the participant. Instructions for the *PAT-2* were given as instructed in the examiner's manual to ensure validity of results (Robertson & Salter, 2007a). In accordance with the designed set-up of the test, assessment proceeded in graded tasks from sentences to words or syllables and thereafter, phonemes. The progression of grading was also followed for the assessment of the initial, final and then medial position of phonemes in words. The test took approximately 40 minutes to complete with each participant (Robertson & Salter, 2007a).

2.6.2.3. Provision of questionnaires

Parent questionnaires (Appendix J) were provided to all parents who indicated their willingness for themselves and their child to participate. The questionnaires were given to the participants by the teacher placing the questionnaire in their homework book. The questionnaires were collected from the homework book upon return and given to the researcher by the teachers. The parent questionnaires responses were deemed

reliable as confirmation was obtained through telephonic interviews. The answers were confirmed to eliminate potential misunderstandings, as the parents of the participants were potentially not answering in their L1.

The teachers were provided teacher questionnaires (Appendix K) by the researcher. The researcher sat with each teacher whilst they completed their questionnaire to ensure that all questions were understood correctly. By sitting with each teacher during completion of the questionnaire, the researcher ensured that the teachers did not discuss their responses and adjust their response accordingly. The intended written answers were confirmed with each teacher once the questionnaire was completed to prevent misunderstandings and thus the responses obtained are deemed reliable.

2.7. Data processing and analysis procedure

The implementation of a quantitative approach allowed observable physical skills of the participants to be represented as numbers through the application of formal objective tests (Leedy & Ormrod, 2016). A descriptive method was used to analyse the data obtained and discuss the characteristics and knowledge without attempting to change the situation (Leedy & Ormrod, 2016). Analysis and scoring occurred on a separate sheet for each participant as follows:

Speech perception in noise scores were electronically generated by the *SA Eng DIN Test* and recorded on the score sheet of the participant. The scores were presented as a speech reception threshold (SRT), which is understood as the average signal-to-noise ratio (SNR) whereby 50% of the digit-triplets presented are perceived correctly (Potgieter et al., 2016). A more negative score indicates a lower SRT and better speech perception in noise skills. The preliminary score for children ages 5 years to 6 years 11 months is between -7.75dB and -6.31dB (Methula, Visser, & Zulu 2016).

The responses of the participants for the *PAT*-2 were recorded on the score sheets of participants and their scores were calculated afterwards. PA scores were determined based upon the correct responses provided by the participants. The total number of correct responses was determined for each subtest, sub-section, section and total test score for every participant. The *PAT-2* statistics manual (Robertson & Salter, 2007b) was used to transcribe the raw scores of participants to standardised scores according to their age.

Normative values are not specified for the South African population. As recommended by Højen and Fledge (2006), an EL1 participant control group was included in order to enable an informative assessment and description of the skills of EL2 participants. The scores of the EL1 participants in the control group were used to determine an approximate measure against which the scores of the EL2 participants were compared. Ex post facto comparison was employed as the researcher was not responsible for the prior language exposure and experience of the participants (Leedy & Ormrod, 2016). Within-group analysis of gender as well as SES was employed with both of the EL1 and EL2 participant groups to further investigate the validity of results. Between-group comparisons were conducted regarding the gender and SES of the EL1 and EL2 participants as well.

Age equivalents could not be used. The test was thus interpreted as an indication for the level of functioning. Percentages were provided to enable understanding of the level of skills. Percentages however, have a limitation as ordinal data is generated rather than interval data. As a result, various arithmetic calculations and statistical analysis are prevented (Leedy & Ormrod, 2016). Standardised scores were therefore presented in place of age equivalents.

A standard score is a representation of a participant's score derived from comparison within a distribution of the normative scores. Standard scores provide an indication of the difference between a participant's raw score and the mean, represented in standard deviation (SD) units (Leedy & Ormrod, 2016). In order to prevent reliance on normative results, the standard score results of EL2 participants were described relative to the standard score results of the EL1 participants.

Outlying results could potentially skew the means of data collected due to the small size of the participant group. Medians are accepted as the preferred representation of data with an abnormal or skewed distribution (Neuman, 2014). Medians were thus calculated and used in order to enable comparison between the EL1 and EL2 participant groups. The *PAT-2* uses a mean standardised score of 100 and a SD of 15 (Robertson & Salter, 2007a). Scores less than twice the SD below the mean were considered to be of concern (Robertson & Salter, 2007a).

2.8. Statistical analysis

A statistical representation refers to the numerical estimation of a parameter specified within a population based upon computation from a sample (Neuman, 2014). Analysis refers to the process of using predetermined statistical procedures in conjunction with objective criteria to evaluate the data collected in a research study (Leedy & Ormrod, 2016). Statistical analysis therefore assists the researcher in the endeavour to determine various patterns, trends or relationships amongst the data obtained relevant to a specific sample or study population.

In order to enable ease of record keeping and analysis, all data scores obtained were transcribed from individual participant score sheets and stored on Microsoft® Excel® 2010 Spreadsheets, version 14.0 (Microsoft Corporation). Prior to conducting statistical analysis, the data entered was rechecked thoroughly for errors. Following rechecking the data, code cleaning and contingency cleaning was conducted whereby the variables and categories were checked for impossible codes and combinations (Neuman, 2014). Thereafter, statistical analysis was conducted using the statistical software programme, IBM SPSS Statistics for Windows, version 23.0 (IBM Corp., Armonk, N.Y., USA). To determine the level of PA and speech perception in noise skills of the EL2 learners, the following analyses were undertaken:

The Shapiro-Wilk Test of Normality and histogram graph depictions were used to determine the distribution normality and linearity of the data obtained (Leedy & Ormrod, 2016). Descriptive statistics were used to organise and synthesise the data regarding the demographics of the participant group. The dependant samples t-test was used to determine if there was a significant difference ($p < 0.05$) between the means of normally distributed data such as the age of participants. The Wilcoxon Signed Rank Test was used to observe significant differences ($p < 0.05$) between the medians of variables in a paired sample, such as the standardised scores of EL1 and EL2 learners. This is the non-parametric equivalent of a dependant samples t-test (Leedy & Ormrod, 2016).

Measures of central tendency which includes the mean and median, as well as variability, which includes the SD and interquartile, were also determined for all data pertaining to the assessments of participants. Potential relationships between variables were investigated using Spearman's Rank Order Correlation (rho). The

closer the value of the correlation co-efficient is to 1 or -1, the stronger the correlation, whereas a correlation co-efficient of 0 indicates no relation between the variables (Leedy & Ormrod, 2016). A perfect positive correlation has a value of 1, a perfect negative correlation has a value of -1, whereas a value of 0 indicates no relationship amongst variables. A weak correlation is when rho. = 0.10 – 0.29, a medium correlation is when rho. = 0.30 – 0.49, and a strong correlation is when rho. = 0.5 – 1.0.

2.9. Reliability and validity of research

Reliability refers to the consistency with which a quantifying instrument produces a specific, constant result when the quantified entity remains unchanged (Leedy & Ormrod, 2016). The reliability of the assessment measures was ensured through the use of the *PAT-2* standardised test in accordance with the prescribed assessment procedure explained the Examiner's Manual (Robertson & Salter, 2007a). The researcher being the only person to administer the tests to each of the participants eliminated individual differences in administration and scoring which further increased the reliability.

A reliability of internal consistency refers to the degree to which each item of a measured entity produces a similar result (Leedy & Ormrod, 2016). The between-group significant differences in both the Phonological Awareness section and the Phoneme-Grapheme Knowledge section of the *PAT-2* as well as the total *PAT*-2 test result provide evidence of internal consistency. Consistency was further demonstrated when between-group significant differences were determined for the groups based on gender and SES.

Validity influences the accuracy, meaningfulness and credibility of the research study (Leedy & Ormrod, 2016), and should be considered irrespective of which design is employed. The question of internal validity is whether or not the results and conclusions of the study are truly warranted by the data collected? Internal validity refers to the extent to which the researcher may draw conclusions regarding relationships within the data obtained, in accordance with the design specifications (Leedy & Ormrod, 2016). Comparison of the results of the EL2 learners to normative data which is not standardised according to the South African population or L2 learners may not provide valid results. Therefore, the researcher endeavoured to increase the

validity of the comparison through matching the EL2 participants to EL1 learners of the South African population in order to use their results as a substitute normative value.

The external validity of a research study is understood to be the extent to which generalizations of the results obtained may be made to other contexts or populations (Leedy & Ormrod, 2016). Data collection for this study occurred at the participants' respective schools to maintain a real-life setting and enhance applicability of the study results. Detailed explanation of the study population and their home environment are provided in order to allow clear understanding of where or how the results of this study may be applicable to another population. Elucidation of the method and study population is also provided in order to allow future researchers to replicate this research. Repetition of this study in another context or with a representational sample may further enhance external validity. Both internal and external validity were considered in the design of this research study.

2.10. Summary

Various design considerations should be regarded when developing a research study to ensure the most appropriate approach is used in order to obtain, analyse and present the data. It is important to consider that different factors may impact data analysis. In order to ensure thorough consideration of these factors coupled with the most appropriate management to maintain the validity and reliability of the research study, these factors were comprehensively presented in the chapter. This chapter thus aimed to provide explanation of the design, aims, participants, materials, procedures and the data analysis with acknowledgement of the ethical considerations, in order to prepare a comprehensive approach to the presentation of the data and subsequent discussion to support the conclusions.

CHAPTER THREE: RESULTS

"What we find changes who we become."

Peter Morville

Chapter Aim: The main aim of this chapter is to present the results of the statistical analysis conducted for this study. This chapter includes a graphical representation of the data pertaining to the phonological awareness and speech perception in noise skills of the EL2 participants. An interpretation of the statistical results is also provided.

The results of the EL2 participants are described against the background of the expected level of skills necessary to learn in the ELoLT educational context obtained by the EL1 participants. The levels of skills are discussed as comparisons of the groups as wholes including; the percentage of correct responses, median standardised scores (SS) and their interquartile ranges (IQR), differences according to months, and the p-values for significance of differences.

Firstly, an overview is given of the *SA Eng DIN Test* results to evaluate speech perception in noise skills. Then the results of the *PAT-2* are presented according to the sub-sections. Thereafter comparisons of gender groups are presented. Significant findings from the parent and teacher questionnaires are summarised. Lastly, the overall performance of the EL1 and EL2 participants are provided for the speech perception in noise and PA skills results.

3.1. Performance on the *SA Eng DIN Test*

The speech perception in noise results of the EL1 and EL2 participants obtained via the *SA Eng DIN Test* are depicted in Figure 1. To highlight the difference between EL1 and EL2 participants, the normative SRT for adults and children are included in the graphical representation of the median SRT scores.

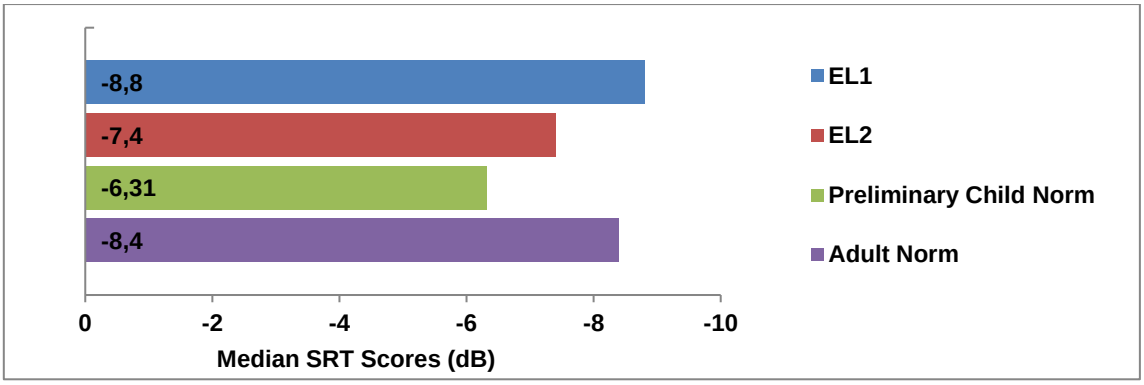


Figure 1: *SA Eng DIN Test: Speech reception thresholds for the EL1 and EL2 participants*

The more negative the SRT score, the better the speech perception in noise skills are as sounds are heard in a higher level of background noise. A median SRT of -8.8 dB was obtained by the EL1 group as seen in Figure 1. The EL2 group obtained a median SRT of -7.4 dB. The Wilcoxon Signed Rank Test showed that the EL2 group obtained a significantly lower (p=0.008) level of speech perception in noise with a higher median SRT.

3.2. Performance on the Phonological Awareness section of the *PAT-2:*

The percentage of correct responses, medians, IQRs, difference in months and the significance of this difference between the EL1 and EL2 participants are indicated in Table 4.

Table 4: *Comparison of scores for EL1 and EL2 participants in the sub-sections of the PAT-2: Phonological Awareness section*

	EL1		EL2		Difference (months)	p-value (<0.05)
	% correct responses	**Median SS (IQR)**	**% correct responses**	**Median SS (IQR)**		
Rhyming	**81%**	**100 (92 – 105)**	**36%**	**66 (30 – 82)**	**>8**	**<0.001***
Discrimination	95%	110 (102 – 110)	56%	85 (32.5 – 98)	>6	<0.001*
Production	67%	98 (89 – 103)	15%	0 (0 – 81.5)	>7	<0.001*
Segmentation	**93%**	**123 (118.5-125.5)**	**68%**	**99 (93 – 108.5)**	**>48**	**<0.001***
Sentences	96%	115 (115 – 115)	84%	108 (95 – 115)	>1	=0.003*
Syllables	92%	119 (113 – 119)	78%	107 (99 – 113)	>16	=0.007*
Phonemes	92%	129 (124 – 129)	41%	100 (95 – 110)	>45	<0.001*
Isolation	**97%**	**117 (114 – 117.5)**	**67%**	**98 (83 – 112)**	**>51**	**<0.001***
Initial	99%	108 (108 – 108)	90%	108 (102 – 108)	1	=0.010*
Final	95%	117 (112 – 117)	60%	103 (89 – 112)	>21	<0.001*
Medial	98%	123 (123 – 123)	50%	106 (0 – 119)	>34	<0.001*
Deletion	**76%**	**108 (102 – 111)**	**48%**	**87 (80.5-100.5)**	**17**	**<0.001***
Compounds & Syllables	84%	109 (103 – 121)	63%	98 (92 –108.5)	26	=0.004*
Phonemes	69%	110 (105 – 115)	32%	96 (0 – 102.5)	12	<0.001*
Substitution	**70%**	**108 (102 – 115)**	**18%**	**0 (0 – 97.5)**	**>26**	**<0.001***
Blending	**94%**	**109 (104.5 – 113)**	**63%**	**79 (70 – 94.5)**	**27**	**<0.001***
Syllables	98%	109 (109 – 110.5)	84%	94 (85 – 106)	>15	<0.001*
Phonemes	90%	111 (103.5 – 112)	42%	81 (65 – 93.5)	32	<0.001*

The score of the EL2 participants differed from the EL1 participants by more than one standard deviation for all Phonological Awareness sub-sections. The score of the EL2 group for the Rhyming sub-section (36%; 66 MEDIAN) was significantly lower ($p<0.001$) than the EL1 group (81%; 100 MEDIAN). The EL1 group obtained a median score of 98 in the Production of Rhyming subtest, whereas the EL2 group obtained a median score of zero. The median scores of the EL2 participants were below the *PAT-2* mean score of 100 for all of the Phonological Awareness sub-sections, though this

result is not valid as the *PAT-2* is designed for EL1 learners. Few EL2 participants demonstrated skills for Substitution resulting in the greatest significant difference between the scores of the EL1 participants (70%; 108 MEDIAN) and the EL2 participants (18%; 0 MEDIAN).

Figure 2 depicts the percentage of correct responses given by the participants for the Phonological Awareness sub-sections of the *PAT-2*.

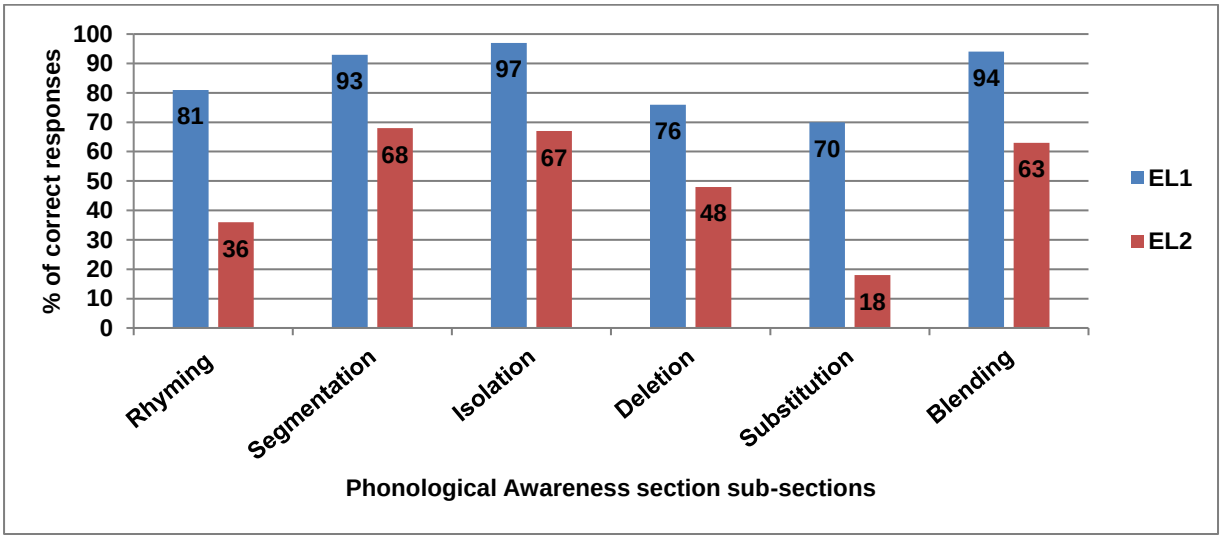


Figure 2: *Sub-sections of the Phonological Awareness section of the PAT-2: The percentage of correct responses of the EL1 and EL2 participants*

The scores of the EL2 participants for all subtests of the Phonological Awareness section were significantly below ($p<0.001$) that of the EL1 participants.

3.3. Performance on the Phoneme-Grapheme Knowledge section of the *PAT-2:*

Figure 3 depicts the percentage of correct responses given by the participants for the Graphemes and Decoding sub-sections of the *PAT-2*.

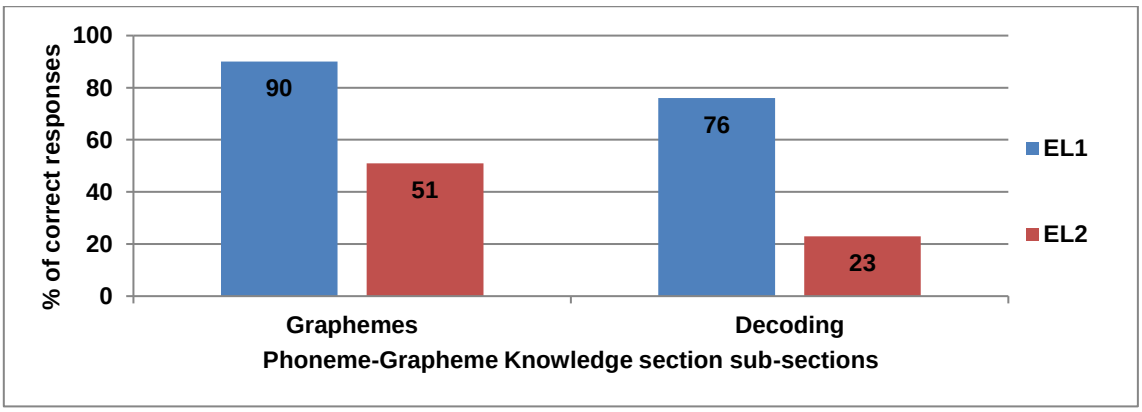


Figure 3: *Sub-sections of the Phoneme-Grapheme Knowledge section of the PAT-2: The percentage of correct responses of the EL1 and EL2 participants*

As seen in Figure 3, the EL2 group scored below that of the EL1 group in both subsections of the Phoneme-Grapheme Knowledge section. Further information is provided in Table 5, including the percentage of correct responses, medians, IQRs, difference in months, and the significance of the difference between EL1 and EL2 participants for the Graphemes and Decoding sub-sections of the Phoneme-Grapheme Knowledge section.

Table 5: *Comparison of scores for EL1 and EL2 participants in the subsections of the PAT-2: Phoneme-Grapheme Knowledge section*

	EL1		**EL2**		**Difference** (months)	**p-value** (<0.05)
	% correct responses	**Median SS (IQR)**	**% correct responses**	**Median SS (IQR)**		
Graphemes	**90%**	**117 (113.5 – 121.5)**	**51%**	**91 (77.5 – 100.5)**	**34**	**<0.001***
Consonants	98%	110 (103 – 110)	74%	83 (76 – 94)	>6	<0.001*
Long/Short Vowels	94%	114 (108 – 115.5)	62%	96 (87 – 104.5)	>9	<0.001*
Consonant Blends	86%	113 (105 – 113)	36%	91 (39 – 100)	>12	<0.001*
Consonant Digraphs	94%	112 (112 – 112)	17%	0 (0 – 86.5)	>5	<0.001*
R-controlled Vowels	92%	123 (123 – 126)	39%	90 (0 – 116)	>28	<0.001*
Vowel Digraphs	68%	118 (109 – 127.5)	26%	0 (0 – 113.5)	>34	<0.001*
Diphthongs	70%	120 (109 – 133.5)	24%	0 (0 – 114.5)	>27	<0.001*
Decoding	**76%**	**118 (114 – 122.5)**	**23%**	**89 (0 – 103.5)**	**27**	**<0.001***
VC words	97%	115 (115 – 116)	52%	100 (0 – 111.5)	>20	<0.001*
CVC words	91%	119 (110.5 – 119)	41%	99 (0 – 110.5)	>33	<0.001*
Consonant Digraphs	88%	119 (113 – 119)	19%	0 (0 – 101.5)	>18	<0.001*
Consonant Blends	70%	115 (106 – 115.5)	18%	0 (0 – 97)	>22	<0.001*
Vowel Digraphs	67%	116 (109 – 126.5)	19%	0 (0 – 108.5)	>17	<0.001*
R-controlled Vowels	73%	118 (114 – 124)	19%	0 (0 – 103)	>22	<0.001*
CVCV words	66%	115 (107 – 127)	5%	0 (0 – 0)	>21	<0.001*
Diphthongs	57%	119 (107.5 – 126)	11%	0 (0 – 98)	>24	<0.001*

The EL2 group scores for the Graphemes sub-section (51%; 91 MEDIAN) and the Decoding sub-section (23%; 89 MEDIAN) were low. A significant difference ($p<0.001$) was indicated between the scores of EL1 and EL2 groups across all subtests in the Graphemes and Decoding subsections as well as the total sub-section scores of the Phoneme-Grapheme Knowledge section.

The EL2 group obtained a median score of zero in the Graphemes sub-section for Consonant digraphs (17%), Vowel digraphs (26%) and Diphthongs (24%). In the Decoding sub-section EL2 participants obtained a median score of zero in the Consonant digraphs (19%), Consonant blends (18%), Vowel digraphs (19%), R-controlled vowels (19%), CVCV words (5%) and Diphthongs (11%) subtests.

The relationship between the Grapheme and Decoding sub-sections was investigated using Spearman's Rank Order Correlation (rho=0.01). A strong, positive correlation between the two variables (rho=0.891, $p<0.001$) was observed where high levels of phoneme-grapheme knowledge are associated with high levels of Decoding skills for the EL2 participants. Further analysis identified a strong, positive correlation between the Graphemes sub-section and Blending subtest (rho=0.648, $p<0.001$). The Decoding sub-section showed a strong positive correlation with the Isolation subtest (rho=0.657, $p<0.001$) as well as a medium positive correlation with the Segmentation subtest (rho=0.435, $p<0.03$).

3.4. Between-group and within-group analysis according to gender

A 2-Tailed Significant Difference Test was used to conduct analysis within groups according to gender as the population size of males and females differed. The Wilcoxon Signed Rank Test was used to conduct analysis between groups, according to gender, as shown in the results to follow. Figure 4 shows the scores of the males and females in the EL1 and EL2 groups for the *SA Eng DIN Test*.

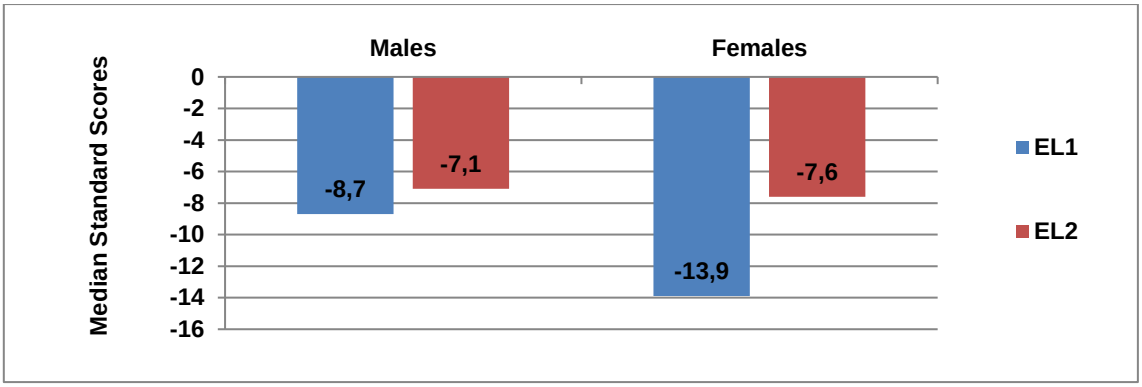


Figure 4: *Scores of the EL1 and EL2 males and females in the SA Eng DIN Test*

From Figure 4 it is clear that the scores of females were higher than males in the *SA Eng DIN Test* within both the EL1 and EL2 groups. The statistical results for within-group analysis of gender for the *SA Eng DIN Test* are shown in Table 6.

Table 6: *Within-group analysis of gender for results of the EL1 and EL2 participants in the SA Eng DIN Test*

	GENDER WITHIN GROUPS	
Categorical comparison	**EL1: Male vs Female**	**EL2: Male vs Female**
SA Eng DIN Test	p=0.617	p=0.467

** p < 0.05*

Though the scores of females were higher than males in both the EL1 and EL2 groups, within-group analysis revealed no statistically significant difference. Between-group analysis of gender for the *SA Eng DIN Test* are depicted in Table 7.

Table 7: *Between-group analysis of gender between EL1 and EL2 participants for results of the SA Eng DIN Test*

	GENDER BETWEEN GROUPS	
Categorical comparison	**EL1 vs EL2: Males**	**EL1 vs EL2: Females**
SA Eng DIN Test	p=0.025*	p=0.084

** p < 0.05*

Between-group analysis of EL1 and EL2 males revealed a significant difference between their scores for the *SA Eng DIN Test* (p=0.025). There was however, no significant difference between the EL1 and EL2 female group scores on the *SA Eng DIN Test* (p=0.084). Due to the larger size of the female group, a larger difference between the female groups is required to be deemed statistically significant. The visual comparison should therefore not be seen as reliable for between-group comparisons.

Figure 5 shows the scores of the males and females in the EL1 and EL2 groups for the total test scores of the *PAT-2.*

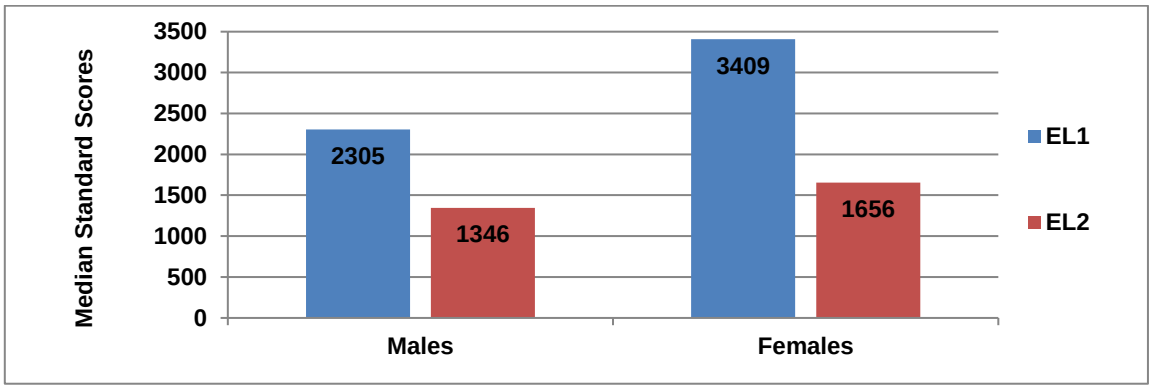


Figure 5: *Total test scores of the EL1 and EL2 males and females in the PAT-2*

Within both the EL1 and EL2 groups, the females scored higher than the males in the total *PAT-2* test, as shown in Figure 5. Table 8 provides further statistical information of within-group analysis which was conducted between EL1 males and EL1 females, as well as between EL2 males and EL2 females.

Table 8: *Within-group analysis of gender with results of the PAT-2 total test and section scores between EL1 and EL2 participants*

	GENDER WITHIN GROUPS	
Categorical comparison	**EL1: Male vs Female**	**EL2: Male vs Female**
PAT-2	p=0.389	p=0.267
PA Section	p=0.911	p=0.255
Phoneme- Grapheme Section	p=0.291	p=0.318

** p < 0.05*

No significant differences (p>0.05) were identified by within-group comparisons across the sections, or the total score of the *PAT-2,* as seen in Table 8. It is notable that further within-group analysis identified significant differences (p<0.05) for decoding of vowel digraphs (p=0.04) between EL1 males and females. Between EL2 males and females, significant differences were identified for the segmentation of syllables (p=0.002) and decoding of CVCV words (p=0.027). Further analysis of the data included between-group comparisons of gender, which is summarised in Table 9.

Table 9: *Between-group analysis of gender with results of the PAT-2 total test and section scores between EL1 and EL2 participants*

	GENDER BETWEEN GROUPS	
Categorical comparison	**EL1 vs EL2: Males**	**EL1 vs EL2: Females**
PAT-2	p<0.001*	p<0.001*
PA Section	p<0.001*	p<0.001*
Phoneme- Grapheme Section	p<0.001*	p<0.001*

** p < 0.05*

The EL1 and EL2 males differed significantly in their scores for the *PAT-2* total test (p<0.001) following between-group analysis. Similarly, between-group analysis of EL1 and EL2 females revealed significant differences between their scores for the *PAT-2* total test (p<0.001). As shown in Table 9, significant differences were observed for the Phonological Awareness and Phoneme-Grapheme Knowledge sections.

Though not tabulated, it is notable that between-group analysis revealed statistically significant differences between EL1 and EL2 females as well as EL1 and EL2 males for all of the *PAT*-2 sub-sections. Further between-group analysis revealed no significant difference (p=0.086) between EL1 and EL2 females for the Isolation of Initial Phonemes subtest in the *PAT-2* Phonological Awareness section. Analysis of EL1 and EL2 males showed no significant differences (p<0.05) for the Sentence Segmentation (p=0.184), Syllable Segmentation (p=0.936), Deletion of Compounds and Syllables (p=0.248) as well as Identification of Vowel Graphemes (p=0.056) subtests of the *PAT-2*. Significant differences(p<0.05) were identified between EL1 and EL2 females as well as EL1 and EL2 males for all other *PAT*-2 subtests.

3.5. Teachers' feedback

All seven (100%) Grade 1 teachers noted awareness of external, internal and room noise sources in their questionnaires, including traffic, machinery, learners around the school as well as the talking and movement of learners within their own classrooms. Every teacher involved in this study showed knowledge of noise reduction strategies such as hanging curtains, closing doors and asking learners to be still or quiet.

Two out of three of the EL2 teachers as opposed to one out of four of the EL1 teachers indicated that they are not EL1 speakers. All teachers from both schools indicated they are literate and fluent in English. The EL2 teachers indicated use of code-switching in their classrooms.

Figure 6 depicts the amount of time the teachers indicated which is usually spent on activities within their classrooms.

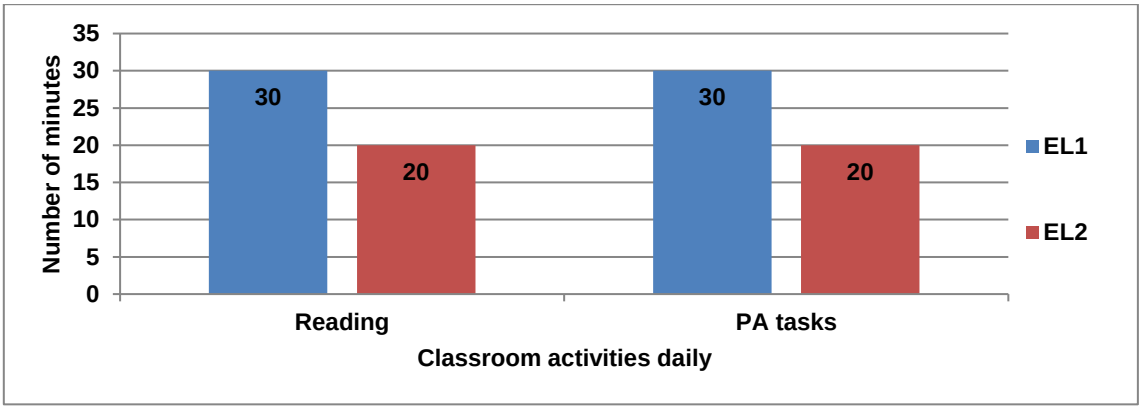


Figure 6: *The time spent on activities within the EL1 and EL2 classrooms daily*

The teachers of the EL1 group indicated spending an average of 30 minutes per day on reading, as shown in Figure 6. Conversely, the teachers of EL2 learners indicated less time reading with an average of only 20 minutes daily. Every teacher indicated their learners are exposed to English print in books or magazines in a combination of group reading, individual reading and teacher-led activities. All teachers of both the EL1 and EL2 learners indicated that their school has a library.

Figure 6 shows that the teachers of the EL1 participants indicated spending an average of 30 minutes per day on PA tasks, whereas the teachers of the EL2 participants indicated an average of 20 minutes daily. Every EL1 Grade 1 teacher indicated their classroom PA activities included syllable clapping games and letter sound associations. One EL2 teacher did not indicate incorporation of syllable clapping games in her classroom PA activities.

One out of four EL1 teachers and two out of three EL2 teachers reported including exposure to songs and nursery rhymes on a daily basis. The remaining teachers indicated nursery rhyme and singing exposure on a weekly basis. The teachers of the EL2 participants explained that PA activities are sometimes only completed once or twice a week. When asked about what support is available to the participants with potential language barriers to literacy development, all teachers discussed remedial lessons as a possible means of support.

3.6. Parents' feedback

In the parent questionnaires all 25 EL2 learners (100%) were indicated to have received no prior literacy exposure in their L1 prior to the start of Grade 1. Figure 7 shows the amount of English literacy exposure through book reading that occurred for EL1 and EL2 participants in Grade R and Grade 1.

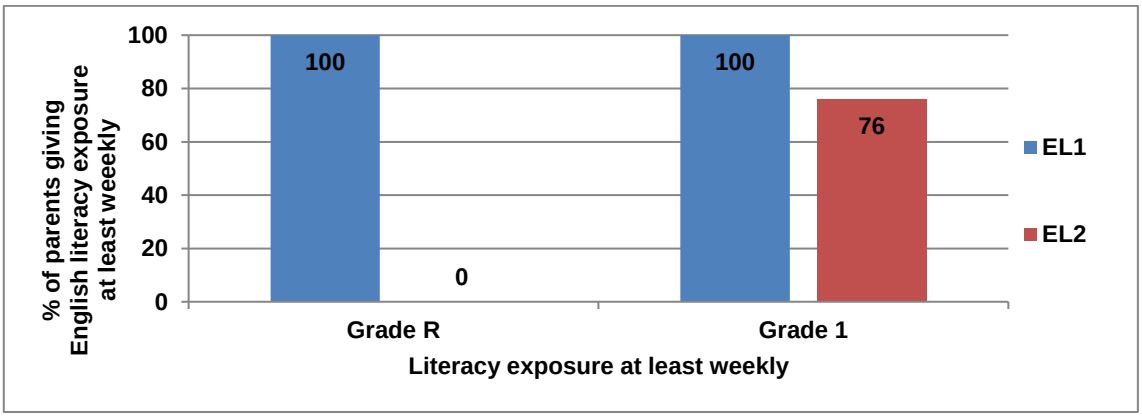


Figure 7: *The percentage of English literacy exposure occurring at least weekly in Grade R and Grade 1 for EL1 and EL2 participants*

All EL1 parents (100%) indicated reading in English with their child at least weekly at home, whereas six (24%) of the EL2 parents indicated less frequent English book reading, monthly. Every parent of the participants indicated awareness of noise in their home environment.

3.7. Overall performance

A summary of the scores for both the *SA Eng DIN Test* and total *PAT-2* scores are displayed in Table 10. The significant differences between the EL1 and EL2 groups identified by the Wilcoxon Signed Rank Test are also portrayed.

Table 10: *Percentages, medians and interquartile ranges of the EL1 and EL2 participants for the SA Eng DIN Test, total PAT-2 and section scores*

	EL1		EL2		Difference (months)	p-value (<0.05)
	% correct responses	**Median SS (IQR)**	**% correct responses**	**Median SS (IQR)**		
SA Eng DIN Test	-	-8.8 (-9.8 – -8.0)	-	-7.4 (-9.0 – -5.6)	N/A	=0.008*
PAT-2 (SS)	85%	117 (114.5 – 120)	45%	81 (71 – 87)	39	<0.001*
PA Section (SS)	88%	114 (112 – 115.5)	55%	84 (74 – 98)	36	<0.001*
Phoneme-Grapheme Section (SS)	82%	117 (114.5 – 123)	35%	88 (79 – 98)	28	<0.001*

The total score of the EL2 participants in the Phonological Awareness section (55%; 84 MEDIAN) was significantly lower (p<0.001) than the EL1 participants (88%; 114 MEDIAN) as seen in Table 10. The EL2 participants performed significantly below the speech perception in noise skill level of the EL1 participants in the *SA Eng DIN Test*. The level of PA skills that the EL2 participants have is below the level of the EL1 participants, as determined by the *PAT*-2.

3.8. Summary

In this chapter the results obtained for the research study were presented. The results were tabulated and presented as figures in the form of bar graphs to provide visual demonstration in order to improve understanding of the data. Responses provided in parent and teacher questionnaires were summarised. Further elucidation of the tables and figures were provided which will be discussed in accordance to the current, relevant literature in Chapter Four.

The speech perception in noise skills of the EL2 participants were appropriate for their age, though remained below that of the level obtained by the EL1 participants. The level of PA skills of the EL2 participants was also lower than that of the EL1 participants. In particular, the EL2 group had difficulty with Rhyming and Phoneme-Grapheme Knowledge tasks. Within-group analysis showed that females consistently obtained higher scores than males in both the speech perception and PA tasks. These results will be discussed further in the following chapter.

CHAPTER FOUR: DISCUSSION

"The aim of an argument, or of discussion, should not be victory, but progress."
Joseph Joubert

Chapter Aim: In this chapter the discussion is presented in accordance with the aims of this study. The results are discussed in light of the current body of knowledge to provide further interpretations of the data, as well as to determine and describe the significance.

The speech perception in noise skills of the learners will be discussed prior to their PA skills and phoneme-grapheme knowledge. Thereafter within-group and between group analysis will be discussed. The implications of the skills of EL2 learners for literacy development will be explained. Throughout the discussion considerations for potential intervention developments will be highlighted.

4.1. Performance on the *SA Eng DIN Test*

This research study aimed to describe the speech perception in noise skills of the EL2 learners for learning in the EL1 educational context by investigating their abilities to perceive digits produced within background noise. For adults with normal hearing in both ears, the mean SRT value for DIN perception is -10.7 dB, whereas the SRT value of -8.4 dB is indicative of a pass or refer (Potgieter et al., 2016). The preliminary normative DIN SRT for children age 5 years to 6 years 11 months is between -7.75 dB and -6.31 dB (Methula et al., 2016). The EL2 participants therefore obtained an age appropriate score. The findings of the study however, showed that the EL1 participants scored better than the pass or refer SRT of adults with normal hearing in both ears in the *SA Eng DIN Test* (Potgieter et al., 2016). Thus, despite the age appropriate score of the EL2 participants, their DIN perception remains 1,4 dB lower than the score of the EL1 participants.

Recent DIN testing obtained a similar result, showing a 1.7dB better SRT for a group of native English speakers with highly competent non-native English speakers compared to a group of non-native English speakers with low English competence (Potgieter et al., 2017). Research thus supports the notion that EL2 learners often

obtain a lower DIN perception score than EL1 learners (Bradlow & Alexander, 2007; Kaandorp et al., 2016; Potgieter et al., 2017).

The findings of this study differ from prior research which showed EL2 learners required an SNR 6dB higher to equate the SRT of EL1 learners for sentence-in-noise perception (Kaandorp et al., 2016). The closer difference between the EL1 and EL2 speech perception in noise scores in this study may be due to the reduced linguistic demand of DIN perception (Lagrou et al., 2013). In DIN perception, there is a limited number of speech sounds required to be recognised in order to perceive the closed set of digits presented, which reduces the necessary language proficiency and linguistic knowledge (Krizman et al., 2017). Many African languages use English digits, and learners are also exposed to counting with English digits in Grade R (Department of Basic Education, 2011b). This early exposure increases familiarity and further reduces linguistic demand (Kaandorp et al., 2016; Smits et al., 2013).

The reduced difference between the participant groups and age appropriate speech perception in noise result of the EL2 participants implies that increased familiarity and reduced linguistic demand of learning material is beneficial. Grading the linguistic demand by using familiar speech material or enabling prior exposure may improve the speech perception of EL2 learners as well as subsequent PA skill acquisition.

In congruence with prior research, the EL2 participants of this study require a higher SNR to benefit from linguistic information (Bradlow & Alexander, 2007; Lagacé et al., 2011). It is a concern that the difference between the speech perception in noise skills of EL1 and EL2 learners increases as the SNR decreases in noisy environments (Bradlow & Alexander, 2007; Krizman et al., 2017; Lagacé et al., 2011). In South Africa, the SNRs of classrooms are frequently poor as a result of overcrowding (Howie et al., 2012). The average number of learners in a class increased from 40 learners (Howie et al., 2012, 2012) to 45 learners over five years (Howie et al., 2017) which implies a continued reduction of the SNR. In accordance with Howie et al. (2017), the lower SNR obtained by the EL2 participants in this study supports the need to reduce class sizes in South Africa in order to improves the SNR.

The poor SNR in classrooms is a concern as a correlation exists between academic achievement and speech perception (Obralić, 2016). The lower level of speech perception in noise skills thus places EL2 learners at a long-term disadvantage in their

learning environment, over and above their likely already reduced language proficiency (Beattie & Manis, 2014; du Plessis & Louw, 2008; Webb et al., 2010). Further modifications can be made to reduce noise and reverberation in the classroom such as inclusion of carpets, curtains and acoustic absorption materials (Mealings et al., 2015). Teachers showed awareness of closing doors and windows, however further training may improve results of their efforts to reduce noise (Sörqvist et al., 2014). Necessary training may include awareness of the effects of noise in various classroom layouts, as well as moving to alternate environments away from other classes for groupwork activities (Mealings et al., 2015).

4.2. Performance on the Phonological Awareness section of the *PAT-2*

Another aim of this research study was to describe the PA skills of EL2 learners for developing literacy in the EL1 educational context. The *PAT-2* (Robertson & Salter, 2007a) was used to investigate the PA skills of the EL2 learners including their rhyming, segmentation, isolation, deletion, substitution and blending skills. The overall Phonological Awareness scores of the EL2 participants were significantly lower than the EL1 participants. As PA is the strongest predictor of literacy success (Webb & Lederberg, 2014), it is a concern that the scores of the EL2 participants were significantly lower than the EL1 participants for all Phonological Awareness sub-sections and subtests. The following discussion includes the implications of the results for each Phonological Awareness sub-section:

4.2.1. Rhyming

The EL2 participants had significant difficulty with rhyming, a foundation skill for the development of PA (Cassady et al., 2008; Webb & Lederberg, 2014). The Rhyming sub-section was divided into two subtests. Firstly, the Rhyming Discrimination subtest assessed the ability of the participants to identify pairs of rhyming words. The second subtest, Production of Rhyming, required the participants to provide a word which rhymed with the stimulus word (Robertson & Salter, 2007a).

The EL2 participants had greater difficulty with the Production of Rhyming sub-section, producing less than a quarter of the rhymes. Nonsense words provided as rhymes were scored as correct, thus the influence of limited vocabulary was potentially reduced. Prior research with Grade R learners in the Cape Flats also showed that learners have greater difficulty generating rhyming words compared to identifying

rhymes (Willenberg, 2007). In both this study, and the study by Willenberg (2007), at least 50% of the participants sored zero for the rhyming production subtest. The lower score of the EL2 participants in the Production of Rhyming subtest supports the notion that rhyming production is a more complex task which may include skills beyond rhyming discrimination such as segmentation and blending of phonemes (Willenberg, 2007). Further emphasis should be placed on developing rhyme production abilities to facilitate the transfer and use of rhyme awareness skills enabling generalisation to support later PA development.

Overall only 36% of the Rhyming sub-section responses provided by the EL2 participants were correct in comparison to the 81% of responses from the EL1 participants. Many of the EL2 participants in this study did not attempt to provide a rhyming word. A possible explanation is that the EL2 participants were not exposed to rhyme as rhyming seldomly exists in the African languages (Combrinck et al., 2014; Prof. P.M. Sebate, personal communication, 05 April 2018). Prior research proposes poor rhyming skills may indicate weak PA as learners have insufficient phonological representations to recognise phonological components of rhyming words (Boets et al., 2011; Peeters et al., 2008; Preston & Edwards, 2010).

Since the speech perception in noise skills required to develop knowledge of phonological representations of the EL2 participants are reduced, their rhyming difficulties may be attributed to this (Chung et al., 2013). The EL2 participants in this study are not sensitive to rhyming which may be a confounding factor upon their challenges to develop literacy in their L2. Reciting of rhymes should therefore be included in a PA programme to provide opportunity for EL2 learners to develop rhyming skills (Wildschut et al., 2016). Numerous research studies support this recommendation with rhyme awareness tasks included in PA and literacy development programs (Hay & Fielding-Barnsley, 2012; Lessing & de Witt, 2016; Wildschut et al., 2016).

4.2.2. Segmentation

In the Segmentation sub-section there were three subtests where participants were required to divide sentences into words, words into syllables and words into phonemes (Robertson & Salter, 2007a). The EL2 participants demonstrated their highest level of PA skills in the Segmentation sub-section with 68% of the answers correct. In the

Sentence segmentation subtest, the EL2 participants obtained a median of 108, alongside a median of 107 in the Syllable segmentation subtest. A median of 100 was obtained in the Phoneme segmentation subtest indicating the EL2 participants had more difficulty with segmenting words into constituent sounds. The EL1 participants also demonstrated their highest level of skills in this Segmentation sub-section with 93% of the answers being correct and a median score of 123. The median score of the EL1 participants was higher than the mean standard score of 100 for the *PAT-2* indicating their performance was above the expected level for their age (Robertson & Salter, 2007a).

A possible explanation for the high level of skills demonstrated by both participant groups is the formal PA skill instruction provided in the Grade R classroom according to the *CAPS: Foundation Phase* syllabus (Department of Basic Education, 2011b). Sentence and syllable segmentation activities are introduced early in Grade R, offering further support that learners should have developed segmentation skills before entering Grade 1. More than half of the teachers from each participant group indicated playing syllable clapping games similar to the subtests in the *PAT-2* Segmentation sub-section. As not all teachers indicated playing clapping games in the classroom, the inconsistent exposure of the participants does reduce the validity of the results for this sub-section.

The participants in both groups performed better in the Sentence Segmentation subtest than in the Phoneme Segmentation subtest. The EL2 participants correct responses decline from Sentence Segmentation (84%), to Syllable Segmentation (78%) and further to Phoneme Segmentation (41%). The EL2 participants provided less than half as many correct responses for Phoneme Segmentation compared to Sentence Segmentation. The EL2 participants thus have a less sophisticated level of PA for segmentation of sentences and syllables, with reduced phonemic awareness for segmentation of phonemes. Callaghan and Madelaine (2012) support that learners require a sufficient level of knowledge at the syllable level of words prior to developing knowledge at the phonemic level. Plausible reasoning for the lower phoneme segmentation result is that it is a newer concept for the participants with exposure occurring in the fourth term of Grade R (Department of Basic Education, 2011b). With the EL2 participants showing a higher level of awareness for words and syllables compared to phonemes, this result implies intervention should support the PA

hierarchy, developing awareness from larger units to phonemes (Cassady et al., 2008). The low Phoneme Segmentation score of the EL2 participants is a concern as it supports the development of phoneme-grapheme knowledge and is likely more closely related to literacy development than sentence and syllable segmentation (Goldberg & Lederberg, 2015).

Despite the EL2 participant's highest level of skills in this sub-section, the scores differed significantly, with the EL2 participant's at least 48 months below the EL1 participants after formal training. Prior research with EL2 learners in Grade 3 supports the finding that the EL2 participants scored lower than the EL1 participants (Le Roux et al., 2017). The correct responses of the EL2 participants (41%) was less than half of those provided by the EL1 participants (92%) in the Phoneme Segmentation subtest. The EL2 participants thus have a lower level of segmentation skills to support their literacy development. Provision of segmentation skill training may positively influence the segmentation skills of both EL1 and EL2 learners and will support phonemic awareness development for literacy acquisition (Le Roux et al., 2017; Malda et al., 2014).

4.2.3. Isolation

Differences between the scores of the EL1 and EL2 participants were larger for tasks where the learners had to isolate and produce the phonemes themselves, such as Segmentation (>48 months) and Isolation of Phonemes (>51 months). The Isolation sub-section determined the skills of the participants to discriminate and produce phonemes in the initial, final, and medial positions of words (Robertson & Salter, 2007a). The median score of the EL1 and EL2 participants was higher than the mean standard score of 100 for all of the *PAT-2* Isolation subtests indicating their performance was above the expected level for EL1 learners of their age (Robertson & Salter, 2007a). The EL1 and EL2 learners scored equally in the Isolation of Initial phonemes subtest with medians of 108. However, their performance level was not equal as the EL2 participants provided 90% of the responses correctly whereas the EL1 learners provided 99%. The overall Isolation sub-section score of the EL2 participants was below that of the EL1 participants as well as each subtest. As the EL2 participant scores are lower, the results obtained from the Isolation subtests provided evidence to inform the support of EL2 learners for PA skill development.

The level of skills of the EL2 participants gradually decreased when the subtest stimuli changed from the initial position in words (90%) to the final position (60%), and further when the stimuli focussed on the medial position in words (50%). Prior research supports that the initial sounds are more salient for the participants compared to final sounds (Willenberg, 2007). Findings of this study provide confirmation that for EL2 learners the position within the word is a crucial influence to the difficulty, within the same PA task (Cassady et al., 2008).

4.2.4. Deletion

The deletion subtest determined whether participants could delete root words, syllables or phonemes and produce what was left. For example (e.g.): "Say *mailbox.* Say it again but don't say *box*", or "Say *pan". "*Say it again but don't say /p/" (Robertson & Salter, 2007a). The EL1 participants provided 76% of the answers correctly for the Deletion sub-section scoring an above-average median of 108. The median sub-section score of the EL2 participants was 87, with less than half (48%) of the answers being correct. The EL2 participants scored below the EL1 participants in both the Deletion of Compounds and Syllables subtest and the Deletion of Phonemes subtest. The EL2 participants had equal difficulty with both Deletion subtests implying their difficulty is related to a poor understanding of this PA task rather than reduced phoneme-grapheme knowledge. The lower level of Deletion skills demonstrated by the EL2 participants indicates that EL2 learners require support to develop this PA skill.

4.2.5. Substitution

The substitution sub-section requires a combination of PA skills and phoneme-grapheme knowledge to segment a word produced, isolate a phoneme, substitute with another phoneme, and produce a new word (Robertson & Salter, 2007a). As specified in the *PAT-2 Examiner's* Manual (Robertson & Salter, 2007a), coloured blocks were used as manipulatives to represent phonemes and visually support cognitive processing. Substitution requires a higher level of phonological awareness (Willenberg, 2007) which may contribute to the significant difference between the EL1 and EL2 participant groups being the largest of all sub-sections. The EL1 participants provided 90% of the possible answers correctly, whereas 18% of the EL2 participants responses were correct. The low score of the EL2 participants is potentially due to a

lack of exposure to the PA task in both the home and classroom environment thus far (Department of Basic Education, 2011b; Howie et al., 2017). Many of the EL2 participants did not understand the substitution task, indicating they have not developed the skill to integrate PA and phoneme-grapheme knowledge in order to manipulate phonemes. Research supports findings of this study which show the EL2 learners have greater difficulty with phonemic awareness tasks for explicit phoneme manipulation compared to forced judgement choices such as rhyme discrimination (Melby-Lervåg et al., 2012). Integration of PA skills and phoneme-grapheme knowledge is vital for literacy development, thus earlier exposure and support for the development of substitution as a PA skill is important.

4.2.6. Blending

The total Blending score of the EL2 participants was indicated to be 27 months below that of the EL1 participants, which raises concern. The Blending sub-section consisted of two subtests whereby participants combined individually presented syllables or phonemes to form a word (Robertson & Salter, 2007a). In the Syllable Blending subtest, the correct responses of the EL2 group (84%) were close to that of the EL1 group (98%). This result indicates that the blending skills of the EL2 group on the syllable level is nearly sufficient for developing literacy in the EL1 environment. The correct responses provided by the EL2 group (42%) were half of that which the EL1 group provided (90%) in the Phoneme Blending subtest. Phoneme blending is important to develop awareness of phoneme-grapheme coupling for literacy, thus the EL2 participants require support for their development of blending skills on the phoneme level.

Although the difference between the scores of the EL1 and EL2 participants is closer in the Blending sub-section compared to the Segmentation sub-section, the results show the EL2 participants have a lower level of blending skills than segmentation skills. This result differs from prior research which demonstrates that blending skills are easier and develop prior to segmentation skills (Le Roux et al., 2017; Ouellette & Haley, 2013).

4.3. Performance on the Phoneme-Grapheme Knowledge section of the *PAT-2*

Further investigation relating to the PA skills of the EL2 participants for learning in the EL1 educational context included assessment of their phoneme-grapheme knowledge

and decoding skills. Though the *PAT-2* is not validated for EL2 learners, it is important to note the difference between the EL1 and EL2 group scores were almost two standard deviations, which warrants intervention according to the *PAT-2* (Robertson & Salter, 2007a). Furthermore, the scores of the EL2 participants were significantly below the EL1 participants in the Graphemes and Decoding sub-sections. This result advocates the need to support the development of EL2 learners' phoneme-grapheme knowledge. The findings of the Decoding sub-section will be discussed after the Graphemes sub-section is presented.

4.3.1. Graphemes

This subtest measured the participants' awareness of phoneme-grapheme correspondences including consonants (e.g. [b]); long and short vowels (e.g. [i] and [ī]), consonant blends (e.g. [bl]), consonant digraphs (e.g. [sh]), R-controlled vowels (e.g. [ar]), vowel digraphs (e.g. [ee]), and diphthongs (e.g. [ou]) (Robertson & Salter, 2007a). The EL2 participants were approximately three years (34 months) behind the EL1 participants regarding their knowledge of phoneme-grapheme representations. The significantly lower score of the EL2 participants implies their phoneme-grapheme knowledge makes it more difficult to develop phonemic awareness compared to the EL1 participants (Ambrose et al., 2012; Ouellette & Haley, 2013). EL2 learners thus require support to develop phoneme-grapheme correspondences and improve their transfer of PA skills to literacy skills (Callaghan & Madelaine, 2012).

Formal phoneme-grapheme instruction commences in Grade 1 (Department of Basic Education, 2011b) providing reduced exposure as a possible explanation for the poor phoneme-grapheme awareness of the EL2 participants. The Graphemes sub-section result thus provides an indication of informal learning and stimulation in the home environment as a result of other PA activities such as rhyme, segmentation and isolation (Willenberg, 2007).

In the Consonants subtest, the EL2 participants obtained a median of 83 indicating that most frequently, EL2 participants could identify fourteen consonants. This result is similar to a study with Grade R learners from the Cape Flats where 48% of learners could identify between one and thirteen letters (Willenberg, 2007). Few EL2 participants could provide both long and short vowels implying the EL2 participants have reduced awareness of English vowel phonemes. Their difficulty may be attributed

to less sophisticated skills to discriminate vowel phonemes due to the reduced number of vowels in African languages such as Setswana (Le Roux et al., 2017). In the Vowel Digraphs section, the EL2 participants provided 26% of the answers correctly whereas the EL1 participants provided 68%. A reduced level of phoneme-grapheme knowledge for vowels impacts the ability of EL2 learners to decode words. The EL2 learners thus need support to develop knowledge and understandings of English vowel phonemes.

The EL2 participants obtained a median of zero for the subtests Consonant Digraphs, Vowel Digraphs and Diphthongs. Many of the EL2 participants thus had difficulty with the phoneme relations for these grapheme combinations. These subtests support that EL2 learners have difficulty drawing on their insufficient phoneme-grapheme knowledge to decode words when adjacent phonemes change sounds in words (Cassady et al., 2008). The EL2 learners are not familiar with the sound changes which occur in the opaque English orthography. The Graphemes sub-section results therefore support that inconsistent many-to-one mappings in English may contribute to the reduced phoneme-grapheme knowledge of EL2 learners (Malda et al., 2014).

The positive correlation between the Graphemes and Blending sub-sections indicates the poor phoneme-grapheme knowledge of the EL2 participants may be a contributing factor to their blending difficulties. The difference in the phonological structure of English and the L1 of the EL2 participants possibly contributes to their poor phoneme-grapheme knowledge and blending difficulties (Malda et al., 2014). A critical need for phoneme-grapheme knowledge development with EL2 learners, particularly vowel phonemes is indicated by the results of the Blending and Graphemes sub-sections.

4.3.2. Decoding

This sub-section was included to investigate whether participants could combine their PA skills and phoneme-grapheme knowledge to decode words. The Decoding sub-section aimed to assess the ability of participants to combine the phonemes of graphemes presented to produce nonsense words (Robertson & Salter, 2007a). The use of nonsense words potentially reduced the impact of vocabulary knowledge impacting the scores of the EL1 and EL2 participants. The subtests included VC words (e.g. [ep]); CVC words (e.g. [cag]), consonant digraphs (e.g. [thip]), consonant blends (e.g. [bund]), vowel digraphs (e.g. [faim]), R-controlled vowels (e.g. [curf]), CVCV words (e.g. [mave]) and diphthongs (e.g. [tound]).

The EL2 participants demonstrated decoding abilities approximately 2 years (27 months) below that of the EL1 participants in the Decoding sub-section. These results show the EL2 participants have difficulty using their limited PA and phoneme-grapheme knowledge to develop literacy and decode nonsense words (Fleisch et al., 2017; Preston & Edwards, 2010), thus substantiating the purpose of this study. The Segmentation sub-section showed a medium, positive correlation to the Decoding sub-section, indicating segmenting skills support decoding skills through developing awareness of syllables and sounds. A strong, positive correlation was found between the Isolation and Deletion sub-sections. The correlation implies that the skill to isolate individual sounds in all positions of words may facilitate the development of decoding skills. The results of the Decoding sub-section contribute to research findings which show learners with poor PA skills are at risk for literacy difficulties (Preston & Edwards, 2010).

A strong, positive correlation is evidenced between the Graphemes and Decoding sub-sections indicating a close relation between phoneme-grapheme knowledge and decoding skills. The EL2 participants had poor phoneme-grapheme knowledge of vowel phonemes, consonant digraphs, vowel digraphs and diphthongs. The impact of phoneme-grapheme knowledge is highlighted when it is acknowledged that the EL2 participants scored a median of zero in the Consonant Digraphs, Consonant Blends, Vowel Digraphs, R-controlled Vowels, CVCV Words and Diphthongs subtests.

In the Decoding subtests the EL2 group were unable to generalise their knowledge and use blending to decode the nonsense syllables and words. It may thus be speculated that the EL2 learners have learnt their phoneme-grapheme correspondences through memorization of ABCs as opposed to understanding the relations between the letters and the sounds (Jarrett et al., 2015). A further concern is that their poor level of PA skills may promote reliance on memorization of phoneme-grapheme representations and little generalization of skills for literacy (Goldstein et al., 2017). Explicit phonics instruction to facilitate phoneme-grapheme coupling has been shown by research to be effective in improving literacy skills of EL2 learners (Le Roux et al., 2017; Lessing & de Witt, 2016).

4.4. Between-group and within-group analysis according to gender

Between-group analysis of gender for the Phonological Awareness and Phoneme-Grapheme Knowledge sections evidenced a moderate level of internal consistency. There was however, no significant difference identified for the *SA Eng DIN* Test between EL1 and EL2 females. Between-group analysis of SES was deemed unreliable due to the small sample size. Within group analysis according to gender further exemplified reliable results with no significant differences being identified between the genders within the groups.

4.5. Teachers' feedback

Teachers being aware of noise and having knowledge about the effects of noise on the learning process is beneficial to EL2 learners as strategies can be employed to reduce background noise. It is important that teachers in classrooms with EL2 learners make efforts to reduce background noise and increase the SNR (Mealings et al., 2015). These efforts can improve the quality of the auditory signal, thereby assisting the perception and comprehension of the already disadvantaged EL2 learners.

In comparison to the teachers of the EL1 learners, more teachers of the EL2 learners did not speak English as their first language. The EL2 learners are thus placed at a further disadvantage as their language model from which they are learning CALP and their ELOLT, is not an EL1 speaker (Jordaan, 2011; Nel & Müller, 2010). The teachers of the EL1 group indicated spending an average of 30 minutes per day on reading and 30 minutes for PA activities, including singing songs or rhymes, playing clapping games and games with sight words. Conversely, the teachers of EL2 learners indicated less time reading with an average of only 20 minutes and explained that PA activities are sometimes only completed once or twice a week. In the *CAPS* syllabus, four hours and thirty minutes are prescribed for reading and phonics development with a maximum of five hours per week (Department of Basic Education, 2011b). This amounts to one hour per day for PA and literacy development on average. The difference in time spent reading and developing skills for literacy acquisition may contribute to the lower level of PA and decoding skills demonstrated by the EL2 group. Inclusion of an intervention programme to support EL2 learners will increase the time spent on PA and literacy tasks to enable sufficient exposure which will also benefit the EL1 learners (Callaghan & Madelaine, 2012; Lessing & de Witt, 2016).

All of the teachers are only aware of remedial lessons as a means of support available to learners who experience language barriers to learning. The teachers of the EL2 learners indicated speaking an average of three languages each in their classrooms daily whereas the teachers of the EL1 learners only use English and Afrikaans. The EL2 teachers did not indicate awareness of code-switching as a strategy to overcome language barriers and support English language development, although they employ the strategy. Without sufficient training on language diversity the efforts of the EL2 teachers to uphold their responsibility and provide multilingual support within the classroom may be ineffective (Department of Education, 2001; Sibomana, 2017). In accordance with prior research (du Plessis & Louw, 2008; Kotze et al., 2017; Sibomana, 2017; Taylor & Fintel, 2016), the findings indicate teachers require training regarding strategies to provide support to learners within their classrooms, particularly relating to language diversity.

4.6. Parents' feedback

The language learning context may enhance the difficulties of EL2 learners to acquire the necessary emergent literacy and language skills for literacy acquisition. It is important for EL2 learners to receive sufficient language stimulation and exposure to literacy in the home environment (Alcock et al., 2017; Hay & Fielding-Barnsley, 2012; Lessing & de Witt, 2016). Frequently research highlights that prior literacy skills developed in the L1 can transfer to support literacy development in the L2 (Chung et al., 2013). As the EL2 learners had not developed prior literacy skills in their L1, no L1 literacy experience can support their L2 literacy acquisition.

The EL2 learners receive less frequent exposure to book reading which reduces opportunities to engage phoneme-grapheme coupling skills and may extenuate a reliance on print as opposed to decontextualised language in word play for literacy (Combrinck et al., 2014; Dale et al., 2015; Goldstein et al., 2017; Willenberg, 2007). Limited literacy and language experience therefore may contribute to the lower phonemic awareness skills of EL2 learners (Cockcroft & Alloway, 2012). Providing a language and literacy home programme with PA, speech perception and decontextualised language tasks may equip parents to develop their own knowledge and support learners (Lessing & de Witt, 2016; Willenberg, 2007).

4.7. Overall performance

This study aimed to determine the level of PA and speech perception in noise skills of EL2 learners. The EL2 participants performed below the level of the EL1 participants in both the *DIN* and *PAT-2* assessments. Significant differences between EL1 and EL2 groups indicate the EL2 participants have insufficient speech perception in noise skills, poor PA and inadequate phoneme-grapheme knowledge. The results thus support prior research showing that at the Grade 1 level, EL2 learners do not have sufficient PA and speech perception in noise skills for literacy development within the EL1 environment (Jordaan, 2011; Kaandorp et al., 2016). Moreover, it is important to understand the implications of these skill levels on the literacy development of EL2 learners.

The EL2 learners are disadvantaged by a curriculum designed and paced at a level for EL1 learners, due to their insufficient skills for literacy and learning. Variances in language proficiency between EL1 and EL2 learners are understood to result in the differences between their level of PA and speech perception in noise skills prior to school attendance (Taylor & Fintel, 2016). Learners who fail to acquire the necessary early literacy skills in childhood are at a greater risk of later literacy failure which contributes to the academic underachievement of South Africa (Lessing & de Witt, 2016). The lower level of PA and speech perception in noise skills suggests the EL2 learners need support to acquire the necessary skills to develop literacy in the EL1 educational context. Providing opportunities for EL2 learners to develop CALP and improve speech perception in noise abilities is important to facilitate the development of PA and phoneme-grapheme knowledge. It is important that this opportunity is extended from the classroom to the home environment as well (Alcock et al., 2017).

4.8. Summary

In order to provide a holistic understanding of the results obtained for this research study, the findings of the data analysis conducted were discussed in accordance with the relevant literature pertaining to the results. The aim of this chapter was to provide discussion in order to bring to light the significance of the interpretations determined from the data analysis.

Although the speech perception in noise skills of the EL2 participants were age appropriate, their skills were less developed than the other learners in their learning

environment. Teachers therefore require training to modify classrooms and reduce noise in order to support EL2 learners. With a lower level of speech perception skills, discriminating phonemes in background noise and developing PA and phoneme-grapheme knowledge is more challenging.

The findings of this study highlighted the difficulty of EL2 learners to develop PA and phoneme-grapheme knowledge sufficiently for the acquisition of literacy simultaneously with the EL1 learners in the EL1 educational context. The results indicated EL2 PA development occurs according to the developmental continuum whereby rhyme awareness leads to the development of syllable awareness, prior to phonemic awareness (Cassady et al., 2008). Researchers propose effective intervention supports the developmental, hierarchical progression of PA with development from large units (rhyming and words) to small units (phonemes) (Callaghan & Madelaine, 2012; Cassady et al., 2008). Regarding the PA support of EL2 learners, in particular their rhyming, and thereafter blending and segmenting skills should be addressed to facilitate optimal literacy acquisition (Ouellette & Haley, 2013).

In light of this discussion, the insufficient PA, limited phoneme-grapheme knowledge and reduced speech perception in noise skills of the EL2 learners are a concern. Support for EL2 learners is necessitated, comprising of phoneme-grapheme knowledge and PA development integrated with opportunities to improve speech-perception in noise and decontextualised language skills (Dale et al., 2015). Development and inclusion of an appropriate intervention programme can support parents to develop PA and literacy skills in English themselves in order to support the EL2 learners.

CHAPTER FIVE: CONCLUSIONS

"We lose the precious sense that an end is only a beginning in disguise."
Craig D. Lounsbrough

Chapter Aim: This chapter presents the conclusions drawn subsequent to the results of this research study. Considerations regarding the clinical effectiveness of the research including the strengths and limitations of the study are provided. Further explanation is given regarding the impacts on reliability as well as the clinical implications and future recommendations.

5.1. Conclusion

In South Africa, the literacy levels of learners are low, particularly for EL2 learners (Fleisch et al., 2017; Howie et al., 2012). PA and speech perception in noise are interrelated skills which are crucial to the literacy acquisition of learners (Chung et al., 2013). It is known that a high level of variability exists between the PA and speech perception in noise skills of EL1 and EL2 learners, despite the expectation to develop literacy skills in the same context (Jordaan, 2011). The pattern of difference between the skills of the EL1 and EL2 learners is understood to develop through variances in language exposure prior to entrance into the formal educational context. Furthermore, the EL1 educational context poses multiple challenges to EL2 learners, including perception of spoken information to develop CALP in classrooms with high levels of background noise (Nel & Müller, 2010; Sörqvist et al., 2014).

The overall PA and speech perception in noise skills of EL2 learners are insufficient to acquire literacy at the same level and equal pace as the EL1 learners. The speech perception in noise skills of EL2 learners are age appropriate. Their speech perception skills however, are not as effective as the EL1 learners, making comprehension and acquisition of the LOLT more difficult. Furthermore, the rhyming skills of EL2 learners which relate to the development of listening skills, auditory memory and phoneme-grapheme knowledge, are diminished. The overall phonemic awareness of EL2 learners, including blending and segmenting skills necessary for literacy acquisition, are also below the expected level to acquire literacy in the EL1 educational context.

The ability to generalise phoneme-grapheme knowledge and integrate phonemic awareness skills for decoding is not shown.

The slower literacy acquisition rate of EL2 learners can further increase their challenges to learning and perpetuate the academic underachievement experienced by learners in South Africa (Bruwer et al., 2014). It is evident that the reduced language proficiency, in particular the CALP of EL2 learners, is detrimental to their literacy development over and above their already challenging learning environment (Nel & Müller, 2010; Nyaga, 2015; Wildschut et al., 2016).

The results thus emphasize the educational significance of the investigation which provides information for the essential support for EL2 literacy development. While it is acknowledged that research in the field of EL2 CALP and literacy acquisition remains somewhat limited, there is presently information to inform the support of EL2 literacy development in the foundation phase. PA skills training, proven effective by research (Le Roux et al., 2017), is important for the EL2 learners who are expected to develop literacy at the pace of the EL1 learners without the required level of skills. Moreover, PA skills training will benefit all learners in a classroom.

Going forward, it is important that a multidisciplinary team-based perspective is used to implement support for EL2 learners. The support for EL2 learners should include undertaking efforts to increase the SNR and reduce the linguistic demand to facilitate improved comprehension of EL2 learners (Mealings et al., 2015; Sörqvist et al., 2014). While working on PA tasks, the task difficulty, linguistic complexity and position within the word should be considered and graded according to the level of understanding of the EL2 learners (Callaghan & Madelaine, 2012; Cassady et al., 2008). Developing the skills and knowledge of parents through home programs may improve their abilities to support and stimulate their own children, particularly the EL2 learners. Programs integrating PA skills training with explicit instruction for phoneme-grapheme coupling (particularly vowel phonemes), is arguably necessary and proven effective by research to improve literacy skills of all learners (Le Roux et al., 2017; Lessing & de Witt, 2016; Malda et al., 2014).

5.2. Critical evaluation

A critical evaluation of the research study is necessary to ensure that interpretation of the findings occurs in accordance with the strengths and limitations which are discussed below:

5.2.1. Study strengths

Describing difficulties of EL2 learners with speech perception in noise and PA skills, advocates for the need to develop intervention to support literacy development of EL2 learners in EL1 educational contexts. This is a strength of this research study as literacy development is a current concern in South Africa (Howie et al., 2017). The participants in the study were matched according to their age, gender, and SES which increases the reliability of the results determined through the comparison.

The use of DIN testing was beneficial to enable understanding of speech perception in noise abilities for the acquisition of phoneme representations and PA skill development for literacy. The study provided evidence to reiterate the difference between the speech perception in noise skills of EL1 and EL2 learners. This finding is a strength as the context of the research evidences that the differences between the speech perception skills of EL1 and EL2 learners exists even following attendance of an EL1 educational context.

5.2.2. Study limitations

The limitations of this research study may impact the clinical implications of the findings and should be noted when interpreting the conclusions. Numerous important skills for literacy development were assessed including speech perception in noise skills, PA skills, and phoneme-grapheme knowledge. The study would however have benefitted from inclusion of other constructs such as working memory and rapid automatised naming. These constructs are alternate predictors of reading achievement (Cockcroft & Alloway, 2012) which could provide further insight regarding the literacy development of the EL2 learners.

The PA and speech perception in noise skills assessments conducted were undertaken in English only. The study would have benefitted from additional assessment of these skills in the L1s of EL2 learners to inform the potential reliability on transference to support literacy acquisition. The L1s of the L2 participants varied across the African language groups and each language also has various dialects

which complicates the testing further. There are also not yet standardised tests available in the African languages thus this testing was not possible. Furthermore, the researcher does not have language proficiency in these languages. Alternatively, interpreters would have required training or alternate speech therapists could be used who do speak the variety of language however this would have introduced further impacting variables.

Although SES was accounted for as all participants were matched according to their SES, an indication of the differences between the overall categories of SES would have been beneficial. This information could be used in order to develop a greater understanding of the influence of SES on speech perception and PA development for literacy. It was not possible to determine the differences between SES due to the size of this study population. The study population size was restricted by the requirement to match participants within the small number of available learners in only two schools. The study population size was not increased by the inclusion of more schools as this would decrease the validity of results through introduction of further uncontrolled variables such as teaching style.

This study is conducted in English and 67% of learners obtain their education in English, however the educational setting is urban and the majority of learners in South Africa obtain their education in a rural setting, thus limiting the ability to generalise the research results to every educational setting. Additionally, the results may not be applicable to all learners and should be interpreted with acknowledgement of the scope of participant characteristics (namely Grade 1, EL2 learners, between six and seven years of age in primarily middle SES home environments with no language or hearing difficulties attending urban schools). The inclusion of more participants from various settings would have resulted in improved potential for generalisation of results.

5.3. Clinical implications

Overall, the speech perception in noise and PA skills difficulties experienced by EL2 learners for literacy acquisition were established and described. The study advocates for the need to develop intervention and support for EL2 learners, learning in EL1 educational contexts. The fact that all skills of the EL2 learners did not reach the expected level of the EL1 learners indicates there is educational significance of the investigation and a need to develop support for EL2 learners. The current study also

provided evidence to reiterate the difference between the speech perception in noise skills of EL1 and EL2 learners, even following attendance of an EL1 educational context.

With acknowledgement of the previously determined difference, this study identified that different aspects of PA (such as rhyme or segmentation), each have a different level of sophistication (such as syllables or phonemes), which is reached by EL2 learners at the start of Grade 1. The need to develop standardised tests with appropriate normative data for the South African population is also highlighted, as without this information it is difficult to objectively determine which EL2 learners are at a greater risk for delayed literacy development.

The measures used in this study provide evidence to teachers of the PA skills which at-risk, EL2 learners may have difficulty with. The difference in learner achievement across graded stimuli was also evidenced highlighting the need to support learners at various developmental levels within the classroom environment. The expectation of teachers to provide support at various levels is unrealistic in light of limited teacher skills, large class sizes, poor parent education levels, and low SES, which create challenging educational contexts. The information of the level of skills of the EL2 learners may thus be used to develop PA intervention programmes, which are proven effective by research, in order to surpass many of these challenges. The findings also highlight that numerous professionals including teachers, speech therapists and audiologists as well as parents are required to support literacy development of EL2 learners in a multidisciplinary team.

5.4. Recommendations for future research

As early intervention is most effective it is recommended that the language and literacy skills of learners are assessed upon entrance to Grade R. Early assessments may identify learners at risk of poor literacy skill development, enabling early provision of support to develop skills for literacy skill acquisition. It is recommended that a normative range is determined for the speech perception in noise abilities of school-aged EL2 learners. Determining a normative result for EL2 speech perception in noise skills may allow identification of learners with poor speech perception skills prior to PA and literacy acquisition. Effective support may thus be provided which may prevent further PA and literacy deficits.

An understanding of the impact of linguistic demand on speech perception in noise would be beneficial to determine the level at which to present new information to EL2 learners. Future research should undertake the assessment of non-word perception in noise as well as graded sentence-in-noise perception over and above DIN testing to provide insight in this regard. Sentence-in-noise testing would potentially be indicative of the speech perception in noise abilities required in the classroom environment.

It is recommended that a standardised test for PA is developed for school-aged South African learners as there is no test available. The difference identified between the PA skills of EL1 and EL2 learners highlights the need to develop separate normative data for EL2 learners, who present with a different level of skills to that of EL1 learners. The development of an objective diagnostic test can provide means of early identification and a direction for supporting learners with PA skill difficulties. A longitudinal study assessing the PA skills of EL1 and EL2 learners between 6 and 10 years old is recommended for future research. Determining the PA skills developed upon entrance to formal literacy instruction may show the effectiveness of formal literacy instruction for EL2 learners within the EL1 context.

Undertaking research to determine effective means for the provision of home intervention programs is also recommended. Empowering parents with materials and knowledge to support learners may enhance learning opportunities in home environments where prior exposure was potentially insufficient for literacy skills development.

5.5. Final comment

Without adequate attention to the differences of skills learners possess for literacy acquisition, the disadvantages EL2 learners face are likely to perpetuate the low literacy achievement and inequalities in education. The South African educational context is challenged with low literacy levels of learners. Supporting literacy skill development of EL2 learners is therefore an imperative goal in education in order to prevent early academic underachievement.

REFERENCES

Alcock, K., Ngorosho, D., & Matthew, J. C.H. (2017). Reading and phonological awareness in Africa. *Journal of Learning Disabilities*, 1–10. https://doi.org/10.1177/0022219417728051

Ambrose, S. E., Fey, M. E., & Eisenberg, L. S. (2012). Phonological awareness and print knowledge of preschool children with cochlear implants. *Journal of Speech Language and Hearing Research*, *55*(3), 811–823. https://doi.org/10.1044/1092-4388(2011/11-0086)

American National Standards Institute/Acoustical Society America (ANSI/ASA) S3.6 - 2010, 2010

American National Standards Institute/Acoustical Society America (ANSI/ASA) S3.39 - 1987 - R2012, 2012

Baddeley, A. (2003). Working memory and language: An overview. *Journal of Communication Disorders*, *36*(3), 189–208. https://doi.org/10.1016/S0021-9924(03)00019-4

Beattie, R. L., & Manis, F. R. (2014). The relationship between prosodic perception, phonological awareness and vocabulary in emergent literacy. *Journal of Research in Reading*, *37*(2), 119–137. https://doi.org/10.1111/j.1467-9817.2011.01507.x

Bekker, I. (2009). *The vowels of South African English.* Unpublished doctoral dissertation, North-West University: Potchefstroom.

Boets, B., Vandermosten, M., Poelmans, H., Luts, H., Wouters, J., & Ghesquiere, P. (2011). Preschool impairments in auditory processing and speech perception uniquely predict future reading problems. *Research in Developmental Disabilities*, *32*(2), 560–570. https://doi.org/10.1016/j.ridd.2010.12.020

Bradlow, A. R., & Alexander, J. A. (2007). Semantic and phonetic enhancements for speech-in-noise recognition by native and non-native listeners. *The Journal of the Acoustical Society of America*, *121*(4), 2339–2349. https://doi.org/10.1121/1.2642103

Bruwer, M., Hartell, C., & Steyn, M. (2014). Inclusive education and insufficient school readiness in Grade 1: Policy versus practice. *South African Journal of Childhood Education*, *4*(2), 18. https://doi.org/10.4102/sajce.v4i2.202

Callaghan, G., & Madelaine, A. (2012). Levelling the playing field for kindergarten entry: Research implications for preschool early literacy instruction. *Australasian Journal of Early Childhood*, *37*(1), 13–23.

Cassady, J. C., Smith, L. L., & Putman, S. M. (2008). Phonological awareness development as a discrete process: Evidence for an integrative model. *Reading Psychology*, *29*(6), 508–533. https://doi.org/10.1080/02702710802271966

Chung, K. K. H., McBride-Chang, C., Cheung, H., & Wong, S. W. L. (2013). General auditory processing, speech perception and phonological awareness skills in Chinese-English biliteracy. *Journal of Research in Reading*, *36*(2), 202–222. https://doi.org/10.1111/j.1467-9817.2011.01500.x

Cockcroft, K., & Alloway, T. (2012). Phonological awareness and working memory: Comparisons between South African and British children. *Southern African Linguistics and Applied Language Studies*, *30*(1), 13–24. https://doi.org/10.2989/16073614.2012.693706

Collier, V., & Thomas, W. (2012). What really works for English language learners: Research-based practices for principals. In G. Theoharis & J. Brooks (Eds.), *What Every Principal Needs to Know to Create Equitable and Excellent Schools.* New York: Teachers College Press.

Combrinck, C., van Staden, S., & Roux, K. (2014). Developing early readers: Patterns in introducing critical reading skills and strategies to South African children. *Reading & Writing*, *5*(1). https://doi.org/10.4102/rw.v5i1.45

Dale, P. S., Tosto, M. G., Hayiou-Thomas, M. E., & Plomin, R. (2015). Why does parental language input style predict child language development? A twin study of gene-environment correlation. *Journal of Communication Disorders*, *57*, 106–117. https://doi.org/10.1016/j.jcomdis.2015.07.004

Delany, A., Jehoma, S., & Lake, L. (Eds.). (2016). *South African Child Gauge 2016*. Cape Town, South Africa: Children's Institute, University of Cape Town.

Department of Basic Education. (2010). *The status of the language of learning and teaching (LOLT) in South African public schools: A quantitative overview*. Pretoria, South Africa: Government Printer: Department of Basic Education.

Department of Basic Education. (2011a). *Curriculum and assessment policy statement English first additional language: Foundation phase*. Pretoria, South Africa: Department of Basic Education.

Department of Basic Education. (2011b). *Curriculum and assessment policy statement English home language: Foundation phase*. Pretoria, South Africa: Department of Basic Education.

Department of Basic Education. (2014). *Report on the Annual National Assessment of 2014, Grades 1 to 6 & 9*. Pretoria, South Africa: Department of Basic Education.

Department of Basic Education. (2015). *The Five Year Strategic Plan 2015/16 to 2019/20*. Pretoria, South Africa: Government Printer: Department of Basic Education.

Department of Education. (1997). *Government gazette no. 18546*: Department of Education, South Africa.

Department of Education. (2001). *Education White Paper 6: Special Needs Education: Building an Inclusive Education and Training System*. Pretoria, South Africa: Department of Education, South Africa.

Du Plessis, S., & Louw, B. (2008). Challenges to preschool teachers in learner's acquisition of English as Language of Learning and Teaching. *South African Journal of Education*, *28*, 53–75.

Fleisch, B., Pather, K., & Motilal, G. (2017). The patterns and prevalence of monosyllabic three-letter-word spelling errors made by South African English First Additional Language learners. *South African Journal of Childhood Education*, *7*(1). https://doi.org/10.4102/sajce.v7i1.481

Gauthier, S. V., & Madison, C. L. (1998). *KLST 2: Kindergarten Language Screening Test: The Examiner's Manual*: Pro-Ed.

Goldberg, H. R., & Lederberg, A. R. (2015). Acquisition of the alphabetic principle in deaf and hard-of-hearing preschoolers: The role of phonology in letter-sound learning. *Reading and Writing*, *28*(4), 509–525. https://doi.org/10.1007/s11145-014-9535-y

Goldstein, H., Olszewski, A., Haring, C., Greenwood, C. R., McCune, L., Carta, J., . . . Kelley, E. S. (2017). Efficacy of a supplemental phonemic awareness curriculum to instruct preschoolers with delays in early literacy development. *Journal of Speech Language and Hearing Research*, *60*(1), 89–103. https://doi.org/10.1044/2016_JSLHR-L-15-0451

Hall, K., & Sambu, W. (2016). Demography of South Africa's Children. In A. Delany, S. Jehoma, & L. Lake (Eds.), *South African Child Gauge 2016* (pp. 106–110). Cape Town, South Africa: Children's Institute, University of Cape Town.

Hay, I., & Fielding-Barnsley, R. (2012). Social learning, language and literacy. *Australasian Journal of Early Childhood*, *37*(1), 24–29.

Health Professionals Council of South Africa. (2008). *General ethical guidelines for health researchers*. Retrieved from http://www.hpcsa.co.za/conduct/ethics

Højen, A., & Flege, J. E. (2006). Early learners' discrimination of second-language vowels. *The Journal of the Acoustical Society of America*, *119*(5), 3072–3084. https://doi.org/10.1121/1.2184289

Howie, S. J., Combrinck, C., Roux, K., Tshele, M., Mokoena, G. M., & McLeod Palane, N. (2017). *PIRLS LITERACY 2016: South African Highlights Report*. Pretoria: Centre for Evaluation and Assessment.

Howie, S. J., van Staden, S., Tshele, M., Dowse, C., & Zimmerman, L. (2012). *PIRLS 2011 Progress in International Reading Literacy Study: South African children's reading literacy achievement*. Pretoria: Centre for Evaluation and Assessment.

Howie, S. J., Venter, E., van Staden, S., Zimmerman, L., Long, C., du Toit, C., . . . Archer, E. (2008). *PIRLS 2006 summary report: South African children's reading literacy achievement*. Pretoria, South Africa: Centre for Evaluation and Assessment.

Jarrett, R. L., Hamilton, M., & Coba-Rodriguez, S. (2015). "So we would all help pitch in:" The family literacy practices of low-income African American mothers of

preschoolers. *Journal of Communication Disorders*, *57*, 81–93. https://doi.org/10.1016/j.jcomdis.2015.07.003

Jordaan, H. (2011). Semantic processing skills of Grade 1 English language learners in two educational contexts. *South African Journal of Education*, *31*, 518–534.

Kaandorp, M. W., de Groot, A. M. B., Festen, J. M., Smits, C., & Goverts, S. T. (2016). The influence of lexical-access ability and vocabulary knowledge on measures of speech recognition in noise. *International Journal of Audiology*, *55*(3), 157–167. https://doi.org/10.3109/14992027.2015.1104735

Kotze, T., van der Westhuizen, M., & Barnard, E. (2017). Teaching strategies to support isiXhosa learners who receive education in a second / third language. *South African Journal of Childhood Education*, *37*(3). https://doi.org/10.15700/saje.v37n3a1374

Krizman, J., Bradlow, A. R. N. N., Lam, S. S., & Kraus, N. (2017). How bilinguals listen in noise: Linguistic and non-linguistic factors. *Bilingualism: Language and Cognition*, *20*(04), 834–843. https://doi.org/10.1017/S1366728916000444

Lagacé, J., Jutras, B., Giguère, C., & Gagné, J. (2011). Speech perception in noise: exploring the effect of linguistic context in children with and without auditory processing disorder. *International Journal of Audiology*, *50*(6), 385–395. https://doi.org/10.3109/14992027.2011.553204

Lagrou, E., Hartsuiker, R. J., & Duyck, W. (2013). The influence of sentence context and accented speech on lexical access in second-language auditory word recognition. *Bilingualism: Language and Cognition*, *16*(03), 508–517. https://doi.org/10.1017/S1366728912000508

Le Roux, M., Geertsema, S., Jordaan, H., & Prinsloo, D. (2017). Phonemic awareness of English second language learners. *The South African Journal of Communication Disorders = Die Suid-Afrikaanse Tydskrif Vir Kommunikasieafwykings*, *64*(1), e1-e9. https://doi.org/10.4102/ sajcd.v64i1.164

Leedy, P. D., & Ormrod, J. E. (2016). *Practical research: Planning and design* (Eleventh edition). Boston: Pearson.

Lessing, A., & de Witt, M. (2016). The influence of a school readiness program on the language and phonological awareness skills of preschool children in rural areas of South Africa. *Australasian Journal of Early Childhood*, *41*(1), 106–114.

Lewis, D., Hoover, B., Choi, S., & Stelmachowicz, P. (2010). Relationship between speech perception in noise and phonological awareness skills for children with normal hearing. *Ear and Hearing*, *31*(6), 761–768. https://doi.org/10.1097/AUD.0b013e3181e5d188

Mahomed-Asmail, F., Swanepoel, D. W., Eikelboom, R. H., Myburgh, H. C., & Hall, J. (2016). Clinical validity of HearScreen™ Smartphone Hearing Screening for School Children. *Ear and Hearing*, *37*(1), e11-7. https://doi.org/10.1097/AUD.0000000000000223

Malda, M., Nel, C., & van de Vijver, F. J. R. (2014). The road to reading for South African learners: The role of orthographic depth. *Learning and Individual Differences*, *30*, 34–45. https://doi.org/10.1016/j.lindif.2013.11.008

Mealings, K., Dillon, H., Buchholz, J. M., & Demuth, K. (2015). An assessment of open plan and enclosed classroom listening environments for young children: Part 1 – Children's questionnaires. *Journal of Educational, Pediatric & (Re)Habilitive Audiology*, *1*, 1–17.

Melby-Lervåg, M., Lyster, S. H., & Hulme, C. (2012). Phonological skills and their role in learning to read: A meta-analytic review. *Psychological Bulletin*, *138*(2), 322–352. https://doi.org/10.1037/a0026744

Methula, N., Visser, M., & Zulu, S. (2016). Digits-in-noise test in children - age norms for English home and first additional language speakers. Unpublished dissertation. University of Pretoria, South Africa.

National Institute for Occupational Safety and Health. June 1998. Criteria for a recommended Standard: Occupational Noise Exposure.

Nel, N., & Müller, H. (2010). The impact of teachers' limited English proficiency on English second language learners in South African schools. *South African Journal of Education*, *30*, 635–650.

Nelson, P., Kohnert, K., Sabur, S., & Shaw, D. (2005). Classroom noise and children learning through a second language. *Language Speech and Hearing Services in Schools*, *36*(3), 219. https://doi.org/10.1044/0161-1461(2005/022)

Neuman, W. L. (2014). *Basics of social research: Qualitative & quantitative approaches / W. Lawrence Neuman* (Third edition, Pearson new international edition). Harlow, Essex: Pearson.

Newcomer, P. L., & Hammill, D. D. (1997). *Test of Language Development - Primary* (3rd ed.). Austin, TX: Pro-Ed, Inc.

Nyaga, S. K. (2015). “They do not know much, but then, you have to cover the syllabus”: The quality imperative – a dilemma for teachers in early grade multilingual classrooms in Kenyan primary schools. *Stellenbosch Papers in Linguistics*, *44*, 175–187. https://doi.org/10.5774/44-0-172

Obralić, A. (2016). Students’ attitudes towards acoustics and its impact on academic achievement. *International Journal of Learning & Development*, *6*(1), 53–60.

Ouellette, G. P., & Haley, A. (2013). One complicated extended family: The influence of alphabetic knowledge and vocabulary on phonemic awareness. *Journal of Research in Reading*, *36*(1), 29–41. https://doi.org/10.1111/j.1467-9817.2010.01486.x

Peeters, M., Verhoeven, L., van Balkom, H., & Moor, J. de. (2008). Foundations of phonological awareness in pre-school children with cerebral palsy: the impact of intellectual disability. *Journal of Intellectual Disability Research: JIDR*, *52*(Pt 1), 68–78. https://doi.org/10.1111/j.1365-2788.2007.00986.x

Potgieter, J., Swanepoel, D., Myburgh, H. C., Hopper, T. C., & Smits, C. (2016). Development and validation of a smartphone-based digits-in-noise hearing test in South African English. *International Journal of Audiology*, *55*(7), 405–411.

Potgieter, J., Swanepoel, D. W., Myburgh, H. C., & Smits, C. (2017). The South African English Smartphone Digits-in-Noise Hearing Test: Effect of age, hearing loss, and speaking competence. *Ear and Hearing.* Advance online publication. https://doi.org/10.1097/AUD.0000000000000522

Pottas, L. (2015). Audiology in an educational setting. In S. Moonsamy & H. Kathard (Eds.), *Speech-language therapy in a school context: Principles and practices* (1st ed., pp. 215–236). Pretoria, South Africa: Van Schaik Publishers.

Preston, J., & Edwards, M. L. (2010). Phonological awareness and types of sound errors in preschoolers with speech sound disorders. *Journal of Speech Language and Hearing Research*, *53*(1), 44. https://doi.org/10.1044/1092-4388(2009/09-0021)

Pretorius, E. J. (2014). Supporting transition or playing catch-up in Grade 4? Implications for standards in education and training. *Perspectives in Education*, *32*(1), 51–76.

Robertson, C., & Salter, W. (2007a). *The phonological awareness test 2: The examiner's manual*. East Moline, IL: LinguiSystems.

Robertson, C., & Salter, W. (2007b). *The phonological awareness test 2: The statistics manual*. East Moline, IL: LinguiSystems.

Saville-Troike, M., & Barto, K. (2017). *Introducing second language acquisition* (Third edition). *Cambridge introductions to language and linguistics*. Cambridge: Cambridge University Press.

Sibomana, E. (2017). A reflection on linguistic knowledge for teachers of English in multilingual contexts. *Southern African Linguistics and Applied Language Studies*, *35*(1), 93–104. https://doi.org/10.2989/16073614.2017.1302351

Smits, C., Theo Goverts, S., & Festen, J. M. (2013). The digits-in-noise test: Assessing auditory speech recognition abilities in noise. *The Journal of the Acoustical Society of America*, *133*(3), 1693–1706. https://doi.org/10.1121/1.4789933

Sörqvist, P., Hurtig, A., Ljung, R., & Rönnberg, J. (2014). High second-language proficiency protects against the effects of reverberation on listening comprehension. *Scandinavian Journal of Psychology*, *55*(2), 91–96. https://doi.org/10.1111/sjop.12115

Spaull, N. (2015). Examining oral reading fluency among rural Grade 5 English Second Language (ESL) learners in South Africa: An analysis of NEEDU 2013. *South African Journal of Childhood Education*, *5*(2), 44–77.

Stach, B. A. (2016). *Clinical audiology: An introduction* (Second edition). San Diego CA: Plural Publishing Inc.

Stevenson, A. (E.). (2010). *Oxford dictionary of English* (3rd ed. / edited by Angus Stevenson). Oxford: Oxford University Press.

Swanepoel, D. W., Myburgh, H. C., Howe, D. M., Mahomed, F., & Eikelboom, R. H. (2014). Smartphone hearing screening with integrated quality control and data management. *International Journal of Audiology*, *53*(12), 841–849. https://doi.org/10.3109/14992027.2014.920965

Taylor, S., & von Fintel, M. (2016). Estimating the impact of language of instruction in South African primary schools: A fixed effects approach. *Economics of Education Review*, *50*, 75–89. https://doi.org/10.1016/j.econedurev.2016.01.003

Van den Bos, G. R. (Ed). (2010). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC: American Psychological Association.

Van Staden, S., Bosker, R., & Bergbauer, A. (2011). Differences in achievement between home language and language of learning in South Africa: Evidence from prePIRLS 2011. *South African Journal of Childhood Education*, *6*(1). https://doi.org/10.4102/sajce.v6i1.441

Verhoeven, L. (2009). Components in early second language reading and spelling. *Scientific Studies of Reading*, *4*(4), 313–330. https://doi.org/10.1207/S1532799XSSR0404_4

Webb, M. L., & Lederberg, A. R. (2014). Measuring phonological awareness in deaf and hard-of-hearing children. *Journal of Speech Language and Hearing Research*, *57*(1), 131. https://doi.org/10.1044/1092-4388(2013/12-0106)

Webb, V., Lafon, M., & Pare, P. (2010). Bantu languages in education in South Africa: An overview. Ongekho akekho! – the absentee owner. *Language Learning Journal*, *38*(3), 273–292. https://doi.org/10.1080/09571730903208389

Wiig, E., Secord, W., & Semel, E. (1992). *Clinical Evaluation of Language Fundamentals - Preschool*. San Antonio, TX: The Psychological Corporation.

Wildschut, Z., Moodley, T., & Aronstam, S. (2016). The baseline assessment of Grade 1 learners' literacy skills in a socio-economically disadvantaged school setting. *South African Journal of Childhood Education*, *6*(1), 9. https://doi.org/10.4102/sajce.v6i1.340

Willenberg, I. (2007). Foundations for literacy: Emergent literacy competencies of Grade R learners on the Cape Flats. *The South African Journal of Communication Disorders = Die Suid-Afrikaanse Tydskrif Vir Kommunikasieafwykings*, *54*, 20–28.

Zimmerman, I. L., Steiner, V. G., & Pond, R. E. (1992). *Pre-school Language Scale* (3rd ed.). San Antonio, TX: The Psychological Corporation.

APPENDICES

APPENDIX A

HUMANITIES RESEARCH ETHICS COMMITTEE ETHICAL CLEARANCE

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Research Ethics Committee

31 March 2017

Dear Ms Eslick

Project:	**Phonological awareness and speech perception in noise: Comparison between English first and second language learners in Grade 1**
Researcher:	**C Eslick**
Supervisor:	**Ms M Le Roux**
Department:	**Speech –Language Pathology and Audiology**
Reference number:	**13092562(GW20170309HS)**

Thank you for the application that was submitted for ethical clearance.

I am pleased to inform you that the above application was **approved** by **Research Ethics Committee** on 30 March 2017. Data collection may therefore commence.

Please note that this approval is based on the assumption that the research will be carried out along the lines laid out in the proposal. Should your actual research depart significantly from the proposed research, it will be necessary to apply for a new research approval and ethical clearance.

We wish you success with the project.

Sincerely

Prof Maxi Schoeman
Deputy Dean: Postgraduate and Research Ethics
Faculty of Humanities
UNIVERSITY OF PRETORIA
e-mail: tracey.andrew@up.ac.za

CC: Supervisor (s): Ms E Krüger and Dr L Pottas
HoD: Prof B Vinck

APPENDIX B

SCHOOL INFORMED CONSENT LETTERS

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Denkleiers • Leading Minds • Dikgopolo tša Dihlalefi

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

Researcher:
Casey Eslick - 13092562

Date _____

School 1

Dear Sir/Madam

This letter is to request your permission to allow myself, a Master's student in Speech-Language Pathology, from the Department of Speech-Language Pathology and Audiology, at the University of Pretoria, to include participants from this school in the following research study. The study will be conducted during the first quarter (January – March) in 2017. The University of Pretoria gives permission for this study to be conducted. Relevant evidence thereof is available should it be required.

Title of the study
Phonological awareness and speech perception in noise: Comparison between English first and second language learners in Grade 1.

Purpose of the study
In fulfilment of the requirements to obtain a Master's degree, I am expected to complete a research study. The main aim of this study is to describe the skills of early Grade 1 English second language (L2) learners in the areas of phonological awareness and speech perception in noise. As the assessment tools to be used are not standardized according to the South African population, scores of English first language (L1) learners will be used for comparisons. Assessment of Grade 1 learners early in the year allows opportunity to describe the level of phonological awareness skills of the learners before formal literacy acquisition has occurred. The results obtained may provide further insight into the learners' abilities which may lead to recommendations in this regard that may improve subsequent literacy skills. This research study may also serve as a basis for future research.

Procedures
In the case of your consent, the following procedures will occur:

- The Grade 1 teachers and parents of the learners will receive letters for informed consent.
- The Grade 1 teachers will be asked to complete a short questionnaire indicating daily activities occurring within the classroom.
- Approximately 20 English first language (L1) learners with no hearing loss and/or language delay will be selected.
- Parents will be contacted and will receive a questionnaire asking demographic questions such as the languages spoken in the home.

Communication Pathology Building
Dept. of Speech-Language Pathology and Audiology
Corner of Lynnwood Road and Roper Street, Hatfield
Private Bag X20, Hatfield, 0028
University of Pretoria
PRETORIA
Republic of South Africa

Tel: 012 420 2381
Fax: 012 420 3517

Mia.LeRoux@up.ac.za
www.up.ac.za

- Each learner will provide their own assent by indicating their choice of a "happy" or "sad" face following explanation of the significance as well as writing their name.
- Learners will be taken out of class once for approximately one hour in which all the tests will be conducted.
- Formal testing will include the following four resources:
  - The *HearscreenZA* screening test will be used to determine that participants have normal hearing abilities.
  - The *Digits in Noise* hearing test will be used to determine the participant's abilities to detect words in background noise.
  - The *Kindergarten Language Screening Test (KLST)* will be used to determine that participants have appropriate language abilities; and
  - Subsections of the *Phonological Awareness Test-2 (PAT-2)* will be used to determine the participants' phonological abilities.

Risk and discomfort
There is no risk or discomfort involved for the participants of this study. The amount of time required of each participant will be kept to a minimum.

Implications for the schools
A total of 20 Grade 1 learners will be selected from your school to participate. The assessment process should take no longer than five days at your school, with no longer than an hour per learner. The amount of time required with each participant will be kept to a minimum and all assessments will be conducted in accordance with your school's/ teachers' preference.

Benefits
The results of all tests will be made available to the parents should they request is. The general population of learners stand to benefit from recommendations and information determined from this research study.

The participant's rights
All participation is voluntary, thus participants are free to withdraw at any time without any penalties or consequences. Participants will be free to indicate their willingness to participate by using pictures of a "happy" and "sad". All information will remain confidential. The school, participants and educators will be informed of the results of the study, should they require that. According to the University of Pretoria's policy, all information collected will be stored for a period of 15 years.

Confidentiality
- Information which may identify your school, educators, parents and learners will remain confidential. Personal information will not be disclosed.
- Your school, teachers, as well as parents of the learners are welcome to contact the researcher and/or research supervisors should any concerns arise. The researcher may be contacted on the following number for further information:
  Casey Eslick 082 444 3525

Please provide an official letter containing your school's letterhead and stamp, stating that permission and consent is given to conduct the above mentioned research study at your school.

Thank you in advance.

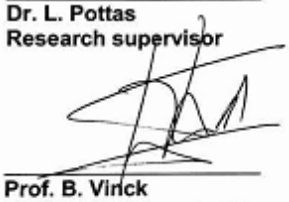
Kind regards

Casey Eslick
Research student

Ms. M. le Roux
Research supervisor

Ms. S. Geertsema
Research supervisor

Dr. L. Pottas
Research supervisor



Prof. B. Vinck
HEAD: Department of Speech-Language Pathology and Audiology

Letter of consent:

The school management team of School 1 gives their consent for selected learners and teachers of this school to participate in the study titled; *Phonological awareness and speech perception in noise: Comparison between English first and second language learners in Grade 1*.

We understand what is expected from the school, learners and teachers, and will encourage all involved with the research study to comply with the requirements.

Signed at _____ on the _____day of _____ 201_.

_____

REMEDIAL THERAPIST

_____

HOD: FOUNDATION PHASE

_____

PRINCIPAL

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Denkleiers • Leading Minds • Dikgopolo tša Dihlalefi

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

Researcher:
Casey Eslick - 13092562

Date _____

School 2

Dear Sir/Madam

This letter is to request your permission to allow myself, a Master's student in Speech-Language Pathology, from the Department of Speech-Language Pathology and Audiology, at the University of Pretoria, to include participants from this school in the following research study. The study will be conducted during the first quarter (January – March) in 2017. The University of Pretoria gives permission for this study to be conducted. Relevant evidence thereof is available should it be required.

Title of the study
Phonological awareness and speech perception in noise: Comparison between English first and second language learners in Grade 1.

Purpose of the study
In fulfilment of the requirements to obtain a Master's degree, I am expected to complete a research study. The main aim of this study is to describe the skills of early Grade 1 English second language (L2) learners in the areas of phonological awareness and speech perception in noise. Assessment of Grade 1 learners early in the year allows opportunity to describe the level of phonological awareness skills of the learners before formal literacy acquisition has occurred. The results obtained may provide further insight into the learners' abilities which may lead to recommendations in this regard that may improve subsequent literacy skills. This research study may also serve as a basis for future research.

Procedures
In the case of your consent, the following procedures will occur:

- The Grade 1 teachers and parents of the learners will receive letters for informed consent.
- The Grade 1 teachers will be asked to complete a short questionnaire indicating daily activities occurring within the classroom.
- Approximately 20 English second language (L2) learners with no hearing loss and/or language delay will be selected.
- Parents will be contacted and will receive a questionnaire asking demographic questions such as the languages spoken in the home.

Communication Pathology Building
Dept. of Speech-Language Pathology and Audiology
Corner of Lynnwood Road and Roper Street, Hatfield
Private Bag X20, Hatfield, 0028
University of Pretoria
PRETORIA
Republic of South Africa

Tel: 012 420 2381
Fax: 012 420 3517

Mia.LeRoux@up.ac.za
www.up.ac.za

- Learners will provide their own assent by indicating their choice of a "happy" or "sad" face following explanation of the significance as well as writing their name.
- Each learner will be taken out of class once for approximately one hour in which all the tests will be conducted.
- Formal testing will include the following four resources:
  - The *HearscreenZA* screening test will be used to determine that participants have normal hearing abilities.
  - The *Digits in Noise* hearing test will be used to determine the participant's abilities to detect words in background noise.
  - The *Kindergarten Language Screening Test (KLST)* will be used to determine that participants have appropriate language abilities; and
  - Subsections of the *Phonological Awareness Test -2 (PAT-2)* will be used to determine the participants' phonological abilities.

Risk and discomfort
There is no risk or discomfort involved for the participants of this study. The amount of time required of each participant will be kept to a minimum.

Implications for the schools
A total of 20 Grade 1 learners will be selected from your school to participate. The assessment process should take no longer than five days at your school, with no longer than an hour per learner. The amount of time required with each participant will be kept to a minimum and all assessments will be conducted in accordance with your school's/ teachers' preference.

Benefits
The results of all tests will be made available to the parents should they request this. The general population of learners stand to benefit from recommendations and information determined from this research study.

The participant's rights
All participation is voluntary, thus participants are free to withdraw at any time without any penalties or consequences. Participants will be free to indicate their willingness to participate by using pictures of a "happy" and "sad". All information will remain confidential. The school, participants and educators will be informed of the results of the study, should they require that. According to the University of Pretoria's policy, all information collected will be stored for a period of 15 years.

Confidentiality
- Information which may identify your school, educators, parents and learners will remain confidential. Personal information will not be disclosed.
- Your school, teachers, as well as parents of the learners are welcome to contact the researcher and/or research supervisors should any concerns arise. The researcher may be contacted on the following number for further information:
  Casey Eslick 082 444 3525

Please provide an official letter containing your school's letterhead and stamp, stating that permission and consent is given to conduct the above mentioned research study at your school.

Thank you in advance.

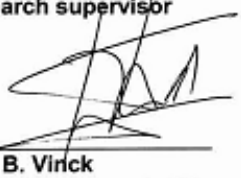
Kind regards

Casey Eslick
Research student

Ms. M. le Roux
Research supervisor

Ms. S. Geertsema
Research supervisor

Dr. L. Pottas
Research supervisor



Prof. B. Vinck
HEAD: Department of Speech-Language Pathology and Audiology

Letter of consent:

The school management team of School 2 gives their consent for selected learners and teachers of this school to participate in the study titled; *Phonological awareness and speech perception in noise: Comparison between English first and second language learners in Grade 1.*

We understand what is expected from the school, learners and teachers, and will encourage all involved with the research study to comply with the requirements.

Signed at _____ on the _____day of _____ 201_.

_____

HOD: FOUNDATION PHASE

_____

DEPUTY PRINCIPAL

_____

PRINCIPAL

APPENDIX C

TEACHER INFORMED CONSENT LETTERS

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Denkleiers • Leading Minds • Dikgopolo tša Dihlalefi

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

Researcher:
Casey Eslick - 13092562

Date _____

School 1

Dear Sir/ Madam

TEACHER INFORMATION LETTER

This letter serves to invite you to participate in the following research study during the first quarter (January – March) in 2017. This research study will be conducted by myself, a Master's student in Speech-Language Pathology, from the Department of Speech-language Pathology and Audiology, at the University of Pretoria. Before you agree, you should understand what is involved in participating in this study. Should you have any questions, please feel free to contact me.

Title of the research study: Phonological awareness and speech perception in noise: Comparison between English first and second language learners in Grade 1.

Purpose of the Research Study
In fulfilment of the requirements to obtain a Master's degree, I am expected to complete a research study. The main aim of this study is to describe the skills of early Grade 1 English second language (L2) learners in the areas of phonological awareness and speech perception in noise. As the assessment tools to be used are not standardized according to the South African population, scores of English first language (L1) learners will be used for comparisons. Assessment of Grade 1 learners early in the year allows opportunity to describe the level of phonological awareness skills of the learners before formal literacy acquisition has occurred. The results obtained may provide further insight into the learners' abilities which may lead to recommendations in this regard that may improve subsequent literacy skills. This research study may also serve as a basis for future research.

Duration of the Research Study
The study will be conducted during the first quarter (January – March) in 2017. Should you decide to participate, you will be requested to complete a questionnaire indicating the types of daily activities performed within the classroom. For example, information regarding rhyming, singing and reading activities will be asked. The questionnaire should take no longer than 30 minutes to complete. I will visit selected participants from your class at school and the study should take no more than an hour with each child.

Communication Pathology Building
Dept. of Speech-Language Pathology and Audiology
Corner of Lynnwood Road and Roper Street, Hatfield
Private Bag X20, Hatfield, 0028
University of Pretoria
PRETORIA
Republic of South Africa

Tel: 012 420 2381
Fax: 012 420 3517

Mia. LeRoux@up.ac.za
www.up.ac.za

Procedures
In the case of your consent, the following procedures will occur:

- All consenting Grade 1 teachers will be provided with a short questionnaire to obtaining information on which daily activities are performed focusing on phonological awareness and early literacy skills development.
- The results obtained will be used for a postgraduate research study.

Risk and discomfort
There is no risk or discomfort involved for all participants of this study. The amount of time required of each participant will be kept to a minimum.

Implications for the schools
You will be asked to complete a questionnaire which should take no longer than 30 minutes. Learners selected to participate in the study may be from your classroom. The assessment process should take no longer than five days at your school, with no longer than an hour per learner. The amount of time required with each participant will be kept to a minimum and all assessments will be conducted in accordance with your school's/ teachers' preference.

Benefits
The results of all tests will be made available to the parents should they request this, which may reinforce recommendations made by yourself, regarding hearing and language concerns. The general population of teachers' and learners stand to benefit from recommendations and information determined from this research study.

The participant's rights
Your participation is voluntary, thus you are free to withdraw, without reason, at any time without any penalties or consequences. All information will be treated as confidential. No names and/or other identifying information will be revealed. The school, participants and educators will be informed of the results of the study, should they require that. According to the University of Pretoria's policy, all information collected will be stored for a period of 15 years.

Confidentiality

- Information which may identify the school, teachers, parents and learners will remain confidential. Personal information as well as information regarding activities within the school will not be disclosed, thus you will not experience consequences for any information shared in the questionnaire.

- Yourself, your school, as well as caregivers of the learners are welcome to contact myself and/or research supervisors should any concerns arise. The researcher may be contacted on the following number for further information:
  Casey Eslick 082 444 3525

Thank you in advance.

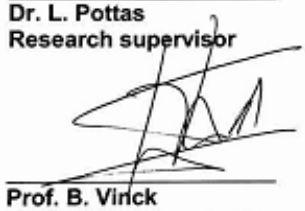
Kind regards

Casey Eslick
Research student

Ms. M. le Roux
Research supervisor

Ms. S. Geertsema
Research supervisor

Dr. L. Pottas
Research supervisor



Prof. B. Vinck
HEAD: Department of Speech-Language Pathology and Audiology

Letter of consent:

Hereby I, as a Grade 1 teacher at School 1, give my consent for myself as well as selected learners and parents of my class to participate in the study titled;
Phonological awareness and speech perception in noise: Comparison between English first and second language learners in Grade 1.
I understand what is expected from myself as well as the learners and parents of my class, and will encourage all involved with the research study to comply with the requirements.

Signed at _____ on the _____day of _____ 201_.

_____
INITIALS & SURNAME
GRADE 1 CLASS TEACHER

Please provide a contact number if indicated you are willing to participate:
_____

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Denkleiers • Leading Minds • Dikgopolo tša Dihlalefi

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

Researcher:
Casey Eslick - 13092562

Date _____

School 2

Dear Sir/ Madam

TEACHER INFORMATION LETTER

This letter serves to invite you to participate in the following research study during the first quarter (January – March) in 2017. This research study will be conducted by myself, a Master's student in Speech-Language Pathology, from the Department of Speech-Language Pathology, at the University of Pretoria. Before you agree, you should understand what is involved in participating in this study. Should you have any questions, please feel free to contact me.

Title of the research study: Phonological awareness and speech perception in noise: Comparison between English first and second language learners in Grade 1.

Purpose of the Research Study
In fulfilment of the requirements to obtain a Master's degree, I am expected to complete a research study. The main aim of this study is to describe the skills of Grade 1 English second language (L2) learners in the areas of phonological awareness and speech perception in noise. Assessment of Grade 1 learners early in the year allows opportunity to describe the level of phonological awareness skills of the learners before formal literacy acquisition has occurred. The results obtained may provide further insight into the learners' abilities which may lead to recommendations in this regard that may improve subsequent literacy skills. This research study may also serve as a basis for future research.

Duration of the Research Study
The study will be conducted during the first quarter (January – March) in 2017. Should you decide to participate, you will be requested to complete a questionnaire indicating the types of daily activities performed within the classroom. For example, information regarding rhyming, singing and reading activities will be asked. The questionnaire should take no longer than 30 minutes to complete. I will visit selected participants from your class at school and the study should take no more than an hour with each child.

Procedures
In the case of your consent, the following procedures will occur:

Communication Pathology Building
Dept. of Speech-Language Pathology and Audiology
Corner of Lynnwood Road and Roper Street, Hatfield
Private Bag X20, Hatfield, 0028
University of Pretoria
PRETORIA
Republic of South Africa

Tel: 012 420 2381
Fax: 012 420 3517

Mia.LeRoux@up.ac.za
www.up.ac.za

- All consenting Grade 1 teachers will be provided with a short questionnaire to obtaining information on which daily activities are performed focusing on phonological awareness and early literacy skills development.
- The results obtained will be used for a postgraduate research study.

Risk and discomfort
There is no risk or discomfort involved for all participants of this study. The amount of time required of each participant will be kept to a minimum.

Implications for the schools
You will be asked to complete a questionnaire which should take no longer than 30 minutes. Learners selected to participate in the study may be from your classroom. The assessment process should take no longer than five days at your school, with no longer than an hour per learner. The amount of time required with each participant will be kept to a minimum and all assessments will be conducted in accordance with your school's/ teachers' preference.

Benefits
The results of all tests will be made available to the parents should they request this, which may reinforce recommendations made by yourself, regarding hearing and language concerns. The general population of teachers' and learners stand to benefit from recommendations and information determined from this research study.

The participant's rights
Your participation is voluntary, thus you are free to withdraw, without reason, at any time without any penalties or consequences. All information will be treated as confidential. No names and/or other identifying information will be revealed. The school, participants and educators will be informed of the results of the study, should they require that. According to the University of Pretoria's policy, all information collected will be stored for a period of 15 years.

Confidentiality
- Information which may identify the school, educators, parents and learners will remain confidential. Personal information as well as information regarding activities within the school will not be disclosed, thus you will not experience consequences for any information shared in the questionnaire.

- Yourself, your school, as well as caregivers of the learners are welcome to contact myself and/or research supervisors should any concerns arise. The researcher may be contacted on the following number for further information:
  Casey Eslick 082 444 3525

Thank you in advance.

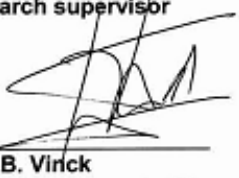
Kind regards

Casey Eslick
Research student

Ms. M. le Roux
Research supervisor

Ms. S. Geertsema
Research supervisor

Dr. L. Pottas
Research supervisor



Prof. B. Vinck
HEAD: Department of Speech-Language Pathology and Audiology

Letter of consent:

Hereby I, as a Grade 1 teacher at School 2, give my consent for myself as well as selected learners and parents of my class to participate in the study titled;
Phonological awareness and speech perception in noise: Comparison between English first and second language learners in Grade 1.
I understand what is expected from myself as well as the learners and parents of my class, and will encourage all involved with the research study to comply with the requirements.

Signed at _____ on the _____day of _____ 201_.

_____
INITIALS & SURNAME
GRADE 1 CLASS TEACHER

Please provide a contact number if indicated you are willing to participate:
_____

APPENDIX D

PARENT INFORMED CONSENT LETTERS

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Denkleiers • Leading Minds • Dikgopolo tša Dihlalefi

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

Researcher:
Casey Eslick - 13092562

Date _____

Dear Parent/ Guardian

PARENT/ GUARDIAN INFORMATION LETTER

This letter serves to invite you to volunteer yourself and your child to participate in a research study. This research study will be conducted by myself, a Master's student, from the Department of Speech- Language Pathology and Audiology, at the University of Pretoria. Before you agree, you should understand what is involved for participation in the study. Should you have any questions, please feel free to contact me.

Title of the research study: Phonological awareness and speech perception in noise: Comparison between English first and second language learners in Grade 1.

Purpose of this Research Study
Research has shown that phonological awareness skills are important for children to learn to read and write. Phonological awareness involves knowledge of the sound structure of a language and can be used to predict progress in a child's abilities to read and spell. I would like to investigate the phonological abilities of English second language learners to determine if they are at a disadvantage. In order to do this, their results need to be compared to that of English first language learners. By conducting this research, results may be used to provide educators with insight into the needs of English second language learners during the acquisition of pre-literacy skills.

Duration of the Research Study
Should you decide that your child may participate, he/she will be one of approximately 40 participants. The study will occur during the first quarter in 2017. I will visit your child at his/her school and the study should take no more than an hour.

Procedures
Parents/ Guardians will be asked to complete a questionnaire of demographic questions regarding your socioeconomic status and your child's exposure to and use of English within the home environment.

- I will interact with your child in school and conduct formal testing which will include the following four resources:
  - The *HearscreenZA* screening test will be used to determine your child's

Communication Pathology Building
Dept. of Speech-Language Pathology and Audiology
Corner of Lynnwood Road and Roper Street, Hatfield
Private Bag X20, Hatfield, 0028
University of Pretoria
PRETORIA
Republic of South Africa

Tel: 012 420 2381
Fax: 012 420 3517

Mia. LeRoux@up.ac.za
www.up.ac.za

hearing abilities.
- The *Digits in Noise* hearing test will be used to determine your child's abilities to detect words in background noise.
- The *Kindergarten Language Screening Test (KLST)* will be used to determine your child's language abilities; and
- Subsections of the *Phonological Awareness Test -2 (PAT-2)* will be used to determine your child's phonological abilities.

- The results obtained will be used for a postgraduate research study.

Does this research study involve risk or discomfort?
No. There is no risk or discomfort involved for the participants of this study. The amount of your child's time required will be kept to a minimum.

Has this study received ethical approval?
Yes. The protocol for this research study has been submitted to the Research Committee of the Department of Speech-Language Pathology and Audiology, at the University of Pretoria, from whom ethical approval was received.

The participant's rights
All participation is voluntary, thus you and your child are free to withdraw at any time or you may withdraw your child whenever you want without giving a reason. Your child's education will not be affected in any way. Your child will be free to indicate his/her willingness to participate by using pictures of a "happy" and "sad" face. When he/she no longer wants to participate, he/she can point to the "sad" face and the session will be terminated. All information obtained will remain confidential. No names and/or other identifying information will be revealed. The information collected during this study will only be accessible to the researcher and the involved research supervisors. According to the University of Pretoria's policy, all information collected will be stored for a period of 15 years.

Benefits
The general population of second language learners stand to benefit from information obtained through this research study. I will be able to provide you with feedback regarding your child's hearing, phonological awareness and language abilities upon your request.

Confidentiality
Information which may identify the school, educators, and your child will remain confidential. Personal or identifying information will not be disclosed.

The research results will be published as a research report and will be accessible in the Library at the University of Pretoria. Parents/ Guardians are welcome to contact myself (the researcher) and/or research supervisors should you have any questions or concerns. I may be contacted on the following number or email address for further information:

Casey Eslick 082 444 3525 cjeslick@gmail.com

If you are willing to participate and to allow your child to participate, please sign and return the attached consent form.

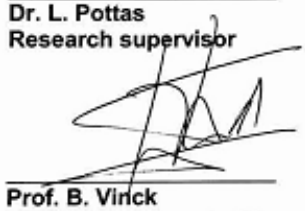
Kind regards

Casey Eslick
Research student

Ms. M. le Roux
Research supervisor

Ms. S. Geertsema
Research supervisor

Dr. L. Pottas
Research supervisor



Prof. B. Vinck
HEAD: Department of Speech-Language Pathology and Audiology

INFORMED CONSENT FOR PARENTS / GUARDIANS (on behalf of minors U18 years)

"I hereby confirm that I have been informed by the researcher, Ms Casey Eslick about the nature, conduct, benefits and risks of the research study titled: "Phonological awareness and speech perception in noise: Comparison between English first and second language learners in Grade 1."

I have also received, read and understood the above written information (Parent/ Guardian Information Letter and Informed Consent) regarding the research study. I am aware that the results of the study, including my child's personal details regarding date of birth, initials and diagnosis will be anonymously processed into a research report.

I may, at any stage, without prejudice, withdraw my consent for myself and/or my child's participation in this research study. I have had sufficient opportunity to ask questions and (of my own free will) declare myself and my child prepared to participate in this research study.

Please indicate whether you give permission that the data obtained may be used for future research.

Herewith I give consent that the data obtained in this current study may be used for future research as well:

Yes ☐ No ☐

(Please tick the relevant block) School 1

Parent/ Guardian(s) Participant's Name _____
(Please print)

Parent/ Guardian(s) Signature _____ Date _____

Parent/ Guardian(s) Contact Number _____

Learner Participant's Name _____
(Please print)

Researcher's Name Casey Eslick

Researcher's Signature  Date _____

Witness's Name _____ Witness's Signature _____ Date _____
(Please print)

4

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Denkleiers • Leading Minds • Dikgopolo tša Dihlalefi

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

Researcher:
Casey Eslick - 13092562

Date _____

Dear Parent/ Guardian

PARENT/ GUARDIAN INFORMATION LETTER

This letter serves to invite you to volunteer yourself and your child to participate in a research study. This research study will be conducted by myself, a Master's student, from the Department of Speech-Language Pathology and Audiology, at the University of Pretoria. Before you agree, you should understand what is involved for participation in the study. Should you have any questions, please feel free to contact me.

Title of the research study: Phonological awareness and speech perception in noise: Comparison between English first and second language learners in Grade 1.

Purpose of the Research Study

Research has shown that phonological awareness skills are important for children to learn to read and write. Phonological awareness involves knowledge of the sound structure of a language and can be used to predict progress in a child's abilities to read and spell. I would like to investigate the phonological abilities of English second language learners to determine if they are at a disadvantage. By conducting this research, educators may be provided with insight into the needs of English second-language learners during the acquisition of pre-literacy skills.

Duration of the Research Study

Should you decide for your child to participate, he/she will be one of approximately 40 participants. The study will occur during the first quarter in 2017. I will visit your child at his/her school and the study should take no more than an hour.

Procedures

Parents/ guardians will be asked to complete a questionnaire of demographic questions regarding your socioeconomic status and your child's home languages, as well as their exposure to, and use of English within the home environment.

- I will interact with your child in school and conduct formal testing which will include the following four resources:
  - The *HearscreenZA* screening test will be used to determine your child's hearing abilities
  - The *Digits in Noise* hearing test will be used to determine your child's abilities to detect words in background noise.

Communication Pathology Building
Dept. of Speech-Language Pathology and Audiology
Corner of Lynnwood Road and Roper Street, Hatfield
Private Bag X20, Hatfield, 0028
University of Pretoria
PRETORIA
Republic of South Africa

Tel: 012 420 2381
Fax: 012 420 3517

Mia.LeRoux@up.ac.za
www.up.ac.za

- The *Kindergarten Language Screening Test (KLST)* will be used to determine your child's language abilities; and
- Subsections of the *Phonological Awareness Test-2 (PAT-2)* will be used to determine your child's phonological abilities.

- The results obtained will be used for a postgraduate research study.

Does this research study involve risk or discomfort?
No. There is no risk or discomfort involved for the participants of this study. The amount of your child's time required will be kept to a minimum.

Has this study received ethical approval?
Yes. The protocol for this research study has been submitted to the Research Committee of the Department of Speech-Language Pathology and Audiology, at the University of Pretoria, from whom ethical approval was received.

The participant's rights
All participation is voluntary, thus you and your child are free to withdraw at any time or you may withdraw your child whenever you want without giving a reason. Your child will be free to indicate his/her willingness to participate by using pictures of a "happy" and "sad" face. When he/she no longer wants to participate, he/she can point to the "sad" face and the session will be terminated. All information obtained will remain confidential. No names and/or other identifying information will be revealed. The data collected during this study will only be accessible to the researcher and the involved research supervisors. According to the University of Pretoria's policy, all information collected will be stored for a period of 15 years.

Benefits
The general population of second language learners stand to benefit from information obtained through this research study. I will be able to provide you with feedback regarding your child's hearing, phonological awareness and language abilities upon your request.

Confidentiality
Information which may identify the school, educators, and your child will remain confidential. Personal or identifying information will not be disclosed.

The research results will be published as a research report and will be accessible in the Library at the University of Pretoria. Parents/ Guardians are welcome to contact myself (the researcher) and/or research supervisors should you have any questions or concerns. I may be contacted on the following number or email address for further information:

Casey Eslick 082 444 3525 cjeslick@gmail.com

If you are willing to participate and allow your child to participate, please sign and return the attached consent form.

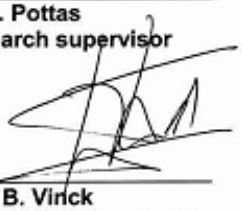
Kind regards

Casey Eslick
Research student

Ms. M. le Roux
Research supervisor

Ms. S. Geertsema
Research supervisor

Dr. L. Pottas
Research supervisor



Prof. B. Vinck
HEAD: Department of Speech-Language Pathology and Audiology

INFORMED CONSENT FOR PARENTS / GUARDIANS (on behalf of minors U18 years)

I hereby confirm that I have been informed by the researcher, Ms Casey Eslick about the nature, conduct, benefits and risks of the research study titled: "Phonological awareness and speech perception in noise: Comparison between English first and second language learners in Grade 1."

"I have also received, read and understood the above written information (Parent/ Guardian Information Letter and Informed Consent) regarding the research study. I am aware that the results of the study, including my child's personal details regarding date of birth, initials and diagnosis will be anonymously processed into a research report.

I may, at any stage, without prejudice, withdraw my consent for my child's participation in this research study. I have had sufficient opportunity to ask questions and (of my own free will) declare my child prepared to participate in this research study.

Please indicate whether you give permission that the data obtained may be used for future research.

Herewith I give consent that the data obtained in this current study may be used for future research as well:

Yes ☐ No ☐

(Please tick the relevant block) School 2

Parent/ Guardian(s) Participant's Name _____
(Please print)

Parent/ Guardian(s) Signature _____ Date _____

Parent/ Guardian(s) Contact Number _____

Learner Participant's Name _____
(Please print)

Researcher's Name Casey Eslick

Researcher's Signature  Date _____

Witness's Name _____ Witness's Signature _____ Date _____
(Please print)

4

APPENDIX E

LEARNER ASSENT LETTER

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

Hello

I am Casey Eslick. You are going to do some listening and spelling and play fun games with me. It will take an hour today. I will ask you to listen to some sounds, numbers and words. We will also spell and make some words. If you make a mistake, it does not matter. If you do not enjoy it, you do not have to do it anymore. You can show me the face-cards when you enjoy it or when you do not want to play anymore.

OPTION		MARK
1. Yes I want to play		
2. No, I do not want to play		

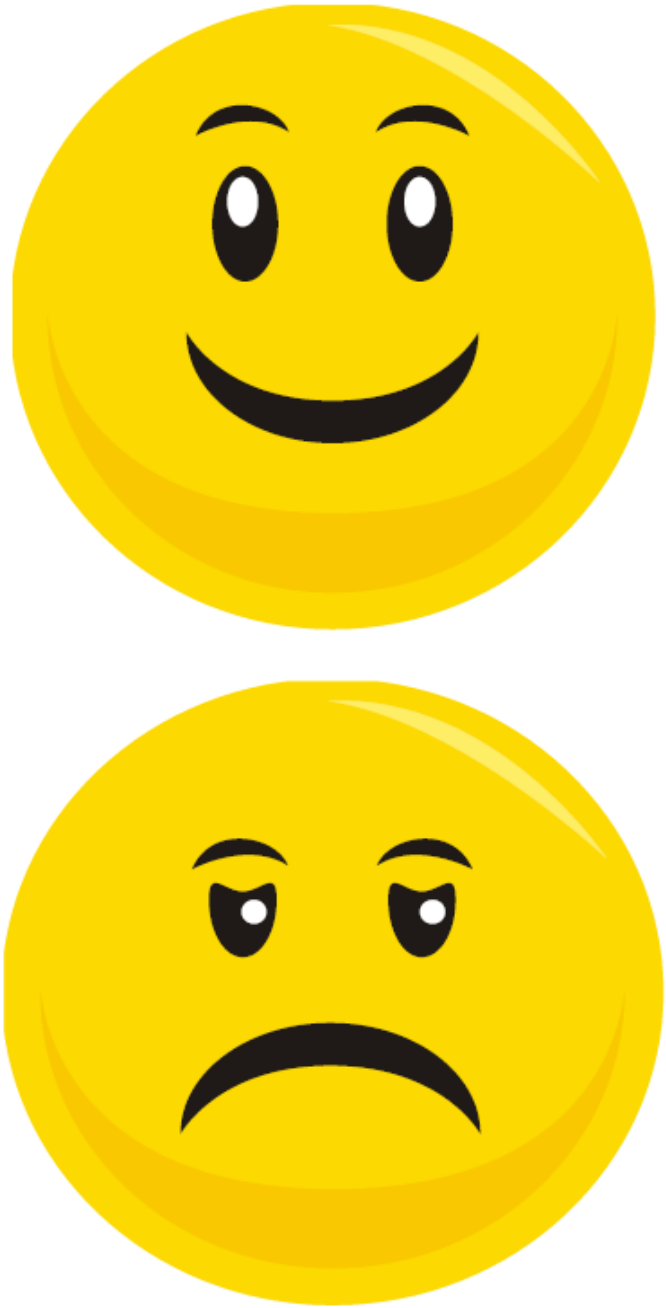
Signature of learner **Date**

…… _____

School 1 / 2

APPENDIX F

HAPPY AND SAD FACE IMAGE



APPENDIX G

DIAGNOSTIC HEARING EXAMINATION REFERRAL LETTER

Referral Letter

Diagnostic Hearing Assessment for Paediatrics

Date of Referral: _____

Dear Parent of _____

As per your consent, your child has received a hearing screening on the _____ as part of the research data collection process. In accordance to protocol, the screening is carried out twice prior to a referral being given. The following results were obtained:

PATIENT INFORMATION:

Name: Date of Birth:

Contact number: Gender:

RESULTS OBTAINED:

Otoscopic examination:

Tympanometry:

EXPECTED RESULT: Type A
Pressure peak of -50 to +50 daPa
Ear canal volume of 1.0 – 1.4 cm^3
Compliance of 0.3 – 1.7 ml

Puretone Screening:

From the above-mentioned results it was determined that your child did not pass the hearing screening. It is recommended that you take this referral letter with your child to see an Audiologist for further diagnostic hearing assessment.

Should you have difficulty obtaining the contact information of an Audiologist, please feel free to contact the researcher for assistance at cjeslick@gmail.com.

Kind regards

Casey Eslick
Masters Student
University of Pretoria

APPENDIX H

SPEECH-LANGUAGE ASSESSMENT REFERRAL LETTER

Referral Letter

Speech-Language Assessment

Date of Referral: _____

Dear Parent of _____

As per your consent, your child received a language screening on the _____ as part of the research data collection process. The screening was conducted with the *Kindergarten Language Screening Test-2* (Gauthier & Madison, 1998). The following results were obtained:

LEARNER INFORMATION:

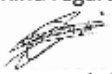
Name: Date of Birth:
Contact number: Gender:

RESULTS OBTAINED:

From the above-mentioned results it was determined that your child did not pass the language screening. It is recommended that you take this referral letter with your child to see a Speech-Language Therapist for further diagnostic speech-language assessment.

Should you have difficulty obtaining the contact information of a Speech-Language Therapist, please feel free to contact the researcher for assistance at cjeslick@gmail.com.

Kind regards



Casey Eslick
Masters Student
University of Pretoria

APPENDIX I

PHONOLOGICAL AWARENESS TEST – 2ND EDITION FORMAT

PHONOLOGICAL AWARENESS TEST – 2ND EDITION FORMAT

*Information in the tables below is summarized from the *Examiner's Manual of the Phonological Awareness Test – 2nd Edition* (Robertson & Salter, 2007).

***Table 1:** *PAT-2* Phonological Awareness Section, Sub-sections and Subtest Descriptions

Section 1: PHONOLOGICAL AWARENESS		
Sub-section 1	Rhyming	Assessed the ability of learners to identify pairs of rhyming words and to produce an appropriate rhyming word based on the stimuli provided.
Subtest 1 Subtest 2	Discrimination Production	Example: "Do these words rhyme? Fan, man" Example: "Tell me a word that rhymes with bat."
Sub-section 2	Segmentation	Measured the ability of learners to divide sentences into words and words into syllables or sounds.
Subtest 1 Subtest 2 Subtest 3	Sentences Syllables Phonemes	Example: "Clap one time for each word I say, My-house-is-big." Example: "Clap one time for each word-part or syllable that I say, Sat-ur-day." Example: "Tell me each sound in cat."
Sub-section 3	Isolation	Assessed the ability of learners to identify a phoneme in the beginning, end or middle position of a word.
Subtest 1 Subtest 2 Subtest 3	Initial Final Medial	Example: "What is the first sound in the word cat?" Example: "What is the ending sound in the word cat?" Example: "What is the middle sound in the word cat?"
Sub-section 4	Deletion	Assessed the ability of learners to manipulate the root words, syllables or phonemes of words.
Subtest 1 Subtest 2	Compounds and Syllables Phonemes	Example: "Say snowman, say it again but don't say man." Example: "Say cat, say it again but don't say /c/."
Sub-section 5	Substitution	Assessed the ability of learners to combine the skills to segment phonemes, isolate phonemes in words and substitute a phoneme to form new words.
Subtest 1	With Manipulatives	Example: "This says fun. Now change fun to run."
Sub-section 6	Blending	Measured the ability of learners to blend syllables or phonemes together to form new words
Subtest 1 Subtest 2	Syllables Phonemes	Example: "What word is this? Ta- ble" Example: "What word is this? P-o-p."

*__Table 2:__ *PAT-2* Phoneme-grapheme Knowledge Section, Sub-sections and Subtest Descriptions

Section 2: PHONEME-GRAPHEME KNOWLEDGE		
Sub-section 1	Graphemes	Measured the ability of learners to demonstrate knowledge of the English sound-symbol (phoneme-grapheme) correspondence. "What sound would this letter make at the beginning of a word?"
Subtest 1	Consonants	Example: "c"
Subtest 2	Long and Short Vowels	Example: "a"
Subtest 3	Consonant Blends	Example: "bl"
Subtest 4	Consonant Digraphs	Example: "sh"
Subtest 5	R-controlled Vowels	Example: "ar"
Subtest 6	Vowel Digraphs	Example: "ee"
Subtest 7	Diphthongs	Example: "ou"
Sub-section 2	Decoding	Assessed the ability of learners to generalize their knowledge of sound-symbol (phoneme-grapheme) correspondence to blend sounds into nonsense words. "Read each word to me"
Subtest 1	VC Words	Example: "ep"
Subtest 2	CVC Words	Example: "cag"
Subtest 3	Consonant Digraphs	Example: "thip"
Subtest 4	Consonant Blends	Example: "bund"
Subtest 5	Vowel Digraphs	Example: "meep"
Subtest 6	R-Controlled Vowels	Example: "curf"
Subtest 7	CVCe Words	Example: "mave"
Subtest 8	Diphthongs	Example: "moy"

*Adapted from: *The phonological awareness test 2: The examiner's manual* (p. 12), by Robertson, C., & Salter, W. (2007). East Moline, IL: LinguiSystems.

APPENDIX J

PARENT QUESTIONNAIRE

Parent/Guardian Questionnaire:

Please answer the questions below with an ☒ and comment where you feel necessary. Questions where more than one answer may be given are indicated with a ✶ . All information will remain confidential.

Child's Name:	Class Teacher:

						RESEARCHERS USE ONLY:
1. Child's date of birth	YEAR	MONTH	DAY			Participant #
2. Primary caregiver						P2
3. Relationship of caregiver to child						P3
4. Age of caregiver						P4
5. Occupation of caregiver						P5
6. Educational qualifications of caregiver	NO	YES	If yes: PLEASE SPECIFY			P6
7. Estimated Socioeconomic-status	LOW < R5 000	MIDDLE R5 000 – R40 000	HIGH > R40 000			P7
8. Child's gender	MALE	FEMALE				P8
9. Number of siblings		Birth Order				P9 A / P9 B
10. Languages spoken in the home ✶	Afrikaans		Setswana			P10
	English		Sesotho			
	isiZulu		SiSwati			
	Sepedi		Xitsonga			
	isiXhosa		Tshivenda			
	isiNdebele		Other: PLEASE SPECIFY			
11. Language your child speaks the most at home						P11
12. How well your child speaks this home language	Does not speak	Single words	Full sentences	Holds a conversation	Reads/ writes	P12
13. Second most spoken language at home						P13
14. How well your child speaks this second language	Does not speak	Single words	Full sentences	Holds a conversation	Reads/ writes	P14
15. First language your child could speak						P15
16. Age at which your child was exposed to English						P16
17. How well your child speaks English	Does not speak	Single words	Full sentences	Holds a conversation	Reads/ writes	P17
18. Age your child started attending school	YEARS MONTHS		Pre-School	Grade R	Primary School	P18 A / P18 B
19. Age your child attended an English Language of Instruction school						P19
20. Language you use to speak to your child ✶						P20

1

21. How much English language exposure does your child have per day at home?	None		Mostly exposure to home language but some English		Equal exposure to home language and English		More exposure to English than home language	P21
22. How many minutes/ hours in a day								P22
23. Indicate the types of exposure to English *	TV programmes							P23
	Radio							
	Siblings and other family members							
	Friends							
	Books and stories							
	Singing songs or nursery rhymes							
	Only exposed at school							
24. Do you read to your child?	NO			YES				P24
25. If yes, how often?	Daily		Weekly		Monthly			P25
26. In what language do you read? *								P26
27. Type of material read *	Books							P27
	Magazines							
	Newspapers							
28. Perceived sources of noise at home	Television			People speaking				P28
	Radio			Cars driving past often				
	Fan/ air conditioner			Other: SPECIFY				

Please feel free to provide additional comments should you wish to do so.

Thank you for taking the time to answer the questions. Should you require further information please contact me. I may be contacted on the following number or email address for further information:

Casey Eslick 082 444 3525 cjeslick@gmail.com

APPENDIX K

TEACHER QUESTIONNAIRE

Teacher Questionnaire:

Please answer the questions below with an ☒. Comments can be provided on the last page. Questions where more than one answer may be given are indicated with a ✶ . All information will remain confidential.

Teacher's Name:	Class:

							RESEARCHERS USE ONLY:
1. Teacher's date of birth	YEAR		MONTH		DAY		Participant #
2. Age							T2
3. Qualifications	NO	YES	If yes: PLEASE SPECIFY				T3
4. Gender	MALE		FEMALE				T4
5. Estimated Socioeconomic- status	LOW < R5 000		MIDDLE R5 000 – R40 000		HIGH > R40 000		T5
6. Languages spoken in the home ✶	Afrikaans		Setswana				T6
	English		Sesotho				
	isiZulu		SiSwati				
	Sepedi		Xitsonga				
	isiXhosa		Tshivenda				
	isiNdebele		Other: PLEASE SPECIFY				
7. Language spoken the most at home							T7
8. How well you speak this home language	Does not speak	Single words	Full sentences	Holds a conversation	Reads/ writes		T8
9. Second most spoken language at home							T9
10. How well you speak this second language	Does not speak	Single words	Full sentences	Holds a conversation	Reads/ writes		T10
11. First language you could speak							T11
12. At what age were you exposed to English							T12
13. How well you speak English	Does not speak	Single words	Full sentences	Holds a conversation	Reads/ writes		T13
14. Languages you speak in the classroom✶	Afrikaans		Setswana				T14
	English		Sesotho				
	isiZulu		SiSwati				
	Sepedi		Xitsonga				
	isiXhosa		Tshivenda				
	isiNdebele		Other: PLEASE SPECIFY				
15. Language you use most the classroom ✶							T15

1

16. Type of material learners read. *	Books			T18
	Magazines/ Newspapers			
	Online Materials (Internet/ Electronic Devices)			
17. Do children spend time reading books themselves in class?	NO	SOMETIMES	YES	T19
18. How often? Please specify time spent on these tasks in minutes.	DAILY MINS	WEEKLY MINS	MONTHLY MINS	T20
19. Does the school have a library?	NO	YES	OTHER	T21
20. How often do learners go to the library? Please specify time spent there in minutes?	DAILY MINS	WEEKLY MINS	MONTHLY MINS	T22
21. Do you read books to the class?	NO	SOMETIMES	YES	T23
22. How often? Please specify time spent on these tasks in minutes.	DAILY MINS	WEEKLY MINS	MONTHLY MINS	T24
23. In what language do you read? *				T25
24. Type of material you read to learners. *	Books			T26
	Magazines			
	Newspapers			
25. Are learners shown the pictures of the story/text?	NO	SOMETIMES	YES	T27
26. Do you ask questions based on the story/ text?	NO	SOMETIMES	YES	T28
27. Do learners know which direction to read in?	NO	SOMETIMES	YES	T16
28. Do learners know which direction to turn a page in?	NO	SOMETIMES	YES	T17
29. Are learners exposed to singing/ nursery rhymes in the classroom?	NO	SOMETIMES	YES	T29
30. How often? Please specify time spent on these tasks in minutes.	DAILY MINS	WEEKLY MINS	MONTHLY MINS	T30
31. When teaching letters and sounds, are associations made? E.g. "a" for apple.	NO	SOMETIMES	YES	T31
32. Can learners identify VOWEL sounds when they are spoken?	NO	SOMETIMES	YES	T32
33. Can learners write down sounds when they are spoken?	NO	SOMETIMES	YES	T33
34. Can learners say the sound of a written letter?	NO	SOMETIMES	YES	T34

35. As a teacher, do you have a positive attitude and motivation toward reading, writing and spelling?	NO	SOMETIMES	YES	T35
36. Are different modes or media used for teaching?	NO	SOMETIMES	YES	T36
37. Please name the different modes ✶				T37
38. Do learners play clapping games(clapping syllables)?	NO	SOMETIMES	YES	T38
39. Do learners play letter sounds/symbols games?	NO	SOMETIMES	YES	T39
40. Do learners play games with sight words?	NO	SOMETIMES	YES	T40
41. Do learners do activities based on books read in class?	NO	SOMETIMES	YES	T41
42. Do you work on phonological awareness skills training every day?	NO	SOMETIMES	YES	T42
43. How much time do you spend on phonological awareness skills training in minutes?	DAILY MINS	WEEKLY MINS	MONTHLY MINS	T43
44. To your own knowledge, what is phonological awareness?				T44
45. To your own knowledge, how does phonics training relate to phonological awareness skills?				T45
46. What sources of noise are you aware of INSIDE your classroom?				T46

47. What sources of noise are you aware of OUTSIDE your classroom?				T47
48. What do you do to overcome the noise?				T48
49. Do you identify learners who experience a barrier to English LoLT? (Language of Learning and Teaching)	NO	SOMETIMES	YES	T49
50. When does this identification occur? *	At registration			T50
	At commencement of the academic year			
	After first formal assessments			
	Other: PLEASE SPECIFY			
51. Do you offer support to these learners identified?	NO	SOMETIMES	YES	T51
52. Please explain what support is offered to these learners?				T52

Please indicate the extent to which you agree with the following statements with an ☒.
Agree = A, Strongly Agree = SA, Disagree = D, Strongly Disagree =SD, Undecided =UN

53. A barrier to English is too difficult to overcome in a mainstream classroom	A	SA	D	SD	UN	T53
54. Teaching learners whose home language is not English is more difficult	A	SA	D	SD	UN	T54
55. Learners who are not proficient in English experience difficulty in most learning areas	A	SA	D	SD	UN	T55
56. Inclusive practice can combat barriers to LoLT	A	SA	D	SD	UN	T56
57. I know how to adapt assessment methods to accommodate learners with barriers to LoLT	A	SA	D	SD	UN	T57
58. I know how to adapt my teaching style to support learners with barriers to LoLT	A	SA	D	SD	UN	T58
59. When the LoLT is not a learner's home language, it can be a serious barrier to learning literacy.	A	SA	D	SD	UN	T59
60. I feel that I am adequately trained to support learners who experience a barrier to English as a LoLT	A	SA	D	SD	UN	T60
61. External noise generated is a barrier to learning	A	SA	D	SD	UN	T61
62. Noise generated inside the classroom is a barrier to learning	A	SA	D	SD	UN	T62
63. I know how to adapt my teaching style to overcome the barriers of noise	A	SA	D	SD	UN	T63
64. I am aware of strategies to employ within the classroom to overcome barriers of noise	A	SA	D	SD	UN	T64

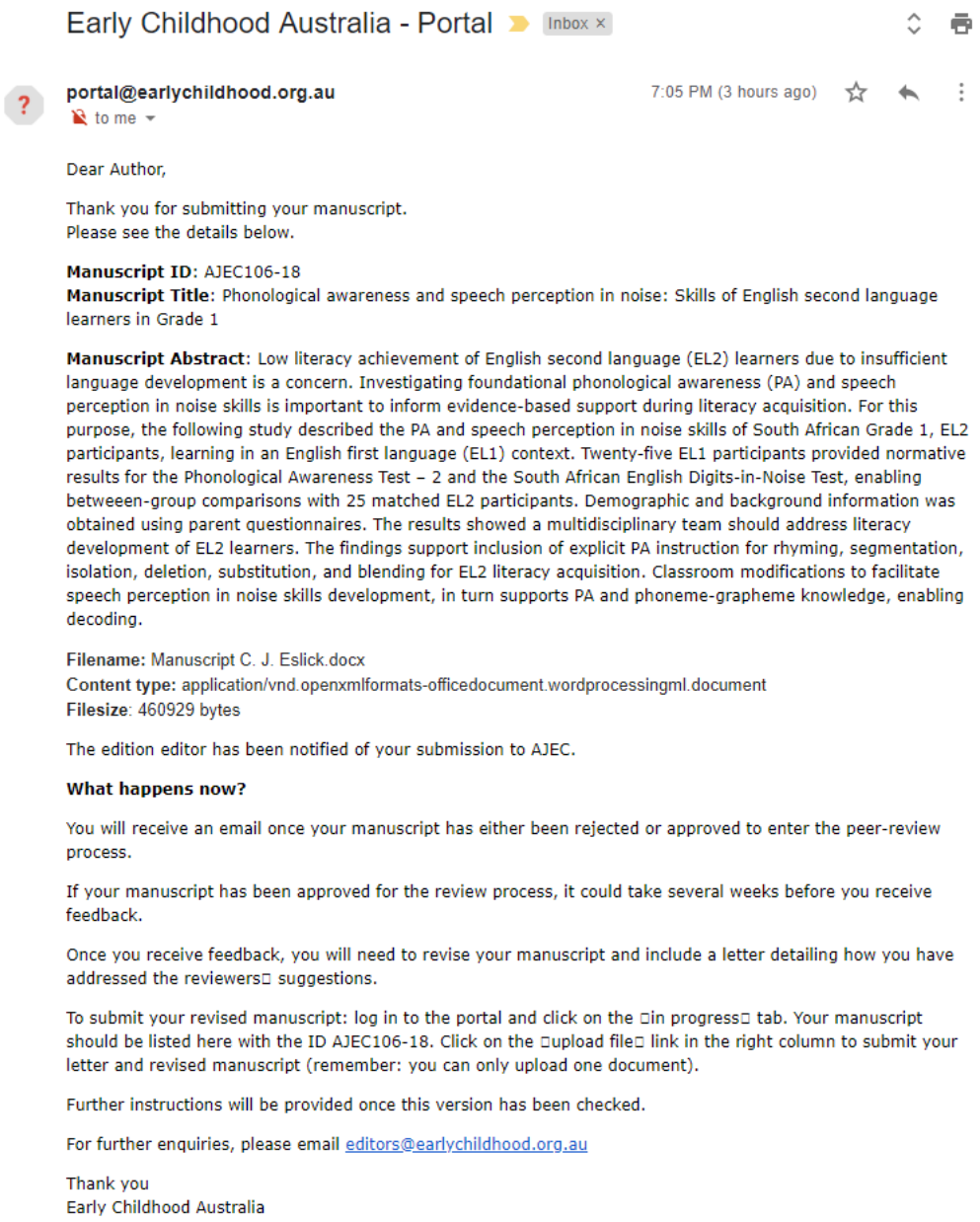
Please feel free to provide additional comments should you wish to do so.

Thank you for taking the time to answer the questions. Should you require further information please contact me. I may be contacted on the following number or email address for further information:

Casey Eslick 082 444 3525 cjeslick@gmail.com

APPENDIX L

MANUSCRIPT SUBMISSION CONFIRMATION



Early Childhood Australia - Portal Inbox ×

portal@earlychildhood.org.au 7:05 PM (3 hours ago)
to me

Dear Author,

Thank you for submitting your manuscript.
Please see the details below.

Manuscript ID: AJEC106-18
Manuscript Title: Phonological awareness and speech perception in noise: Skills of English second language learners in Grade 1

Manuscript Abstract: Low literacy achievement of English second language (EL2) learners due to insufficient language development is a concern. Investigating foundational phonological awareness (PA) and speech perception in noise skills is important to inform evidence-based support during literacy acquisition. For this purpose, the following study described the PA and speech perception in noise skills of South African Grade 1, EL2 participants, learning in an English first language (EL1) context. Twenty-five EL1 participants provided normative results for the Phonological Awareness Test – 2 and the South African English Digits-in-Noise Test, enabling betweeen-group comparisons with 25 matched EL2 participants. Demographic and background information was obtained using parent questionnaires. The results showed a multidisciplinary team should address literacy development of EL2 learners. The findings support inclusion of explicit PA instruction for rhyming, segmentation, isolation, deletion, substitution, and blending for EL2 literacy acquisition. Classroom modifications to facilitate speech perception in noise skills development, in turn supports PA and phoneme-grapheme knowledge, enabling decoding.

Filename: Manuscript C. J. Eslick.docx
Content type: application/vnd.openxmlformats-officedocument.wordprocessingml.document
Filesize: 460929 bytes

The edition editor has been notified of your submission to AJEC.

What happens now?

You will receive an email once your manuscript has either been rejected or approved to enter the peer-review process.

If your manuscript has been approved for the review process, it could take several weeks before you receive feedback.

Once you receive feedback, you will need to revise your manuscript and include a letter detailing how you have addressed the reviewers□ suggestions.

To submit your revised manuscript: log in to the portal and click on the □in progress□ tab. Your manuscript should be listed here with the ID AJEC106-18. Click on the □upload file□ link in the right column to submit your letter and revised manuscript (remember: you can only upload one document).

Further instructions will be provided once this version has been checked.

For further enquiries, please email editors@earlychildhood.org.au

Thank you
Early Childhood Australia