

MASTER'S DEGREE IN COMMUNICATION PATHOLOGY 2015

Comparing the oral language abilities of children with autism spectrum disorder and specific language impairment using the Comprehensive Assessment of Spoken Language (CASL)

In fulfilment of the requirements for the degree of MCommunication Pathology

In the Department of Speech-Language Pathology and Audiology,

Faculty of Humanities, University of Pretoria, South Africa.

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Student: Cecile Malan

Student number: 26136482

Supervisor: Prof. Alta Kritzinger

Co-supervisor: Mrs. Salomé Geertsema

TABLE OF CONTENTS

Declaration	v
Acknowledgements.....	vi
Figures.....	vii
Tables.....	vii
Appendices.....	vii
Abbreviations.....	viii
Abstract	ix
1 Introduction	1
1.1 Background.....	1
1.2 Oral language abilities in children with ASD and SLI	3
1.3 Problem statement.....	6
2 Methodology.....	8
2.1 Research Aim	8
2.2 Research Design	8
2.3 Ethical considerations.....	9
2.3.1 Ethical clearance	9
2.3.2 Avoidance of harm.....	9
2.3.3 Informed consent.....	9
2.3.4 Deception of participants	10
2.3.5 Confidentiality and right to privacy.....	10
2.3.6 Actions and competence of researcher	10
2.3.7 Dissemination of findings.....	10
2.3.8 Reliability and Validity.....	11
2.3.9 Acknowledgement	12
2.4 Research Participants.....	12
2.4.1 Sampling procedure	12

2.4.2	Description of participants	13
2.5	Material and Apparatus.....	15
2.5.1	Questionnaire	15
2.5.2	Language measure.....	15
2.6	Data Collection.....	17
2.6.1	Research setting.....	17
2.6.2	Data collection procedures	17
2.6.3	Procedures for data processing and analysis	18
3	Comparing the oral language abilities of children with autism spectrum disorder and specific language impairment using the Comprehensive Assessment of Spoken Language (CASL).....	19
3.1	Abstract.....	19
3.2	Introduction	20
3.3	Method.....	24
3.3.1	Aim	24
3.3.2	Research Design	24
3.3.3	Participants.....	24
3.3.4	Materials.....	26
3.3.5	Procedures	28
3.3.6	Data Analysis	28
3.4	Results.....	28
3.4.1	Lexical semantic skills	29
3.4.2	Syntactic skills	31
3.4.3	Supralinguistic skills	32
3.4.4	Pragmatic skills	33
3.5	Discussion	34
3.6	Conclusion	37
4	Discussion and conclusion	39

4.1	Discussion of results	39
4.2	Clinical implications and Recommendations	42
4.3	Critical assessment of study strengths and limitations	43
4.3.1	Strengths of the study	43
4.3.2	Limitations of the study	43
4.4	Future research	44
4.5	Conclusion	44
	References	46
	Appendices	53

DECLARATION

Name and student number: Cecile Malan, 26136482

Dissertation / research report: Comparing the oral language abilities of children with autism spectrum disorder and specific language impairment using the Comprehensive Assessment of Spoken Language (CASL)

I declare that this assignment/report is my own original work. Where secondary material has been used (either from a printed source, a previous report or the internet), this has been carefully acknowledged and referenced. I understand what plagiarism is and am aware of the department's policy in this regard.

Signature: 

Date: 31 March 2015

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FIGURES

Figure 1 Lexical Semantic Skills Box Plot

Figure 2 Syntactic Skills Box Plot

Figure 3 Supralinguistic Skills Box Plot

Figure 4 Pragmatic Skills Box Plot

TABLES

Table 2.1 Participant Characteristics (n=35)

Table 2.2 CASL Language Categories, Subtests, and corresponding Language Processes tested

Table 3.1 Participant Characteristics (n=35)

Table 3.2 CASL Language Categories, Subtests, and corresponding Language Processes tested

Table 3.3 CASL results: Number of standard deviations (SDs) below the mean

Table 3.4 Language Structure Category Scores (ANOVA and Tukey)

Table 3.5 Language Category Scores (Mean, Standard Deviation, Range)

APPENDICES

Appendix A Submission to South African Journal of Communication Disorders

Appendix B Ethical Clearance – Faculty of Humanities, University of Pretoria

Appendix C Letter to Head of Private Schools

Permission from the principals

Appendix D Informed consent letter to Parents of participants with ASD, SLI, and TD (Private Schools)

Appendix E Child assent form

Appendix F Case history and information form (ASD and SLI, and TD)

Appendix G Declaration for the conservation of research data and/or documents

ABBREVIATIONS

ASHA	American Speech-Language-Hearing Association
ANOVA	Analysis of Variance
ASD	Autism Spectrum Disorder
CAPS	Curriculum and Assessment Policy Statements
CASL	Comprehensive Assessment of Spoken Language
DSM	Diagnostic and Statistical Manual of Mental Disorders
EAL	English Additional Language
ICD	International Statistical Classification of Diseases and Related Health Problems
ILT	Integrative Language Theory
LiEP	Language in Education Policy
LoLT	Language of Learning and Teaching
SD	Standard Deviation
SES	Socio-Economic Status
SLI	Specific Language Impairment
SPD	Semantic Pragmatic Disorder
TD	Typical Development
UK	United Kingdom
WHO	World Health Organisation

ABSTRACT

Since the adoption of the DSM-5, there appears to be a shift of focus away from the expressive language difficulties of children with autism spectrum disorder (ASD) to their social communication difficulties only. A significant body of research, on the other hand, has revealed that many children with ASD present with language impairment similar to that found in children with specific language impairment (SLI). It appears that a comprehensive test such as the CASL has not been used to investigate the differences in language impairment in children with ASD and SLI.

The aim of the present study was to compare the oral language abilities of children in middle childhood with ASD (n=11) and SLI (n=12) to the corresponding abilities of a matched control group of children with typical development (TD) (n=12). All participants were EAL learners and came from bilingual or multilingual backgrounds. The group with ASD were high functioning. Lexical semantic, syntactic, supralinguistic, and pragmatic abilities were investigated using the CASL. A standard-group comparison design was used and participants were purposively assigned to the three groups (ASD, SLI, and TD). Differences in language scores were determined using analysis of variance and Tukey's test.

Results showed no significant differences between the participants with ASD and SLI for lexical semantic, syntactic, and supralinguistic abilities, but significant differences were evident when their results were compared to those of the TD participants. Great variability was seen in the language abilities of participants with ASD and SLI with the majority scoring one or more standard deviations below the mean of the CASL. Mean scores for pragmatics for the three participant groups differed significantly, with $ASD < SLI < TD$. Some participants with ASD demonstrated patterns of oral language deficits similar to children with SLI, thereby confirming results of previous findings.

The results suggest that pragmatic and supralinguistic abilities should be included in the language assessment of children with ASD and SLI. It appears that the CASL can be applied as a successful tool to identify specific language deficits in children with ASD, but may not fully describe oral language deficits such as echolalia in children with ASD. The results imply that the language impairments of children with ASD and SLI are on a

continuum where differences can be seen in severity. This study contributes to a database for multilingual South African children with language impairment.

Key Words:

Autism spectrum disorder, Comprehensive Assessment of Spoken Language (CASL), English additional language (EAL) learners, language impairment, lexical semantic abilities, middle childhood, multilingual, oral language, pragmatic abilities, specific language impairment, supralinguistic abilities, syntactic abilities.

CHAPTER 1

1 INTRODUCTION

1.1 BACKGROUND

Autism Spectrum Disorder (ASD) and Specific Language Impairment (SLI) are two distinct disorders that present with various shared deficits in language abilities and social performance (Leyfer, Tager-Flusberg, Dowd, Tomblin, & Folstein, 2008). Language competence and language development are typically reflected in the oral language abilities of a child (Sterponi, De Kirkby, & Shankey, 2014). Impaired language competence may change over time, but for some children these deficits have a lifelong impact (Jansen et al., 2013; Owens, 2014). As a result of the permanency of language impairment and the extensive impact on a child's life, research into the oral language deficits of both children with ASD and SLI is relevant.

ASD is a neurodevelopmental disorder that encompasses great heterogeneity. ASD is currently viewed as a neurobiological disorder with genetic causes and behavioural markers that form the essence of the diagnosis (Guthrie, Swineford, Wetherby, & Lord, 2013). The Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5) (American Psychiatric Association; APA, 2013) now lists these observable markers mainly as two criteria, i.e. deficits in social communication and interaction; and restricted, repetitive behaviour, interests, or activities. Further criteria of the DSM-5 (APA, 2013) are the early onset of the symptoms and the impairments must be clinically significant. Expressive language deficits are no longer part of the diagnosis of ASD (Guthrie et al., 2013), but are rather viewed as a specifier to further describe the diagnosis as *with or without language impairment* (Lai, Lombardo, Chakrabarti, & Baron-Cohen, 2013). It is recognised, however, that some children with ASD fail to develop language, while a large group develop normal language abilities, although subtle linguistic anomalies persist even in the most able (Boucher, 2012). According to Boucher (2012) another subgroup of children with ASD has clinically significant structural language impairments in addition to impaired communication. The American Speech-Language-Hearing Association (ASHA; 2006) portrays the core features of ASD as impairments in social communication, language and related cognitive skills, behaviour and emotional regulation, and sensory and feeding issues. According to the DSM-5 (APA, 2013) the presence of language

impairment is not compulsory for the diagnosis of ASD, as not all children with present with language impairment. Research indicates that many children with ASD have language impairment even though it does not form part of the diagnostic criteria, therefore the language impairment of children with ASD, particularly in middle childhood, should not be overlooked. Due to great variability in and complexity of symptoms, children with ASD are challenging to assess and differential diagnosis between related disorders can be intricate. An extensive speech and language assessment is therefore necessary to identify language impairment as a specifier to further describe the diagnosis of ASD.

Children with ASD present with variability in oral language abilities; in fact, language impairment was viewed by some authorities as more extensive than commonly portrayed by diagnostic criteria – even before the publication of the DSM-5 (Groen, Zwiers, Van der Gaag, & Buitelaar, 2008). Although some children with ASD develop eloquent language later in childhood (Boucher, 2012), delayed language development is still regarded as an important characteristic in early and middle childhood (Howlin, 2003). The conflicting information regarding the language abilities of children with ASD is particularly apparent in literature about middle childhood language impairment. Despite early intervention, which leads to improvement in the language skills of some children with ASD (Magiati, Moss, Charman, & Howlin, 2010), language impairments may still be present in middle childhood (Kelley, Niagles, & Fein, 2010; Suh et al., 2014). A follow up study by Magiati et al. (2010) over six to seven years suggested that children with ASD in middle childhood (mean age 10.3 years) can show significant improvement in language abilities when they had received early communication intervention. However, the participants continued to show delays, and the authors advocated the provision of ongoing specialised education to children with ASD. It appears that language impairments are still present to differing degrees in children with ASD during their middle childhood years, even with early intervention. The question now arises whether language impairment found in children with ASD is viewed as different from children with language impairment, but who are otherwise typically developing.

SLI is a developmental clinical condition in which language deficits are considered a hallmark symptom (Rice, Warren, & Betz, 2005). SLI is diagnosed when a child presents with delays or deficits in language development, but with normal hearing, intelligence,

and physical development, and all in the absence of ASD (Whitehouse, Barry, & Bishop, 2008). Although children with SLI often experience difficulties in both the receptive and expressive domains of language (Whitehouse et al., 2008), considerable heterogeneity has been noted in their language abilities (Lindgren, Folstein, Tomblin, & Tager-Flusberg, 2009; Tager-Flusberg, 2006). The core features observed in children with SLI are impaired phonology and grammatical morphology (Owens, 2014; Tager-Flusberg, 2006). As with ASD, SLI is seldom outgrown. Up to two-thirds of pre-school children with SLI will continue to have difficulty with language as adolescents (Owens, 2014). It therefore appears that some children in middle childhood with ASD and some with SLI still present with language deficits that warrant assessment and intervention services.

1.2 ORAL LANGUAGE ABILITIES IN CHILDREN WITH ASD AND SLI

Language comprises of functional components of phonology, morphology, syntax, semantics, and pragmatics (Groen et al., 2008; Owens, 2012), which are all integrated into a functional framework of language (Owens, 2012). Together these components form the basic rule systems found in language (Owens, 2012). The language components are the focus of the following literature overview regarding the oral language abilities of children with ASD and those with SLI. For the purpose of this study another component, supralinguistic abilities, is also included and discussed as it forms part of the components addressed in the Comprehensive Assessment of Spoken Language (CASL; Carrow-Woolfolk, 1999), the measuring instrument used in this study.

Over the last three decades a significant body of research has been devoted to the possible overlap between the language abilities of children diagnosed with ASD and those diagnosed with SLI (Lindgren et al., 2009; Verhoeven et al., 2012; Williams, Botting, & Boucher, 2008). Numerous research studies have been conducted on the semantic abilities (or lexical semantics) of both children with ASD and SLI. *Lexical semantics*, defined as the knowledge of meanings of words and how meanings map onto the real world (Eigsti, De Marchena, Schuh, & Kelley, 2011), in particular semantic organisation, has been found to be deviant in both children with ASD (ASHA, 2006; Boucher, 2012; Eigsti et al., 2011) and children with SLI (Owens, 2014; Sheng & McGregor, 2010). Lexical semantics include the breadth (word-to-referent knowledge seen in the number of words in the lexicon) and depth (word-to-word relationships as seen in the 'richness with which a word is represented') (McGregor et al., 2012, 37).

McGregor et al. (2012) found that both children with ASD and SLI scored significantly lower on lexical semantic depth than age-matched peers. Both groups appear to have difficulty with expressive vocabulary (McGregor, Oleson, Bahnsen, & Duff, 2013; Owens, 2014) although some verbal children with ASD may score adequately on vocabulary tests (Tager-Flusberg & Caronna, 2007). A unique characteristic of semantic storage has been reported in children with ASD, who present with difficulty in understanding mental state verbs (Eigsti et al., 2011), whereas children with SLI display poorly structured semantic storage (Owens, 2014). There appears to be more overlaps than differences in the semantic abilities of children with ASD and those with SLI, but complex language may be an area of difficulty in both groups.

Supralinguistic abilities can be described as the understanding of complex language in which an individual cannot draw on lexical or grammatical information to derive meaning (Carrow-Woolfolk, 1999). Supralinguistic abilities include nonliteral meaning, the use of sarcasm, inferences, and the interpretation of words (ASHA, 2006; Owens, 2012); and can be described as the semantics of advanced language which typically develop during middle childhood (Owens, 2012). Supralinguistic skills are an important aspect to take into consideration when language abilities of children in middle childhood are discussed as this is an area in which these children might experience great difficulty in. It is well known that children with language deficits have difficulty understanding non-literal language such as idioms (Owens, 2004) and making inferences (Adams, Clarke, & Haynes, 2009). ASHA (2006) and Bartlett et al. (2012) confirmed that children with ASD and some diagnosed with SLI present with poor supralinguistic skills. Poor supralinguistic skills are not considered core deficits in children with SLI, but impairments do occur, as pointed out by Bartlett et al. (2012). These authors found that both groups with ASD and those with SLI performed below age level regarding supralinguistic skills with no significant differences between their scores (Bartlett et al., 2012). Children with SLI and children with ASD who present with language impairment may therefore be expected to experience difficulty with supralinguistic skills.

Deficits are also evident in the *syntactic abilities* (including morphology and syntax) of the two groups. Morphology is described as the smallest meaningful units of language including words and word beginnings and endings (Eigsti et al., 2011; Owens, 2012) and syntax is the combination of words into phrases (Eigsti et al., 2011). Both children with

ASD and children with SLI present with deficits on morphological level. Errors, omissions, or substitutions are seen in pronouns (third person singular /s/), regular and irregular past tense verbs, and function words such as articles or prepositions (Boucher, 2012; Hesketh & Conti-Ramsden, 2013; McGregor et al., 2012; Owens, 2014; Rice et al., 2005; Williams et al., 2008). Deficits in grammar are another shared feature although some differences are present (Kjelgaard & Tager-Flusberg, 2001). Characteristics noted only for children with SLI are the overuse of one form rather than making random errors, and errors in the use of the copula (be), plural (s), auxiliary verbs (be, do), and progressives (-ing) (Rice et al., 2005). Deficits are also evident on a sentence level (syntax) for both groups. Children with ASD uniquely present with a superficial form of sentence construction (Owens, 2014). The use of stereotyped speech or echolalia (e.g. repeating words from a movie, or echoing the last words of another person) typically occurs in children with ASD (Kim, Junker, & Lord, 2014) and may be connected to their superficial understanding of the underlying meaning of sentences and overreliance on word order (Owens, 2014). Echolalia may be interactive or non-interactive and have functions such as turn taking, requesting, providing information, self-directive, and self-regulatory (Prizant, 1983; Vicker, 1999). It appears that echolalia is only reported in children with ASD. Children with SLI on the other hand display reduced length of utterance and limited knowledge of argument structures (McGregor et al., 2012). It appears that although a general overlap between the two groups is evident on word level, there are also unique differences on sentence level.

Pragmatic abilities consist of rules and conventions governing the social use of language which forms the tool used for communication (Eigsti et al., 2011; Groen et al., 2008). Deficits in pragmatic abilities form part of the defining features of ASD and are included in the DSM-5 (APA, 2013). This appears to be the most consistently impaired domain in individuals with ASD at all developmental stages and their area of greatest weakness (Eigsti et al., 2011; Groen et al., 2008; McGregor et al., 2012; Rice et al., 2005), irrespective of the presence of language impairment or not. Children with ASD have a restricted way of using language as they seldom request information, comment, or describe events (Tager-Flusberg & Caronna, 2007). These authors also note other difficulties including turn taking, adhering to rules of politeness and including relevant information in telling stories. As a hallmark symptom of ASD, deficits in pragmatics were thought to distinguish this disorder from SLI (Leyfer et al., 2008). Leyfer and colleagues

(2008) have suggested, however, that some children with SLI may present with social impairments typical to children with ASD. Social impairments in children with SLI include difficulty with social interaction and peer relationships (Osman, Shohdi, & Aziz, 2011). A subtype of language impairment, known as semantic pragmatic disorder (SPD) (Bishop, 2000), is sometimes diagnosed where expressive language is normal, but deficits in language use (pragmatics) only are present (Leyfer et al., 2008). Rice et al. (2005) reported that some children with SLI present with mild pragmatic difficulties. Several other studies support these findings (Donlan & Masters, 2000; Hart, Fujiki, Brinton & Hart, 2004; Jansen et al., 2013). On the other hand, literature suggests that children with SLI primarily present with deficits in semantics and syntax; and pragmatics is noted as a secondary impairment (Leyfer et al., 2008; McGregor et al., 2012; Rice et al., 2005). Although an overlap may be present between children with ASD and those with SLI, it appears that children with SLI present with less severe pragmatic deficits.

1.3 PROBLEM STATEMENT

ASD and SLI are diverse developmental disorders which may present similarly in terms of language abilities, especially in the expressive domain of language (Lindgren et al., 2009). These overlaps in oral language may complicate differential diagnoses (McGregor et al., 2012). According to Williams et al. (2008) different typical language profiles are observed in school-aged children diagnosed with ASD and SLI. Despite these differences, there are many similar traits (Lindgren et al., 2009; Tager-Flusberg, 2006). Leyfer et al. (2008) highlight an overlap between clinical features in these two populations. These authors suggest that children with ASD present with language impairments similar to children with SLI; and children with SLI may present with pragmatic difficulties similar to children with ASD.

It appears that few studies have been conducted to describe the detailed oral language abilities of children diagnosed with ASD and SLI in South Africa, and less so with a focus on the school-aged population. Therefore few clearly distinguished descriptions of the nature of differences between children with ASD and those with SLI are available. In South Africa important factors such as multilingualism should also be taken into consideration. Multilingualism in schools is an international phenomenon and a reality in many countries (Naudé, 2006). Particularly in urban settings of South Africa multilingualism increased since the rule of the new constitution in 1994 (De Klerk, 2002).

According to Naudé (2006) the eleven official languages in South Africa, contributing to the multilingual nature of the people in this country, are viewed in a positive light even though it may bring forth many practical difficulties. Little research has been conducted to investigate the influence of African languages on the language development of multilingual children (Naudé, 2006). Regarding education, Jordaan (2011) noted that most school children in South Africa are receiving education in English as an additional language (EAL). In one classroom, where many languages are represented of which the majority are African languages, English is both the language of learning and teaching (LoLT) and the language of mutual understanding between teachers and children (Naudé, 2006). EAL is therefore an additional characteristic also for most children with ASD and SLI in South Africa.

Based on current evidence, children with ASD and children with SLI present with difficulties across all the components of language. A better understanding of the overlapping and unique linguistic characteristics of the two groups may be conducive to more effective clinical treatment (Lindgren et al., 2009). There appears to be a clinical need and an ongoing debate to distinguish between the language deficits of ASD and SLI. Of all the studies discussed it appears that the CASL has not been used as an outcome measure to distinguish between the language deficits of school aged children with ASD and SLI. Van Dulm and Southwood (2013) conducted a study in which they determined the assessment materials mostly used by 238 speech-language therapists in South Africa. It appears that the CASL was not one of the tools listed considered as frequently used for language assessment. The CASL may therefore be a viable test to assist with differential diagnosis and to distinguish between the two disorders and contribute to the debate. The CASL includes all the language components including pragmatics as well as supralinguistic abilities – an essential language component when children in middle childhood are investigated. Comparing the lexical semantic, syntactic, supralinguistic, and pragmatic abilities of children with ASD and SLI may provide another perspective on the nature and severity of differences and similarities between the groups.

The research question for the present study is whether or not the CASL, an oral language test which encompasses the main areas of known differences between children with ASD and SLI, will contribute to an integrated description of differences and similarities between the two groups of children.

CHAPTER 2

2 METHODOLOGY

2.1 RESEARCH AIM

The aim of this study was to compare the oral language abilities of children with autism spectrum disorder (ASD) and specific language impairment (SLI) to a matched control group of children with typical development (TD). Specific oral language categories were investigated to determine if statistically significant differences were present in the *lexical semantic, syntactic, supralinguistic, and pragmatic abilities* of the three groups of participants.

The results were compiled and described in the article titled ‘Comparing the oral language abilities of children with autism spectrum disorder and specific language impairment using the Comprehensive Assessment of Spoken Language (CASL)’ (Chapter 3), submitted for publication in the *South African Journal of Communication Disorders* (Appendix A).

2.2 RESEARCH DESIGN

A standard-group comparison design was used to conduct the study. Groups were formed on the basis of one dependent variable (diagnosis) and were compared based on other dependent variables (Hegde, 2003). The other dependent variables that were compared acted as points of comparison between groups and included lexical semantic, syntactic, supralinguistic, and pragmatic abilities. A cross-sectional approach was utilised within a quantitative framework. Participants were purposively assigned to three groups: two groups were formed on the basis of diagnosis and a third group was utilised as a control.

By using a standard-group comparison design, the language deficits of children with ASD and children with SLI were compared to describe the similarities and differences thereof. These similarities and differences aided in the possibility to distinguish between the language deficits of the two disorders.

2.3 ETHICAL CONSIDERATIONS

Performing research is an ethical venture which needs to be guided by a code of moral guidelines. This ensures that the research is conducted in a way that is morally acceptable and that it may prevent scientific misconduct (Struwig & Stead, 2001).

2.3.1 Ethical clearance

The research was approved by the Research Ethics Committee of the Faculty of Humanities at the University of Pretoria (Reference number 26136482) before commencement of the study (Appendix B).

Ethical principles that were implemented in this study include:

2.3.2 Avoidance of harm

The researcher had an ethical responsibility to prevent participants from experiencing physical discomfort and emotional harm as a result of the research project. The researcher did not expose the participants to any physical or psychological discomfort at any time even though data collection took a considerable time, of which the participants and their parents were well-informed (De Vos, Strydom, Fouché, & Delpont, 2012; Leedy & Ormrod 2013). Regular breaks were given to participants and they were offered a snack and a drink during the session.

During the research project the researcher became aware of private details of participants and schools. The researcher was obliged to keep information confidential and to treat participants in an ethical manner. Reporting of results was anonymous (De Vos *et al.*, 2012). There was no discrimination against participants and they were treated equally and with respect.

2.3.3 Informed consent

Parents and their children were requested to participate in this research study and they received adequate information regarding the goal and nature of the study and expected participant involvement. Participation was strictly voluntary therefore nobody was coerced into participating (De Vos *et al.*, 2012; Leedy & Ormrod, 2013).

An informed consent form was given to parents of prospective participants to provide information as explained above (Appendix D). Written consent was obtained before participation was finalised. As the participants were seven to 10 years old, child assent was obtained in addition to parental consent. The procedures were explained to each participant and when they agreed to participate, they signed their name on an image depicting a smiling face (Appendix E).

2.3.4 Deception of participants

All relevant information regarding the goal, procedures, and execution of the study was presented to the parents and participants to prevent misunderstanding (De Vos et al., 2012). After data collection, the results of each participant were made available to the parents in the form of a written report.

2.3.5 Confidentiality and right to privacy

The researcher informed respondents that their privacy and personal information were dealt with confidentially. The 'right of privacy' of participants was respected by safeguarding the privacy and identity of respondents. The researcher kept the nature and quality of the performance of the participants strictly confidential (De Vos et al., 2012; Leedy & Ormrod, 2013). All relevant data including the biographical information from the case history forms were converted to numerical or alphanumerical codes to increase confidentiality of the data of each respondent.

2.3.6 Actions and competence of researcher

The researcher was adequately skilled and competent in the field of study to undertake the proposed investigation. The researcher aimed to be sensitive towards cultural differences, was objective, and had restraint in making value judgements (De Vos et al., 2012). A literature review was conducted to obtain a comprehensive background regarding the scope of study. Proper acknowledgement was given to all sources and researchers whose work was described or referred to in this study. All other contributors were recognised and acknowledged for their contribution to this report.

2.3.7 Dissemination of findings

The researcher reported the findings of this research study in a complete and honest fashion, unambiguously, and without misrepresenting what has been done (De Vos et al.,

2012; Leedy & Ormrod, 2013). A research report and an article are now made available to the scientific community, parents of participants and the schools where the research was conducted (Struwig & Stead, 2001). The researcher ensured that the research report and article was clear and contained all the information necessary for readers to comprehend (De Vos et al., 2012). The report was composed in the form of an article and a dissertation. The article was as accurate and objective as possible, no biased language was used, and results were not manipulated (De Vos et al., 2012). The findings were revealed to the participants to provide parents with a deeper insight into the language difficulties of their children, as a form of recognition for their participation in the study, and in a manner to maintain a good relationship with the participants for future research in ASD and SLI (De Vos et al., 2012).

2.3.8 Reliability and Validity

The validity of a research project can be explained in terms of internal and external validity. Internal validity refers to the extent to which the design and data obtained from a study allows for making inferences of cause-and-effect and causal relationships (Leedy & Ormrod, 2013; Trochim, 2006). Internal validity is not relevant in descriptive studies (Trochim, 2006) and will therefore not be discussed further. External validity of a study entails the extent to which results can be generalised and hold true to other respondents, situations, or investigations (Leedy & Ormrod, 2013; Trochim, 2006). Although a relative small sample was used, normal distribution was obtained so that results may be generalised. Since the sample included children from different language backgrounds in South Africa, the credibility and relevancy of the study is increased. Test results were scored and interpreted following the guidelines of the CASL. The CASL (Carrow-Woolfolk, 1999) was administered correctly, adhering to the standards set forth in the manual.

When conducting a research study it is important to consider the validity and reliability of the measurement instrument. It is important to ensure that the research design is valid. Neglecting these aspects can result in findings of the study being worthless (Struwig & Stead, 2001).

Validity of the measurement instrument is an indication that the instrument measures what it is intended to measure (De Vos et al., 2012). The process of validation can be

described two-fold: that the instrument measures the concept in question and that the instrument measures that concept accurately (De Vos et al., 2012). The CASL yields high test-retest reliabilities as it provides definite and consistent results (Carrow-Woolfolk, 1999). The internal reliability of the test shows a high degree of item uniformity within the subtests and stability of the scores is evident in the test-retest study which was carried out (Carrow-Woolfolk, 1999). Carrow-Woolfolk (1999) indicated that the CASL obtained validity in terms of: 1) content validity as this assessment measure sufficiently samples the domain it claims to measure; 2) construct validity by measuring the underlying construct it declares; 3) criterion validity because it is significantly related to similar assessments; and 4) clinical validity because results of the instrument provide information to discriminate between special populations of individuals evaluated with the CASL. The CASL has a high degree of consistency in all standard scores. Reichow and colleagues (2008) found a significant correlation between the Inferences and Pragmatic Judgement subtests of the CASL and the assessment of communication and social abilities of the Vineland Adaptive Behavior Scales (Vineland; Sparrow, Balla, & Cicchetti, 1984). These authors suggested that the CASL is an acceptable tool to identify difficulties with the social use of language in children with higher functioning ASD. High correlations were also obtained between the CASL and three other measures: the Peabody Picture Vocabulary Test, Third Edition (PPVT-III; Dunn & Dunn, 1997), the Expressive Vocabulary Test (EVT; Williams, 1997), Oral and Written Language Scales (OWLS; Carrow-Woolfolk, 1995), and the Test for Auditory Comprehension of Language-Revised (TACL-R; Carrow-Woolfolk, 1985) (Carrow-Woolfolk, 1999).

2.3.9 Acknowledgement

Plagiarism was avoided by acknowledging all professionals who contributed to an integral part of this research project. All literature references were also cited in the research report (Struwig & Stead, 2001).

2.4 RESEARCH PARTICIPANTS

2.4.1 Sampling procedure

Purposive sampling was used to identify and select participants for the study to ensure that the sample contains elements that were the most characteristic of the population it represents (De Vos et al., 2012). Permission was obtained from two private schools in the same area to use their databases to identify prospective participants. The purposive

sampling approach was also utilized when a matched normal group (TD children) was formed.

2.4.2 Description of participants

Thirty five participants in middle childhood (aged seven to 10 years) were included in the study: 11 children with ASD, 12 children with SLI, and 12 TD children. According to Carr (2011) middle childhood ranges from six to 12 years of age. The middle childhood years were targeted as both children with ASD and those with SLI may present with poor supralinguistic skills, which typically develop during the school years (Bartlett et al., 2012; Owens, 2012). Participants from the three groups were recruited by means of convenience sampling from two private schools. They were matched according to age (all participants were aged between seven and 10 years; interval differences of three to four months were allowed) and LoLT, which was English. All the participants were immersed in an English medium of education from Grade R, although they were all exposed to English to a certain extent before that (see Table 2.1). The socio-economic status (SES) of the participants was similar as they lived with their parents in similar suburbs in the same city who could all afford private education. Parents reported normal hearing and hearing screening was conducted in cases where information was lacking. Parents and teachers indicated that all participants showed appropriate yearly progress in school. None of the participants repeated a school year according to scholastic reports. Participants with ASD and SLI received speech-language therapy in English at the time of the study. Participants with ASD were verbal and attended a private school. Based on the inclusion criteria it can be suggested that this group falls into the high functioning group although an intelligence test was not conducted to select the participants. High functioning verbal children with ASD were specifically included as the CASL test material requires verbal answers. Participant characteristics are summarised in Table 2.1.

Table 2.1 Participant Characteristics (n=35)

	ASD (n=11)			SLI(n=12)			TD(n=12)		
	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
Age	103.9	13.13	84 - 131	93.3	8.48	84 - 107	103.1	13.00	86 - 129
# Languages exposed to	2	0.87	1 - 4	3	0.98	2 - 5	2	0.43	1 - 3
Age since exposure to English	2	2.15	0 [†] - 5	2	1.16	0 [†] - 4	0 [†]	0 [†]	0 [†]
Gender (%)	%			%			%		
Male	72.7			83.3			66.7		
Female	27.3			16.7			33.3		

[†] Since birth

All participants with ASD (n=11, mean age 103.9 months) had previously been diagnosed by a qualified clinician based on the DSM-IV-TR® (APA, 2000) or the ICD-10 (World Health Organisation (WHO), 1992).

The participants with SLI (n=12, mean age 93.4 months) presented with no neurological or genetic syndrome; physical, mental, or behavioural impairment; or developmental disorder other than SLI. Four speech-language therapists practicing in the same area previously diagnosed these participants with SLI as they met the criteria for a receptive and/or expressive language disorder (F80.2) as defined in the ICD-10 classification by the WHO (2010). The participants were also identified as being EAL. According to the WHO (2010) in most cases of a receptive language disorder expressive language is also affected. The participants with SLI all obtained a standard score lower than one standard deviation below the mean on language tests. Deficits in these areas contribute to the defining phenotype of SLI (Whitehouse et al., 2008).

The TD participants all presented with normal development and had no previous or current diagnosis of a developmental disorder. According to scholastic reports these participants performed academically on an average to above average level by obtaining between Substantial Achievement and Outstanding Achievement (60%–100%) on the Scale of Achievement for the National Curriculum Statement as specified in the Curriculum and Assessment Policy Statements (CAPS; Department of Basic Education, 2011).

The ages for participants with ASD and TD were similar, with larger age ranges and standard deviations than the participants with SLI. The participants with SLI were slightly younger than those with ASD, but not younger than the youngest participant with ASD. In terms of gender, an acceptable degree of equivalence was considered to be present between the three participant groups. The diversity in the ethnicity and home languages of the participants in the groups may be seen as typical of the South African urban school population. Even though many languages are represented in one classroom, of which the majority are African languages, English is both the language of learning and teaching and the language of mutual understanding between teachers and children (Naudé, 2006). Therefore, most school children in South Africa are receiving education in English as an additional language (Jordaan, 2011). All the participants, except for three (two with ASD

and one TD participant) were exposed to two or more languages at home, one of which was English in every case. Only three participants were monolingual, which could influence performance on the language test. Even though the different home language backgrounds could not be controlled in the study and could have influenced the results differently for each participant, all the participants have been exposed to English before they went to primary school (see Table 2.1). The participants therefore shared the multilingual characteristics of many South African learners. Although many South African children are exposed to multiple languages at home, English appears to be one of these languages in most cases (Naudé, 2006). Most of the participants were EAL learners, representing nine home languages.

2.5 MATERIAL AND APPARATUS

The following test procedures was conducted after written informed consent was obtained from parents of participants and written assent from participants. Test procedures included a case history questionnaire and the administration of the CASL (Carrow-Woolfolk, 1999).

2.5.1 Questionnaire

A case history questionnaire was developed which included open and closed-ended questions to obtain developmental and medical information of participants (Appendix F).

2.5.2 Language measure

The CASL was used as data collection tool to determine the oral language abilities of the participants. The CASL, an oral language assessment battery for ages three through 21, is based on the Integrative Language Theory (ILT), which suggests language is founded on two basic dimensions (Carrow-Woolfolk, 1999). According to ILT, language knowledge (the structure of language) and language performance (the process of comprehending and expressing language) provides the basis of spoken language. The content and procedures of the CASL reflect this combination of the cognitive, linguistic, and pragmatic areas of language in examining the language elements of spoken communication (language structure, meaning, and use) (Carrow-Woolfolk, 1999). The CASL provides an in-depth assessment of the oral language abilities of individuals which includes (1) the oral language processing system of auditory comprehension, oral expression, and word retrieval, (2) the knowledge and use of words and grammatical

structures of language, (3) the ability to use language for special tasks requiring higher-level cognitive functions, and (4) the knowledge and use of language in communicative contexts (Carrow-Woolfolk, 1999). Kelley (2011) further states that evaluating the communication abilities of an individual should not only be an assessment of the “verbal behaviour” of a child. The CASL is suitable for testing multiple aspects of language and includes the more traditional language subtests as well as pragmatic subtests (Kelley, 2011). The supralinguistic and pragmatic categories of the CASL are specifically appropriate to older children and high functioning children with ASD who may be ‘challenged by meaning that cannot be accessed directly through lexical and grammatical information’ (Bartlett et al., 2012, 693). The CASL appears to be a relevant language measure for this study as it is a relevant tool for children with ASD and SLI for a number of reasons: Reichow et al. (2008) suggested that the CASL (specifically the Pragmatic Judgement and Inferences subtests) is an acceptable tool to determine the social communication abilities in higher functioning children diagnosed with ASD. The CASL was also recommended as a measuring instrument to be used with children in middle childhood with SLI (Hoffman, Loeb, Brandel, & Gillam, 2011). The language categories and subtests of the CASL are summarised in Table 2.2.

Table 2.2 CASL Language Categories, Subtests, and corresponding Language Processes tested

Language Category	Subtest	Language Process
Lexical/Semantic abilities	Antonyms [†]	Expression, Retrieval
	Synonyms [‡]	Comprehension
	Sentence Completion [‡]	Comprehension/Expression, Retrieval
Syntactic abilities	Syntax construction [†]	Expression
	Paragraph Comprehension [†]	Comprehension
	Grammatical Morphemes [‡]	Expression
	Grammatical Judgement [‡]	Expression
Supralinguistic abilities	Non-literal Language [†]	Comprehension/Expression, World Knowledge
	Inferences [‡]	World Knowledge
Pragmatic abilities	Pragmatic Judgement [†]	Expression, World Knowledge

[†] Core subtests; [‡] Supplementary subtests

Ten subtests of the CASL form part of the core and supplementary subtests for the age range seven to 10 years (see Table 2.2): Antonyms, Synonyms, Sentence Completion, Syntax Construction, Paragraph Comprehension, Grammatical Morphemes, Grammatical Judgement, Non–literal Language, Inferences, and Pragmatic Judgement. These

subtests are grouped into four language categories, namely, lexical semantics, syntactic skills, supralinguistic skills, and pragmatics. A mean of 100 and standard deviation of 15 is set for each subtest.

2.6 DATA COLLECTION

2.6.1 Research setting

An office at each of the two schools was selected for data collection. The offices had similar, quiet environments. Testing occurred during or after school hours as arranged with parents and school teachers of participants.

2.6.2 Data collection procedures

The study commenced once written consent was received from relevant principals of the private schools (Appendix C), as well as ethical clearance obtained from the Research Ethics Committee of the Faculty of Humanities at the University of Pretoria (Appendix B). The data was collected in a once-off session for each participant. The data collection procedures were as follows:

- The principals of the two private schools were contacted to obtain permission to access databases to identify prospective participants.
- The principals gave written consent and speech-language therapists and a teacher at the schools assisted in the selecting of participants.
- Parents of participants were contacted telephonically and informed regarding the goals and procedures of the study. A letter of informed consent was sent to parents, who agreed that their child may participate, in order to give written consent to willingly participate in the research project (Appendix D). The letter of informed consent was sent via e-mail or as a hard copy. The case history form (Appendix F) was then sent to parents to be completed and submitted before the evaluation session.
- Data collection commenced in February 2014 and ended in July 2014.
- Individual appointments were scheduled for participants at the schools.
- On arrival, procedures were explained and written assent was obtained (Appendix E). A hearing screening was carried out where necessary.
- The language test was administered by the researcher, a certified speech-language therapist and audiologist. The duration of the evaluation was between 60 and 90

minutes during which the participants were given opportunity to rest between subtests. Tangible rewards were given during and after the session.

- Procedures described in the CASL assessment Manual (Carrow-Woolfolk, 1999) were followed to obtain standard scores.
- A sound recording was made of each evaluation session to ensure that accurate scoring of the oral answers of the participants could be conducted afterwards.
- The test results were scored by the researcher.
- After the language assessments were completed, scores were calculated and processed.

2.6.3 Procedures for data processing and analysis

The data was processed by calculating the mean and standard deviation scores according to the proposed guidelines of the CASL (Carrow-Woolfolk, 1999). All relevant data including biographical information from the case history forms was converted to numerical or alphanumeric form. Data was then captured in an Excel spreadsheet for further analysis.

- To ensure normality of the data, residuals were tested for independence. A normal probability plot was fitted against the residuals to ensure approximate normality. The residuals were also tested for stable variance using Bartlett's test. Obtaining normal distribution of the data ensured external validity of the study, although a small sample was used.
- Analysis of variance (ANOVA) was performed to determine whether significant differences existed in the language categories between the ASD, SLI and TD groups.
- Tukey's test was used to compare the differences between the means of the language categories of the three groups to determine which means were significantly different. Confidence intervals were constructed on the differences in all pairs of means. The group means were considered to be different if zero fell within the confidence interval.
- Since the sample size was small, the median and inter-quartile range values were used to summarise measurements and to describe the data spread around the measures of central tendency.
- The results were then transferred to tables and figures.

CHAPTER 3

3 COMPARING THE ORAL LANGUAGE ABILITIES OF CHILDREN WITH AUTISM SPECTRUM DISORDER AND SPECIFIC LANGUAGE IMPAIRMENT USING THE COMPREHENSIVE ASSESSMENT OF SPOKEN LANGUAGE (CASL)

Authors: Cecile Malan, Alta Kritzinger, Salomé Geertsema.
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3.1 ABSTRACT

Background: Since the adoption of the DSM-5, expressive language difficulties in children with autism spectrum disorder (ASD) may be under-emphasised in favour of social communication difficulties. A large body of research describes language impairment in children with ASD similar to children with specific language impairment (SLI), but research within a multilingual South African context is lacking. It appears that a comprehensive test such as the CASL has not been used to investigate the nature of these similarities, although this tool is recommended for these groups.

Objective: The aim of the study was to compare the oral language abilities of children in middle childhood with ASD and SLI to a matched control group of children with typical development (TD).

Method: A standard-group comparison design was used. Thirty five participants, aged seven to 10 years, were purposively assigned to three groups: ASD ($n=11$), SLI ($n=12$), and TD ($n=12$). Lexical semantic, syntactic, supralinguistic, and pragmatic abilities were investigated using the CASL. Most participants were English additional language (EAL) learners with diverse home languages.

Results: Results showed no significant differences between participants with ASD and SLI for lexical semantic, syntactic, and supralinguistic abilities, but were significantly different compared to the TD participants. For pragmatics, mean scores for the three

groups differed significantly, with ASD<SLI<TD. Some participants with ASD demonstrated patterns of oral language deficits similar to children with SLI.

Conclusion: The results suggest that pragmatic and supralinguistic abilities should be included in the language assessment of children with ASD and SLI. The CASL can be applied as a successful tool to identify specific language deficits in children with ASD, but may not fully describe oral language deficits such as echolalia in children with ASD. The study contributes to a database of multilingual South African children with language impairment.

Key Words

Autism spectrum disorder, English additional language learners, language impairment, middle childhood, multilingual, oral language, specific language impairment

3.2 INTRODUCTION

Autism Spectrum Disorder (ASD) and Specific Language Impairment (SLI) are two distinct disorders that present with various shared deficits in language abilities and social performance (Leyfer, Tager-Flusberg, Dowd, Tomblin, & Folstein, 2008). Language competence and language development are reflected in the oral language abilities of a child (Sterponi, De Kirkby, & Shankey, 2014). Impaired language competence may change over time, but for most children these deficits have a lifelong impact (Jansen et al., 2013; Owens, 2014).

ASD is currently viewed as a neurobiological disorder with genetic causes and behavioural markers that form the essence of the diagnosis (Guthrie, Swineford, Wetherby, & Lord, 2013). The Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5) (American Psychiatric Association, 2013) lists these observable markers as: deficits in social communication and interaction; and restricted, repetitive behaviour, interests, or activities. Expressive language deficits are no longer part of the diagnosis of ASD (Guthrie et al., 2013), but are rather viewed as a specifier to further describe the diagnosis as *with or without language impairment* (Lai, Lombardo, Chakrabarti, & Baron-Cohen, 2013). Children with ASD present with variability in oral language abilities; in fact, language impairment is viewed by some authorities as more extensive than commonly portrayed by formal diagnostic criteria (Groen, Zwiers, Van der Gaag, & Buitelaar, 2008). Although some children with ASD develop eloquent language later in childhood

(Boucher, 2012), delayed language development is still regarded as an important characteristic in early and middle childhood (Howlin, 2003). There is conflicting information, however, regarding the language abilities of children with ASD, especially during middle childhood. Research suggests that children with ASD present with different degrees of language impairment in addition to social communication deficits. Despite early intervention, which leads to better outcomes in the language skills of some children with ASD (Magiati, Moss, Charman, & Howlin, 2010), language impairments may still be present in middle childhood (Kelley, Niagles, & Fein, 2010; Suh et al., 2014).

SLI is a developmental clinical condition in which language disorders are considered a hallmark symptom (Rice, Warren, & Betz, 2005). SLI is diagnosed when a child presents with delays or deficits in language development, but with normal hearing, intelligence, and physical development, and all in the absence of ASD (Whitehouse, Barry, & Bishop, 2008). Although children with SLI often experience difficulties in both the receptive and expressive domains of language (Whitehouse et al., 2008), considerable heterogeneity has been noted in their language abilities (Lindgren, Folstein, Tomblin, & Tager-Flusberg, 2009; Tager-Flusberg, 2006). As with ASD, language impairments in SLI remain a relative weakness. Up to two-thirds of pre-school children with SLI will continue to have difficulty with language as adolescents (Owens, 2014).

The different language components i.e. phonology, morphology, syntax, semantics, and pragmatics (Groen et al., 2008; Owens, 2012) form a functional framework and represent the basic rule systems of language (Owens, 2012). These components are the focus of the following literature overview regarding the oral language abilities of children with ASD and those with SLI. Supralinguistic abilities are also discussed as it forms a unique part of the semantics, and is addressed in the Comprehensive Assessment of Spoken Language (CASL; Carrow-Woolfolk, 1999), the measuring instrument used in this study.

Over the last three decades a large body of research has been devoted to the possible overlap between the language abilities of children diagnosed with ASD and those with SLI. *Lexical semantics*, in particular semantic organisation, has been found to be deviant in both children with ASD (ASHA, 2006; Boucher, 2012; Eigsti, De Marchena, Schuh, & Kelley, 2011) and children with SLI (Owens, 2014; Sheng & McGregor, 2010). The difficulties in lexical semantics appear to overlap, but some unique and varied

characteristics are displayed by each group (Eigsti et al., 2011; McGregor, Oleson, Bahnsen, & Duff, 2013; Owens, 2014; Tager-Flusberg & Caronna, 2007). An overlap is also evident in the *syntactic abilities* of the two groups. It appears that common characteristics exist on a word level for the two groups (Boucher, 2012; Hesketh & Conti-Ramsden, 2013; Kjelgaard & Tager-Flusberg, 2001; McGregor et al., 2012; Owens, 2014; Rice et al., 2005; Williams, Botting, & Boucher, 2008), but there are certain unique differences in their sentence structures (Kim, Junker, & Lord, 2014; McGregor et al., 2012; Owens, 2014; Rice et al., 2005). *Supralinguistic abilities* develop during school-age years and include non-literal meaning, the use of sarcasm, inferences, and the interpretation of words (ASHA, 2006; Owens, 2012). For children with ASD, these abilities are also impaired (ASHA, 2006). Poor supralinguistic skills are not considered core deficits in children with SLI, but impairments do occur, as pointed out by Bartlett et al. (2012). Children with SLI and those with ASD who present with language impairment may therefore be expected to experience difficulty with supralinguistic skills. Deficits in *pragmatic abilities* form part of the defining features of ASD. This appears to be the most consistently impaired domain in individuals with ASD at all developmental stages and their area of greatest weakness (Eigsti et al., 2011; Groen et al., 2008; McGregor et al., 2012; Rice et al., 2005). Leyfer and colleagues (2008) have suggested, however, that some children with SLI may present with social impairments typical to children with ASD. Although an overlap may be present between children with ASD and those with SLI, it is generally accepted that children with SLI present with less severe pragmatic deficits.

Based on current evidence, children with ASD and with SLI present with difficulties across all the components of language. A better understanding of the overlapping and unique linguistic characteristics of the two groups will be conducive to more effective clinical treatment (Lindgren et al., 2009). It appears, however, that few studies have been conducted to describe the detailed oral language abilities of children diagnosed with ASD and SLI in South Africa, and less so with a focus on the school-aged population. Therefore few clearly distinguished descriptions of the nature of differences between children with ASD and those with SLI are available. In South Africa important factors such as multilingualism should also be taken into consideration. Limited research has been conducted to investigate the influence of African languages on the language development of multilingual children (Naudé, 2006). Multilingualism in schools is an international phenomenon and a reality in many countries (Naudé, 2006). In a typical

classroom, where many first languages are represented, of which the majority are African languages, English is both the language of learning and teaching (LoLT) and the language of mutual understanding between teachers and children (Naudé, 2006). English Additional Language (EAL) is therefore an additional characteristic for most children with ASD and SLI in South Africa.

Speech-language therapists in South Africa experience many challenges working in a multilingual and multicultural setting (Southwood & Van Dulm, 2015) and even more so than other professionals. Speech-language therapists need to act in response to the communication needs of an extensively diverse population, a challenge also experienced in the UK (Mennen & Stansfield, 2006). Southwood and Van Dulm (2015) concluded in their study of 150 participants in South Africa, that the majority of speech-language therapists were able to render services in English and Afrikaans and the minority in an African language. It therefore appears that most children with English as language of learning and teaching (LoLT) will receive speech-language therapy in English, even though English might not be their first or home language.

The challenge is to find an assessment tool that is both applicable to children from different first language backgrounds, and ASD and SLI. It appears that the CASL has not been used as an outcome measure to distinguish between the language deficits of school aged children with ASD and SLI. Aitken (2015) also remarked that the CASL is not a commonly used tool, especially for the ASD population. Van Dulm and Southwood (2013) conducted a study in which they determined the assessment materials mostly used by 238 speech-language therapists in South Africa. It appears that the CASL was not one of the tools listed considered as frequently used for language assessment. The CASL may therefore be a viable test to assist with differential diagnosis, to distinguish between the two disorders, and contribute to the debate. The CASL includes all the language components i.e. pragmatics as well as supralinguistic abilities – an essential language component when children in middle childhood are investigated. The CASL appears to be a relevant language measure for this study for a number of reasons: Paul and Sutherland (2003) recommended this tool to be used in the assessment of individuals diagnosed with ASD and Reichow et al. (2008) suggested that the CASL (specifically the Pragmatic Judgement and Inferences subtests) is an acceptable tool to determine the social communication abilities in higher functioning children with ASD. The

CASL was also recommended as a measuring instrument to be used with children in middle childhood with SLI (Hoffman, Loeb, Brandel, & Gillam, 2011). The CASL may therefore be a relevant tool, but it should be anticipated that some test items may not be culturally applicable to South African children.

This study aimed to contribute to an integrated description of differences and similarities between multilingual South African children with ASD and SLI by using an oral language test which encompasses the main areas of known differences between the two groups of children. The study also aimed to extend the South African literature of multilingual children with ASD and those with SLI.

3.3 METHOD

3.3.1 Aim

The aim of this study was to compare the oral language abilities (using comprehension, expression, and retrieval language processes) of matched groups of children with ASD, SLI, and TD. Specific oral language categories were investigated to determine if statistically significant differences were present in the *lexical semantic, syntactic, supralinguistic, and pragmatic abilities* of the three groups of participants.

3.3.2 Research Design

A standard-group comparison design was used which entailed a cross-sectional approach utilising a quantitative framework. Participants were purposively assigned to three groups: two groups were formed on the basis of diagnosis and a third group was utilised as a control.

3.3.3 Participants

Thirty five participants in middle childhood (aged seven to 10 years) were included in the study: 11 children with ASD, 12 children with SLI, and 12 TD children. The middle childhood years were targeted as both children with ASD and those with SLI may present with poor supralinguistic skills, which typically develop during the school years (Bartlett et al., 2012; Owens, 2012). Participants from the three groups were recruited by means of convenience sampling from two private schools. These two schools are inclusive educational institutions admitting children with ASD and SLI together with TD children. The three groups of participants were matched according to age. All the participants were

aged between seven and 10 (interval differences of three to four months were allowed); and the LoLT was English. All the participants were exposed to English as an academic language from Grade R, although they were all exposed to English to a certain extent before that (see Table 3.1). The socio-economic status (SES) of the participants was similar as they lived with their parents in similar suburbs in the same city and all could afford private education. Most of the mothers of participants had matric or some form of tertiary education, which also confirms the families' SES. Parents reported normal hearing and hearing screening was conducted in cases where information was lacking. Parents and teachers indicated that all participants showed appropriate yearly progress in school. None of the participants repeated a school year according to scholastic reports. Participants with ASD and SLI received speech-language therapy in English at the time of the study. Participant characteristics are summarised in Table 3.1.

Table 3.1 Participant Characteristics (n=35)

	ASD (n=11)			SLI(n=12)			TD(n=12)		
	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
Age	103.9	13.13	84 - 131	93.3	8.48	84 - 107	103.1	13.00	86 - 129
# Languages exposed to	2	0.87	1 - 4	3	0.98	2 - 5	2	0.43	1 - 3
Age since exposure to English	2	2.15	0 [†] - 5	2	1.16	0 [†] - 4	0 [†]	0 [†]	0 [†]
Gender (%)	%			%			%		
Male	72.7			83.3			66.7		
Female	27.3			16.7			33.3		

[†] Since birth

All participants with ASD ($n=11$, mean age 103.9 months) had previously been diagnosed by a qualified clinician based on the DSM-IV-TR® (American Psychiatric Association, 2000) or the ICD-10 (World Health Organisation (WHO), 1992). All the participants with ASD were verbal and attended a private school. Although an intelligence test was not conducted to select the participants, academic progress and inclusion criteria for this group suggest that they were all high functioning.

The participants with SLI ($n=12$, mean age 93.4 months) all had a documented history of language impairment. No neurological or genetic syndrome; physical, mental, or behavioural impairment; or developmental disorder other than SLI was present in this group. Speech-language therapists practicing in the same area previously diagnosed these participants with SLI as they met the criteria for a receptive language disorder (F80.2) as defined in the ICD-10 classification by the WHO (2010). According to the

WHO (2010) in most cases of a receptive language disorder expressive language is also affected, which was also the case in this study. The participants with SLI all obtained a standard score lower than one standard deviation below the mean on language tests. Deficits in these areas contribute to the defining phenotype of SLI (Whitehouse et al., 2008).

The TD participants ($n=12$, mean age 103.1 months) all presented with normal development and had no previous or current diagnosis of a developmental disorder. According to scholastic reports these participants performed academically on an average to above average level by obtaining between Substantial Achievement and Outstanding Achievement (60%–100%) on the Scale of Achievement for the National Curriculum Statement as specified in the Curriculum and Assessment Policy Statements (CAPS; Department of Basic Education, 2011).

The ages for participants with ASD and TD were similar, with larger age ranges and standard deviations than the participants with SLI. In terms of gender, an acceptable degree of equivalence was considered to be present between the three participant groups. All the participants, except for three (two with ASD and one TD participant were monolingual) were exposed to two or more languages at home, one of which was English in every case. Only three participants were monolingual. Even though the different home language backgrounds could not be controlled in the study and could have influenced the results differently for each participant, all the participants have been exposed to English before they went to primary school (see Table 3.1). The participants were mostly English additional language (EAL) learners, representing nine different home languages. The LoLT in the schools was English.

3.3.4 Materials

A questionnaire was developed which included open and closed-ended questions to obtain developmental and medical information of participants. The CASL (Carrow-Woolfolk, 1999) was used as data collection tool to determine the oral language abilities of the participants. The CASL, an oral language assessment battery for ages three through 21, is based on the Integrative Language Theory (ILT), which suggests language is founded on two basic dimensions. According to ILT, language knowledge (the structure of language) and language performance (the process of comprehending and expressing

language) provides the basis of spoken language. The content and procedures of the CASL reflect this combination of the cognitive, linguistic, and pragmatic areas of language in examining the language elements of spoken communication (language structure, meaning, and use) (Carrow-Woolfolk, 1999). The CASL is suitable for testing multiple aspects of language and includes the more traditional language subtests as well as pragmatic subtests (Kelley, 2011). The supralinguistic and pragmatic categories of the CASL are specifically appropriate to older children and high functioning children with ASD who may be 'challenged by meaning that cannot be accessed directly through lexical and grammatical information' (Bartlett et al., 2012: 693). The test yields high test-retest reliabilities as it provides definite and consistent results (Carrow-Woolfolk, 1999). The internal reliabilities show a high degree of item uniformity within the subtests and stability of CASL scores is evident in the test-retest study which was carried out (Carrow-Woolfolk, 1999). In terms of validity Carrow-Woolfolk (1999) indicates that the CASL obtained *content validity* as it sufficiently samples the domain it claims to measure; *construct validity* by measuring the underlying construct it declares; *criterion validity* because it is significantly related to similar assessments; and *clinical validity* because results of the instrument provide information to discriminate between special populations.

Ten subtests of the CASL form part of the core and supplementary subtests for the age range seven to 10 years, which are grouped into four language categories (see Table 3.2). A mean of 100 and standard deviation of 15 is set for each subtest.

Table 3.2 CASL Language Categories, Subtests, and corresponding Language Processes tested

Language Category	Subtest	Language Process
Lexical/Semantic abilities	Antonyms [†]	Expression, Retrieval
	Synonyms [‡]	Comprehension
	Sentence Completion [‡]	Comprehension/Expression, Retrieval
Syntactic abilities	Syntax construction [†]	Expression
	Paragraph Comprehension [†]	Comprehension
	Grammatical Morphemes [‡]	Expression
	Grammatical Judgement [‡]	Expression
Supralinguistic abilities	Non-literal Language [†]	Comprehension/Expression, World Knowledge
	Inferences [‡]	World Knowledge
Pragmatic abilities	Pragmatic Judgement [†]	Expression, World Knowledge

[†] Core subtests; [‡] Supplementary subtests

3.3.5 Procedures

The research was approved by the Research Ethics Committee of the Faculty of Humanities at the University of Pretoria (Reference number 26136482). Written informed consent was obtained from the parents of all participants and they completed a case history questionnaire. Following written assent of participants, they were individually assessed at the schools in offices with similar, quiet environments. The CASL was administered by oral instruction and either an oral response or pointing was required. All the data collection assessments were conducted by the first author. Regular breaks were given to all participants and tangible rewards were given during and after the session. Audio recordings were made to ensure accurate scoring. A control group of TD children was included as a point of reference in addition to the norms of the CASL, as the test is not a standardised measuring instrument in South Africa.

3.3.6 Data Analysis

Data was processed by calculating mean and standard deviation scores according to the guidelines of the CASL (Carrow-Woolfolk, 1999). To ensure normality of the data, residuals were tested for independence. A normal probability plot was fitted against the residuals to ensure approximate normality. The residuals were also tested for stable variance using Bartlett's test. Obtaining normal distribution of the data ensured external validity of the study, although a small sample was used. Analysis of variance (ANOVA) was performed to determine whether significant differences existed in the language categories between the ASD, SLI and TD groups. Significance was set at an alpha level of 0.1. Tukey's test was used to compare the differences between the means of the language categories of the three groups to determine which means were significantly different. Confidence intervals were constructed on the differences in all pairs of means. The group means were considered to be different if zero fell within the confidence interval. The overall significance level is at most 0.05 for unequal sample sizes. Since the sample size was small, the median and inter-quartile range values were used to summarise measurements and to describe the data spread around the measures of central tendency.

3.4 RESULTS

Across the CASL subtests, 80% of the participants were able to complete the full test. As described in the CASL guidelines, a standard score cannot be computed if a child scored

zero for a subtest. The participants who failed to complete the CASL all obtained scores of zero in specific subtests. Results from these participants were omitted when the results from the supralinguistic category were analysed as the incomplete subtests were only from this category. The supralinguistic category consisted of the Inferences and Non-literal Language subtests. Six participants (three participants with ASD and three with SLI) were unable to obtain scores for the Inferences subtest and two participants with ASD for Non-literal Language, which may indicate that the test items were too difficult, either in content or due to unfamiliar vocabulary. It seems that making inferences was difficult for participants with ASD and SLI alike (mean scores 73.1 and 83.1). It is important to note that the Inferences subtest was also an area of difficulty for the TD participants (mean 94), as evidenced by the fact that their mean fell below the mean for the standardisation group of the original CASL.

3.4.1 Lexical semantic skills

The results are presented in Tables 3.3, 3.4, and 3.5, and in Figure 1.

Table 3.3 CASL results: Number of standard deviations (SDs) below the mean

	ASD (n=11)								SLI (n=12)							
	# of SDs below the mean								# of SDs below the mean							
	0	0.5	1	1.5	2.0	2.5	3	3.5	0	0.5	1	1.5	2.0	2.5	3	3.5
Lexical Semantic	0	0	2	3	4	1	0	1	0	2	4	5	0	1	0	0
Syntactic	1	0	1	4	2	2	1	0	3	1	3	2	2	1	0	0
Supralinguistic[†]	0	1	1	2	2	1	0	0	1	3	3	1	1	0	0	0
Pragmatic	0	0	0	2	3	2	3	1	0	1	4	3	3	1	0	0

[†] ASD n=7; SLI n=9

Table 3.4 Language Structure Category Scores (ANOVA and Tukey)

ANOVA		Lexical Semantics	Syntactic	Supra-linguistic[†]	Pragmatics
F_{test}		35.69*	25.95*	19.4*	38.39*
F_{crit}		2.48	2.48	2.53	2.48
Tukey					
ASD SLI	Lower Limit	-18.94	-19.62	-20.65	-23.41
	Upper Limit	0.75	2.88	0.11	-3.15
ASD TD	Lower Limit	-42.28	-42.70	-33.85	-45.58
	Upper Limit	-22.59	-20.21	-14.25	-25.32
SLI TD	Lower Limit	-32.96	-34.08	-22.86	-32.07
	Upper Limit	-13.70	-12.08	-4.69	-12.26

[†] ASD n=7; SLI n=9; *p<0.001

Table 3.5 Language Category Scores (Mean, Standard Deviation, Range)

	ASD (<i>n</i> =11)			SLI (<i>n</i> =12)			TD (<i>n</i> =12)		
	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
Lexical/Semantics	71.8	9.94	51 - 87	80.9	9.05	62 - 96	104.3	9.70	90 - 120
Syntactic	75.5	11.24	58 - 98	83.9	13.08	61 - 102	107.0	7.80	94 - 125
Supralinguistic	77.3 [†]	8.89	66 - 93	87.6 [‡]	9.93	71 - 107	101.3	6.54	90 - 110
Pragmatics	64.6	10.43	48 - 81	77.9	9.04	60 - 90	100.1	10.03	88 - 122
Highest	77.3	Supralinguistic		87.6	Supralinguistic		107.0	Syntactic	
Lowest	64.6	Pragmatics		77.9	Pragmatics		100.1	Pragmatics	

[†] ASD *n*=7; [‡] SLI *n*=9

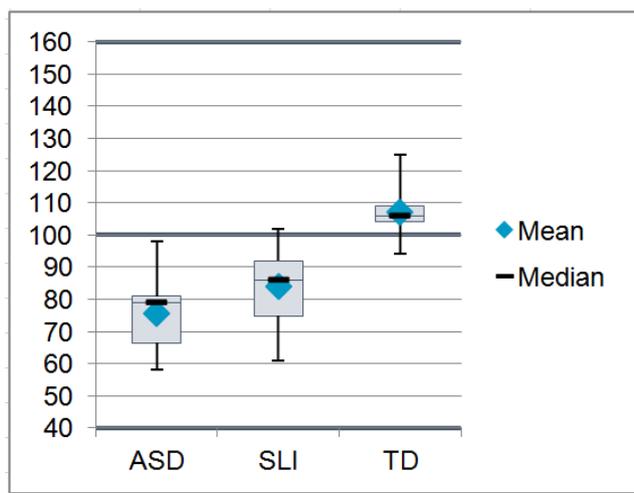


Figure 1 Lexical Semantic Skills Box Plot (Bottom of the grey box represents the 25th percentile and the top the 75th percentile).

The means of the participants with ASD and SLI were respectively two standard deviations and one standard deviation below the mean of the CASL for this category (see Table 3.3). As depicted in Table 4 the ANOVA test confirmed a significant difference in the lexical semantic abilities of the ASD, SLI, and TD participant groups. The difference between the mean scores for the participants with ASD and SLI, however, was not significant according to Tukey’s test. Tukey’s test further confirmed that these two groups scored significantly lower than their typically developing peers. Mean scores of the participants with SLI (80.9; see Table 3.5) had a very small inter-quartile range of 8 with the 25th and 75th percentiles at 77 and 85 respectively, which were both close to the median at 82 (Figure 1). The mean was therefore a good representative of the data set, which is an indication that the CASL may be a sensitive tool for identifying lexical semantic deficits in South African children with SLI. When pragmatic scores were excluded, participants with ASD and participants with SLI obtained the lowest scores for

this language category and for the category *syntactic abilities*. These results are in accordance with findings reported by Kjelgaard and Tager-Flusberg (2001), who also found deficits in lexical semantics in children with ASD and SLI.

3.4.2 Syntactic skills

The results regarding the syntactic abilities of the three groups of participants are presented in Tables 3.3 and 3.4, and Figure 2. According to Table 4 the ANOVA confirmed a significant difference in the syntactic abilities of the ASD, SLI, and TD participant groups. Further analysis (Tukey’s test) showed that the mean scores for participants with ASD and SLI did not differ significantly (Table 3.4). The score for these two groups differed significantly from the mean score of the TD group.

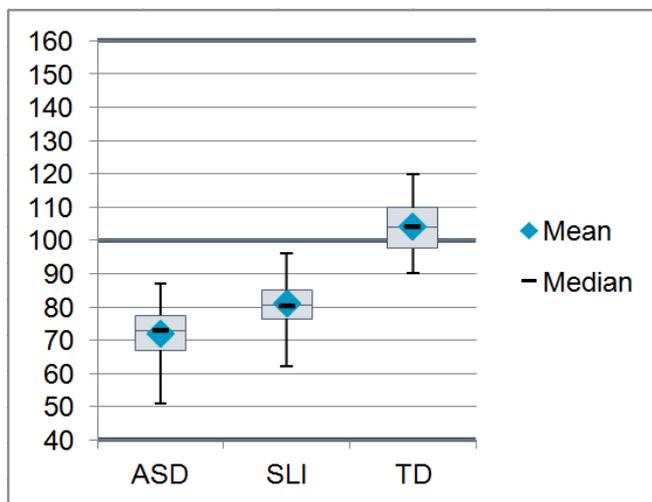


Figure 2 Syntactic Skills Box Plot (Bottom of the grey box represents the 25th percentile and the top the 75th percentile).

The data spread for the ASD and SLI groups was large (Figure 2). These results confirm the great variability found by other researchers for children with ASD (Groen et al. 2008) and SLI (Lindgren et al., 2009; Tager-Flusberg, 2006). In contrast with the results for these two groups, the TD participants obtained scores that were grouped closely together (Figure 2), which resulted in a very small inter-quartile range (5) with the 25th percentile at 104, 109 for the 75th percentile, and the median 106. The mean (107) was therefore an acceptable representation of the TD group’s performance, indicating age appropriate results. As depicted in Table 3.3 the participants with ASD scored 1.5 standard deviations and the SLI participants scored one standard deviation below the mean. These results are in line with findings from McGregor and colleagues (2012).

Similarities in the groups with ASD and SLI were seen in difficulties with regular and irregular past tense verbs, third person singular, and pronoun use. These errors were also described by Boucher (2012), Hesketh and Conti-Ramsden (2013), McGregor et al. (2012), Owens (2014), Rice et al. (2005), and Williams et al. (2008) for both groups. The two groups also performed poorly with regard to regular plurals, progressives (ing), and auxiliary verbs. Rice et al. (2005) reported similar findings for children with SLI but not for children with ASD. Further errors were seen with irregular plurals, negative forms (contractions), and imitation for both population groups. Differences in syntactic abilities were evident in the incorrect use of comparative degree in participants with ASD, whereas participants with SLI used incorrect superlative degree. Participants with SLI also had difficulty using adverbs, suffixes, and adverbs correctly.

3.4.3 Supralinguistic skills

Tukey's test revealed that the participants with ASD and SLI scored significantly lower than the TD group. Participants with SLI scored less than 0.5 and the participants with ASD scored less than one standard deviation below the mean of the CASL. The mean scores for the two groups (participants with ASD and SLI) did not differ significantly, which is in line with findings from Bartlett et al. (2012).

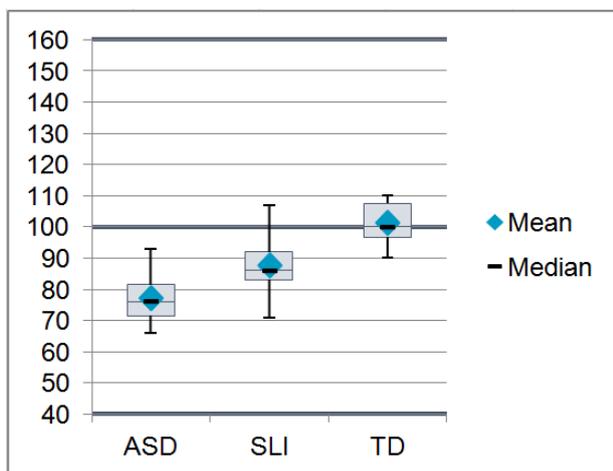


Figure 3 Supralinguistic Skills Box Plot (Bottom of the grey box represents the 25th percentile and the top the 75th percentile).

It is clear from the current results (see Figure 3) that great variability exists among the participants with SLI. Variability is also evident for participants with ASD, but less for the TD group.

3.4.4 Pragmatic skills

According to Tukey's test there was a significant difference in the scores for pragmatic judgment between participants with ASD and with SLI, participants with ASD and TD participants, and between the participants with SLI and TD participants (Table 3.4). This was the only language category where a significant difference was present between all three groups. The TD participants scored within the normal range, whereas the participants with ASD scored 2.5 standard deviations and participants with SLI scored 1.5 standard deviations below the mean (Table 3.3).

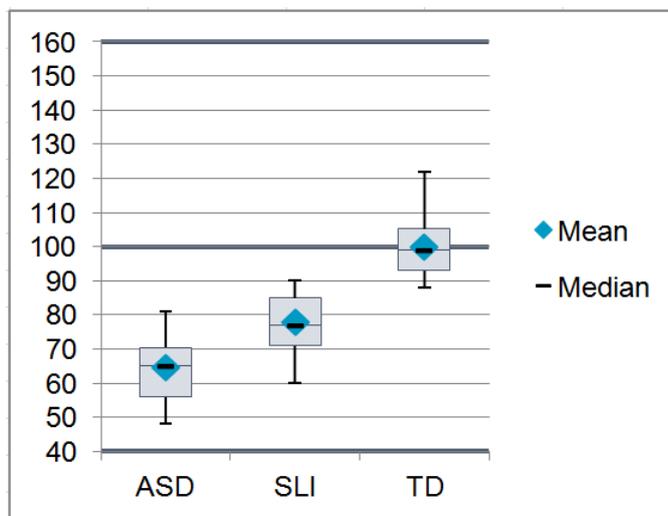


Figure 4 Pragmatic Skills Box Plot (Bottom of the grey box represents the 25th percentile and the top the 75th percentile).

Great variability was present in the pragmatic scores for all three groups (Figure 4). The data spread was large in each case, which is indicative of distinct individual differences. Even though poor pragmatic skills have been identified as the greatest limitation for children with ASD (Rice et al., 2005), deficits found in this study were diverse. Examples of areas of difficulty for participants in the current study were expressing regret for someone else's disappointment, inquiring (requesting information), and giving a respectful compliment.

When comparing the language category scores, pragmatics was the lowest scoring category for all three groups (Table 3.5). Results for participants with ASD are in accordance with the statement by McGregor et al. (2012) that this domain was identified

as the area of greatest weakness in children with ASD. Similar scores were obtained in a study by Bartlett et al. (2012).

3.5 DISCUSSION

Kjelgaard and Tager-Flusberg (2001, 287) hold the view that ‘problems in language are central to our understanding of autism’. Based on results from the current study and evidence from several earlier studies it is clear that some children with ASD share patterns in language deficits with children with SLI (Kjelgaard & Tager-Flusberg, 2001) and that children with SLI may also present with pragmatic deficits, a characteristic symptom of ASD (Leyfer et al., 2008). This discussion describes the patterns in language deficits as they emerged from the rich data obtained from the CASL.

In terms of lexical semantic skills the results of the present study are consistent with the findings reported by McGregor et al. (2012) who noted that a group with ASD (with syntactic deficits that characterise SLI) and a group with SLI both scored significantly lower on lexical semantic depth than their age-matched peers. A significant positive correlation between the depth of lexical semantics and expressive syntactic abilities was confirmed by McGregor et al. (2012). According to these authors, not all children with ASD present with syntactic and lexical semantic deficits. However, some children with ASD do present with syntactic deficits and are likely to display sparse lexical semantic abilities as well (McGregor et al., 2012). This relationship between lexical semantics and syntactic abilities was also evident in the present study as participants with ASD and those with SLI scored significantly lower than the TD group on syntactic and lexical semantic scores. On average, the participants with SLI scored slightly better than those with ASD, although the difference was not statistically significant.

In the current study participants with ASD as well as participants with SLI presented with deficits on the morphological level of syntactic abilities. Overlaps and some differences were evident between the groups. Syntactic skills seem to be regarded generally as the area of language affected most in children with SLI, whereas lexical semantics are affected to a greater extent in children with ASD (Owens, 2004). In contrast, results from the study in hand showed that both participants with ASD and with SLI obtained lower scores for lexical semantics than for syntactic skills.

Supralinguistic skills represent a third language category which is not always included in the language assessment battery when language deficits of children with ASD and SLI are investigated. Results of the present study revealed that this was an area of difficulty for most participants with ASD and SLI. The inference subtest was especially difficult as even the TD participants scored below the suggested average. Inference, according to Carrow-Woolfolk (1999), is based on previously acquired knowledge that is used to draw meaning from inferences in spoken language. Two questions of the Inferences subtest may have been unfamiliar to South African children as they dealt with earthquakes and a basketball player. Earthquakes are not typical natural disasters that occur in South Africa and basketball is not as commonly played as in the US where the CASL was standardised. Some South African children might know about earthquakes and basketball players, but these concepts may not be general knowledge to all. If these two questions were taken into account and marks were allocated where applicable, it had a minimal effect on the results. The general world knowledge of the South African TD participants may be considerably different from that of the original test population of the CASL and adaptations may need to be made in this regard.

Finally, pragmatics was the weakest area of all the areas assessed across all participants. Significant differences were apparent between the participants with ASD, SLI, and TD with mean scores showing $ASD < SLI < TD$. These results are in line with previous findings from Leyfer et al. (2008). Helland, Lundervold, Heimann, and Posserud (2014) concluded in their study that language impairment in seven to nine year old children with behaviour problems was a significant predictor of pragmatic deficits in adolescence. Pragmatic deficits in children with SLI were also reported to be secondary to deficits in semantics and syntax (Leyfer et al., 2008; McGregor et al., 2012; Rice et al., 2005). It is possible that the language deficits in participants with SLI contribute to the pragmatic difficulties they display. Some children with SLI present with pragmatic deficits similar to those found in children with ASD (Leyfer et al., 2008) even though these deficits might be caused by different factors. The low scores of participants with SLI confirmed previous data that this population present with pragmatic deficits (Donlan & Masters, 2000; Hart, Fujiki, Brinton & Hart, 2004; Rice et al., 2005). These results accentuate the importance of including pragmatics skills in the linguistic assessment and intervention of children with SLI (Leyfer et al., 2008). It should be noted that although the CASL offers some information on pragmatic deficits, a structured test may mask the

peculiarities in the oral language of children with ASD. A language sample should therefore be conducted in addition to a structured test to obtain the full view of the pragmatic deficits of a child (Suh, 2012). A weakness of the CASL is the limitation to fully describe the pragmatic deficits of children with ASD. The inclusion of the supralinguistic category in the test may be viewed as a strong point.

Participants in this study demonstrated great variability in language abilities. Scores obtained by participants with ASD and SLI on the CASL revealed deficits that ranged from near average to severe, with the only significant difference between the ASD and SLI groups noted in pragmatic abilities. SPD is considered a subtype of SLI in the UK. This diagnosis is made when children with SLI present with deficits in pragmatic skills while structural language is fairly intact (Bishop, 2000). In the DSM-5 SPD falls under the category Social (Pragmatic) Communication Disorder (SCD) which is characterised by 'difficulty with verbal and nonverbal communication that cannot be explained by low cognitive ability' (APA, 2013). SPD is distinguished from ASD as ASD includes restricted and repetitive behaviour patterns, activities, or interests which are not part of SPD (APA, 2013). ASD should therefore be ruled out to be able to diagnose SPD (APA, 2013). In the present study, three participants with SLI met this criterion, but were not identified before the study as presenting with SPD.

Across the language categories, the majority of participants with ASD and SLI scored one or more standard deviations below the mean of the CASL (Tables 3.3 and 3.5). The result of the participants could have been influenced by their differing home languages, which could not be controlled for. These scores arguably warrant clinical concern (McGregor et al., 2012) and point to the importance of including a wide variety of language categories when identifying language impairment as a specifier contributing to the diagnosis of children with ASD in middle childhood. The CASL is suggested as a commendable example of such an identification tool in conjunction with the support of language sampling. It also appears to be sensitive in identifying pragmatic deficits in SPD. This study makes a contribution towards a research database of multilingual South African children with language impairment.

3.6 CONCLUSION

Similarity in the linguistic profiles of children with ASD and children with SLI pointed to common goals for language intervention (McGregor et al., 2012). Although derived from a small sample, the findings from the current study highlighted the prominence of oral language deficits in children with ASD and SLI in middle childhood and the overlap between the language deficits of these groups. The DSM-5 provides new guidelines separating language impairment from the core features of ASD. Findings from this study suggest that the language impairment of children with ASD and those with SLI can be seen on a continuum. A difference is seen in the severity of the language impairment of these two groups, rather than a difference in the nature of language impairment. The shift away from language impairment in ASD must however not lead to an under emphasis to the severe difficulties in language abilities that may be present in children with ASD, and most notably so in middle childhood. The language abilities of the participants with ASD in the present study ranged from near-average to severe difficulties. The wide range in severity pointed to the importance of comprehensive language assessment of children in middle childhood with ASD which should provide guidelines for intervention to treat specific needs (Lewis, Murdoch, & Woodyatt, 2007). The results of the study may therefore contribute to the debate about language differences and similarities between children with ASD and SLI.

The results were furthermore specifically relevant to the South African context as the findings were in line with previous studies conducted elsewhere, even though the participants were mostly bilingual or multilingual and EAL learners, a typical feature of South African children. Understanding the similarities and differences between these two groups is important for treatment implications in clinical practice (Lindgren et al., 2009) seeing as it is the responsibility of speech-language therapists to support individuals to be 'competent communicators in the language of their communities' (McLeod, 2014, 208). McLeod further states that a mismatch in the languages spoken by speech-language therapists and their clients is often experienced as the majority of the global population is multilingual and more than 7000 languages are spoken in the world. In Australia, English is the main language used during assessment and intervention for multilingual children (McLeod, 2014). South African speech-language therapists also mainly use English as well as Afrikaans when rendering services to multilingual children (Southwood & Van

Dulm, 2015). A great need exists to support South African speech-language therapists in providing services to the multilingual population.

The fact that first language concordance could not be controlled across the groups is both a threat to the internal validity of the study, and also a strong point. The home languages of the participants could have influenced the results of each child in a different way. The study, however, recognises the diversity in home languages of South African children with language impairment.

CHAPTER 4

4 DISCUSSION AND CONCLUSION

4.1 DISCUSSION OF RESULTS

Since the publication of the new DSM-5 in May 2013, it appears as if the focus has shifted away from the expressive language difficulties of children with ASD to emphasise their social communication difficulties. Numerous researchers have confirmed, however, that many children with ASD present with language impairment similar to that in children with SLI. A significant body of research has been devoted to the overlaps and differences in language impairment between children with ASD and those with SLI. It appears that a comprehensive measure of multifaceted oral language abilities, such as the CASL, has not been used to investigate the differences in language impairment in children with ASD and SLI in middle childhood, specifically in the South African context. This study examined the difficulties in oral language that South African EAL children with ASD and those with SLI in middle childhood experience. This discussion describes the patterns in language deficits as they emerged from the rich data obtained from the CASL.

According to the results of the study great variability was measured in the language abilities of participants with ASD and those with SLI where the majority of participants from both groups scored one or more standard deviations below the mean of the CASL (Table 4). The results of the lexical semantic skills were consistent with the findings reported by McGregor et al. (2012) who confirmed a significant positive correlation between the depth of lexical semantics and expressive syntactic abilities. This relationship between lexical semantics and syntactic abilities was also evident in the present study, although the participants obtained lower scores for lexical semantics than for syntactic skills.

There appears to be clinical significance in the results indicating that intervention goals should target both semantic and syntactical deficits as gains in one area may benefit gains in the other area. The poor lexical semantic scores obtained by the participants may be reflected in the supralinguistic results, as this was an area of difficulty for most of the participants. Some of the ASD and SLI participants failed to obtain standard scores for this category and the TD participants scored below the average for the Inferences subtest. A reason may be that most of the participants were EAL learners or it is an

indication that the test items were too difficult, either in content or due to unfamiliar vocabulary. Supralinguistic skills are not always included in the language assessment battery when language deficits of school aged children with ASD and SLI are investigated. The results of this study suggest that this is an important area to include in the language assessment, especially for children in middle childhood.

Pragmatics was the weakest area of all the areas assessed across all participant groups. The results are in line with previous findings from Leyfer et al. (2008) and confirm the importance of including pragmatics skills in the linguistic assessment and intervention of children with SLI (Leyfer et al., 2008). Semantic Pragmatic Disorder (SPD), a subtype of SLI in the UK, is diagnosed when children with SLI present with deficits in pragmatic skills while structural language is fairly intact (Bishop, 2000). SPD is distinguished from ASD as ASD includes restricted and repetitive behaviour patterns, activities, or interests which are not part of SPD (APA, 2013). In the present study, three participants with SLI met this criterion of SPD, but were not identified as such before the study.

The majority of participants with ASD and SLI scored one or more standard deviations below the mean of the CASL across the language categories. These scores arguably warrant clinical concern (McGregor et al., 2012) and point to the importance of including a wide variety of language categories when identifying language impairment as a specifier, contributing to the diagnosis of children with ASD in middle childhood. The CASL as language measuring instrument is therefore suggested as a practical example of such a tool. The CASL also appears to be sensitive to identify pragmatic deficits also seen in SPD although caution should be taken as the test addresses only specific areas of pragmatic language (Suh, 2012). Researchers and clinicians suggest the use of spontaneous speech and language samples to be used in combination with formal tests for the evaluation of pragmatic deficits (Young et al., 2005). Reichow et al. (2008) investigated the use of the CASL as a valid instrument to assess everyday language in children with ASD. These authors found that the Pragmatic Judgement and Inferences (part of the supralinguistic language category) significantly correlated with the communication and social abilities of the Vineland (Sparrow et al., 1984), suggesting that this tool identifies the severe social communicative deficits observed in children with high functioning ASD.

According to Hoffman et al. (2011) the CASL further correlates with another norm-referenced measure of overall language skills, the Test of Language Development – Primary, Third Edition [TOLD–P:3] (Newcomer & Hammill, 1997). Even though the CASL and the TOLD–P:3 are based on different theoretical frameworks, Hoffman et al. (2011) confirmed the robustness of these tools when used with children in middle childhood diagnosed with SLI. These two language measures are also described to be ‘highly associated for clinical and research purposes’ (Hoffman, et al., 2011, 1605). The population, children in middle childhood with language impairment, is specifically relevant to the caseload of many speech-language therapists (Hoffman et al., 2011). The CASL furthermore appears to be a relevant tool to use. Firstly, as it includes the supralinguistic language category which specifically develops during the middle childhood years and secondly, because this is an area of difficulty for children with ASD and those with SLI as seen in the results of this study and reported by Bartlett et al. (2012) and Owens (2012).

The Language in Education Policy [LiEP] (Department of Education, 1997) stipulates the right of children to be educated in the language of choice (i.e. one of the 11 official languages) which promotes multilingualism in a framework where both the home language and additional language(s) are supported (also known as additive bilingualism) (Kathard et al., 2011). The promotion of multilingualism and additive bilingualism are also seen in Canada and certain European countries (McCabe, et al., 2013). McCabe et al. (2013, 3) refer to bilingualism or multilingualism in a positive light as ‘an entry card for the global economy’. In South Africa most children in grades one to three receive education in an African or home language (Kathard et al. 2011). From grade four as a consequence of the LiEP, the LoLT changes to English or Afrikaans even though many of these children were not exposed to these languages during grades one to three (Kathard et al., 2011).

Many South African parents, however, prefer that their child receive education in a school where the LoLT is English (Naudé, 2006). It appears that the majority of children receive education in EAL (Jordaan, 2011) and that English is the main language spoken in South Africa (Kathard et al., 2011) as it is the only language of mutual understanding (Naudé, 2006). Speech-language therapists in South Africa experience many challenges working in a multilingual and multicultural setting (Southwood & Van Dulm, 2015) and even more so than other professionals because they need to act in response to the communication

needs of a extensively diverse population, a challenge also experienced in the UK (Mennen & Stansfield, 2006). Southwood and Van Dulm (2015) concluded that in their study of 150 participants, the majority of speech-language therapists were able to render services in English and Afrikaans and the minority in an African language. It appears therefore that most children with English as LoLT will receive speech-language therapy in English, even though English might not be their first or home language. McCabe et al. (2013, 4) reported on research which indicates that the level of vocabulary and grammatical development in each of the languages in multilingual children is dependent on the 'relative and absolute amounts of exposure to each language'. The home or first language and EAL should therefore continue to be supported (McCabe, et al., 2013) in multilingual children. For EAL learners with ASD and SLI who have English as their LoLT and who receive speech-language therapy in English, it is expected that their development in English will improve. For improvement in the home or first language, increased access to adult conversation and child directed speech by mothers are may be a viable option considering that not many South African speech-language therapists are able to speak one or more African language (Southwood & Van Dulm, 2015).

4.2 CLINICAL IMPLICATIONS AND RECOMMENDATIONS

In this study the researcher report on the similarities and differences in the oral language deficits of children in middle childhood diagnosed with ASD and children with SLI. Understanding the similarities and differences between these two groups are important for treatment implications in clinical practice. The findings from the current study highlight the prominence of oral language deficits in children with ASD and SLI in middle childhood and the overlap between these groups. The research should be of interest to readers in the areas of ASD, SLI, oral language, and language impairment during middle childhood. The findings are clinically important firstly in terms of assessment: to address as many language components as possible, and secondly to treatment: vocabulary and syntax should be treated together as there may be mutual benefits (see McGregor et al. (2012) who described a correlation between these components). The CASL also aided to distinguish between ASD with language impairment and SPD in conjunction with the DSM-5 which should be used by speech-language therapists. As confirmed by the results of this study, language impairment still presents in middle childhood and should not be overlooked. The question therefore is if language impairment can be improved, if not 'cured', as this will greatly benefit academic performance.

4.3 CRITICAL ASSESSMENT OF STUDY STRENGTHS AND LIMITATIONS

The strengths and limitations of this research study were considered critically. This critical evaluation aided to direct future and continuing research.

4.3.1 Strengths of the study

This study contributed in the first place to the existing body of literature about the differences and similarities between school-aged children with ASD and those with SLI by confirming the findings of Leyfer et al. (2008), McGregor, et al. (2012), and Bartlett et al. (2012) amongst others. The strength of the findings enhances of the knowledge base of speech-language therapists providing services to school-aged children diagnosed with ASD and SLI. Language milestones in children diagnosed with ASD are strongly related to long-term prognosis (Eigsti et al., 2011). Longitudinal research has also shown that gains in language acquisition, among others, predict positive outcomes in the hallmark features of ASD (ASHA, 2006). The promotion of understanding and the gaining of knowledge of the exact overlap of, and differences between the oral language abilities of children with ASD and SLI, may therefore have significant implications for intervention. The results from the CASL in the present study imply that the language impairments of the children with ASD and those with SLI can be seen on a continuum and not as separate categories. This does not necessarily mean that ASD and SLI are viewed on a continuum, but that the language impairments of the two groups differ in severity.

Secondly, multilingual South African children with high functioning ASD and SLI in middle childhood appear to be presenting with language impairment that warrants clinical concern even though they have been receiving speech-language therapy. The results also yield valuable information regarding the use of the CASL for assessing the oral language abilities of children with ASD and SLI in clinical practice. One of the unique features of the study was the inclusion of EAL participants, and therefore children from diverse cultural and first language backgrounds (see Table 2.1), the typical feature of South African learners.

4.3.2 Limitations of the study

Although the study addressed the research aim, there were limitations. Firstly, pragmatic abilities (as assessed by the CASL) are elicited in a restricted context and should optimally be supplemented with spontaneous language assessment to advance

developing intervention goals (Kim et al., 2014). Secondly, a small number of participants were included in this study and although normal distribution was obtained, it would be beneficial to replicate this study on a bigger scale.

4.4 FUTURE RESEARCH

This study described the oral language abilities of South African children in middle childhood with ASD and those with SLI. Suggestions for future and continuing research are as follows:

Firstly, it is evident that children with ASD and those with SLI still present with language deficits in middle childhood. Research is required to determine the effectiveness of language intervention in the middle childhood, as improved language abilities may benefit academic performance. Secondly, considering that most participants in this study were EAL learners, future investigations need to confirm if EAL has an impact on the results of a standardised tool such as the CASL. Thirdly, as observed in the results from this study and results of McGregor et al. (2012) it appeared that a correlation between the lexical semantic and syntactic abilities of children with ASD and SLI was present. It is recommended that this correlation should be investigated further as it could inform assessment and intervention procedures. Fourthly, the peculiarities, repetitions, difficulty to maintain topic, and echolalia observed in the oral language of children with ASD may be masked when only structured, standardised tests are being used. Therefore, it is strongly recommended that both the CASL and a spontaneous language sample is used to assess pragmatic abilities. Fifthly, it is recommended that the CASL is used as an assessment tool in South Africa on a larger group of participants to determine if any adaptations need to be made for future use in the South African context. Lastly, the study obtained information from a small number of participants. A similar study with a larger sample would yield valuable results for the South African literature and knowledge base.

4.5 CONCLUSION

Similarity in the linguistic profiles of children with ASD and children with SLI pointed to common goals for language intervention (McGregor et al., 2012). Understanding the similarities and differences between these two groups are important for treatment implications in clinical practice (Lindgren et al., 2009). Although derived from a small sample size, the findings from the current study highlighted the prominence of oral

language deficits in children with ASD and SLI in middle childhood and the overlap between the language deficits of these groups. The DSM-5 provides new guidelines separating language impairment from the core features of ASD. Findings from this study suggest that the language impairment of children with ASD and those with SLI can be seen on a continuum. A difference is seen in the severity of the language impairment of these two groups, rather than a difference in the nature of language impairment. The shift away from diagnosing language impairment in ASD must therefore not lead to an under emphasis of the severe difficulties in language abilities that may be present in children with ASD, and most notably so in middle childhood. The language difficulties of the participants with ASD in the present study ranged from near-average to severe. The wide range in severity in language impairment pointed to the importance of comprehensive language assessment of children in middle childhood diagnosed with ASD. Such an assessment should provide guidelines for intervention to treat specific needs (Lewis, Murdoch, & Woodyatt, 2007). The results of the study may therefore contribute to the debate about language differences and similarities between children with ASD and SLI. The fact that the findings were in line with previous international studies, even though the participants were mostly EAL learners, may guide future research on the topic. The study contributed to data on children with EAL in the caseloads of speech-language therapists in South Africa.

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APPENDICES

APPENDIX A

Submission to South African Journal of Communication Disorders



Cecile Malan <cecilemalan@gmail.com>

SAJCD Submission - 107: Confirming Receipt

Rochelle Flint <submissions@sajcd.org.za>
To: Cecile Malan <cecilemalan@gmail.com>

5 November 2014 at 13:01

Dear Cecile Malan

Ref. No.: 107

Title: Comparing the oral language abilities of children with autism spectrum disorder and specific language impairment using the Comprehensive Assessment of Spoken Language (CASL)
Journal: South African Journal of Communication Disorders

We confirm and thank you for submitting your manuscript. Please use the manuscript reference number given above in all future correspondence.

With the online journal management system that we are using, you will be able to track progress of the manuscript through the editorial process by logging into the journal's website:

Manuscript URL:

<http://www.sajcd.org.za/index.php/sajcd/author/submission/107>

Username: cecilemalan

Your article will now undergo a preliminary review by the editor to assess whether the article is within the focus of the journal.

Thank you for considering this journal to publish your work. If you have any questions, please do not hesitate to contact me.

Kind regards

Rochelle Flint

South African Journal of Communication Disorders

South African Journal of Communication Disorders

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Cecile Malan <cecilemalan@gmail.com>

SAJCD Editor Decision - 107: Resubmit for Review

Dr Anita Edwards <anitaedwards247@gmail.com>
To: Cecile Malan <cecilemalan@gmail.com>

19 January 2015 at 06:47

Dear Authors

Ref. No.: 107
Title: Comparing the oral language abilities of children with autism spectrum disorder and specific language impairment using the Comprehensive Assessment of Spoken Language (CASL)
Journal: South African Journal of Communication Disorders

Thank you for your submission.
Our decision is that you will need to revise the manuscript and resubmit the revisions for a further round of review.
Please see the comments from the reviewers (one included below and one available on the website).
Please resubmit within 8 weeks for a second round of review before a decision about whether to publish this article is reached.

Kind regards
Dr Anita Edwards
SAJCD
Cell 0832307704
anitaedwards247@gmail.com

Reviewer C:

Well done on a lovely piece of writing. The study seems well situated in the literature and your findings are certainly interesting. I am recommending 'accept with revisions'. Keep in mind I am a qualitative scholar rather than a quantitative scientist in interpreting my feedback.

Here are some thoughts, queries, wonderings..

- I believe that the findings probably aren't unexpected and your work mostly just agrees with the work of McGregor et al. and/or other scholars. If so, how is this paper making a substantial contribution to the field?

- I think the answer lies in the context. What is substantial is that you are beginning to build a base of literature around South Africa and South African students. Really emphasize this in your paper. State... this work is important is because it is a contribution to our knowledge about children in the South African/multi lingual context.

- I'd like more description about the children

- I'd be interested in a descriptive analysis of the responses to your questionnaire

- I wonder how these findings might generalize to a broader South African population (e.g. non private school).

- Where do you envision this work leads you? What next?

- Your paper has a very formulaic structure, which is partly what makes it so readable. I would add a bit more in the discussion.. go off script, what do you think about all this? outside the stats?

- Your conclusion is pretty weak and that's a sad way to end a nice paper. Hammer home the South African context. Restate your claims. At the moment it seems like you are admitting that the work has no new substantive information. Don't leave the reader with that.. tuck those thoughts in earlier in the discussion.
Best of luck.

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Cecile Malan <cecilemalan@gmail.com>

SAJCD Submission - 123: Confirming Receipt

Rochelle Flint <submissions@sajcd.org.za>
To: Cecile Malan <cecilemalan@gmail.com>

2 March 2015 at 19:54

Dear Cecile Malan, Alta Kritzinger, Salome Geertsema

Ref. No.: 123

Title: Comparing the oral language abilities of children with autism spectrum disorder and specific language impairment using the Comprehensive Assessment of Spoken Language (CASL)
Journal: South African Journal of Communication Disorders

We confirm and thank you for submitting your manuscript. Please use the manuscript reference number given above in all future correspondence.

With the online journal management system that we are using, you will be able to track progress of the manuscript through the editorial process by logging into the journal's website:

Manuscript URL:

<http://www.sajcd.org.za/index.php/sajcd/author/submission/123>

Username: cecilemalan

Your new submission will undergo a preliminary review by the editor to assess whether the article is within the focus of the journal.

Thank you for considering this journal to publish your work. If you have any questions, please do not hesitate to contact me.

Kind regards
Rochelle Flint
South African Journal of Communication Disorders

South African Journal of Communication Disorders
<http://www.sajcd.org.za/index.php/sajcd>

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APPENDIX B

Ethical Clearance – Faculty of Humanities, University of Pretoria



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Research Ethics Committee

15 November 2013

Dear Prof Kritzinger

Project: Comparing oral language abilities with autism spectrum disorders, specific language impairment and typical development using the CASL
Researcher: C Malan
Supervisor: Prof A Kritzinger
Department: Speech-Language Pathology and Audiology
Reference numbers: 26136485

Thank you for your response to the Committee's letter of 9 October 2013.

I am pleased to be able to tell you that the above application was **approved** by the **Research Ethics Committee** on 15 November 2013. 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 the actual research depart significantly from the proposed research, it will be necessary to apply for a new research approval and ethical clearance.

The Committee requests you to convey this approval to the researcher.

We wish you success with the project.

Sincerely

Prof Karen Harris
Acting Chair: Postgraduate Committee &
Research Ethics Committee
Faculty of Humanities
UNIVERSITY OF PRETORIA
e-mail: Karen.Harris@up.ac.za

APPENDIX C

Letter to Head of Private Schools

Written consent from principals



UNIVERSITEIT VAN PRETORIA
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Denkleiers • Leading Minds • Dikgopolo tša Dihlalefi

Faculty of Humanities
Department of Communication Pathology

May 2013
Preparatory School Principal
Mr M. Theunissen
Woodhill College
De Villebois Mareuil Drive
Faerie Glen
Pretoria
0043

Dear Mr Theunissen,

Comparison of oral language abilities of 7-11 year old children with autism spectrum disorders, specific language impairment, and typically developing children

I am a speech-language therapist, presently working at Tomorrow's People Independent Primary School in Pretoria. I am currently registered for the degree M Communication Pathology at the University of Pretoria. As part of the requirements of the degree, I am conducting a study regarding the oral language abilities of children diagnosed with Autism Spectrum Disorders (ASD), Specific Language Impairment (SLI), and typically developing children.

I hereby request permission to select children from Woodhill College to participate in this study. If my request is granted, your assistance will be required to identify prospective participants aged between 7 and 11 years with typical development achieving average to above average marks in school. I will need the contact details of parents of prospective participants to obtain their consent. Permission is also requested to perform the evaluations at your school after school hours.

The **purpose of this study** is to compare the oral language abilities of 7 to 11 year old South African children diagnosed with Autism Spectrum Disorders, Specific Language Impairment, and typically developing children. The results of this study aim to describe the differences and similarities in the oral language abilities of these groups. This may benefit differential diagnosis and treatment of these developmental disorders.

The **procedures** of this study entail an oral language assessment conducted on the children included in the study. Prospective participants' parents will be contacted. If they agree to their child's participation, an appointment will be made during which the assessment will take place. Parents and their children will be requested to give written consent before commencement of the evaluation. I will be conducting all the

University of Pretoria
Pretoria
0002
South Africa

cecilemalan@gmail.com
www.up.ac.za

Page 1

appointment will be made during which the assessment will take place. Parents and their children will be requested to give written consent before commencement of the evaluation. I will be conducting all the assessments. Each child will be assessed individually and an audio recording will be made of each session to ensure correct and accurate scoring.

Ethical clearance will be obtained from the Research Ethics Committee of the Faculty of Humanities at the University of Pretoria before commencement of the study.

Although the school will not directly **benefit** from this study, it will be broaden the knowledge base of speech-language therapists providing services to children diagnosed with Autism Spectrum Disorders and Specific Language Impairment. This will enhance intervention services.

Rights of the participants include the following: Participation is strictly voluntary. Parents and children will be given the opportunity to withdraw from the research project at any stage. Prospective participants will be informed that there will be no negative consequences should they withdraw from the study.

Strict **confidentiality** will apply throughout the study. Only the researcher, supervisors, and statisticians will have access to the information. No individual names will be mentioned in the results. Data will be statistically analysed and utilised for international publications or conference presentations on the mentioned topic. The results will also be recorded in a master's thesis. Should a participant withdraw from the study, all data obtained from the participant will be destroyed. According to University policy all data will be kept safe in the Department of Communication Pathology for a period of 15 years.

Your co-operation is highly appreciated. Should you need any further information you can contact me at 084 250 9347 or cecilemalan@gmail.com.

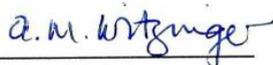
Yours sincerely



Miss Cecile Malan

Speech-Language Therapist & Audiologist

MCommunication Pathology student



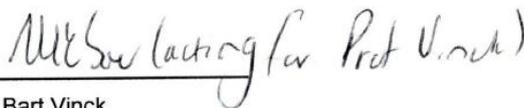
Prof Alta Kritzinger

Supervisor



Mrs Salomé Geertsema

Co-Supervisor



Prof Bart Vinck

Head: Department of Communication Pathology

WOODHILL COLLEGE



Tel: +27 (0) 12 998 1774 | Fax: +27 (0) 12 998 2507 | De Villebois Mareuil Drive Pretoria East | PO Box 1818 Faerie Glen 0043
E-mail: director@woodcol.co.za | Website: www.woodhillcollege.co.za

Consent form

I, Mike Theunissen, hereby give permission for children to be selected from Woodhill College to participate in this study. Contact details of parents of prospective participants will be provided. Evaluations may take place at Woodhill College after school hours.

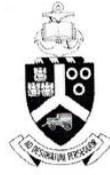
Date

8/11/2013

Signed

Managed by

Directors:



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Faculty of Humanities
Department of Communication Pathology

June 2013

The Principal
Mrs Z Botes
Tomorrow's People Independent Primary School
381 Selikats Causeway
Faerie Glen
Pretoria
0043

Dear Mrs Botes

Comparison of oral language abilities of 7-11 year old children with autism spectrum disorders, specific language impairment, and typically developing children

I am a speech-language therapist and currently registered for the degree MCommunication Pathology at the University of Pretoria. As part of the requirements of the degree, I am conducting a study regarding the oral language abilities of children diagnosed with Autism Spectrum Disorders (ASD), Specific Language Impairment (SLI), and typically developing children.

I hereby request permission to select children from Tomorrow's People Independent Primary School to participate in this study. If my request is granted, your assistance will be required to identify prospective participants aged between 7 and 11 years, diagnosed with Autism Spectrum Disorders (ASD) or Specific Language Impairment (SLI) and typically developing children achieving average to above average marks in school. I will need the contact details of parents of prospective participants to obtain their consent. Permission is also requested to perform the evaluations at your school after school hours.

The **purpose of this study** is to compare the oral language abilities of 7 to 11 year old South African children diagnosed with Autism Spectrum Disorders, Specific Language Impairment, and typically developing children. The data will be used aim to describe the differences and similarities in the oral language abilities of these groups. This may benefit differential diagnosis and treatment of children with these developmental disorders.

The **procedures** of this study entail an oral language assessment conducted on the children included in the study. Prospective participants' parents will be contacted. If they agree to their child's participation, an

University of Pretoria
Pretoria
0002
South Africa

cecilemalan@gmail.com
www.up.ac.za

Page 1

appointment will be made during which the assessment will take place. Parents and their children will be requested to give written consent before commencement of the evaluation. I will be conducting all the assessments. Each child will be assessed individually and an audio recording will be made of each session to ensure correct and accurate scoring.

Ethical clearance will be obtained from the Research Ethics Committee of the Faculty of Humanities at the University of Pretoria before commencement of the study.

Although the school will not directly **benefit** from this study, it will be broaden the knowledge base of speech-language therapists providing services at the school to children diagnosed with Autism Spectrum Disorders and Specific Language Impairment. This will enhance intervention services.

Rights of the participants include the following: Participation is strictly voluntary. Parents and children will be given the opportunity to withdraw from the research project at any stage. Prospective participants will be informed that there will be no negative consequences should they withdraw from the study.

Strict **confidentiality** will apply throughout the study. Only the researcher, supervisors, and statisticians will have access to the information. No individual names will be mentioned in the results. Data will be statistically analysed and utilised for international publications or conference presentations on the mentioned topic. The results will also be recorded in a master's thesis. Should a participant withdraw from the study, all data obtained from the participant will be destroyed. According to University policy all data will be kept safe in the Department of Communication Pathology for a period of 15 years.

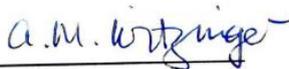
Your co-operation is highly appreciated. Should you need any further information you can contact me at 084 250 9347 or cecilemalan@gmail.com.

Yours sincerely



Miss Cecile Malan

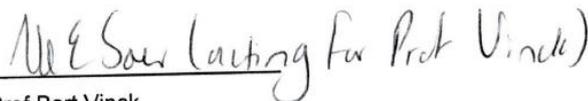
Speech-Language Therapist & Audiologist
MCommunication Pathology student



Prof Alta Kritzinger
Supervisor



Mrs Salomé Geertsema
Co-Supervisor



Prof Bart Vinck
Head: Department of Communication Pathology



Tel: 012 991 5051 | **Fax:** 012 991 5052
Email: info@tompeo.co.za
Website: www.tomorrowspeople.co.za
Street Address: 381 Selikats Causeway, Faerie Glen, 0043
Postal Address: P O Box 905 398, Garsfontein, 0042

28 October 2013

TO WHOM IT MAY CONCERN

I, Zelna Botes, in my capacity as Managing Director of Tomorrow's People Independent Schools hereby confirm that the Board of Directors is aware of the research topic and procedures involved in the study undertaken by Cecile Malan.

The Board of Directors further give permission to Cecile Malan to review the academic performance records of the children selected for the study, from Tomorrow's People Independent Primary School.

Sincerely

Zelna Botes
Managing Director





Tel: 012 991 5051 | **Fax:** 012 991 5052
Email: info@tompeo.co.za
Website: www.tomorrowpeople.co.za
Street Address: 381 Selikats Causeway, Faerie Glen, 0043
Postal Address: P O Box 905 398, Garsfontein, 0042

28 October 2013

TO WHOM IT MAY CONCERN

I, Zelna Botes, hereby give permission for children to be selected from Tomorrow's People Independent Primary School to participate in this study. Contact details of parents of prospective participants will be provided. Evaluations may take place at Tomorrow's People Independent Primary School after school hours.

Zelna Botes
Principal



APPENDIX D

Informed consent letter to Parents of participants with ASD, SLI, and TD (Private Schools)



June 2013

Dear Parents or Caregivers,

Comparing oral language abilities of children with autism spectrum disorders, specific language impairment, and typical development using the CASL

Thank you for letting your child participate in this study. All the necessary information regarding the study is explained in this letter.

I am a speech-language therapist presently working at Tomorrow's People School in Pretoria. I am currently registered for the degree M Communication Pathology at the University of Pretoria. As part of the requirements of the degree, I am conducting a study regarding the oral language abilities of children diagnosed with Autism Spectrum Disorders (ASD), Specific Language Impairment (SLI), and typically developing children. You are kindly requested to give written consent so that your child with Autism Spectrum Disorders or Specific Language Impairment may participate in my study.

The **purpose of this study** is to compare the oral language abilities of 7 to 11 year old South African children diagnosed with Autism Spectrum Disorders, Specific Language Impairment, and typically developing children. The results of this study aim to describe the differences and similarities in the oral language abilities of these groups. This may benefit differential diagnosis and treatment of these developmental disorders.

The **procedures** of this study entail that an oral language assessment will be conducted on your child. Once you have given written consent for your child to participate, an appointment will be made during which the individual assessment will take place. The assessment will be conducted at Tomorrow's People School after school hours and will be once off. You will be asked to complete a case history and information form and your child will be asked to give written assent before commencement of the evaluation. I will be conducting the evaluation which will take approximately 60 – 90 minutes. Periods of rest will be provided to your child during the session. Each child will be assessed individually and an audio recording will be made of each session to ensure correct and accurate scoring.

Ethical clearance has been obtained from the Research Ethics Committee of the Faculty of Humanities at the University of Pretoria.

University of Pretoria
Pretoria
0002
South Africa

cecilemalan@gmail.com
www.up.ac.za

Page 1

Although you and your child will not directly **benefit** from this study, the results will broaden the knowledge base of speech-language therapists providing services to children diagnosed with Autism Spectrum Disorders and Specific Language Impairment. This will enhance intervention services. A written report will be provided on request to discuss the results of your child's evaluation.

Rights of the participants include the following: Participation is strictly voluntary. You and your child will be given the opportunity to withdraw from the research project at any stage. There will be no negative consequences should you withdraw from the study.

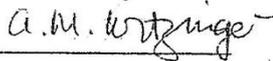
Strict **confidentiality** will apply throughout the study. Only the researcher, supervisors, and statisticians will have access to the information. No individual names or schools will be mentioned in the results. Data will be analysed statistically and utilised for international publications or conference presentations on the mentioned topic. The results will also be recorded in a master's thesis. Should a participant withdraw from the study, all data obtained from the participant will be destroyed. According to University policy all data will be kept safe in the Department of Communication Pathology for a period of 15 years.

Your co-operation is highly appreciated. Should you need any further information you can contact me at 084 250 9347 or cecilemalan@gmail.com.

Yours sincerely



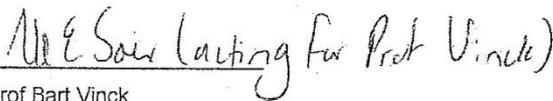
Miss Cecile Malan
Speech-Language Therapist & Audiologist
MCommunication Pathology student



Prof Alta Kritzinger
Supervisor



Mrs Salomé Geertsema
Co-Supervisor



Prof Bart Vinck
Head: Department of Communication Pathology

Consent for my child to participate in the study

I _____ parent of _____ hereby give written permission
for my child to participate in the study conducted by Miss Cecile Malan.

Date _____

Signed _____



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Faculty of Humanities
Department of Communication Pathology

June 2013

Dear Parents or Caregivers,

Comparison of oral language abilities of 7-11 year old children with autism spectrum disorders, specific language impairment, and typically developing children

Thank you for letting your child participate in this study. All the necessary information regarding the study is explained in this letter.

I am a speech-language therapist presently working at Tomorrow's People School in Pretoria. I am currently registered for the degree M Communication Pathology at the University of Pretoria. As part of the requirements of the degree, I am conducting a study regarding the oral language abilities of children diagnosed with Autism Spectrum Disorders (ASD), Specific Language Impairment (SLI), and typically developing children. You are kindly requested to give written consent so that your child with typical development may participate in my study.

The **purpose of this study** is to compare the oral language abilities of 7 to 11 year old South African children diagnosed with Autism Spectrum Disorders, Specific Language Impairment, and typically developing children. The results of this study aim to describe the differences and similarities in the oral language abilities of these groups. This may benefit differential diagnosis and treatment of these developmental disorders.

The **procedures** of this study entail that an oral language assessment will be conducted on your child. Once you have given written consent for your child to participate, an appointment will be made during which the individual assessment will take place. The assessment will be conducted at Woodhill College after school hours and will be once off. You will be asked to complete a case history and information form and your child will be asked to give written assent before commencement of the evaluation. I will be conducting the evaluation which will take approximately 60 – 90 minutes. Periods of rest will be provided to your child during the session. Each child will be assessed individually and an audio recording will be made of each session to ensure correct and accurate scoring.

Ethical clearance has been obtained from the Research Ethics Committee of the Faculty of Humanities at the University of Pretoria.

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Pretoria
0002
South Africa

cecilemalan@gmail.com
www.up.ac.za

Page 1

Although you and your child will not directly **benefit** from this study, the results will broaden the knowledge base of speech-language therapists providing services to children diagnosed with Autism Spectrum Disorders and Specific Language Impairment. This will enhance intervention services. A written report will be provided on request to discuss the results of your child's evaluation.

Rights of the participants include the following: Participation is strictly voluntary. You and your child will be given the opportunity to withdraw from the research project at any stage. There will be no negative consequences should you withdraw from the study.

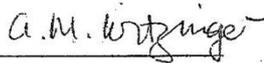
Strict **confidentiality** will apply throughout the study. Only the researcher, supervisors, and statisticians will have access to the information. No individual names or schools will be mentioned in the results. Data will be analysed statistically and utilised for international publications or conference presentations on the mentioned topic. The results will also be recorded in a master's thesis. Should a participant withdraw from the study, all data obtained from the participant will be destroyed. According to University policy all data will be kept safe in the Department of Communication Pathology for a period of 15 years.

Your co-operation is highly appreciated. Should you need any further information you can contact me at 084 250 9347 or cecilemalan@gmail.com.

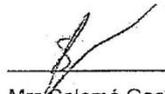
Yours sincerely



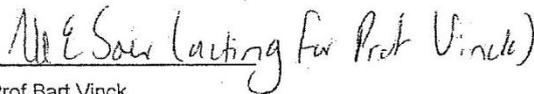
Miss Cecile Malan
Speech-Language Therapist & Audiologist
MCommunication Pathology student



Prof Alta Kritzinger
Supervisor



Mrs Salomé Geertsema
Co-Supervisor



Prof Bart Vinck
Head: Department of Communication Pathology

Consent for my child to participate in the study

I _____ parent of _____ hereby give written permission
for my child to participate in the study conducted by Miss Cecile Malan.

Date _____

Signed _____

APPENDIX E

Child assent form



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Department of Communication Pathology

June 2013

Dear _____

I would like to ask you to help me, Cecile Malan, with my project. I want you to answer some questions. You can give the answer that you think is right. Nothing will happen if you do not know the answer. If you would like to help me, please write your name on the smiling face. If you do not want to answer the questions, write your name on the sad face.

If you have any questions about my project or what you need to do, you are welcome to ask me.

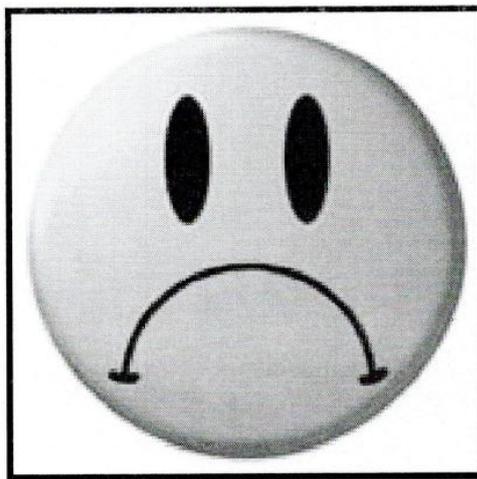
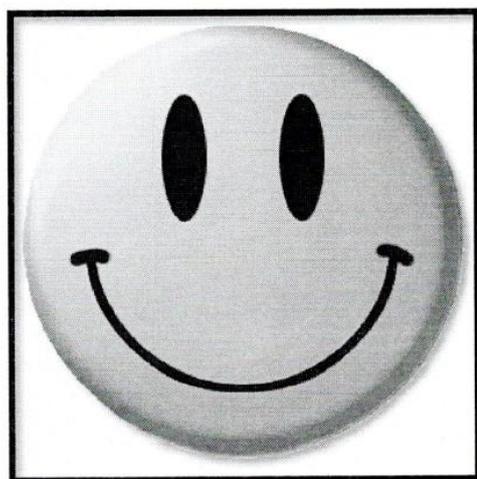
Yours sincerely

Cecile Malan

Miss Cecile Malan

Speech-Language Therapist & Audiologist

M Communication Pathology student



University of Pretoria
Pretoria
0002
South Africa

cecilemalan@gmail.com
www.up.ac.za

Page 1

Page | 10

APPENDIX F

Case history and information form (ASD and SLI, and TD)

Case History and Information Form

A

Information regarding your child

1 Name _____

2 Date of Birth _____

3 Age _____ years _____ months

4 Gender

Male	Female
------	--------

5 School _____

6 Home address _____

8 Home Language (mark all applicable boxes)

English	Afrikaans	isiXhosa	isiZulu	siSwati
Setswana	Xitsonga	Sesotho	Tshivenda	isiNdebele
Northern Sotho		Other: _____		

9 Other languages your child is exposed to (and from which age)

Language _____ Age _____

Language _____ Age _____

Language _____ Age _____

10 Language of Learning and Teaching (Educational Language) _____

B

General Background

1 Family structure: mark all the people that live at home

Mother	Father	Grandmother
Brother	Sister	Grandfather
Other: _____		

2 Number of siblings (write number) _____ brothers _____ sisters

3 Birth order of this child (e.g. first, second) _____

4 Family history of developmental disorders

Yes	No
-----	----

5 Family history of learning disorders

Yes	No
-----	----

C

Birth and Medical History
Mother

1 Duration of pregnancy _____ weeks

2 Difficulties during pregnancy _____

3 Type of delivery

Normal	C-section
--------	-----------

Child

4 Birth weight _____ kg

5 Difficulties after birth (specify if yes)

No

Yes : _____

6 Was your child admitted to the NICU after birth (Neonatal Intensive Care Unit)?

No

Yes, duration: _____ days

Case History and Information Form

7 Specify illnesses

8 Specify accidents

9 History of middle ear infection?

Yes	No
-----	----

9.1 If yes, how many times? _____

10.1 Has your child's hearing been tested?

Yes	No
-----	----

10.2 If yes, specify
Date: _____
Results: _____

11.1 Medication

None

Chronic: _____ dosage: _____
Reason for medication: _____

Other: _____ dosage: _____
Reason for medication: _____

D

Developmental History

Indicate the age of developmental milestones

1 Vocalize (making sounds)	_____ years	_____ months
2 Babble	_____ years	_____ months
3 Say first words	_____ years	_____ months
4 Use word combinations	_____ years	_____ months
5 Sit	_____ years	_____ months
6 Crawl	_____ years	_____ months
7 Walk	_____ years	_____ months

E

Feeding History and Current Eating Habits

1 Feeding

Exclusive breastfed
Breast and Formula
Formula

3 Age of introduction to solids? _____ months

4 Specify feeding difficulties

None

5 Specify food preferences

None

Case History and Information Form

F

Communication Difficulties

1 Age at which child's communication difficulties were noticed _____

2 Date of diagnosis _____

3 Doctor's name (who made diagnosis) _____

4 Speech-Language Therapy:

4.1 Starting date _____

4.2 Interval

monthly	weekly	every other week
---------	--------	------------------

4.3 Duration of sessions

60 min	45 min	30 min	15 min
--------	--------	--------	--------

4.4 Other therapies _____

G

Parent Information
Mother

1 Name _____

2 Age _____

3 Educational level _____

4 Occupation _____

5 Marital status _____

6 Area of residence (Suburb and Town) _____

Father

7 Name _____

8 Age _____

9 Educational level _____

10 Occupation _____

11 Marital status _____

12 Area of residence (Suburb and Town) _____

Thank you for completing the form, your co-operation is highly appreciated!



Case History and Information Form

A

Information regarding your child

1 Name _____

2 Date of Birth _____

3 Age _____ years _____ months

4 Gender Male Female

5 School _____

6 Home address _____

8 Home Language (mark all applicable boxes)

English	Afrikaans	isiXhosa	isiZulu	siSwati
Setswana	Xitsonga	Sesotho	Tshivenda	isiNdebele
Northern Sotho		Other: _____		

9 Other languages your child is exposed to (and from which age)

Language _____ Age _____

Language _____ Age _____

Language _____ Age _____

10 Language of Learning and Teaching (Educational Language) _____

B

General Background

1 Family structure: mark all the people that live at home

Mother	Father	Grandmother
Brother	Sister	Grandfather
Other: _____		

2 Number of siblings (write number) _____ brothers _____ sisters

3 Birth order of this child (e.g. first, second) _____

4 Family history of developmental disorders Yes No

5 Family history of learning disorders Yes No

C

Birth and Medical History
Mother

1 Duration of pregnancy _____ weeks

2 Difficulties during pregnancy _____

3 Type of delivery Normal C-section

Child

4 Birth weight _____ kg

5 Difficulties after birth (specify if yes)

No

Yes : _____

6.1 Was your child admitted to the NICU after birth (Neonatal Intensive Care Unit)?

No

Yes, duration: _____ days

Case History and Information Form

7 Specify illnesses

8 Specify accidents

9 History of middle ear infection? Yes No

9.1 If yes, how many times? _____

10.1 Has your child's hearing been tested? Yes No

10.2 If yes, specify
Date: _____
Results: _____

11.1 Medication None

Chronic: _____ dosage: _____
Reason for medication: _____

Other: _____ dosage: _____
Reason for medication: _____

D

Developmental History

Indicate the age of developmental milestones

1 Vocalize (making sounds) _____ years _____ months

2 Babble _____ years _____ months

3 Say first words _____ years _____ months

4 Use word combinations _____ years _____ months

5 Sit _____ years _____ months

6 Crawl _____ years _____ months

7 Walk _____ years _____ months

E

Feeding History and Current Eating Habits

1 Feeding Exclusive breastfed
 Breast and Formula
 Formula

3 Age of introduction to solids? _____ months

4 Specify feeding difficulties None

5 Specify food preferences None

Case History and Information Form

G

Parent Information

Mother

1 Name

2 Age

3 Educational level

4 Occupation

5 Marital status

6 Area of residence (Suburb and Town)

Father

7 Name

8 Age

9 Educational level

10 Occupation

11 Marital status

12 Area of residence (Suburb and Town)

Thank you for completing the form, your co-operation is highly appreciated!



APPENDIX G

Declaration for the conservation of research data and/or documents

100
1903 - 2003



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UNIVERSITY OF PRETORIA
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FAKULTEIT GEESTESWETENSAPPE
NAVORSINGSVOORSTEL- EN ETIEKKOMITEE

Verklaring vir die bewaring van navorsingsdata en/of dokumente

Ek/Ons, die hoofnavorser(s) Me C. Malan
 en studieleier(s) Prof A. Kritzinger, Me S. Geertsema
 van die volgende studie, getiteld Comparing the oral language abilities of children with autism spectrum disorder and specific language impairment using the Comprehensive Assessment of Spoken Language (CASL)
 sal al die navorsingsdata en/of dokumente met betrekking tot die bogenoemde studie bewaar in die volgende
 departement: Departement van Sprak- en Taalpatologie en Audiologie

Ons verstaan dat die bewaring van die genoemde data en/of dokumente vir minstens 15 jaar vanaf die begin van die studie moet geskied.

Begindatum van studie: 01/01/2013
 Voorsiene einddatum van studie: 01/01/2015
 Tot watter datum data bewaar sal word: 01/01/2028

Naam van Hoofnavorser(s)	Handtekening	Datum
Me C. Malan	<i>C. Malan</i>	06.08.2013

Naam van Studieleier(s)	Handtekening	Datum
Prof A. Kritzinger	<i>A.M. Kritzinger</i>	06.08.2013
Me S. Geertsema	<i>S. Geertsema</i>	06.08.2013

Naam van Departementshoof	Handtekening	Datum
Prof B. Vinck	<i>B. Vinck</i>	06/08/2013